Australian Government
Bureau of Meteorology

Annual Report 2023–24

Trusted, reliable and responsive weather, water, climate, ocean and space weather services for Australia–all day, every day.

Bureau of Meteorology summary

The Bureau of Meteorology

Our vision

To be an organisation of global standing, that is highly valued by the community for our pivotal role in enabling a safe, prosperous, secure and healthy Australia.

Our purpose

To provide trusted, reliable and responsive weather, water, climate, ocean and space weather services for Australia – all day, every day.

Key activities

- Community Services
- Business Solutions
- Data and Digital
- Science and Innovation
- Enterprise Services
- the Australian Climate Service

Capabilities

- Relationships
- People
- Data and technology
- Asset management and sustainment

Government, industry and the Australian community

Our outcome

Enabling a safe, prosperous, secure and healthy Australia through the provision of weather, water, climate, ocean and space weather services.

Benefits

- Public safety
- Community wellbeing
- Economic prosperity
- National security
- Environmental health

Our Strategy

Impact and value

Products and services that enhance the wellbeing of all Australians.

Operational excellence

Outstanding people supported by secure, effective and resilient systems, processes and technology.

Insight and innovation

Practical implementation of novel, mission-directed solutions for our customers.

The Bureau way

One enterprise that lives its values through agreed behaviours every day.

Letter of transmittal

Australian Government
Bureau of Meteorology

Office of the CEO

The Hon Tanya Plibersek MP
Minister for the Environment and Water
Parliament House
CANBERRA ACT 2600

Dear Minister

As the Accountable Authority for the Bureau of Meteorology (the Bureau) and the Australian Climate Service, I am pleased to present the Annual Report of the Bureau of Meteorology, including the report of the Australian Climate Service, for 2023–24. The report details our ongoing efforts to provide trusted, reliable and responsive weather, water, climate, ocean and space weather services for Australia – all day, every day.

The report has been prepared in accordance with Section 46 of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) which requires that you present the report to the Parliament. It includes the Bureau's audited financial statements as required by Section 43(4) of the PGPA Act.

In accordance with Section 10 of the *Public Governance, Performance and Accountability Rule 2014*, I certify that:

- the Bureau has a fraud risk assessment and fraud control plan
- the Bureau has appropriate fraud prevention, detection, investigation, recording and reporting mechanisms that meet its needs
- that all reasonable measures have been taken to deal appropriately with fraud relating to the Bureau.

Yours sincerely

Dr Andrew Johnson PSM FTSE FAICD
CEO and Director of Meteorology

2 October 2024

Brisbane Office | GPO Box 413, Brisbane QLD 4001 Australia | T: +61 7 3239 8700 | www.bom.gov.au | ABN 92 637 533 532

Acknowledgement of Country

The Bureau acknowledges the Traditional Owners and Custodians of Country throughout Australia and acknowledges their continuing connection to land, water, sky, and community.

We pay respects to Elders past and present, and acknowledge and celebrate the unique living cultural knowledge and practices of Aboriginal and Torres Strait Islander peoples as essential to connection, protection and caring of Country.

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The Bureau at a glance

Our purpose

Our purpose is defined by our mission:

To provide trusted, reliable and responsive weather, water, climate, ocean and space weather services for Australia – all day, every day.

To achieve our purpose – across the domains of weather, water, climate, oceans and space weather – we:

- monitor and report on current conditions
- provide forecasts, warnings and long-term outlooks
- analyse and explain trends
- foster greater public understanding and use of the information we provide
- continue to extend our understanding of, and ability to forecast, Australian conditions.

Our vision

Our vision is:

To be an organisation of global standing, that is highly valued by the community for our pivotal role in enabling a safe, prosperous, secure and healthy Australia.

Our strategy

Guided by the Bureau's Strategy 2022–2027, our work is focused on 4 pillars of success:

Impact and value

Products and services that enhance the wellbeing of all Australians.

Operational excellence

Outstanding people supported by secure, effective and resilient systems, processes and technology.

Insight and innovation

Practical implementation of novel, mission-directed solutions for our customers.

The Bureau way

One enterprise that lives its values through agreed behaviours every day.

Authority

The Bureau operates under the authority of the *Meteorology Act 1955* and the *Water Act 2007*. The Bureau is an Executive Agency under the *Public Service Act 1999*, and a non-corporate entity under the *Public Governance, Performance and Accountability Act 2013*. The *Meteorology Act 1955* requires the Bureau to fulfil Australia's international obligations under the Convention of the World Meteorological Organization (WMO) and related international treaties and agreements.

Portfolio and ministers

At 30 June 2024, the Bureau operated within the Climate Change, Energy, the Environment and Water Portfolio reporting to the Minister for the Environment and Water, the Hon Tanya Plibersek MP.

Senator the Hon Jenny McAllister, Assistant Minister for Climate Change and Energy, was the Minister responsible for the Australian Climate Service.

Funding

The Bureau receives the majority of its funding from the Australian Government ($362.3 million in 2023–24). Additional revenue ($118.6 million in 2023–24) was derived from other sources, including the sale of goods and services. More information is provided in the Financial resource management chapter (p.193) and in the Climate Change, Energy, the Environment and Water Portfolio Budget Statements 2023–24.

Under the Portfolio Budget Statements, the Bureau is responsible to the Australian Government for Program 1.1 – Bureau of Meteorology, and for delivering the following outcome:

Enabling a safe, prosperous, secure and healthy Australia through the provision of weather, water, climate, ocean and space weather services.

Top: Hazard Preparedness and Response Queensland Manager Laura Boekel speaking at a press conference for tropical cyclone Jasper in Brisbane.

Bottom: Technical Officer Garry O'Sullivan unpacking tender from an offshore trip at Cable Beach in Broome, Western Australia.

Our staff

At 30 June 2024, the Bureau had 2,334 total staff, including 1,711 ongoing staff, 171 non-ongoing staff, and 452 contractors, as well as over 3,100 volunteer observers who help maintain Australia's climate record. More information can be found in the People management chapter (p.172).

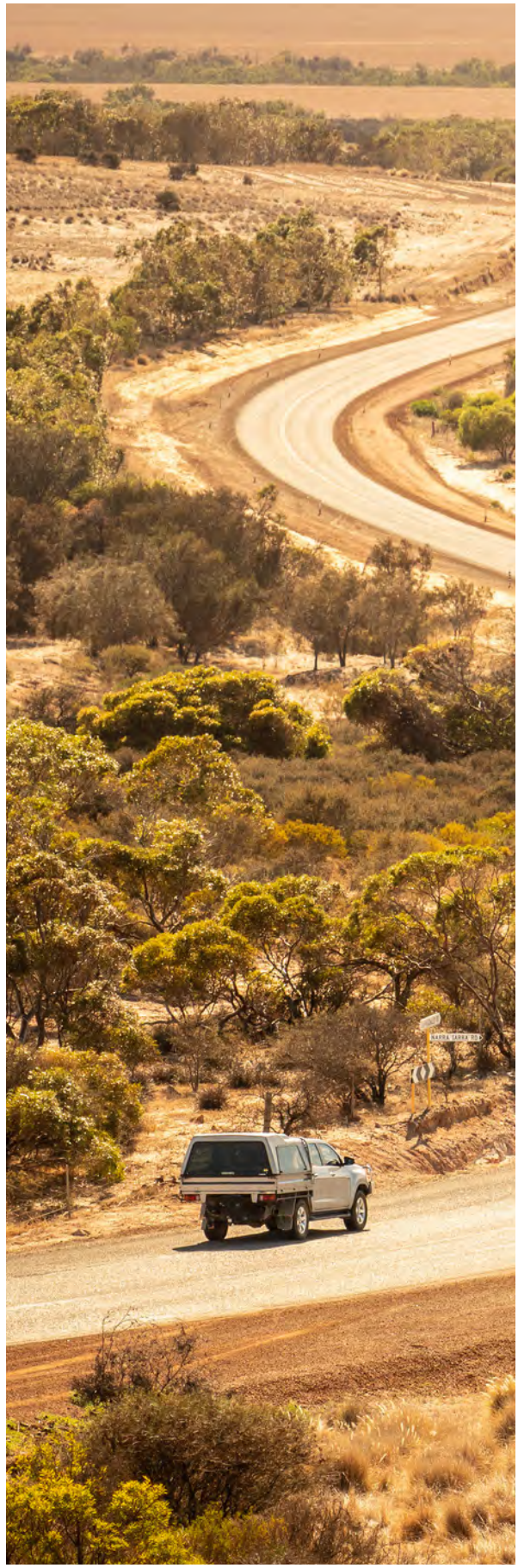
Bureau staff are located across Australia, on remote islands and in Antarctica. We observe and forecast from the Antarctic to north of the equator, and from the Indian Ocean to the Pacific. More information on the location of our staff and services is provided in the Agency overview (p.28).

Our values

The values that guide our behaviours are:

- safety
- integrity
- customer focus
- passion and tenacity
- responsibility
- humility.

More information on the Bureau's values can be found in the Agency overview (p.28).



The impact and value of our work

The Bureau is entirely focused on providing products and services that enhance the wellbeing of all Australians. Here are some of the ways the Bureau contributes to a safe, prosperous, secure and healthy Australia.

Our severe weather forecasts and warnings

- alert Australians to protect themselves and their property from severe weather such as tropical cyclones, thunderstorms and damaging winds
- enable communities to prepare for and respond to the effects of heavy rainfall including flash flooding
- support emergency services agencies to carry out effective emergency and disaster preparation, response and recovery.

Our flood watches and warnings

- alert Australians to protect themselves and their property from riverine flooding
- enable communities to prepare for and respond to the effects of flooding, including making timely evacuations
- support emergency services agencies to carry out effective emergency and disaster preparation, response and recovery.

Our fire weather forecasts and warnings

- alert Australians to weather conditions conducive to the spread of dangerous bushfires
- help state and territory fire agencies predict fire conditions and make decisions about total fire ban days and bushfire warnings
- allow emergency services to pre-position personnel and equipment to minimise fire damage.

Our marine, ocean and Antarctic services

- support safe navigation of Australia's local and coastal waters and high seas
- alert Australians to tsunamis, dangerous winds, waves, tides, currents and surf conditions
- support ports and shipping operations, fishing and aquaculture industries
- support safe and efficient operation of offshore infrastructure such as windfarms and oil and gas platforms
- support the Australian Antarctic Program and safe and efficient aviation, marine and land operations in Antarctica and the Southern Ocean.

Our aviation and defence forecasts and warnings

- facilitate safe and efficient aviation sector operations
- inform flight planning and fuel load decisions
- provide alerts on hazardous weather and atmospheric conditions such as turbulence and volcanic ash
- support Australia's defence operations in Australia and overseas including anticipating global climatic events.

Our UV forecasts and heatwave warnings

- help Australians avoid dangerous UV exposure, to protect against skin cancer
- help protect vulnerable Australians against heat exhaustion and heatstroke
- alert health authorities to periods of heightened demand
- allow energy operators to prepare for increased power demand.

Our climate monitoring, maps and information

- support situational awareness by providing a clear picture of current and antecedent conditions with climate context
- help Australians understand the nation's climate patterns, trends and variations, and climate-related risks
- support natural resource managers to respond to climate risks and opportunities
- inform solar, wind and hydropower installations and production potential
- support insurance claims processes
- support the development of climate-appropriate infrastructure.

Our water and environmental information services

- underpin water planning, efficient water use and water operations
- guide investment in and maintenance of water infrastructure, and aid decision-making in water supply and irrigation activities
- provide transparency to communities and water users around water management and trade
- support ecosystem management.

Our long-range forecasts

- allow emergency managers to tactically prepare themselves and their communities ahead of flood, bushfire and tropical cyclone seasons
- allow the finance sector to price climate risk at seasonal timescales
- help the water sector manage water resources
- help farmers make decisions about crop planting, fertiliser application and stock management
- help retailers and tourist operators to tailor their activities to seasonal variations.

Our everyday weather forecasts

- help Australians plan their everyday activities, from the daily commute, sporting and outdoor activities, to hanging out washing
- support activities in the construction and transport industries
- help tourism operators and event managers optimise their activities and events, and prepare contingencies when required.

Our space weather forecasts

- help defence, aviation, energy, emergency services, and space industries to manage and mitigate the impacts of space weather
- help Australians understand how space weather can significantly disrupt the technology that underpins our energy, transport, communication, navigation and financial systems.

2023–24 snapshot

Eye on the environment

70
weather radars

657
automatic weather stations

13
wind profilers

38
upper air balloon stations

~1,100
flood warning stations

~3,100
volunteer rainfall observers

43
sea level stations

41 wave buoys operated by the Bureau and its partners

79
drifting meteorological buoys

6 deep ocean tsunameter stations

7
ozone monitoring sites

13 terrestrial solar radiation monitors

22 space weather observation stations

6
satellite ground stations

30+ satellites operated by international partners

What we delivered

~680,000
routine public forecast products

176,000+
marine safety broadcasts

17,448
weather and ocean warnings

2,303
flood watches and warnings

4,262 incident weather forecasts to support fire-fighting activities

1.5 million
aviation forecast products

726 briefings to the Australian Government's National Situation Room

~500,000
climate graphs and charts

173 peer-reviewed scientific journal articles published

582 long-range forecast, seasonal outlook and climate risk briefings

268 locations in the seasonal streamflow forecasts service

The reach of our services

1 million+
Facebook followers

790,000+
X (formerly Twitter) followers

196,000+
Instagram followers

13.9 million
total BOM Weather app downloads (since launch)

2.5 million
BOM Weather app downloads (during 2023–24)

654 million
visits to the Bureau's website (during 2023–24)

6,680
media enquiries

250+
media releases issued

~99% of the population covered by a Bureau radar

~91% of the population within 20 km of a Bureau automatic weather station

Our service highlights

98.8% uptime of automatic weather stations

96.8%
weather radar network availability

98.3%
satellite network availability

99.9% production availability of the Australis supercomputer

Top 5 performance of ACCESS among global forecasting models

16 minutes
average time from earthquake to tsunami bulletin

Top ranked
free weather app in Australia in both the Apple and Google Play stores

85% of users satisfied with the BOM Weather app

+43 Net Promoter Score for community customers

+45 Net Promoter Score for emergency management customers and partners

How we performed

The Bureau's performance is measured against 12 strategic success measures. For each measure, a critical assessment determines whether the Bureau's performance met expectations, partially met expectations or did not meet expectations. For more information see the Annual Performance Statement (p.33).

Impact and value

The financial and social value we deliver to government, industry and the Australian community.	Performance met expectations
The levels of satisfaction and trust our customers and partners have in us and the way we interact with them.	Performance met expectations
The utilisation of our services by new customers and existing customers.	Performance met expectations

Operational excellence

Our delivery against agreed customer requirements and commitments.	Performance met expectations
Capacity utilisation, system reliability, security and resilience benchmarked against best practice.	Performance met expectations
Verification of our products and services.	Performance met expectations

Insight and innovation

The depth, breadth and quality of our external partnerships and collaborations.	Performance met expectations
The conversion of ideas to opportunities to customer outcomes.	Performance partially met expectations
The quality and application of our research and development, benchmarked internationally.	Performance met expectations

The Bureau way

Our performance benchmarked internationally against work health, safety and environment best practice.	Performance met expectations
Individual and team actions demonstrate commitment to enterprise values and behaviours.	Performance met expectations
A diverse and inclusive workforce, that reflects the communities we serve.	Performance did not meet expectations

National weather event summary

July

7–8: A strong cold front and deep low pressure system brought damaging winds, localised heavy rainfall, hazardous surf, and snow on elevated areas across south-eastern Australia. More than 20 cm of snowfall was recorded in alpine areas of Victoria, Tasmania and New South Wales. High water levels in Port Philip Bay resulted in some coastal flooding.

13: Unusually mild overnight conditions in Tasmania saw many stations having their highest July daily minimum temperature on record, including Hobart with 13.0 °C (137 years of data).

20: Clear skies and light winds resulted in low daily minimum temperatures across southern and eastern parts of the country. Glen Innes Airport in New South Wales recorded a minimum temperature of -10.8 °C on 20 July. This was Australia's lowest temperature recorded in 2023.

23–27: Heavy rainfall impacted parts of Queensland's east coast and adjacent inland areas. Many stations around Queensland's Capricornia, Central and North Tropical Coast and Tablelands districts recorded 4-day rainfall totals of more than 100 mm, greatly exceeding their July average of between 25 and 50 mm.

31: Very strong north-westerly winds associated with a cold front impacted southern Tasmania, with several sites recording their highest daily wind gust for July or for any month. This included 200 km/h at Maatsuyker Island, 169 km/h at Scotts Peak Dam and 146 km/h at Low Rocky Point.

August

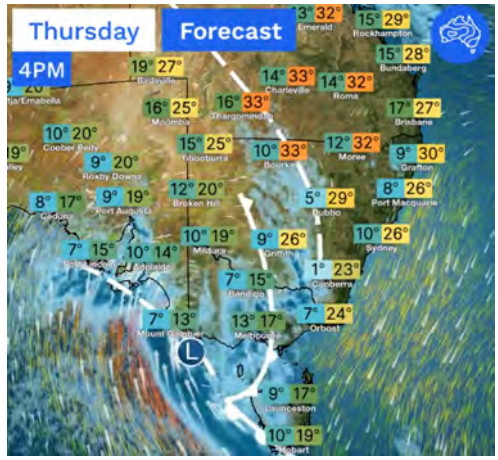
3: A strong cold front crossed south-west Western Australia generating strong winds and heavy rainfall. The Busselton coast was impacted with heavy rainfall and isolated thunderstorms. In the 24 hours to 9 am on 3 August, falls of 40 to 80 mm were recorded around Bunbury.

18: Warm conditions and strong winds across Queensland and northern New South Wales elevated Fire Danger ratings to High and Extreme. Fire Weather warnings were issued for parts of the Northern Territory and the north of Western Australia.

22: Severe thunderstorms impacted parts of New South Wales and the Australian Capital Territory, with storms lashing Canberra in the early evening. Severe thunderstorms hit areas of the Riverina district of New South Wales, bringing hail and strong winds.

September

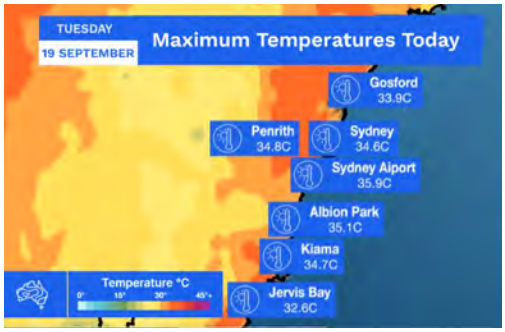
7–8: Severe winds affected broad areas of south-eastern Australia due to a strong cold front and low pressure trough. Maximum daily wind gusts greater than 100 km/h were recorded across elevated and coastal areas of Victoria and New South Wales. In Victoria there were reports of swells of more than 9 m at Port Fairy and 8 m at Portland.



13: A strong cold front and low pressure trough moved over southern Western Australia with damaging to locally destructive winds, severe thunderstorms and heavy rain that resulted in

flash flooding. In the 24 hours to 9 am, 91.4 mm of rain was recorded at Busselton Aero.

11-20: Unusually warm conditions developed across southern Australia during mid-September. On the 14 September many sites in elevated and alpine areas of Tasmania, Victoria and southern New South Wales set records for their highest maximum temperature for September. A low-to-severe intensity heatwave warning was issued for 17 to 20 September for the New South Wales South Coast. On 19 September Sydney (Observatory Hill) equalled its warmest September day on record with 34.6 °C.



October

4: A low pressure system and associated cold front moved over south-east Australia early in October and brought heavy rainfall, damaging winds, severe thunderstorms and showers. In the 24 hours to 9 am, many stations in Victoria had their highest October daily rainfall on record, including Mount Hotham which received 198.8 mm. Heavy rainfall led to flash flooding and widespread riverine flooding across north-eastern and eastern Victoria.

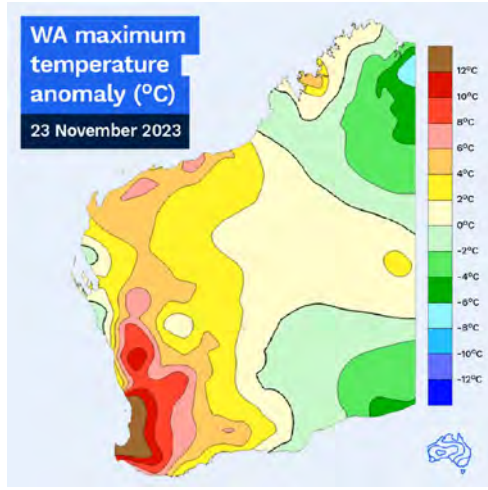
31: Dry and very warm weather with maximum temperatures close to 40 °C and gusty north-westerly winds elevated Fire Danger ratings to Extreme in the south-eastern interior of Queensland and eastern and northern parts of New South Wales. Smoke from ongoing fires led to periods of poor air quality across Queensland and New South Wales.

November

4: A low pressure system off the west coast, combined with inland troughs, generated hot, dry and locally windy conditions across Western Australia. Fire Danger ratings were High to Extreme, with Fire Weather warnings issued for parts of the Central West. Thunderstorms brought dry lightning, but little rain, to the south of the state.

4: Storms brought heavy rainfall and strong winds to many areas of New South Wales. More than 150,000 lightning strikes were recorded in north-eastern New South Wales, flash flooding impacted Sydney and a hailstorm at O'Connell reportedly covered the ground white. A reported waterspout near Swansea moved onto land as a weak tornado ('landspout').

20-27: The west coast of Western Australia, including Perth, was affected by a low-to-severe intensity heatwave, as a near stationary low pressure trough directed heat from the interior of the continent towards the west coast. Hot, dry conditions and strong winds across south-west Western Australia on 23 November resulted in Extreme to Catastrophic Fire Danger ratings.



21-30: Persistent daily showers and thunderstorms brought heavy rainfall over several days at many locations in southern Queensland and northern New South Wales leading to localised river rises across the southern interior. Between 27 and 30 November heavy rain, hail and lightning impacted South Australia, Victoria, New South Wales and Queensland as an upper level low pressure system merged with warm and moist air from the north. There was flash flooding in many Adelaide suburbs with more than 50 mm of rain falling in a few hours.

December

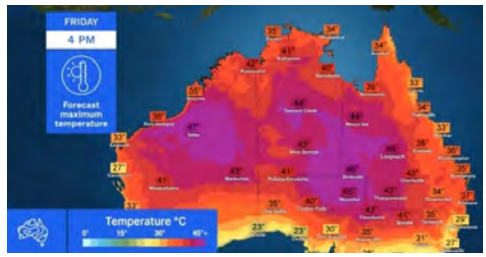
12: Extensive severe thunderstorms moved across south-east South Australia during the afternoon and brought lightning, hail, and damaging winds, with reports of a tornado at Millicent.

5-18: Tropical cyclone Jasper formed on 5 December from a tropical low near the Solomon Islands. The system tracked towards the Queensland east coast and made landfall near Wujal Wujal, 120 km north north-west of Cairns, as a category 2 system around 8pm AEST on 13 December.

Daily rainfall totals to 9am on 14 December were around 200 to 300 mm in the Cairns area, and 400 to 600 mm from Kuranda to the Daintree region. This resulted in moderate to major flooding along the Barron, Mossman and Daintree rivers. Ex-tropical cyclone Jasper then stalled for several days over the Cape York Peninsula. Many rain gauges across northern Queensland recorded more than 1,000 mm of rainfall over the 5-day period to 18 December, with totals at 3 gauges exceeding 2,000 mm. Cape Tribulation Store recorded 861.2 mm in the 24 hours to 9am 18 December, the third-highest daily rainfall total ever measured in Australia.

19-31: Low pressure troughs over inland Queensland and New South Wales – interacting with moist tropical air – generated thunderstorms along the east coast. Over 24-26 December, there were multiple severe thunderstorms over Brisbane and south-eastern Queensland bringing intense rainfall, flash flooding, damaging winds and reports of hail up to 15 cm in diameter. In the evening of 25 December, there were damaging to locally destructive wind gusts on the Gold Coast and Scenic Rim, resulting in a 3 to 4 km wide and 30 to 50 km long area of damage. Gold Coast Seaway recorded a maximum wind gust of 106 km/h, a December record for the site.

26-31: Much of northern and central Australia was affected by low-to-severe intensity heatwaves during the last week of December, including extreme heatwave conditions in north-west Western Australia. Roebourne Aero, in north-west Western Australia, had the highest temperature recorded in Australia in 2023 with 49.5° C on 31 December.



January

1-2: Humid and unstable weather in eastern Australia triggered thunderstorms and heavy rainfall across eastern Queensland and north-eastern New South Wales. The highest daily totals recorded to 9 am on 1 and 2 January respectively were 351.0 mm at Springbrook Road (Queensland) and 252.0 mm at Mt Tamborine (Queensland).

8: A broad band of rain with embedded thunderstorms moved across south-eastern Australia, bringing heavy rainfall to central Victoria and many stations had their highest January daily rainfall on record in the 24 hours to 9 am on 8 January. Flood warnings were issued for several catchments across Victoria, including major flood warnings for the Campaspe, Goulburn and Yea rivers.

10: Heavy rainfall from a tropical low and a monsoon trough, which stretched across the Top End of the Northern Territory to Cape York Peninsula in Queensland, resulted in widespread flooding in parts of northern Australia, including major flooding of the Herbert River at Gleneagle and Magnificent Creek at Kowanyama Airport in Queensland.

20-26: A widespread heatwave, with locally extreme conditions in parts of Western Australia's Pilbara, affected large parts of the country. Large areas of New South Wales, north-eastern South Australia and

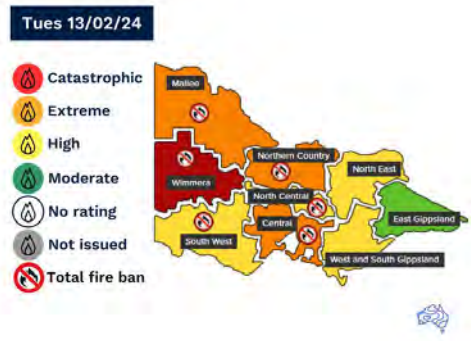
south-western Queensland had maximum temperatures above 40 °C. On 25 January, Birdsville Airport in Queensland recorded 49.4 °C, the second-highest temperature on record for Queensland. This was followed by a minimum of 36.4 °C in the 24 hours to 9am on 26 January, the second-highest minimum temperature on record for Australia.

24–25: Tropical cyclone Kirrily formed on 24 January in the Coral Sea and reached severe intensity (category 3) on 25 January. The system crossed the north Queensland coast as a category 2 system on the evening of 25 January just north of Townsville. After landfall, it continued moving south-west towards Queensland's interior and stalled over western Queensland bringing heavy rain and flooding.

29–31: Thunderstorms developed over south-eastern Queensland, with the heaviest rainfall north and west of Brisbane. The heavy rainfall led to areas of flash flooding, and some rivers and streams quickly reached major flood levels.

February

13: Victoria was impacted by a strong cold front that brought thunderstorms, some severe, dry lightning, locally heavy rainfall and hail, as well as damaging wind gusts. Several stations set records for February wind gusts and some approached or exceeded their annual record, including 130 km/h at Mount Gellibrand near Colac, and 122 km/h at Avalon Airport. Hot daytime temperatures combined with the strong gusty winds led to Victoria's worst fire weather conditions since 2019–20. Fire Danger ratings were elevated to Catastrophic for the Wimmera district and Extreme for the Mallee, Northern Country and Central districts.



16: Tropical cyclone Lincoln made landfall as a category 1 system west of the border between Northern Territory and Queensland and rapidly weakened below tropical cyclone intensity. The system brought gale force winds and heavy rainfall while moving west through central Northern Territory and northern Western Australia. Heavy rainfall resulted in renewed flooding across parts of north-western Queensland and north-eastern Northern Territory, as rain fell on already saturated rivers and creeks. Numerous flood warnings were issued, including major flood warnings for the Nicholson, Gregory and Flinders rivers in Queensland.

18–19: Extreme heatwave conditions impacted the western Kimberley in Western Australia, with several stations recording their highest daytime temperature for February or for any month. The most significant of the annual records included Carnarvon Airport with 49.9 °C (equal eighth-highest ever recorded in Australia) and Shark Bay Airport with 49.8 °C (equal tenth-highest ever recorded in Australia). Fire Danger ratings reached Extreme levels for parts of the south-west and south of the state.

19: Slow-moving thunderstorms developed around much of eastern New South Wales and south-eastern Queensland, bringing heavy rain that resulted in flash flooding at several locations and about 75,000 lightning strikes were recorded across Greater Sydney.

March

3: A cold front moved across Tasmania, bringing showers, damaging winds and daily maximum temperatures up to 6 °C below average in southern Victoria, Tasmania and

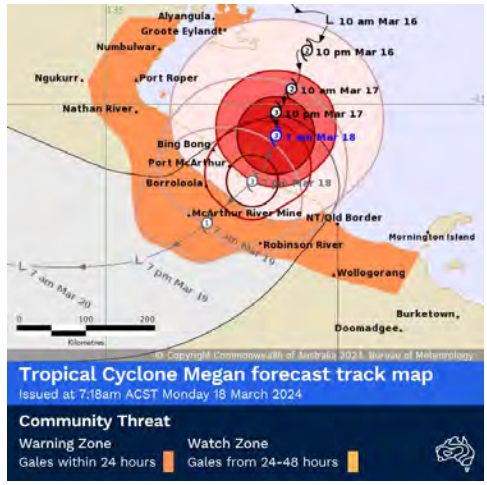
coastal parts of New South Wales. The first snowfall of 2024 settled on kunanyi / Mount Wellington in Tasmania.

8–11: Low-to-severe intensity heatwave conditions persisted for several days over most of southern South Australia, Victoria, Tasmania and parts of the New South Wales. Daytime temperatures peaked on 9 March, with temperatures 10 to 16 °C above the March average and a total fire ban was in place for parts of South Australia and Victoria.

9–12: Frequent showers, heavy rain and thunderstorms across inland areas of Western Australia triggered significant flooding through parts of southern and south-eastern Western Australia. Four-day rainfall totals were 2 to 5 times the March average of 20 to 30 mm across a large area of the state's interior.

11: A monsoon trough across the Top End of the Northern Territory and far north Queensland resulted in widespread showers and thunderstorms. Heavy rainfall impacted Queensland's North Tropical Coast where many stations recorded daily rainfall totals above 100 mm on multiple days. Heavy rainfall resulted in flash and riverine flooding across parts of northern Queensland, the Northern Territory and northern Western Australia.

16–19: Tropical cyclone Megan developed on 16 March bringing heavy rainfall to parts of the eastern Arnhem district of the Northern Territory. Groote Eylandt Airport received 431.0 mm in the 24 hours to 9 am on 17 March, its highest daily rainfall for any month. Megan reached severe intensity (category 3) on 17 March and made landfall around 4 pm AEST on 18 March on the south-western Gulf of Carpentaria coast about 45 km south-east of Port McArthur. Megan brought heavy rainfall and strong winds to coastal regions of the Northern Territory and Queensland and to several nearby islands. Borroloola Airport and McArthur River Mine Airport had daily rainfall totals of 256.6 mm and 274.4 mm respectively to 9am on 19 March, their highest daily rainfall for any month. This caused major flooding along the McArthur River at Borroloola, which exceeded the record flood level of 15.0 m from 2001.



25: Showers and thunderstorms impacted parts of central and southern Northern Territory, western and southern Queensland and north-western New South Wales as a low pressure trough brought moisture from ex-tropical cyclone Megan. Alice Springs Airport had a 3-day rainfall total (to 25 March) of 153.8 mm, nearly 5 times its March average.

April

2: A trough and associated cold front moved across Victoria and northern Tasmania bringing widespread showers and localised thunderstorms with heavy falls and strong damaging winds. In the 24 hours to 9 am on 2 April, 25 to 100 mm of rainfall was recorded across central and southern parts of Victoria and much of Tasmania.

4: A series of low pressure troughs drew tropical moisture south across Queensland, generating heavy rainfall across western and southern Queensland and caused widespread minor to major flooding that lasted for weeks as the water travelled south.

8: A cold front moved across southern South Australia, Victoria and Tasmania bringing cooler conditions. Snow was reported across New South Wales and Victoria, with 10 cm of snow falling around Perisher in New South Wales and several centimetres of snow across alpine areas of Victoria.

16: Parts of Queensland's tropical north received several days of heavy rainfall and isolated thunderstorms. The highest daily rainfall totals were recorded along the North

Tropical Coast and the Tablelands district in the 24 hours to 9 am on 16 April. This resulted in flash and riverine flooding with flood warnings issued including a moderate flood warning for the Daintree and Mossman Rivers.

May

5-6: A low pressure system combined with onshore flow brought heavy rainfall to coastal areas of New South Wales, with 50 to 100 mm of rainfall in the 24 hours to 9 am on 5 May across the Illawarra, Sydney Metropolitan and Hunter districts, with the highest rainfall totals of over 100 mm in the Illawarra district.

10: Western Australia's South West Land Division experienced strong winds, showers and severe thunderstorms from the passage of a trough ahead of a cold front. A tornado impacted Bunbury and surrounding suburbs.

10-11: The first planetary G5 level geomagnetic storm of solar cycle 25 was observed, the first since October 2003 in solar cycle 23. Multiple coronal mass ejections over this period caused extreme variations in the Earth's magnetic field and bright auroras were visible at unusually low latitudes, such as in New South Wales and Queensland. The maximum solar wind speed reached 994 km/s.

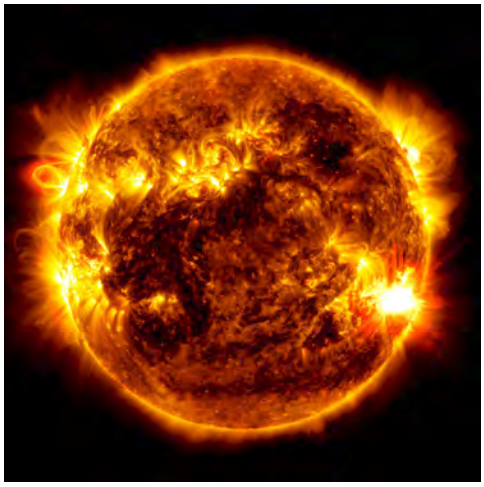


Image credit: NASA Solar Dynamics Observatory

29: A cold front moved across south-west Western Australia, accompanied by isolated thunderstorms with small hail, strong wind gusts and widespread rainfall. Wind gusts across the Perth Metropolitan region exceeded 100 km/h in some locations. There were reports of a waterspout off the coast in Dunsborough.

31: A cold front moved across south-eastern Australia, generating damaging winds gusts over elevated areas of southern New South Wales, Victoria and Tasmania. Several sites recorded wind gusts up to 100 km/h.

June

1-2: A coastal low off the New South Wales coast generated widespread rainfall across coastal and adjacent inland areas. In the 24 hours to 9 am on 2 June large areas of coastal New South Wales recorded rainfall of 15 to 50 mm. In Sydney, over 50 mm of heavy rainfall led to localised flash flooding and wave heights exceeded 5 m.

6-8: A low pressure system generated widespread rainfall and localised heavy falls across coastal and adjacent inland areas of New South Wales. Multi-day rainfall totals across Sydney, the Illawarra, Hunter and Southern and Central Tablelands exceeded 50 mm, with isolated falls over 200 mm in the Illawarra. Flood watches and warnings were issued for the coast from the Hunter to the South Coast districts including a moderate flood warning for the Hawkesbury and Nepean Rivers.

18-19: Clear skies and light winds from a high pressure system in the Great Australian Bight combined with a stationary low pressure system in the Tasman Sea generated minimum temperatures 2 to 6 °C below the June average for much of Victoria, New South Wales, Australian Capital Territory, Tasmania and Queensland. Areas in central Queensland were 6 to 10 °C below the June average on 18 June leading to large areas of morning fog and frost.

26-28: A low pressure trough extending over central and southern Queensland drew in moisture from the Coral Sea generating widespread and unseasonal rainfall across coastal and central areas. In the 3 days to 9 am on 28 June rainfall totals across the area were 25 to 100 mm. Most of the rain fell on 27 June when many sites received more than their average June total rainfall.

Section 1:

Overview

Review by the CEO and Director of Meteorology

Dr Andrew Johnson, PSM FTSE FAICD

I am delighted to present the Bureau's achievements for 2023–24. Once again, we have delivered on our mission to provide trusted, reliable and responsive weather, water, climate, ocean and space weather services for Australia – all day, every day.

This year we continued implementing our Strategy 2022–2027 (the Strategy) to deliver products and services that contribute in a material way to Australia's public safety, community wellbeing, economic prosperity, national security and environmental health.

Our Annual Performance Statement shows that we are continuing to meet expectations and we remain committed to applying our unique and important capabilities to serve the Australian community.

I am honoured to lead an organisation that delivers such crucial services to our communities, governments and industries. Throughout the year our customers, partners and stakeholders have provided positive and constructive feedback on the quality of our products and services, the professionalism, dedication and excellence of our staff, and the new technologies and channels we continue to implement. This feedback is crucial for identifying and prioritising how we improve our products and services to deliver impact and value for Australia.

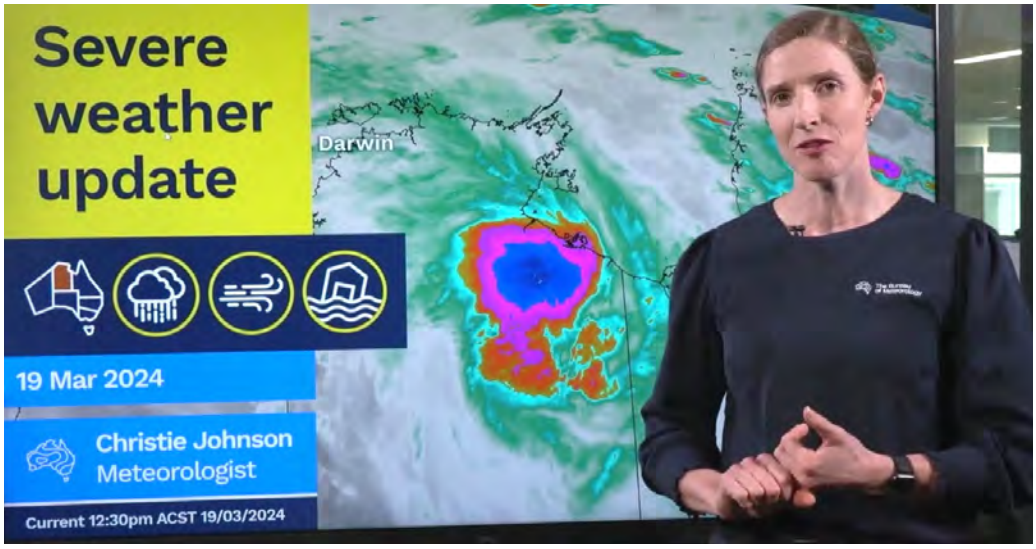
A year of contrasts and extremes

Australia experienced the full gamut of weather events in 2023–24, from tropical cyclones, storms and floods to bushfires and heatwaves. The Bureau worked closely with emergency services partners at all levels of government to keep the community informed of high-risk weather.

2023–24 was the second warmest financial year on record with a national mean temperature 1.31 °C above the 1961–1990 climatological average. Australia's overall rainfall was 14% above the 1961–1990 climatological average at 532.2 mm.

Despite the overall trends, temperature and rainfall patterns varied greatly across different parts of Australia at different times of the year. Rainfall was above average for much of northern Australia, and below average for much of the south. Even with above average rainfall overall, August to October was Australia's driest 3-month period on record since 1900. Western Australia had both its warmest spring and warmest summer on record since observations began in 1910. April was the only month during the year with below average temperature overall, and the coolest April nationally since 2015.

There were 8 tropical cyclones in the Australian region during the 2023–24 tropical cyclone season with 2 causing significant impacts on communities – tropical cyclone Jasper in north Queensland in December and tropical cyclone Megan in the Gulf of Carpentaria in March (see p. 60).



Meteorologist Christie Johnson provides a severe weather update on the flood risk and hazards to communities as ex-tropical cyclone Megan crosses the Northern Territory.

Most of Australia was affected by heatwaves in December and February, and Western Australia and central and southern parts of the country in late January. Bushfires affected parts of southern Western Australia throughout summer, while in February, there were significant bushfires in western Victoria and central Tasmania.

Significant flooding, associated with tropical systems, affected large areas of northern Australia during summer, while severe thunderstorm activity brought flooding to parts of the eastern and south-eastern mainland. In March, significant flooding affected large parts of central and eastern Western Australia, northern Queensland and the Northern Territory, associated with a monsoon trough and severe tropical cyclone Megan.

As we approach solar maximum, the peak of the Sun's solar cycle that occurs approximately every 11 years, increased levels of geomagnetic activity were recorded during the year, including the Earth's first extreme geomagnetic storm in 21 years.

Delivering more when it matters most

In 2023–24, we introduced several new and enhanced products and services to help deliver maximum impact and value for Australia.

Ahead of the severe weather season, the Bureau released a new 7-day forecast for tropical cyclones, providing more lead time and more detailed information to help emergency services and the Australian community better prepare (see p.69).

Our coastal hazard warnings were enhanced in response to stakeholder feedback and a new abnormally high tide warning was introduced in Victoria for consistency across Australia.

Identified through extensive stakeholder consultation, several flood warning service improvements were implemented that enable the Bureau to deliver more timely, targeted and relevant products and services to the emergency services and the Australian community (see p.70).

In support of community safety and health outcomes, 2023–24 saw 2 important developments: the release of the first phase of the Australian Smoke Dispersion System that predicts the likely distribution and concentration of smoke and pollutant emissions; and finalisation of the National Heatwave Warning Framework that establishes roles and responsibilities of the different levels of government, emergency and health agencies, across the end-to-end warning system.

In October, the Bureau assumed responsibility for the issuing of flood forecasts and warnings for sections of the River Murray in South Australia, aligning with Bureau services provided upstream in New South Wales and Victoria, and other rivers and catchments in South Australia (see p.58).

The Bureau continued to enhance its BOM Weather app – Australia's most widely used weather application that sees an average of more than 1.4 million users each day and has had 13.9 million total downloads since launch. New features added during the year include coastal hazard warnings, a summary of recent weather on the past weather screen and additional home screen widgets for iOS.

In June, we released a beta version of a new Bureau website with enhanced usability as well as improved security features. Customer feedback will be used to continue to refine and build the site in 2024–25.

The Bureau's beta test website gives the community the opportunity to experience improved features and provide feedback on the site.

Across the year, the Bureau has also delivered several initiatives that are supporting the productivity and competitiveness of Australian industries. This includes growing spaceflight capability to support emerging launch providers and operators, enhancing our decision support capability for the aviation sector and extending 'My Climate View' to support the agriculture industry with farmer-focused online climate information.

Delivering on our commitments

Throughout 2023–24, we have continued to meet our core obligations and deliver on the specific initiatives that have been entrusted to us.

On 30 June, we formally closed the ROBUST Program, a 7-year initiative to transform the security, stability and resilience of the Bureau's information and observing technologies. The program delivered a fundamental shift in the Bureau's operations, ensuring continuous availability of the Bureau's critical services (see p. 94).

In July, the Bureau commenced work on the 10-year national Flood Warning Infrastructure Network (FWIN) Program, established through the 2023–24 Budget to simplify ownership and improve maintenance of the flood network across Australia. Significant progress was made in engaging with the 64 Queensland councils in scope for the program and in piloting processes for remediating flood warning infrastructure in Australia's highest risk areas (see p. 79).

In accordance with the Bureau's expanded water information role under the *Water Amendment (Restoring Our Rivers) Act 2023*, and the Australian Government's Murray–Darling Basin Water Markets Reform Roadmap, the Bureau has commenced development of a new Water Data Hub and Water Markets website to enhance the transparency and availability of water markets data.

As one of the partners of the Australian Climate Service (ACS), and the host agency, the Bureau has supported the ACS in fulfilling its responsibilities for providing data, intelligence and expert advice on climate and natural hazard risks and their impacts to inform decision-making. Notable achievements for the year have been supporting the First Pass Assessment of Australia's climate risk and developing climate projections out to the end of the century (see p.124).

Transforming and modernising our operations

Several radars were replaced or upgraded during the year to provide enhanced weather surveillance capability. New radars were installed at Mackay, Toowoomba and Brisbane in Queensland and Gove in the Northern Territory. Two further radars – at Cairns in northern Queensland and at Carnarvon in the Gascoyne region of Western Australia – were upgraded with more advanced observing technology (see p.90).

We progressed a project to automate observing systems at capital city airports that will give the Bureau real-time 24-hour access to observations and enhance services to the aviation industry. We also implemented 2 new automatic meteorological balloon launching systems (AMBLS) in the Northern Territory to improve the Bureau's upper air observation capability as well as a new AMBLS at Clifton Beach in northern Queensland (see p.93).

Throughout 2023–24, the Bureau continued to develop and test new systems, tools and approaches that advance our Numerical Weather Prediction and modelling capability to deliver better weather, water, climate, ocean, space weather and Earth system information and insights for Australia. This included developing a prototype national storm-scale model for improved extreme weather prediction, developing probabilistic flood map capability, and enhancing hail prediction and rainfall guidance techniques.

We continue to apply our science and research capabilities in supporting our customers. This year, we have established an approach for efficiently developing site-based forecasts for energy

The new Toowoomba radar.

and resource sectors using machine learning. We have also been developing and applying world-leading solar and wind nowcasting and forecasting technologies into practical applications to assist Australia's energy transformation.

During the year we established an Artificial Intelligence (AI) Taskforce to investigate the potential of generative AI to transform the Bureau's public service delivery, enhance user experience and improve community outcomes. We also trialled the use of Copilot for M365 as part of a Digital Transformation Agency initiative to explore the safe and responsible use of generative AI.

Continuation of the Business Systems Transformation program delivered enhancements that are having a marked effect in streamlining the Bureau's financial and human resources systems and processes. The Bureau also implemented new project and portfolio management practices to ensure the Bureau is doing the right projects, at the right times, in the right way.

Growing our partnerships for increased impact

In November, the Bureau and Powerlink renewed their Strategic Relationship Agreement for another 3 years to support improved weather-related decision-making and in May, the Bureau signed a new Agreement with the Department of Defence to strengthen and streamline our collaboration with the Australian Defence Force.

Working with our Canadian counterparts, the Bureau delivered a pilot meteorological data sharing capability under the Meteorological Five Eyes (MET5) Community of Practice that supports the members of the Five Eyes intelligence alliance comprising Australia, Canada, New Zealand, the United Kingdom and the United States.

In February, the Bureau signed an agreement with the European Centre for Medium-Range Weather Forecasts on collaboration, data sharing and capability exchange programs that will help the Bureau to improve weather and climate modelling and research for Australians (see p.64).

In July, the Bureau's Hazards Services Forum endorsed the final report of the mid-term review of the Intergovernmental Agreement on the Provision of Bureau of Meteorology Hazard Services to the States and Territories. The Forum continues to facilitate important consultation with state and territory operational emergency service agencies.

The Bureau has continued to work with global and regional partners through various initiatives delivered in 2023–24, including capacity building, infrastructure installations, training and technology transfer.

Strengthening our workforce and culture

An important highlight of 2023–24 was the establishment of a dedicated First Nations Office to support the Bureau's vision for reconciliation (see p.115). Tasked with revising and leading the Bureau's Reconciliation Action Plan, the office has an important role in supporting the Bureau's First Nations employees and engagement with First Nations peoples and communities.

We continued to promote the diversity of the Bureau's staff through recognising and celebrating a range of events that support inclusion and raise awareness about different cultures, abilities and backgrounds. Ongoing health and safety and training activities continued to support the Bureau's workforce in an inclusive, safe, secure and flexible working environment. We continued to promote STEM careers through our STEM Ambassadors and Introduction to Meteorology courses.

Financial results

The Bureau reported a net cash operating deficit of $41.5 million for 2023–24. This deficit is largely due to pressure across the expense base, driven by resource costs and increased communication and consumable costs associated with running the observation network, software licences, maintenance and Information Technology (IT) service delivery costs reflecting transition and implementation of IT transformation projects. The loss was funded from prior year appropriation and a range of saving measures have been implemented to manage costs into the 2024–25 financial year.

Total income for the Bureau in 2023–24 was $480.9 million. This is an increase of $33.5 million compared to 2022–23.

Revenue from Government was $362.3 million in 2023–24, which was $16.8 million higher compared to 2022–23. Own-source income was $118.6 million, an increase of $16.7 million compared to 2022–23. This was largely related to the aviation sector where cost recovery arrangements were reinstated following a period of supplementation from government due to the COVID-19 pandemic.

The Bureau's operating expenditure for 2023–24 was $633.6 million, an increase of $62.1 million (11%) compared to 2022–23.

Outlook for 2024–25

In 2024–25, we will seek to build upon what we have achieved in 2023–24 while we navigate a challenging fiscal environment as cost of living and inflation continue to increase the cost of doing business. We will continue to implement actions under our Strategy 2022–2027 to ensure we provide trusted, reliable and responsive weather, water, climate, ocean and space weather services for Australia – all day, every day.

To deliver impact and value to our customers, we will:

- continue to provide high-quality, accessible, timely products and services to Australian communities, industries and governments
- provide customers with simple, intuitive, trusted and reliable digital experiences that deliver the Bureau's products and services, including through the new Bureau website
- work with the Australian community and emergency management partners to establish future warning enhancements
- implement projects to increase the frequency of our routine forecasts, including through the Forecast Improvement Delivery Stream initiative

- help the nation to understand and respond to a changing climate, including by uplifting our seasonal climate communications
- begin physical remediation of flood warning infrastructure in Queensland under the Flood Warning Infrastructure Network (FWIN) program
- deliver water information to underpin national water security and supply services, and work in collaboration with the energy sector to support renewable energy systems and emissions reduction.

To maintain and enhance our operational excellence, we will:

- ensure the safety, security, resilience, and relevance of our core operations, including through implementation of the ROBUST Transition Program of works and ongoing application of Essential 8 mitigation strategies
- continue delivery of key technology commitments, including through the upgrade of our high performance computing capability and provision of new data centres
- migrate the Bureau's high-performance computing Earth system models to our new supercomputer, with effective disaster recovery capability
- strengthen our financial management, governance and resilience
- leverage automation and business intelligence to optimise our operations
- continue to embed and mature our lifecycle, product, program and project management capabilities.

To develop and apply insight and innovation, we will:

- leverage emerging technologies and our deep scientific capability to keep pace with the evolving needs of customers, including through continued exploration of artificial intelligence and machine learning
- continue to implement enhancements to our forecasting models, and embed and mature our forecast verification approaches
- continue to strengthen our partnerships and collaborations, including with peer meteorological and hydrological agencies and academia.

To enact and embed the Bureau way, we will:

- ensure the Bureau remains an employer of choice, recognising the needs of our people and equipping them with the tools, skills and opportunities to grow and excel
- maintain an ongoing focus on the health and wellbeing of our people, and further mature our safety culture and work health and safety practices
- retain a strong commitment to the respect of First Nations peoples and cultures and work to ensure our workforce reflects the diversity of the community we serve
- continue to build a customer-focused enterprise culture
- embed stewardship as part of the Bureau's values and behaviours.

Agency Overview

Role and functions

The Bureau of Meteorology (the Bureau) is Australia's national weather, climate and water agency and one of the few organisations in Australia that touches the lives of all Australians every day. Since 1908, the Bureau has proudly provided products and services that contribute to economic prosperity, public safety and community wellbeing. These services include observations, forecasts, warnings, analyses and advice covering Australia's atmosphere, water, ocean and space environments.

Our expertise supports governments, emergency services and industry to make informed decisions and assists Australians to live safely and productively within their natural environment.

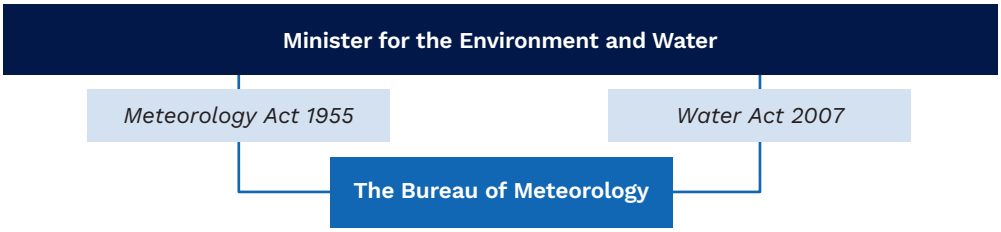
The knowledge of, and insights into, Australia we have gained over this period are unique and irreplaceable. For more information on how the Bureau meets its obligations to the Australian community, see the Corporate responsibility chapter (p.154).

Authority

The Bureau operates under the authority of the *Meteorology Act 1955* and the *Water Act 2007*, which together provide the legal basis for its activities. The Bureau must also fulfil Australia's international obligations under the Convention of the World Meteorological Organization (WMO) and related international meteorological treaties and agreements.

The Bureau is an Executive Agency under the *Public Service Act 1999* (Public Service Act) and a non-corporate Commonwealth entity under the *Public Governance, Performance and Accountability Act 2013* (PGPA Act). Under the Public Service Act, the Director of Meteorology has the powers and responsibilities of an Agency Head.

At 30 June 2024, the Director of Meteorology reported to the Minister for the Environment and Water, the Hon Tanya Plibersek MP.

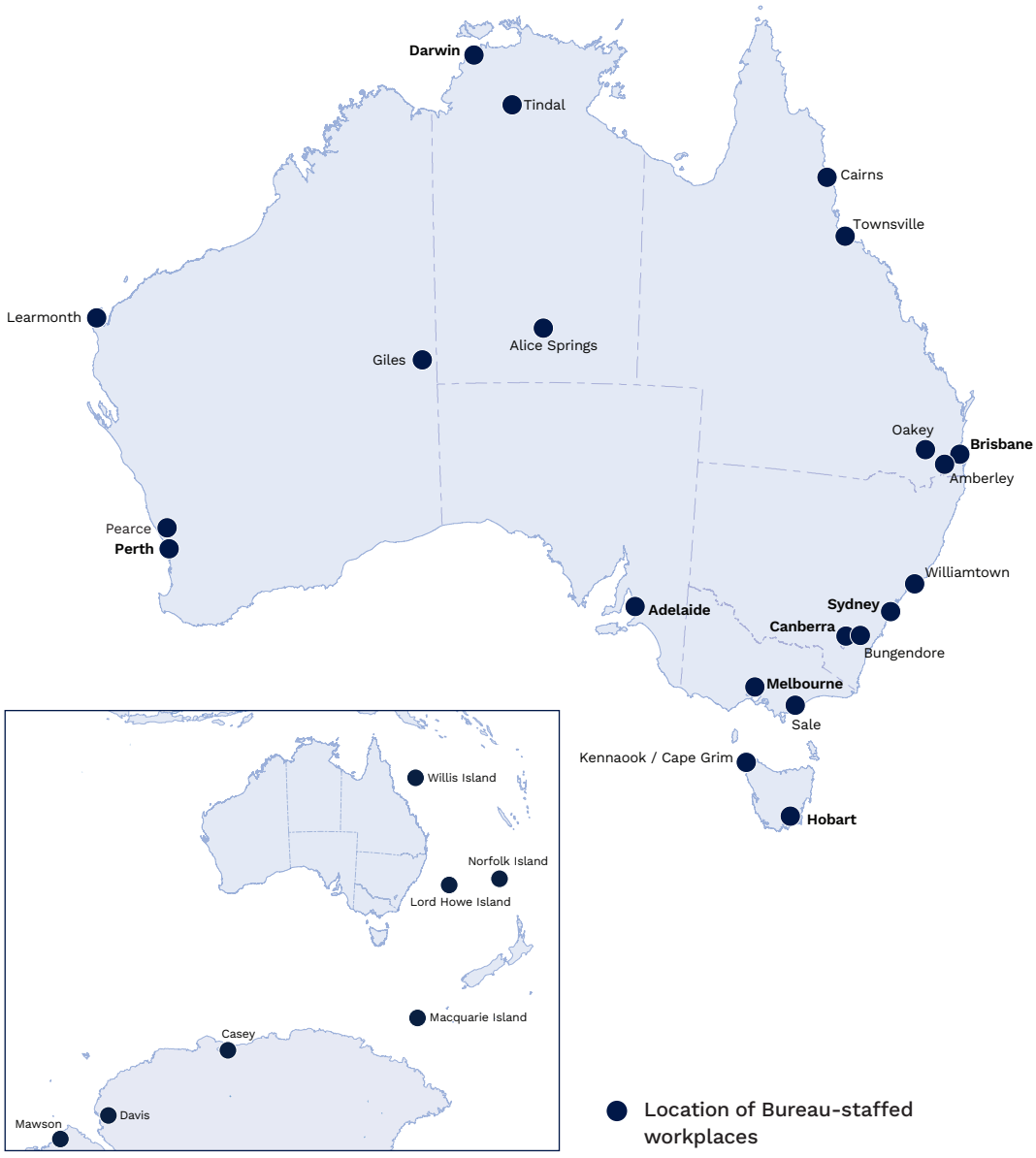


At 30 June 2024, the Bureau operated within the Climate Change, Energy, the Environment and Water Portfolio reporting to the Minister for the Environment and Water.

Location

The Bureau's services span the Australian region encompassing the mainland, Tasmania, Australia's offshore islands and territories (including the Australian Antarctic Territory), and the surrounding oceans and seas. Some Bureau services have greater reach. For example, the Bureau's Volcanic Ash Advisory Centre covers volcanically active regions of Indonesia, Papua New Guinea and the southern Philippines. As a partner in the Joint Australian Tsunami Warning Centre, the Bureau also provides threat information to National Tsunami Warning Centres in Indian Ocean countries.

Bureau staff are located across Australia, on remote islands and in Antarctica.



Organisational structure

For 2023–24, the Bureau was structured into 5 Groups, each with defined accountabilities and responsibilities. The Bureau's CEO and Director of Meteorology was also the Accountable Authority for the Australian Climate Service. The Corporate governance chapter provides more detail on the Bureau's governance arrangements and an organisational chart (p. 139).

Staff

At 30 June 2024, the Bureau had 2,334 total staff, including 1,711 ongoing staff, 171 non-ongoing staff, and 452 contractors. Many staff work around the clock to provide monitoring, forecast and warning services 24 hours a day, every day of the year. Detailed information on the Bureau's staff and the management of human resources is provided in the People management chapter (p. 172).

Values

In delivering products and services to its customers, Bureau staff individually and collectively uphold the Australian Public Service values of impartiality, commitment to service, accountability, respectfulness and ethical conduct. These values guide our behaviours and how we treat our customers, our partners and each other. The Strategy builds on this, outlining Bureau-specific values and behaviours:

Safety

We are committed to actively improving the health and wellbeing of our people and strive for zero harm.

Integrity

Our integrity is founded on trust, honesty and reliability.

Customer focus

We listen to our customers, understand their needs and are invested in their success. We strive to provide them with an outstanding experience. We are a pleasure to work with and can be relied upon to deliver.

Passion and tenacity

We are proud of our heritage, who we are, what we do and where we are headed. We deliver in times of crisis. Our deep commitment to our nation's wellbeing drives our success.

Responsibility

We understand and accept our responsibilities. We learn from success and failure. We hold each other to account for our actions and results.

Humility

We are humble in our dealings with each other and our customers. We help each other and operate as one enterprise.

Customers, partners and stakeholders

The Bureau works with a broad range of customers, partners and stakeholders across all sections of the community, and provides special services to an extensive range of Commonwealth, state and local government departments and agencies. These services support emergency management (including prevention, preparedness and response), agriculture, aviation, land and marine transport, energy and resources operations, climate policy, water management, defence and foreign affairs.

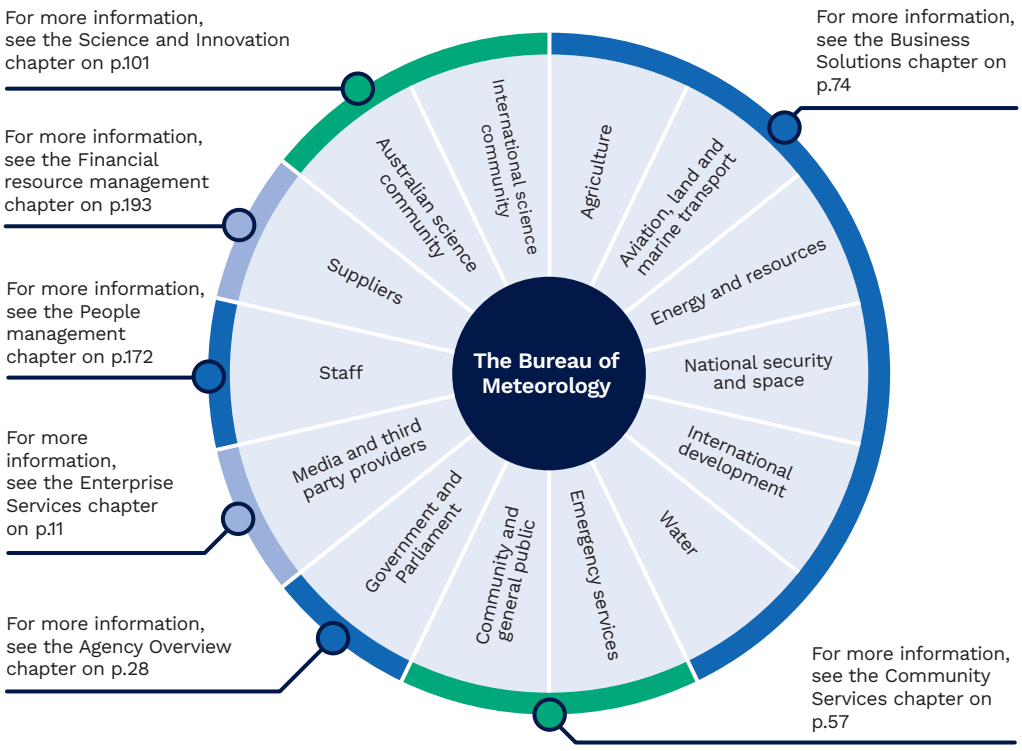
Across almost all sectors of the economy, the Bureau's weather, water, climate, ocean and space weather services support business decisions – from planting to harvesting, excavation to construction, logistics and operational planning. Sector-specific applications of the Bureau's products and services are essential for the safe and efficient operation of many industries (e.g. aviation) that have flow-on benefits for all Australians.

Every day, millions of Australians use the Bureau's information to help make decisions about activities that are affected by the weather. In emergency situations, the Bureau's services enable individuals, families, businesses and communities to make informed decisions about evacuating or preparing themselves for potential or imminent danger.

The national and international meteorological and scientific community is another vital partner, as cooperation through sharing global weather observations and research efforts is an essential and integral part of the Bureau's operations.

Other Bureau stakeholders include government ministers and the Parliament, the Australian science community, the media, staff and suppliers.

For information on engagement and outreach activities, refer to the Corporate responsibility chapter (p. 154).



The Bureau's primary stakeholders.

Section 2:

Annual Performance Statement

Introductory statement

I, Andrew Johnson, as the Accountable Authority of the Bureau of Meteorology present the Bureau's 2023–24 Annual Performance Statement as required under paragraph 39(1)(a) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act). In my opinion, the Bureau's Annual Performance Statement accurately reflects the Bureau's performance in achieving its purpose for the year ended 30 June 2024 and complies with subsection 39(2) of the PGPA Act.

Dr Andrew Johnson PSM FTSE FAICD
CEO and Director of Meteorology

2 September 2024

Performance Framework

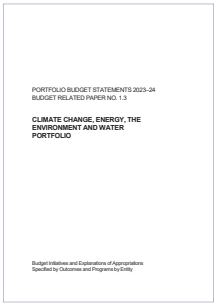
The Bureau operates within the enhanced Commonwealth performance framework in accordance with the PGPA Act.

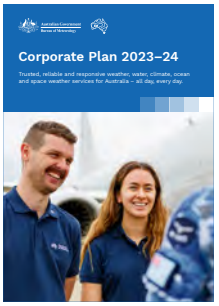
In 2023–24, resources were provided to the Bureau through the Government Budget as documented in the Portfolio Budget Statements (PBS) for the Climate Change, Energy, the Environment and Water Portfolio. This states the outcome of the Bureau and includes high-level performance requirements. The 2023–24 PBS for the Climate Change, Energy, the Environment and Water Portfolio are available at: https://www.dcceew.gov.au/about/reporting/budget.

To provide more detail, the PGPA Act requires each Commonwealth agency to produce a corporate plan at the beginning of the reporting cycle that sets out its purpose, strategies for achieving its purpose and how success will be measured. The Bureau's purpose, as defined by its mission, is to provide trusted, reliable and responsive weather, water, climate, ocean and space weather services for Australia – all day, every day. The Bureau's Corporate Plan 2023–24 is available online at: http://www.bom.gov.au/inside/Bureau_of_Meteorology_Corporate_Plan_2023-24.pdf.

At the end of the reporting cycle, agencies are required to produce an annual performance statement and assess the extent they have succeeded in achieving their purpose. The Bureau's performance is measured using the 12 success measures outlined in its Corporate Plan 2023–24.

This section reports on the Bureau's results for 2023–24 against the purpose and performance criteria published on pages 19-23 of the Bureau's Corporate Plan 2023–24 and on pages 137-158 of the 2023–24 PBS for the Climate Change, Energy, the Environment and Water Portfolio.





2023–24 performance

May 2023

Portfolio Budget Statements 2023–24

1 July 2023

Corporate Plan 2023–24

30 June 2024

Annual Report 2023–24
Annual Performance Statement

Measures of success

The Bureau measures its performance using 12 success measures, summarised below. These measures cover all aspects of the organisation's operations and are structured against the 4 pillars in the Bureau's Strategy.

Analysis of performance against agency purpose

For 2023–24, the Bureau performed satisfactorily against the performance indicators identified in its Corporate Plan, as detailed in the performance results. The Bureau's performance met expectations against 10 measures, partially met expectations against one measure and did not meet expectations for one measure, indicating that the Bureau has been largely successful in delivering its priorities and planned achievements for the year in line with its purpose.

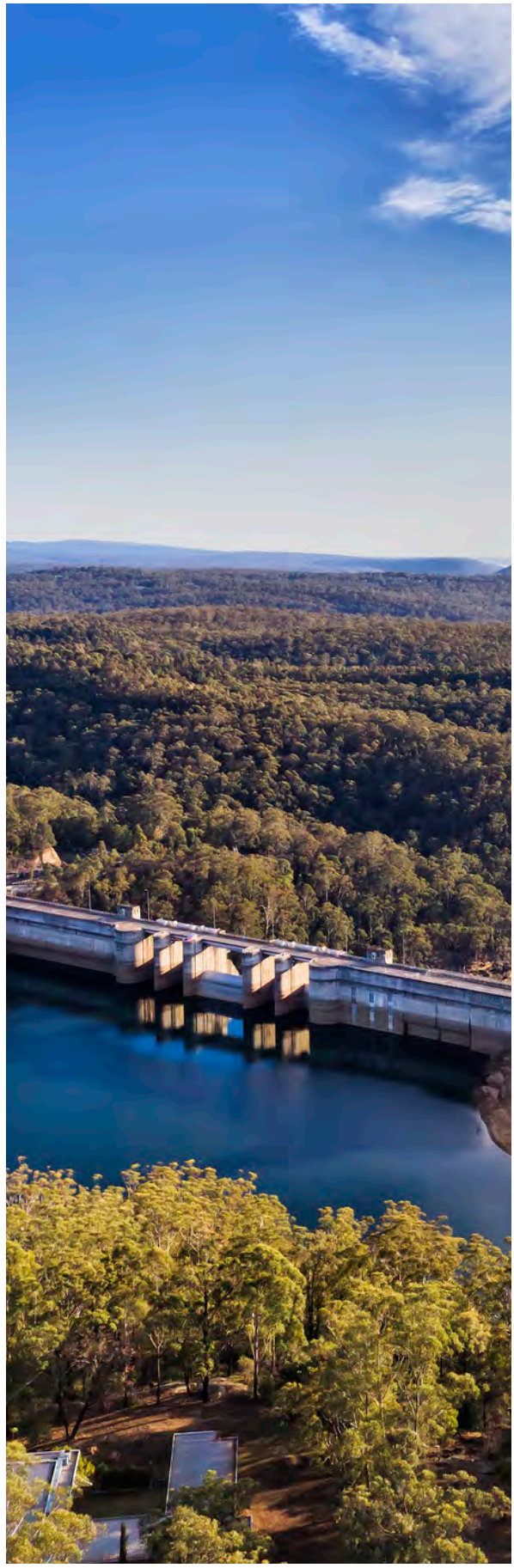
The Bureau's performance results were achieved in the context of a challenging and dynamic operating environment. This is likely to continue for 2024–25 and the outlook period (2025–26 to 2027–28) as the Bureau seeks to continues to amplify and accelerate the value it provides to Australian communities, industries and governments.

Important challenges and opportunities affecting the Bureau's performance include:

- meeting the growing demand for more actionable and location-specific forecasts and warnings
- meeting the growing demand for future hazard risk information, in the context of future climate projections
- uplifting the Bureau's data practices to ensure data and information is in standard, easily accessible and customisable formats
- balancing customer needs and expectations with rising costs and budget constraints
- responding to Australia's growing investment in renewable energy and the sector's reliance on weather forecasts to maximise productivity
- monitoring and adapting to continued growth in mobile applications, and an increasing appetite for personalised, comprehensive and real-time data
- exploring and leveraging opportunities offered by exponential increases in data volumes, including potential insights from big data, generative artificial intelligence and numeric artificial intelligence
- identifying, harnessing and operationalising advances in science and technology into effective products and services
- engaging appropriately with rapid growth of generative artificial intelligence model uptake, including conversational 'chat services'
- ensuring the Bureau remains an expert, authoritative and trusted source of weather and climate information, as other sources of information, including misinformation, grow rapidly
- proactively monitoring and responding to medium-to-long term positioning in key customer, partner and related services sectors, seeking opportunities for collaboration as appropriate
- supporting Australia's objectives to promote and protect security and prosperity through international cooperation, particularly in the Indo-Pacific region
- monitoring and preparing for the increasing volume and sophistication of cyber security threats
- progressing the Bureau's diversity and inclusion ambition to build a culturally capable workforce that reflects the diversity of the community it serves.

Significant change initiatives that affected the Bureau's performance in 2023–24 included:

- concluding implementation of the ROBUST Program to ensure the security, stability and resilience of the Bureau's information and observing technologies (see p.94)
- commencing the national Flood Warning Infrastructure Network (FWIN) remediation program to enhance flood forecasts and warnings, supporting disaster preparedness, response and recovery (see p.79)
- commencing work on the data and systems components of the Government's Water Market Reform Roadmap to improve water markets transparency and future-proof national water information systems (see p.75)
- continuing to lead coordination of the Australian Climate Services to transform Australia's capability to better understand climate and weather event related risks and impacts within Australia now and into the future (see p.122)
- continuing implementation of the Business Systems Transformation Program to uplift and streamline finance and human resources systems and processes (see p.120).



Performance results

The Bureau's performance in 2023–24 against the 12 strategic success measures (SSMs), planned contributing measures and intended targets outlined in its Corporate Plan 2023–24 is shown below.

Impact and value

Products and services that enhance the wellbeing of all Australians.

SSM01: The financial and social value we deliver to the Government, industry and the Australian community.	Performance met expectations
Rationale: The Bureau plays a critical role in helping to protect life and property through hazard preparedness and response during severe weather events and supporting key industries to operate safely and productively. This measure aims to demonstrate the Bureau's effectiveness in meeting its Outcome of supporting a safe, prosperous, secure and healthy Australia.	

Performance met expectations for all 5 contributing measures. Performance met expectations overall, as it did for comparable measures for 2022–23.

Contributing measure	Target
Mitigation of property damage and reduced long-term trend in fatalities from extreme weather events including bushfires, heatwaves, floods, tropical cyclones and severe thunderstorms	Various

Performance met expectations. The Bureau provided customers with information, including forecasts and warnings, to help protect life and property during severe weather events, contributing to the long-term downward trend in the annual number of fatalities per capita in Australia from bushfires, tropical cyclones and severe thunderstorms. The annual number of flood-related fatalities per capita since 1992 has remained steady. Data showing fatalities attributed to heatwaves is not yet sufficiently robust to compare over time. The Bureau's services are estimated to have helped mitigate around $175 million in damage from severe weather events in 2023–24 based on Insurance Council of Australia estimates of $2.19 billion in insured losses.

Economic value added to Australia's water sector	$100m

Performance met expectations. The Bureau's services, information and insight contributed an estimated $410 million in economic value to Australia's water sector in 2023–24.

Economic value added to Australia's aviation sector	$80m

Performance met expectations. The Bureau contributed an estimated $194 million of economic value to Australia's aviation sector in 2023–24 based on estimated fuel savings and contractual aviation services at new locations.

Economic value added to Australia's energy and resources sectors	$80m

Performance met expectations. The Bureau contributed significant economic value to Australia's energy and resources sectors during 2023–24 through the delivery of world-leading forecasts, highly-valued decision support and scientific advisory services, helping industry manage environmental and technical challenges with scientific insights. The Bureau contributed an estimated minimum $80-120 million of economic value to resource sector customers in 2023–24 by providing specialised services to help mitigate the impacts of severe weather, optimise production, enable the transition towards net zero and keep a highly-exposed workforce safe. The Bureau contributed an estimated $50-100 million of economic value to energy sector customers in 2023–24.

Economic value added to Australia's agriculture sector	$50m

Performance met expectations. The Bureau contributed an estimated $154 million of economic value to Australia's agriculture sector in 2023–24 through the delivery of initiatives such as Climate Services for Agriculture and Agri-Climate Outlooks.

SSM02: The levels of satisfaction and trust our customers, partners and stakeholders have in the products and services we provide.	Performance met expectations

Rationale: The Bureau produces essential products and services that are used by the community, key partners, industry and government to inform decision-making. This measure aims to gauge the effectiveness of these products and services as assessed by those that use them, and ensure they are meeting their intended purpose.

Performance met expectations for 2 contributing measures, performance partially met expectations for one contributing measure and did not meet expectations for one contributing measure. The 2 results meeting expectations were considered to provide a greater contribution to the overall performance against the success measure, with performance assessed as meeting expectations overall as it did for comparable measures for 2022–23.

Contributing measure	Target
General community, key partner and emergency services customers have an overall positive experience	90%

Performance partially met expectations overall. Surveys found that an average of 73% of general community and emergency management customers had an overall positive customer experience based on their assessment of 'Access, Content, Timing, Relevance and Staff' in 2024.

80% of community customers reported an overall positive customer experience in 2024. 66% of partner and emergency management customers reported an overall positive customer experience in 2024. Further detail on the Bureau's customer feedback and response mechanisms is outlined in Corporate Responsibility (see p.154).

Industry and government customers are satisfied with the services provided by the Bureau	Various

Performance met expectations overall.

- Positive feedback was received from key customers in the water sector, including on engagements to progress Commonwealth legislation amendments and inform development and implementation of the Water Market Reforms.
- Positive feedback was received from customers and partners in the agricultural sector, including on the services provided under the Climate Services for Agriculture and Agri-Climate Outlooks initiatives.
- Positive feedback was received from customers in the energy and resources sectors, particularly on supporting operational decision-making. In a survey of 39 customers, 95% rated the Bureau's services as 'good' or 'excellent' and 92% were satisfied with their recent interactions with the Bureau.
- Positive feedback was received from customers and stakeholders in the national security sector, including on the Bureau's Global Seasonal Outlook and 24-hour service of the Meteorological Intelligence Support Team.
- Positive feedback was received from customers of the Meteorological Authority Office with 95% of customers surveyed in 2023–24 either satisfied or very satisfied with its expert advice and engagement.

Annual increase in overall customer satisfaction across the Bureau's digital channels	Various

Performance met expectations. The BOM Weather app continued to be Australia's top ranked free weather application in 2023–24, with 85% of customers rating their satisfaction level as 'satisfied' or higher. The app recorded average ratings of 4.6 in the Google Play Store and 4.7 in the Apple App Store in 2023–24.

Net promoter score for forecast and warning services	Various

Performance did not meet expectations overall.

Surveys reported a Net Promoter Score of +45 for partner and emergency management customers in 2024.

Surveys reported an average Net Promoter Score of +43 for general community customers in 2024.

Noting that possible scores range from -100 to +100, the Bureau's positive scores indicate strong customer satisfaction and loyalty despite not achieving the annual targets for 2023–24.

SSM03: The utilisation of our services by new customers and the return rate from existing customers.	Performance met expectations

Rationale: The value of the Bureau's products and services is realised when they are used by customers to achieve a positive outcome. This measure aims to ensure the Bureau is maximising the value of its work by maintaining engagement with existing customers while expanding the reach of its work to new users.

Performance met expectations for 2 contributing measures and partially met expectations for one contributing measure. Performance met expectations overall, as it did for comparable measures in 2022–23.

Contributing measure	Target
General community preference for Bureau services as a primary source to enable decision-making	35%

Performance partially met expectations. Surveys found that an average of 30% of general community customers nominated a Bureau source as their most used source for accessing forecasts or warnings in 2024.

Contributing measure	Target
Key partner and emergency services preference for Bureau services as a primary source to support their decision-making	75%

Performance met expectations. Surveys found that an average of 88% of partner and emergency management customers nominated a Bureau source as their most used source for accessing forecasts or warnings in 2024.

Contributing measure	Target
Increase in usage and engagement across the Bureau's digital channels	Various

Performance met expectations overall.

Usage of the BOM Weather app increased with:

- 13.9 million total downloads since release and 2.5 million total downloads during 2023–24
- an average of 4.0 million monthly active users compared to an average of 3.8 million monthly active users in 2022–23
- 1.1 billion total visits during 2023–24.

The Bureau's website (www.bom.gov.au) had 654 million visits in 2023–24.

Growth in engagement across the Bureau's social media platforms continued, with followers increasing across all platforms. At 30 June 2024, the Bureau had over 2.14 million total followers compared to 2.07 million total followers at 30 June 2023. The level of engagement with social media posts – such as likes, comments and shares – was maintained at an average of 6.7%, with 5,591 posts across 13 Bureau accounts.

Operational excellence

Outstanding people supported by secure, effective and resilient systems, processes and technology.

SSM04: Our delivery against agreed customer requirements and commitments.	Performance met expectations

Rationale: Customers use the Bureau's products and services to plan, make decisions, optimise their activities and manage risks. This measure aims to ensure the Bureau is effectively delivering the specific outputs to which it has committed, and that its customers need.

Performance met expectations for all 6 contributing measures. Performance met expectations overall, as it did for comparable measures for 2022–23.

Contributing measure	Target
Delivery against the requirements of the Intergovernmental Agreement on the Provision of Bureau of Meteorology Hazard Services to the States and Territories and delivery of agreed Hazard Services Forum recommendations	Requirements met

Performance met expectations. The Bureau delivered services to state and territory emergency services agencies in line with the Intergovernmental Agreement (IGA) during 2023–24. The Hazards Services Forum (HSF) engaged positively with the outcomes of the 2022–23 mid-term review of the IGA and were supportive of the body's future function as a customer advisory forum. Review actions relating to the IGA and the HSF's functions are scheduled for completion by October 2024, with other actions relating the service schedules will be sustained activities due to interdependencies on service and product reviews.

Forecasts and warnings meet agreed performance targets	Various

Performance met expectations overall.

- Key services were delivered as per service level specifications to the Australian Government National Situation Room for flood, thunderstorm, tropical cyclone, fire weather, tsunami and embedded meteorologists.
- The Bureau issued 1,968 Flood Warnings and 335 Flood Watches in 2023–24, with timeliness of 97%, meeting the 97% target. 74% of flood forecast peak height predictions met service level specification targets, exceeding the 70% target. 69% of flood forecast lead times met service level specification targets, below the 70% target.
- The Bureau issued 2,605 Regional Severe Thunderstorm Warnings, 958 Detailed Severe Thunderstorm Warnings and 1,154 Severe Weather Warnings in 2023–24. Nationally, the timeliness was 98% for Regional Severe Thunderstorm Warnings, 96% for Detailed Severe Thunderstorm Warnings and 88% for Severe Weather Warnings, all exceeding the product average timeliness between 2017–2024. Severe weather verification is limited by data availability and the localised nature of reports.
- The Bureau issued 64 'No Threat' bulletins under the Australian Tsunami Warning System (ATWS) in response to 64 earthquakes and 1 volcanic eruption during 2023–24. The average response time for ATWS was 16.0 minutes, meeting the target of 30 minutes.
- 93.5% of routine public weather products were delivered on schedule.

General community customers report that the Bureau's information enables their decision-making	60%

Performance met expectations. Surveys found that an average of 65% of general community customers reported that the Bureau's information enabled their decision-making in 2024.

Key partner and emergency services customers report that the Bureau's information enables their decision-making	80%

Performance met expectations. Surveys found that 79% of emergency management customers reported that the Bureau's information enabled their decision-making in 2024.

Delivery of Defence meteorological services meets or exceeds agreed service levels in support of tactical, planning and strategic activities	Requirements met

Performance met expectations. The Bureau's Defence meteorological services met or exceeded agreed service levels as per the Meteorological Service Agreement with Air Command and Joint Operations Command. Feedback indicated satisfaction with the quality, timeliness, accuracy and responsiveness of the services delivered.

Delivery of aviation meteorological services meets or exceeds International Civil Aviation Organization standards and recommended practices for Australia's area of responsibility and aviation industry standards	Requirements met

Performance met expectations. The Bureau's aviation meteorological services continued to meet the requirements of the International Civil Aviation Organization and the needs of the aviation industry during 2023–24.

SSM05: Capacity utilisation, system reliability, security and resilience benchmarked against best practice.	Performance met expectations

Rationale: The work of the Bureau is underpinned by a complex array of technologies and systems located across Australia, its surrounding oceans and islands, and in Antarctica. These systems operate around the clock and are particularly critical during severe weather events. This measure aims to provide assurance about the reliability, efficiency, quality and security of these systems in providing uninterrupted access to Bureau services.

Performance met expectations for 5 contributing measures and performance partially met expectations for 2 contributing measures. Performance met expectations overall.

Contributing measure	Target
Operational systems meet agreed performance targets for uptime and capacity utilisation	Various

Performance partially met expectations overall. Stretch targets for observing networks were established in 2023–24 aligned to customer needs. Performance is expected to improve as future network enhancements are implemented on a multi-year timeframe.

- Satellite network availability was 98.3%, exceeding the 97% target.
- Tsunami network availability was 98.5%, exceeding the 95% target.
- Radar network availability was 96.8%, slightly below the 97% target. Radar downtime was due to several factors including extended outages for radar replacements, mechanical overhauls and unplanned outages.
- Wind profiler availability was 90.2% below the 98% target. Availability was impacted by several extended outages due to receiver hardware faults.
- Automatic weather station (AWS) uptime was 98.8%, slightly below the 99% target. Lower availability primarily due to disruption in Inmarsat satellite communications service was resolved during the year.
- Upper air network availability was 95.3%, below the 98% target. The rate of successful soundings was impacted by sonde and balloon failures on launch, adverse conditions preventing launches, and balloon launcher equipment faults.
- Ozone network availability was 93.8%, below the 95% target. Two extended outages of Brewer photo-spectrometers at Macquarie Island and Brisbane airport impacted overall availability during the year.
- Coastal sea level network availability was 84.8%, below the 98% target. Availability was largely impacted by long-term station outages due to host wharf infrastructure degradation or replacement activities, and disruption in satellite service provider communications service affecting multiple sites.
- Marine network availability was 70.1%, below the 95% target. Availability was impacted during the year with 2 of 4 wave buoys offline due to vandalism, ongoing restoration of the ship-borne AWS fleet and changes in the availability of expendable bathythermograph due to changing shipping routes.
- Space weather network availability was 75.9%, below the 97% target. Restoration of long-term magnetometer outages and upgrades to aged ionosonde equipment progressed during the year, with ongoing availability improvements expected over the coming years.
- Solar data remained unavailable during 2023–24 due to a long-term data quality control system outage. System restoration has been implemented and data will become available in 2024–25 as the quality control backlog is processed.

Average production availability of the Bureau's Australis supercomputer was 99.89%, exceeding the 99.5% target.

Average production capacity utilisation of the Bureau's Australis supercomputer was 65%, exceeding the 30% target.

Protective security maturity score	Rated as 'Developing'

Performance partially met expectations. The Bureau implemented improvements in a range of security domains during 2023–24, particularly related to security operations, risk management and third-party security controls, albeit slower than planned. Maturity assessments demonstrated material improvement in relevant technical domains of security measured against Government policy standards.

Increase in data information management maturity assessed using the National Archives of Australia Check-up PLUS questionnaire	Increase in data maturity

Performance met expectations. The Bureau's 2023 Checkup Plus data maturity score was 3.67, better than the average for Australian Government agencies (3.65).

Compliance of identified quality management systems to ISO 9001	Certification achieved or maintained

Performance met expectations. Six certified Quality Management Systems (QMS) maintained their existing certification of compliance to ISO 9001: Aviation Meteorological Services, the Meteorological Authority Office, Defence Weather Services, Energy and Resources Program, Tsunami Warning Services and Operational Technology and Engineering.

Sustained, measurable improvement in risk and business continuity maturity based on external surveys and assessments	Various

Performance met expectations overall. The Bureau delivered several initiatives to improve risk management maturity in 2023–24, including through development of its Risk Culture Uplift Plan and Risk Culture Statement. The next Comcover Benchmarking survey will be completed in 2025. The Bureau's self-assessed business continuity maturity maintained the 'Level 3 – Standards Compliant' in 2023–24, with the rating of 58.57%.

Operational forecasters with meteorological qualifications that meet or exceed the international standard defined by the World Meteorological Organization	Operational requirements met

Performance met expectations overall. Of the Bureau's 294 operational meteorological forecasters, 292 had meteorological qualifications that met or exceeded the international standard, as defined by the World Meteorological Organization. The following operational competencies were held:

- 146 aviation forecasting
- 204 fire weather forecasting
- 117 severe thunderstorm forecasting
- 45 tropical cyclone forecasting with 18 as lead forecasters.

Proportion of new transformation priority systems transitioned into operations	100%

Performance met expectations. All transition activities were completed by 30 June 2024 in line with the official closure of the ROBUST Program.

SSM06: Verification of our products and services.	Performance met expectations

Rationale: The Bureau routinely measures the accuracy and timeliness of its forecast and warning products using a range of recognised verification techniques. This measure aims to present this information so that customers, and the Australian community more generally, can have confidence in the Bureau's products and services and their improvements over time.

Performance met expectations for the single contributing measure. Performance met expectations overall, as it did for comparable measures for 2022–23.

Contributing measure	Target
Verification of forecast quality and improvements in forecast accuracy and lead time	Various

Performance met expectations overall.

- The Bureau issued 1,968 Flood Warnings and 335 Flood Watches in 2023–24, with timeliness of 97%, meeting the 97% target. 74% of flood forecast peak height predictions met service level specification targets, exceeding the 70% target. 69% of flood forecast lead times met service level specification targets, below the 70% target.
- Nationally, the timeliness was 98% for Regional Severe Thunderstorm Warnings, 96% for Detailed Severe Thunderstorm Warnings and 88% for Severe Weather Warnings, all exceeding the product average timeliness between 2017–2024. Severe weather verification is limited by data availability and the localised nature of reports.
- The Bureau issued 149 Tropical Cyclone Advices during 2023–24. Tropical cyclone forecast track location errors were better than the 5-year average for all lead times. Tropical cyclone forecast intensity errors were better than the 5-year average for lead times of 0-72 hours but were worse than the 5-year average for lead times of 96-120 hours.
- The Bureau issued 457 Fire Weather Warnings, 3,544 Fire Weather Forecasts and 4,262 Incident Weather Forecasts during 2023–24. The average accuracy of the primary and secondary fire behaviour indices was 95% and 92% respectively, both exceeding the target of 75%.
- The Bureau issued 186 Heatwave Forecasts and 445 Heatwave Warnings during 2023–24. Performance targets for the service remained under development during the year.
- The Bureau issued 64 'No Threat' bulletins under the Australian Tsunami Warning System (ATWS) in response to 64 earthquakes and 1 volcanic eruption during 2023–24. The average response time for ATWS was 16.0 minutes, meeting the target of 30 minutes.
- The overall operational accuracy (measured in terms of annual weighted percent consistency) of the seasonal chance above median forecasts of rainfall, maximum and minimum temperature during 2023–24 was 67%, exceeding the 55% target. Averaged skill for maximum and minimum temperature was 83% and 77% respectively. The rainfall seasonal forecast had a lower average accuracy of 43%, largely due to an underestimation of summer and autumn rainfall which was consistent with the advice from most the leading WMO forecast centres in that period.
- 93.5% of routine public weather products were delivered on schedule.
- 90.9% of next-day maximum temperature forecasts were within 2°C of the observed temperature. 82.4% of next-day minimum temperature forecasts were within 2°C of the observed temperature.
- 91.0% of all next-day wind speed forecasts were within 5 knots of the observed wind speed. 87.1% of next-day coastal wind speed forecasts were within 5 knots of the observed wind speed.
- 87.4% of next-day significant wave height forecasts were within 0.5m of the observed significant wave height.

Insight and innovation

Practical implementation of novel, mission-directed solutions for our customers.

SSM07: The depth, breadth and resilience of our external partnerships and collaborations.	Performance met expectations

Rationale: Working with other organisations – both nationally and internationally – is an integral part of the Bureau's operations. Whether it's in science, technology, data sharing or delivering services, strong collaboration is essential for achieving the Bureau's purpose. This measure seeks to ensure the Bureau is effectively building and maintaining these critical relationships.

Performance met expectations for the 2 contributing measures. Performance met expectations overall, as it did for comparable measures for 2022–23.

Contributing measure	Target
Value and effectiveness of partnerships and collaborations, assessed by the Bureau and its partners	Various

Performance met expectations overall. Strong relationships were renewed and established with a wide range of customers, partners and stakeholders – nationally and internationally – during 2023–24.

The Bureau's Hazards Services Forum continued to demonstrate the productive collaboration between the Bureau and its federal, state and territory emergency management partners.

The Bureau continued to expand existing relationships and establish new partnerships in the national security and energy sectors, with the renewal of strategic relationship agreements with Defence and Powerlink respectively.

The Bureau also undertook considerable stakeholder engagement activities with Queensland councils to build understanding of communities' needs as the 10-year national Flood Warning Infrastructure Network (FWIN) Program commenced.

The Bureau continued to maintain significant partnerships and collaborations with key science agencies, enhanced scientific research activities with university partners and further expanded its relationships internationally with peer meteorological and hydrological service agencies, including through a new strategic relationship agreement the European Centre for Medium-Range Weather Forecasts (ECMWF) on collaboration, data sharing and capability exchange programs.

The Bureau also continued to grow its support of national decision-making bodies such as the Australian Parliament and taskforces, including through inquiry submissions and appearances.

Achievement of the Bureau's performance standards as a regulator under the *Water Act 2007* demonstrates collaboration and engagement	Met

Performance met expectations, noting that interim arrangements for the Bureau's delivery of functions as a regulator as required under the *Water Act 2007* were in place during 2023–24. The Bureau has commenced implementation of key recommendations in the National Performance Report Indicator Review, such as the publication of a new handbook with more nationally relevant indicators focused on core areas of water utilities' performance. The Bureau has also supported key government reforms to restore transparency, integrity, and confidence in water markets.

SSM08: The conversion rate from ideas to opportunities to customer outcomes.	Performance partially met expectations

Rationale: Meeting increasing customer expectations and demands of the Bureau's products and services requires innovation and new solutions. This measure seeks to demonstrate that ideas, innovations and enhancements provide tangible improvements for customers.

Performance met expectations for one contributing measure and performance partially met expectations for one contributing measure. The result partially meeting expectations was considered to provide a greater contribution to the overall performance against the success measure, with performance assessed as partially meeting expectations overall, as it did for comparable measures in 2022–23.

Contributing measure	Target
Customer outcomes delivered from ideas and opportunities	Case studies

Performance partially met expectations overall. Comprehensive reporting on the conversion of customer ideas and opportunities remains an area for development. The Bureau implemented a range of product and service enhancements for customers during 2023–24, including for flood, tropical cyclones, fire weather, coastal hazards, water information, space weather and aviation. The Bureau continued to strengthen management of its portfolio of work (see p.113). Through its Benefits Management Framework, the Bureau regularly reports on the progress of benefits realisation from its projects. During 2023–24, project reporting showed the Bureau contributed to external customer benefits related to public safety, community wellbeing, national security and economic prosperity across several sectors including emergency management, national security, transport, water and international development.

Proportion of customer-driven major and moderate initiatives that successfully pass through the Research to Operations gateway	100%

Performance met expectations. 100% (2 in total) of major and moderate initiatives successfully passed through the Bureau's Gateway to Operations Reference Group in 2023–24.

SSM09: The quality and application of our research and development, benchmarked internationally.	Performance met expectations

Rationale: The Bureau undertakes and applies world-class scientific research and development to ensure it can provide the best products and services for its customers. This measure aims to demonstrate the quality of the Bureau's scientific research activities, and the flow-on effect to customers.

Performance met expectations for 2 contributing measures and partially met expectations for one contributing measure. Performance met expectations overall, as it did for comparable measures in 2022–23.

Contributing measure	Target
Performance of the Bureau's global Numerical Weather Prediction model in comparison to other meteorological agencies	In the top 5 globally

Performance met expectations. The Bureau's global weather models ranked within the top 5 global models based on World Meteorological Organization scores. The Bureau's ACCESS-GE was ranked the third best model among all available global models for the Southern Hemisphere. Recent upgrades – including through APS4 – have resulted in significant improvements in ACCESS-G4 compared to ACCESS-G3.

Forecasts and warnings display continuous improvements with respect to attributes such as lead time, accuracy and timeliness	Measured improvements

Performance partially met expectations overall.

- The accuracy of seasonal forecasts indicated an ongoing long-term positive trend in the performance of the Bureau's seasonal outlooks for temperature and rainfall over Australia.
- STEPS3 rainfall nowcasts consistently outperformed ACCESS-C3 rainfall forecasts during 2023–24, exhibiting lower error scores and higher correlation values for all lead times and across all regions.
- The number of observations assimilated in operational ACCESS-G was consistent with 2022–23. This is expected as the number of observations will increase after the new version of ACCESS-G is operationalised.
- The accuracy of automated and official forecasts measured as 12-month means against the 2016–2020 reference period were slightly below target for 2023–24.
- Ocean and marine forecast models, gridded historical analyses and Australian regional models each demonstrated improvement across several variables, although verification metrics for these models remained under development in in 2023–24.

Proportion of Bureau scientific publications in peer-reviewed journals that have an Impact Factor of 3.0 or above	≥70%

Performance met expectations. In 2023–24, 121 (70%) of the 173 Bureau scientific publications published in peer-reviewed journals had an Impact Factor of 3.0 or above.

The Bureau way

One enterprise that lives its values through agreed behaviours every day.

SSM10: Our performance benchmarked against work health, safety, wellbeing, security and environment best practice.	Performance met expectations

Rationale: The Bureau's critical, complex and highly distributed operations expose staff to a range of work health, safety and wellbeing risks and can impact the environment of the thousands of sites where Bureau equipment and facilities are located. This measure seeks to demonstrate that the Bureau is effectively managing these risks to ensure positive safety, security and environmental outcomes.

Performance met expectations for 2 contributing measures and partially met expectations for one contributing measure. Performance met expectations overall, as it did for comparable measures in 2022–23.

Contributing measure	Target
Compliance with legislation, government policy and mandatory governance requirements	Requirements met

Performance met expectations overall. Zero non-compliances of the work health and safety legislation were reported in 2023–24. The Bureau was rated as compliant in the Comcare proactive regulatory inspection on its Hazard and Incident Management system.

The Bureau managed privacy and FOI matters appropriately.

The Bureau complied with requirements in Annex 3 of the Convention on International Civil Aviation.

The Bureau's Finance and procurement processes complied with relevant legislation and were audited as per requirements, including through publication of the Bureau's Financial Statements.

The Bureau's Environmental sustainability management arrangements complied with legislation and standards

Lost time injury frequency rate	At or better than industry benchmark

Performance partially met expectations. The Bureau's overall lost time injury frequency rate (LTIFR) for all incidents during 2023–24 was 3.64, slightly above the industry benchmark of 3.1 for Professional Scientific & Technical Services (Safe Work Australia). Safe Work Australia confirm this benchmark is likely to be an underestimate as it is based on lost time injuries from workers' compensation claims. The Bureau's LTIFR from workers' compensation claims during 2023–24 was 0.36 – significantly better than the benchmark.

Staff wellbeing index as measured by organisational surveys	≥70%

Performance met expectations. The Bureau's 2024 APS Census Wellbeing Index was 70%, meeting the 70% target.

SSM11: Individual and team actions demonstrate commitment to enterprise values and behaviours.	Performance met expectations

Rationale: Strong values and behaviours drive the way the Bureau operates, connect staff, and most importantly, underpin public trust and confidence in the Bureau's products and services. This measure seeks to ensure the Bureau's workforce is engaged and its leadership is effectively demonstrating these values.

Performance met expectations for 2 contributing measures and partially met expectations for one contributing measure. Performance met expectations overall, as it did for comparable measures in 2022–23.

Contributing measure	Target
Positive perception of leadership effectiveness as measured by organisational surveys	≥65%

Performance met expectations. The Bureau's 2024 APS Census 'Immediate supervisor leadership' index was 78% and 'SES manager leadership' index was 67%, both meeting the 65% target.

Positive perception of employee connection to the Bureau's Strategy 2022–2027 as measured by organisational surveys	≥80%

Performance partially met expectations overall. The Bureau's 2024 APS Census showed:

- a positive workforce response of 80% for 'Customer focus will continue to guide our strategy and operations. I understand what this means in my day-to-day role.'
- a positive workforce response rate of 52% for 'I feel connected to the Bureau's Strategy 2022–2027'

Surveys from the Bureau's Strategy in Action (SIA) workshops held in 2023–24 showed 80% of respondents strongly agreed that 'SIA helps me build the knowledge to connect the work of my team with the Bureau's Strategy 2022–2027'.

The target for this measure will be adjusted in 2024–25 to better align with the more specific Census question on connection to the Strategy given the recent results available.

Positive employee engagement as measured by organisational surveys	≥75%

Performance met expectations. The Bureau's 2024 APS Census Employee Engagement Index was 74%, marginally below target of 75%.

SSM12: A diverse and inclusive workforce, that reflects the communities we serve.	Performance did not meet expectations

Rationale: Diverse backgrounds, experiences, talents, and perspectives enhance both the development of services and their delivery to all Australians. This measure seeks to demonstrate that the Bureau is building and maintaining a workforce that reflects the Australian community it serves.

Performance did not meet expectations for the single contributing measure. Performance did not meet expectations overall, the same result for comparable measures in 2022–23.

Contributing measure	Target
Organisational diversity and inclusion targets met	Various

Performance did not meet expectations overall.

- Female staff comprised 37.5% of the Bureau's workforce in 2023–24, below the existing target of 50% by 2025.
- Aboriginal and Torres Strait Islander staff comprised 1.2% of the Bureau's workforce in 2023–24, below the existing target of 2.7% by 2023.
- People identifying with a disability comprised 2.8% of the Bureau's workforce in 2023–24, below the existing target of 7% by 2025.

Based on a review of 10-year workforce data, the Bureau's diversity targets will be updated to reflect year-on-year trends and to focus on consistent incremental improvements to reach a more attainable target by 30 June 2028. The Bureau will continue activities in 2024–25 to strengthen its workforce and culture through diversity, inclusion and STEM initiatives to build a safe, inclusive and diverse enterprise with a culturally capable workforce that is responsive to First Nations people and communities. The Bureau will continue to develop its people capability to ensure its workforce have the contemporary skills and knowledge needed to achieve the Bureau's outcomes and meet customer needs.

Upholding capability

As described in its Corporate Plan 2023–24, the Bureau has a responsibility to maintain a complex and wide-ranging field of capabilities to ensure it meets its purpose. To this end, the Bureau implemented the 16 strategic actions identified in its Strategy 2022–2027 and progressed capability developments across 5 broad themes: strategy, people, relationships and geographical footprint, data and technology, and asset management and sustainment.

Achievements in capability development

The sections below identify the Bureau's achievements in capability development across the 5 themes identified in its Corporate Plan 2023–24.

Strategy

Capability aim: To further integrate the Bureau's planning, prioritisation and investment activities to drive coordinated, responsive and accountable service delivery across the enterprise.

To enhance its strategic capability, the Bureau has:

- continued to mature its environmental scanning capability to support the organisation in navigating changes in its operating environment
- continued to mature its centralised transformation capability and delivered tools, training and leadership coaching to uplift skills and embed best practice
- matured its risk management approach and culture, incorporating risk evaluation into decision making across the enterprise and providing regular risk reporting to the Security, Risk and Business Continuity Committee and Executive Team
- completed its Projectisation Program – a series of activities to improve the maturity and capability of program and project management across the organisation
- continued to mature and integrate its planning, performance monitoring and evaluation skills and processes to better support budget and investment decisions.

Relationships and geographical footprint

Capability aim: To build Australia's resilience to natural hazards and a changing climate through focused engagement with industries and governments, and through provision of timely information to communities. This will enable the Bureau to enhance customer outcomes by providing timely, expert advice on risks, impacts and opportunities that supports improved decision making, when it matters most and actively partners and collaborates nationally and internationally to deliver better outcomes for customers.

To enhance its relationships and geographical footprint the Bureau has:

- systematically engaged and strengthened relationships with its customers, partners and stakeholders to better understand, measure and monitor how its services enable them to deliver their operational priorities
- worked within international and intergovernmental fora to promote cooperative advancement in science and technology, and partnered with Australian Government agencies, international meteorological agencies and universities to develop new innovations that advance the Bureau's services

- coordinated the Australian Climate Service in partnership with CSIRO, the Australian Bureau of Statistics and Geoscience Australia to support a safer, adaptive and prosperous Australia, resilient and prepared for climate challenges and natural hazards
- continued to operate a national Decision Support Services team, serving customers, partners and stakeholders across multiple jurisdictions to build operational resilience.

People

Capability aim: To foster a workforce that is skilled, agile and equipped for the future, ensuring its teams have the skills and knowledge required to achieve the outcomes of the Bureau and meet customer needs. To build a customer-focused enterprise culture where people are empowered and grow through clear career pathways in an inclusive, safe, and flexible working environment, and reflects the diversity of the community it serves.

To maintain and enhance its people capability, the Bureau has:

- negotiated and implemented the Bureau of Meteorology Enterprise Agreement 2024 as part of the broader 2023 Australian Public Service enterprise bargaining negotiations
- continued to strengthen workforce and culture through diversity, inclusion and STEM initiatives, including through establishment of its First Nations Office and delivery of the 2021–23 Innovate Reconciliation Action Plan
- continued to support the development of a leadership and cultural transformation through a Strategy in Action workshops and the Bureau Way Manager Program
- sought to enhance the Bureau employee experience by recognising high performance, responding to employee perceptions and prioritising staff wellbeing.

Data and technology

Capability aim: To continue to invest in the Bureau's data, enterprise-wide data management and applications to enhance digital capability and provide technological solutions that enable all Australians to easily access and utilise our services to meet their individual needs. To enhance its information systems, observations technology, infrastructure, processes and data to ensure they are fit-for-purpose in delivering secure, stable and sustainable services, particularly during high-impact events.

To maintain and enhance its data and technology capability, the Bureau has:

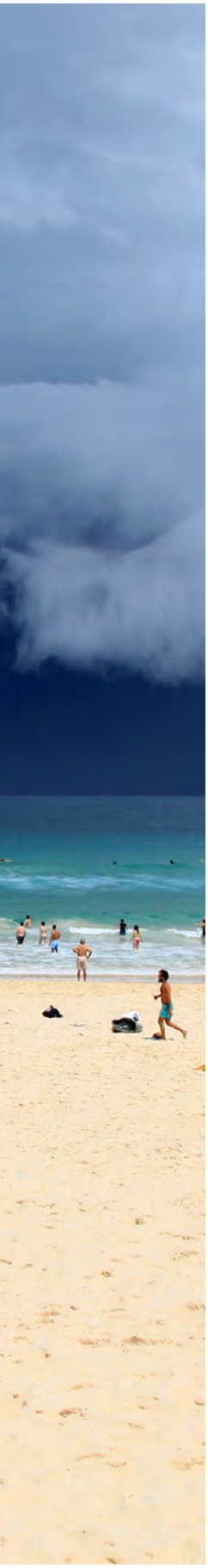
- concluded implementation of the ROBUST program, enhancing security, stability and resilience by uplifting capability and business practices, IT infrastructure and data management
- continued to improve the reliability and resilience of its observing systems capability, including by replacing and upgrading existing radars and installing new radars at several sites across Queensland and Western Australia, installing new automatic meteorological balloon launching systems (AMBLS) in the Northern Territory, and upgrading the space weather observing systems in New South Wales and the Northern Territory
- released its test website beta.bom.gov.au to seek customer feedback and enable further improvements and ensure secure, stable and resilient services to customers
- retained certification of its Operational Technology and Engineering Quality Management System in compliance with the ISO 9001:2015 Quality Management Standard
- continued to implement its Information Technology Strategic Plan 2022–2027 and Observations Ecosystem Roadmap to chart the course for its information and observations technology capabilities.

Asset management and sustainment

Capability aim: To apply a strategic approach to asset management will ensure that Bureau's assets are safe, sustainably managed on a whole-of-life approach and deliver the intended service in accordance with the Bureau's mission and its customer expectations. To mature its asset management capabilities by better integrating its planning, costing, procurement, contract management and strategic vendor management expertise.

To enhance its asset management and financial sustainability capability, the Bureau has:

- continued to mature its enterprise asset management system to enable improved reporting on asset performance and facilitate data-driven asset management and funding decision-making
- developed 10-year asset network plans to map resource demand for future asset projects, improving project delivery, efficiency and supply contract planning
- continued implementation of its Business Systems Transformation Program to stabilise and modernise its core corporate enterprise resource planning systems, streamline service delivery and reduce red tape
- continued to mature its procurement and strategic vendor management through a new procurement service model and an expanded offering that includes commercial advice and contract negotiation
- continued to uplift its property management capability, including through a review of its leasing arrangements and designing and managing new accommodation fit-outs.



Section 3:

Group Performance

Community Services

Goal: Deliver trusted, reliable and responsive weather, water, climate and ocean forecasts and analyses, contributing to the financial and social value we deliver to Government, industry and the Australian community.

The Community Services Group is responsible for providing high quality weather, water, climate and ocean services to the Australian community and emergency management sector. These services are aimed at preventing loss of life and reducing the social and economic impacts of natural hazards. The group's focus is to do this in a resilient, efficient and sustainable way that enables the Bureau to deploy its capabilities when and where they are needed most.

The group's services span the breadth of Australia, its territories and oceans. These services are delivered in a tiered approach with national context typically derived centrally and tailored locally to meet customer needs.

For 2023–24, the group consisted of 3 programs with the following responsibilities:

Program	Responsibilities
National Production Services	• National production and coordination of forecast and warning services • Assessment of warning potential and service escalation needs • Incident management • Consistency of quality assurance, verification, performance reporting and monitoring, and continuous improvement process across the Community Services Group
Environmental Prediction Services	• National warning, forecasting and modelling services for flood, thunderstorms, severe weather, fire, heatwaves, cyclones, oceans, tsunami, water, climate and drought • Development and implementation of service enhancements aligned to Bureau policy and customer requirements • Service capability and capacity enhancements • Staff competency assessment and development • Quality assurance, verification, performance reporting and monitoring of warning services
Decision Support Services	• Understanding public and emergency management partner needs, requirements and decision-making processes • Operation of a multi-hazard decision support capability including both on-site and embedded meteorology, hydrology, climatology and communications services • Engagement with the Australian community • Local and regional delivery of media and social media content related to weather, climate, water and oceans • Local environment monitoring and escalation of issues, impacts and intelligence

Throughout 2023–24, the group focused on delivering 4 outcomes that support the achievement of the Bureau's Strategy and purpose. The group's achievement in delivering each of these outcomes is outlined below.

Outcome 1: Understand and meet Government, Emergency Services and Australian Community priority needs

Achieving the outcome

Delivering a consistent flood warning service for the River Murray

In October, the Bureau took over the responsibility for flood forecasts and warnings for the South Australian section of the River Murray, aligning with the national flood warning service. This was previously the responsibility of the South Australian Department for Environment and Water (DEW) and the South Australian State Emergency Service (SASES).

This transition to a consistent, Basin-wide flood forecasting and warning service followed a 2019

review by the South Australian Government and its partners into all aspects of the River Murray flood warning arrangements. Bureau representatives from the Hazard Preparedness and Response and Environment Prediction Services Water teams worked closely with the Murray-Darling Basin Authority, DEW and the SASES to develop the service.

Communities can now stay updated with the latest forecasts and warnings via the BOM Weather app and the Bureau's website, while continuing to receive the same early warning information and advice from local emergency services. The change also helps emergency services and local councils to continue to provide vital support to local communities when preparing for, and responding to, flood events.

The River Murray in flood at Mannum, South Australia in December 2022.

Using stakeholder feedback for improved coastal hazard warnings

Coastal hazards pose risks of inundation and damage to properties, coastal erosion, and at times, are life-threatening. In May, the Bureau transitioned warnings for damaging surf and abnormally high tide phenomena from its existing Severe Weather Warning to a new Coastal Hazard Warning. This change ensures the Australian community can easily distinguish between coastal and land-based weather warnings and better supports marine safety authorities and emergency management partners. The change was made in response to feedback from the Bureau's partners and the community.

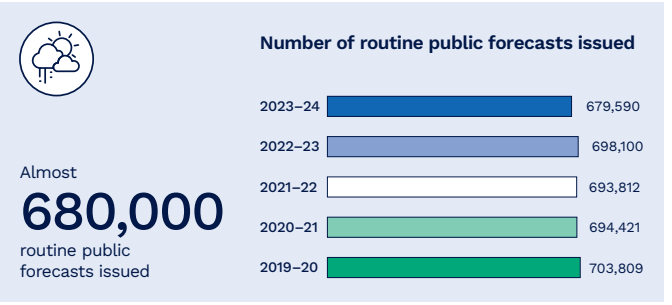
In June, the Bureau also extended its warning service for abnormally high tides to Victoria, bringing the state into line with the rest of Australia. Warning thresholds were developed through extensive collaboration, which was well supported by the Victoria State Emergency Service.

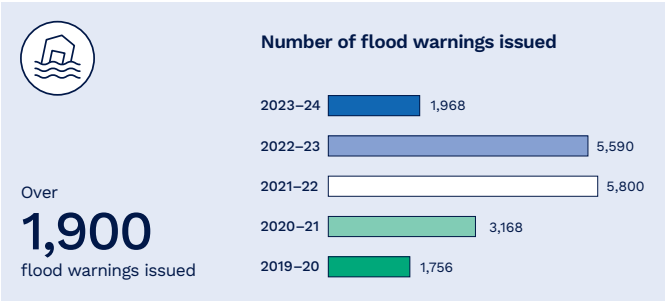
These milestones highlight the ongoing improvements and progression towards national consistency in warning for hazards that impact our vast coastlines where many population centres lie.

Right: Part of a Facebook post highlighting the change to Coastal Hazard Warnings.

Improving decision-making by uplifting the Hazard Services Forum

The Bureau's Hazards Services Forum (HSF) is a national forum that facilitates consultation with state and territory operational emergency service agencies. In July, the HSF endorsed the final report of the mid-term review of the Intergovernmental Agreement on the Provision of Bureau of Meteorology Hazard Services to the States and Territories (the IGA) conducted by the Bureau in 2022–23.





In response to the review recommendations, and to dig deeper into the needs highlighted by HSF members, the Bureau conducted a customer discovery workshop in March. This workshop helped the members better understand the potential impact and value of the HSF, determine user requirements within the various jurisdictions and consider service priorities. Implementation of actions from the review will continue in 2024–25.

The Bureau also strengthened its national Disaster Risk Policy team which provides enhanced secretariat functions to the HSF. This team works closely with state and territory agencies, alongside the Bureau's own jurisdictional teams, to strengthen coordinated engagement with the sector.

The 2023–24 tropical cyclone season

There were 8 tropical cyclones in the Australian region during the 2023–24 tropical cyclone season, below the long-term average of between 9 and 11 each season. Six tropical cyclones – Jasper, Anggrek, Kirrily, Neville, Megan and Olga – reached at least Category 3 (severe tropical cyclone) while in the Australian region. There were 4 coastal crossing events: Jasper (December) and Kirrily (January) crossed the north Queensland coast, and Lincoln (February) and Megan (March) crossed the southwest Gulf of Carpentaria (Northern Territory) coast. Olga (April) did not cross the Western Australia coast, but gales were recorded from offshore islands in the western Pilbara. Anggrek (January) and Neville (March) occurred in the western region without land impacts. Paul was a short-lived event in the northeastern Coral Sea in April. Of these events, the 2 most impactful tropical cyclones were Jasper and Megan.

After crossing the coast north of Cairns as a Category 2 tropical cyclone, Jasper weakened inland over the Cape York Peninsula. The remnant low was slow moving and contributed to an intense rainfall event in mid-December which caused widespread significant flooding over the area. Some areas received more than 2,000 mm of rainfall over several days, causing significant damage to infrastructure and the landscape, resulting in a lengthy recovery process.

Track map of tropical cyclones in the Australian region during 2023–24.

The slow movement of severe tropical cyclone Megan in the Gulf of Carpentaria caused intense rainfall and flooding on Groote Eylandt and in catchments along the southern coast of the Gulf. A record major flood was recorded in the McArthur River on 22 March. Groote Eylandt recorded significant damage to vegetation and the wharf was badly damaged as the Manganese bulk carrier MV Anikitos was pushed against it.

For the 2023–24 tropical cyclone season, the position accuracy (where the tropical cyclone travelled) of Bureau forecasts was better than the 5-year average for all lead times. The intensity forecast accuracy (how intense the tropical cyclone was) was also better than the 5-year average for all lead times up to 72 hours.

Helping communities in Western Australia to prepare for severe weather

Over 2 weeks in October, the Bureau partnered with the Western Australian Department of Fire and Emergency Services (DFES) to visit 12 communities across the Kimberley, Pilbara, Gascoyne and Central West districts as part of its annual community awareness campaign. Held ahead of the severe weather season, the goal of the campaign was to inform and build resilience within communities that are susceptible to hazards such as tropical cyclones, flooding, storm surge and fire.

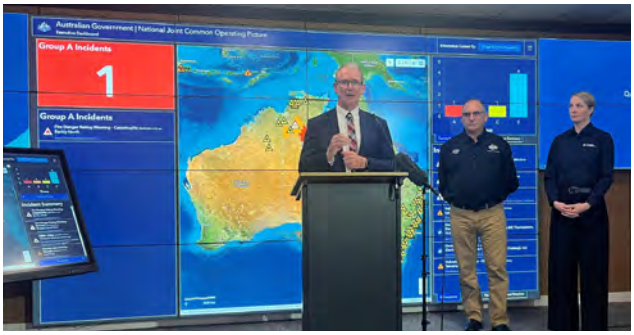
The 3 focus areas for the tour were to communicate changes to the Australian Warning System (led by DFES) ahead of the system being implemented for all hazards in WA during July 2024, to hold conversations with First Nations organisations and radio stations, and to highlight and explain the new 7-day Tropical Cyclone Forecast product.

The Bureau established new and valuable relationships with First Nations organisations and community leaders, and strengthened relationships with DFES staff including with first responders and decision-makers in regional Australia.

Highlights and significant events

Supporting Australians before and during the severe weather season

In the lead up to Australia's 2023–24 high-risk weather season, which ran from October to April, the Bureau took part in the inaugural National Preparedness Summit in Canberra on 25–26 September. The aim of the summit was to foster emergency management sector and Australian Government preparedness through pre-season briefings, and exercise plausible high-end event scenarios.



NEMA's Coordinator–General Brendan Moon AM, Deputy Coordinator-General (Emergency Management and Response) Joe Buffone PSM, and the Bureau's Manager National Operations Support Agata Imielska brief the media on the Higher Risk Weather Season Outlook in September. Credit: NEMA.

The Bureau attended alongside approximately 250 crisis management, response and recovery specialists from Australian governments, industry, community and the not-for-profit sector. Bureau staff worked with the National Emergency Management Agency (NEMA) to prepare the 2023–24 Higher Risk Weather Season Outlook which was presented by the Bureau's Director of Meteorology and CEO Dr Andrew Johnson. The outlook was released, analysed and discussed by stakeholders across the 2-day summit. The Bureau also led the development of Australian Climate Service higher-risk weather season scenarios to exercise the coordination and response effort across jurisdictions in a crisis.

Throughout the season, the Bureau provided over 3,800 technical briefings to the emergency management sector and various government agencies. Meteorologists and hydrologists embedded in state-based emergency services across the country continued to provide emergency managers with briefings and advice tailored to individual agency needs and functions. This intelligence supported key decision making across the high-risk weather season to keep communities safe.

Cultural training on Country with First Nations elders

Northern Queensland comprises 37 local councils, of which 15 identify as Aboriginal and Torres Strait Islander Shires. Confidently engaging with Aboriginal and Torres Strait Islanders in a culturally appropriate way is key to the Bureau's ability to support community safety and provide impactful decision support.

To expand on learnings from Bureau Cultural Awareness (CORE) training and to further develop engagement skills, Northern Queensland staff walked on Country with Wulgurukaba and Juru Elder, Gavin Kum Sing. Staff visited a sacred archaeological site, Turtle Rock, in the Harvey Ranges west of Townsville. Turtle Rock was historically a meeting place for neighbouring

Elder Gavin Kum Sing led the team into the Bora Ring at the base of 'Turtle Rock'.

tribes across the Northern Queensland region. Dozens of people would gather to share stories and learnings, develop local rules, and construct tools while teaching children of the next generation. Staff learnt about the dreaming story and the meaning and significance of ancient cave paintings of shields, fish and ancestors.

Working with Indigenous communities to improve severe weather communications

Remote First Nations communities in Northern Australia face the potential of severe weather events every wet season, including cyclones, thunderstorms and floods. In November, the Bureau supported an on-site workshop in Ngukurr – around 600 km from Darwin in southern Arnhem Land. The goal of the workshop was to strengthen mutual understanding of the impacts of these events on the community and enable seasonal community preparedness.

First Nations Climate Communications Community Workshop in Ngukurr.

The workshop was facilitated by Yolŋu Elder and project lead Ian Mongunu Gumbula and included Ngukurr Elders and leaders, the Charles Darwin University team and the Bureau's Decision Support Services staff. The focus of the event was on physical and cultural safety, the role of weather knowledge and language in building disaster resilience, and finding out what was working well in Ngukurr and what could work better. For many it was the first opportunity to discuss the challenges with communication and emergency management that arose during previous cyclones.

Insights gathered by the Bureau included the challenges faced by some community members, particularly those who speak English as a second language, in understanding weather and emergency reports. Examples included if the person delivering the advice spoke very quickly or used difficult and technical English words, which could lead to people feeling nervous and afraid. The Bureau is working with emergency management partners to simplify community messaging, with a focus on preparedness activities.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 1 include:

- delivering a standard flood warning service for greater Melbourne catchments, including the transition of riverine flood forecasting responsibility from Melbourne Water to the Bureau
- continuing to generate insights, manage opportunities and update sector plans for the Emergency Management and Australian Community sector customers, products, services and channels
- improving the decision-making process around climate data through the Climate Tools Uplift project.

Outcome 2: Our high-impact products and services enable our customers to take timely decisions and actions.

Achieving the outcome

Improving weather and climate modelling through collaboration

In February, the Bureau signed an agreement with the European Centre for Medium-Range Weather Forecasts (ECMWF) on collaboration, data sharing and capability exchange. As part of the agreement, the Bureau was invited to work with the ECMWF Copernicus Climate Change Service on extended and long-range forecasting. The addition of the Bureau's ACCESS-S long-range forecasts to the ECMWF Copernicus multi-system global ensemble increased the total contributors in this advanced modelling system to nine.

Delivering ongoing improvements to fire weather services

Following on from the implementation of the Australian Fire Danger Rating System in 2022, a range of high-priority improvements were identified by emergency services customers.

In 2024, the Bureau worked with customers and the National Council for Fire and Emergency Services to implement agreed improvements, including updating of fuel information and fire spread models used in the systems. This uplift of the Bureau's services provides more accurate fire weather information to better support emergency management planning and response to bushfires.

From left: Meteorologists Kevin Parkyn and Jun Smith, and Decision Support Services Officer Joanna Hewes, participating in a planned burn field trip in Victoria. Credit: Joe Gomez

Finalising the National Heatwave Warning Framework

In December, the National Heatwave Warning Framework was finalised, leading to the coordinated delivery of an impactful service for the Australian community. This followed the launch of the Bureau's new Heatwave Warning Service in 2022–23 to support authorities and the public in preparing for and mitigating the impacts of heatwaves.

This achievement is the result of a 3-year collaborative effort through the National Heatwave Warning Group made up of the Bureau and state health and emergency services agencies. The Framework establishes an agreed definition of heatwaves and the roles and responsibilities of the different levels of government, state emergency service and health agencies across the end-to-end warning system.

Recognising 20 years of partnerships in tide predictions and oceanography

Tidal analysis and predictions underpin planning and decision making right across the Australian community and economy. Since 2004, the Bureau has served as the national centre for tidal information, working closely with partners in the Australian Hydrographic Office, Australian Maritime Safety Authority, and Ports and Maritime Agencies across the states and territories.

The Bureau also contributes data and expertise to international sea level programs such as the Global Sea Level Observing System operating under the Intergovernmental Oceanographic Commission and the Pacific Sea Level and Geodetic Monitoring component of the Climate and Oceans Support Program in the Pacific (COSPPac).

The Bureau's operational ocean forecasting also marks 20 years of partnering with Defence and CSIRO in Bluelink – the world-leading forecasting effort that focuses on global ocean modelling.

Highlights and significant events

Playing a critical role in delivering resilient operations in Antarctica

Undertaking scientific endeavours in the Antarctic – one of the most hostile environments on the planet – requires detailed planning and preparation, and weather is a critical factor in this process. In August, the Bureau provided weather forecasting, ice analysis and observation data to support the medical air evacuation of an unwell expeditioner from Australia's Casey Station in Antarctica.

The most viable solution for the medical evacuation was for the Australian Antarctic Division's icebreaking research and supply vessel, Nuyina, to depart Hobart at very short notice. The icebreaker travelled 3,500km across the wintery Southern Ocean and into sea-ice within helicopter range of Casey Station. Two helicopters took flight in the brief period of available daylight to bring the patient back to the ship, and then back to the Australian mainland.

Helicopter approaching the heli-deck of RSV Nuyina. Credit: Jenn McGhee, Australian Antarctic Program.

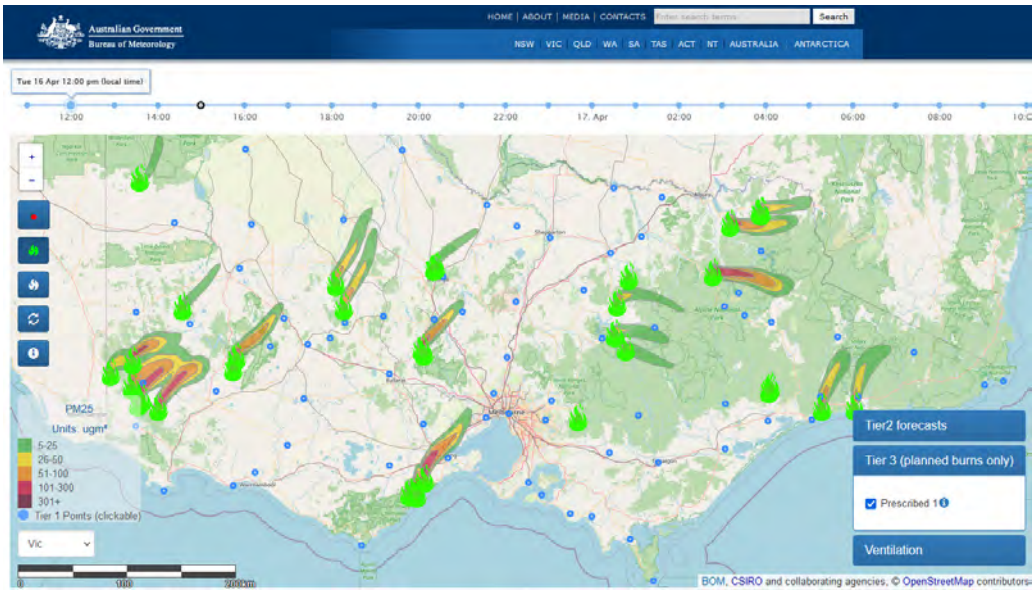
All weather- and ice-sensitive decisions of the voyage were supported by experienced Bureau Antarctic weather forecasters who were mobilised to support the mission. The Bureau's embedded observers and technicians at Casey Station provided the observational reports to support the helicopter operations. After 18 days at sea, the ship returned to Hobart and the mission was successfully completed.

Delivering a nationally consistent approach to smoke forecasting

In August, the Bureau released the first phase of the Australian Smoke Dispersion System (ASDS) to all states and territories. Used for predicting the distribution and concentration of smoke and pollutant emissions, the ASDS is the operational smoke forecasting system used in Australia and is endorsed by the National Council for Fire and Emergency Services.

Previously, forecasts of smoke dispersion from prescribed burns were only available in Victoria and New South Wales. Now this capability is available in every state and territory thanks to the project funded by the National Emergency Management Agency (NEMA).

The Bureau gathers data from fire and land management agencies about upcoming prescribed burns and uses the ASDS to provide detailed information about potential smoke impacts from those burns. Agencies use that information to decide whether to go ahead with the burn or to make changes to the burn plan to minimise community exposure to harmful levels of smoke. ASDS also provides predictive weather information at specific locations to enable fire and land management agencies to identify potential windows within the next week to safely conduct prescribed burns.



Smoke dispersion from planned burns in Victoria shown in the ASDS.

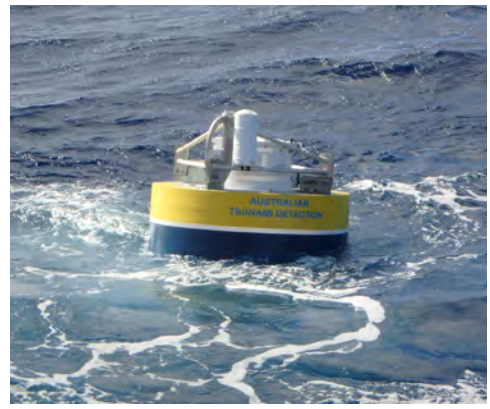
Testing and improving our tsunami response through IOWave23

The Joint Australian Tsunami Warning Centre, consisting of experts from the Bureau and Geoscience Australia, leads the Australian Tsunami Warning System and is also one of 3 Tsunami Service Providers for the Indian Ocean Tsunami Warning and Mitigation System.

Tsunamis are recorded in Australia approximately once every 2 years. Due to the infrequency of real events, it is important to test warning systems through exercises. In October, the Bureau took part in IOWave23, an international Indian Ocean-wide tsunami exercise with partners including NEMA, Geoscience Australia and the WA Department of Fire and Emergency Services (DFES).

The exercise simulated a large earthquake just south of Java, Indonesia, producing a tsunami which threatened much of Australia's coastline, particularly the northwest of Western Australia. Tsunami warnings and bulletins were disseminated to participants in real time. This tested many aspects of the warning system, including operational readiness, internal and external communication links, media responses, provision of high-level briefings, and the robustness of the Bureau's systems.

The Bureau worked closely with the DFES in planning the exercise during the months leading up to October. This involved coordination of 15 Bureau teams and 13 external agencies who either actively participated in or observed the exercise. Successfully simulating a potentially high-impact event prompted agencies to consider their response and readiness. Debriefs of the exercise helped inform opportunities for further improvements to an otherwise well-established warning system.



Left: Emergency management personnel participating in the IOWave23 event. Right: A tsumater buoy which is an important component of the Australian Tsunami Warning System.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 2 include:

- delivering the Australian Smoke Dispersion System
- uplifting flood warning services by supporting the Flood Warning Infrastructure Network (FWIN) program and the delivery of probabilistic forecasting service via Next Generational Rainfall and Streamflow project and new South-East Queensland warning service
- implementing the new application Tsunami Observation and Simulation Tool into operations
- further developing the Future Warnings Framework to support the delivery of a nationally consistent, multi-hazard, impact-based warning and alerting system for the Australian community.

Outcome 3: Resilient, sustainable, national operations delivered across CSG.

Achieving the outcome

Celebrating the Public Services Transformation program and its continued benefits

In August, Piero Chessa, Group Executive for the Community Services Group, hosted a Bureau-wide event to celebrate the conclusion of the 4-year Public Services Transformation (PST) program which formally closed in June 2023.

In 2023–24, the benefits of the program continued to be realised through a more resilient, integrated and sustainable national operating model – complemented by local, customised decision support services and high-impact products and services. The Bureau continued to:

- incorporate the latest science and technology to improve the accuracy and quality of its forecasting and warning services, resulting in improved decision making by critical sectors
- increase the connection to customers through decision support roles and by growing customer engagement skills
- uplift its national rainfall and severe weather intelligence across all weather hazards, enabling the provision of more accurate and timely warnings
- increase targeted automation of forecasting services through improved guidance and an uplift in the use of forecast verification that has enabled productivity gains within CSG as staff focus on higher value activities.

The Bureau will continue to mature and improve its processes to deliver even greater benefits for its customers in 2024–25.

The Bureau's Public Services Transformation program designed and delivered new ways of providing its weather, water, ocean and climate services to the Australian community to better serve and respond to the needs of customers – now and into the future.

Responding to community needs through a 7-day tropical cyclone forecast

In September, the Bureau released the new tropical cyclone 7-day forecast product. Feedback from Bureau customers, including state emergency services and government agencies, played an essential role in its development. Customers across a range of sectors had advised that the previous tropical cyclone 3-day forecast product did not provide enough lead-time for critical decision making. This new forecast provides more lead time and more detailed information to help emergency services and the Australian community prepare for the impacts of tropical cyclones earlier.

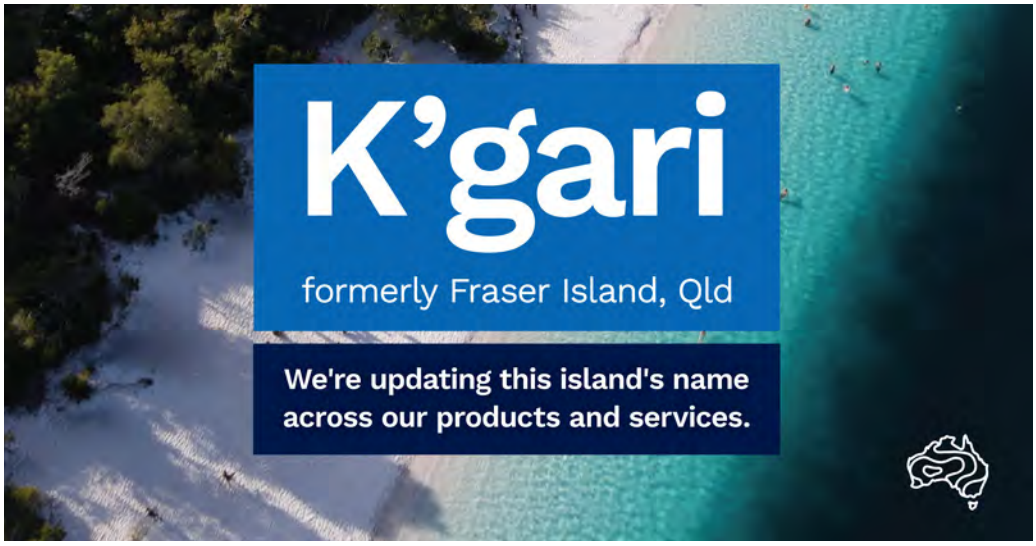
The 7-day forecast uses an innovative scientific process developed by the Bureau to provide a calibrated probabilistic forecast that is both more objective and can be produced more efficiently.

Benefiting from the National Response Duty Officer

After its establishment in 2022–23, the National Response Duty Officer (NRDO) role is continuing to strengthen the Bureau's operational efficiency and resilience. The NRDO is a daily rostered/on-call role that coordinates and leads CSG operations during major weather events, acting as the single point of contact for other groups and programs across the Bureau. During 2023–24, the benefits of the NRDO role were realised through an increased focus on critical operations in a more collaborative and systematic way that supports staff wellbeing during high-pressure situations.

Bringing First Nations place names into our products and services

In February, following the Queensland Government's official renaming of Fraser Island to K'gari, the Bureau updated its products and services to reflect this change. K'gari is the island's traditional name in the language of the local Butchulla peoples. Australians can now see this change in a wide range of services in this area, including coastal waters forecasts, marine wind warnings and tsunami warnings. The Bureau committed to using First Nations place names in its Innovate Reconciliation Action Plan 2021–2023 (see p.115) and this is an important step towards reconciliation.



The Bureau promoted the change to K'gari through its social media platforms.

Highlights and significant events

Delivering major flood services and forecasting improvements

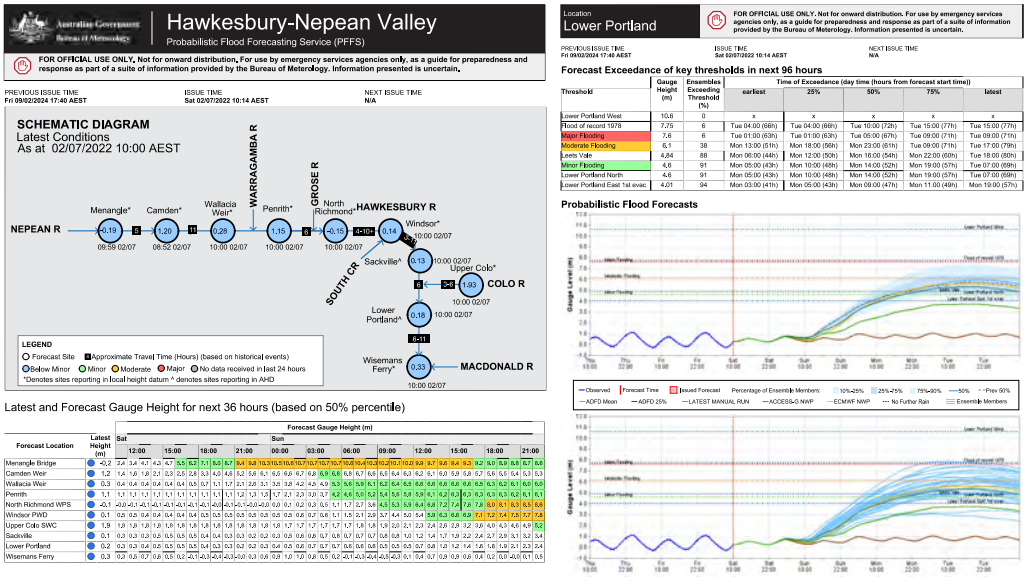
In 2023–24, updates to the Bureau's Hydrological Forecasting System (HyFS) delivered significant improvements to the operational efficiency of this critical flood forecasting system. Key flood warning service improvements included:

- the addition of new forecast locations in South Australia, Queensland and Western Australia
- flood modelling improvements in Tasmania
- flood class level updates across all states and territories.

Upgrades in HyFS included the implementation of ensemble rainfall forecasting, blending the latest radar scans into modelled rainfall. Automatically generated probabilistic flood forecasts (see p.104) are available at a greater frequency and longer lead time, resulting in more timely flood predictions of the potential range of flood outcomes for emergency responders. Operational efficiency improvements included the automation of peak river height calculations along with updates to metadata and maintaining flood models to account for changes in river behaviour following flooding.

These changes enable the Bureau to deliver more timely, targeted and relevant products and services to the emergency services and the Australian community. They were made possible through dedicated work from teams right across the Bureau and external partners.

HyFS releases underpinned delivery of several priority floods projects during the year, including the Hawkesbury Nepean Valley Probabilistic Flood Forecasting Service. This project is an excellent example of leveraging the best available science, systems and technology, codesigned with the Bureau's emergency services partners, to deliver an enhanced probabilistic flood warning service – which is the first of its kind.

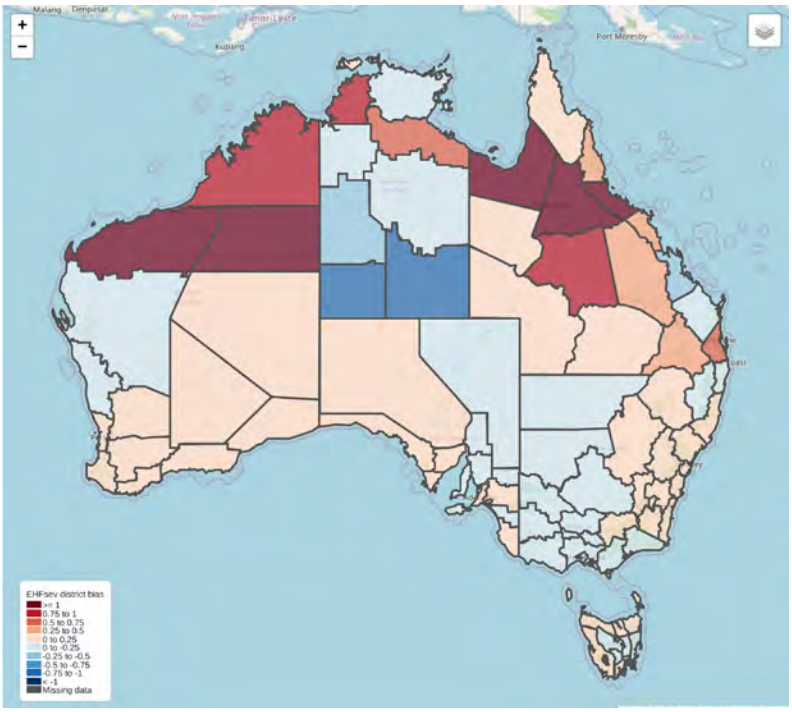


Examples of the information available from the new HyFS releases.

Uplifting our heatwave forecast verification

The Bureau's Forecast Quality project is uplifting its verification and evaluation capabilities, improving the Bureau's ability to assess forecast quality, report on forecast performance and take targeted actions to improve accuracy. A key output of the project has been Forecaster Verification Dashboards that display daily and long-term verification results for a range of weather elements including temperature, precipitation, wind, and dew point.

To improve temperature forecasts in the days leading up to and during heatwave events, particularly when warnings are required, a new Heatwave Verification Dashboard was released in August. The new dashboard allows operational meteorologists and other teams in the Community Services Group to assess the recent accuracy of both area and point-based heatwave forecasts, as well as minimum and maximum temperature forecasts.



The Forecast Verification Dashboard displaying the difference between the district heatwave forecasts and the district heatwave observations on a single day.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 3 include:

- delivering pilot production processes for an increase in routine production from 2 to 4 times per day through the Forecast Improvement Delivery Stream
- implementing Lean processes across priority operational services
- developing a dedicated Rainfall Intelligence capability within the Community Services Group to support flood forecasting and warning decisions.

Outcome 4: A valued, safe and inclusive workforce with a clear sense of purpose.

Achieving the outcome

Expanding our wellbeing program

Following a strong response from staff to the successful 3-month pilot program held in 2023, the Bureau engaged Converge International to deliver the next iteration of the CSG Wellbeing Program for 4 months (May–August) leading up to the 2024–25 peak season. The proactive program, tailored and dedicated to the needs of the group, supports staff wellbeing through education and the building of personal resilience strategies. The program's 2 elements offer workshops and webinars, which are delivered as general resources, and an onsite support service provided by Converge counsellors and psychologists. These strategies aim to help staff prepare for and bounce back from prolonged high stress periods, leading to improving team capacity during peak events and reducing recovery time post events. The Bureau will continue to assess the value of this program in 2024–25.

Strengthening public policy ties through our STEM Ambassador

In July, Bureau Senior Meteorologist, Jonathan How, became a Science & Technology Australia STEM Ambassador, joining the program for twelve months to forge stronger relationships between scientists and Parliamentarians. Jonathan, who joined the Bureau in 2014 and has worked in various roles including within the media and communications, was selected through a highly competitive process. He was matched by the program with Peter Khalil MP, the Member for Wills in Melbourne's inner north. The pair met throughout the year, giving Jonathan the opportunity to get involved in policy and the decision-making process, while providing expert advice on STEM opportunities, topics and events. Jonathan has also revived the local STEM community group and looks forward to seeing what they achieve going forward. The Bureau will continue to encourage staff involvement in the STEM Ambassador program to contribute to Parliamentarians' understanding of meteorology.

Bureau Senior Meteorologist, Jonathan How.

Highlights and significant events

Collaborating to promote interdisciplinary research

In August, the Bureau participated in the annual meeting of the World Weather Research Program (WWRP) in Geneva. The WWRP is a World Meteorology Organization (WMO) program that facilitates core projects on weather prediction and impacts, science for service activities and working groups. The Bureau co-chairs the Social and Economic Research Applications (SERA) Working Group which contributes across all of WWRP's activities.

Attendees at the World Weather Research Program (WWRP) in Geneva.

The SERA Working Group reported on the contributions made by SERA members to projects such as the Value Chain project being led by the Bureau, and the Tropical Cyclone Probabilistic Forecast Products, Paris Olympics (see p.107) and Polar Prediction projects. This was a significant meeting because as well as celebrating the impacts and achievements of the working group's 2016–2023 Implementation Plan, the 2024–2027 Implementation Plan was launched, focusing on the UN call for Early Warning and Early Action for all and embracing a versatile scientific portfolio reflecting the diverse needs of people across the globe.

In September 2023, the Bureau led the Australian delegation, including representatives from Geoscience Australia, to the 30th Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System of IOC-UNESCO in Tonga. This participation underscores Australia's significant contributions to the international tsunami warning and mitigation systems for both the Indian and Pacific Oceans. The Bureau's involvement is timely given the ongoing UN Decade of Ocean Science for Sustainable Development (2021–2030), which aims to transform ocean science for sustainable development. Additionally, a special technical workshop was held with the International Union of Geodesy and Geophysics Joint Tsunami Commission to address lessons learned from the Hunga Tonga-Hunga Ha'apai volcano eruption in January 2022, which caused a basin-wide tsunami impacting Australia's east coast.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 4 include:

- continuing to foster a proactive safety culture and processes that focus on all aspects of fatigue, wellbeing and psychological safety of staff, including expanded EAP trials
- progressing strategic leadership capabilities of our emerging leaders
- continuing to enhance the group's diversity and inclusion and use of flexible working arrangements.

Business Solutions

Goal: Business Solutions Group enables customers in the Bureau's focus sectors to achieve their missions by contributing to the prosperity, safety and security of those sectors and Australia as a whole.

The Business Solutions Group builds deeper, more focused, and systematic engagement with the Bureau's customers and partners. Its goal is to deliver greater impact, innovation, quality and value in critical sectors including agriculture, aviation, land and maritime transport, energy, resources, national security, water and international development. The group also delivers on the Bureau's function as a regulator under the *Water Act 2007*, to bring together Australia's water information.

In 2023–24 the group comprised 6 programs:

Program	Responsibilities
Agriculture and Water	• Deepening the Bureau's relationships • Developing an in-depth understanding of each sector and its needs • Delivering responsive, coordinated, world-class services
Aviation, Land and Maritime Transport	
Energy and Resources	
Flood Warning Infrastructure Network	
International Development	
National Security and Space	

Throughout 2023–24, the group focused on delivering 3 outcomes to support the Bureau to achieve its Strategy and purpose. The group's achievements in delivering to these outcomes are outlined below.

Outcome 1: Ensure delivery of existing 'flagship projects' to time, scope and budget and ensure we create the impact and value planned.

Achieving the outcome

Building resilience through MET5

The Meteorological Five Eyes (MET5) Community of Practice shares climate monitoring data, space weather, meteorology and oceanographic capabilities among members of the Five Eyes intelligence alliance comprising Australia, Canada, New Zealand, the United Kingdom and the United States. It focuses efforts on objectives that improve defence and national security. Through these shared objectives, the Bureau and Canada piloted a new cloud-based data sharing capability in 2022–23 that has proven extremely valuable and in 2023–24 attracted commitment from all MET5 members, together with their respective Defence departments, to be implemented for all. With this

new capability, members can access the data, products and services shared by others to fill gaps in their data, share common datasets when supporting joint international operations, and generate improved products via ensemble techniques, and for quality control. This ensures resilience but more importantly reliable, scalable, and flexible data exchange between Australia and its allies. While the capability does not yet service all requirements, it will continue to be developed to ensure resilience and provide for reliable, scalable, and flexible data exchange between Australia and its allies.

Delivering effective space weather warnings and alerts

In its second year of operation, the Australian Space Weather Forecasting Centre (ASWFC) continued to provide a 24/7 service of space weather forecasts, warnings, and alerts throughout 2023–24. In May, the Earth experienced its first extreme geomagnetic storm in 21 years. The ASWFC was central to providing timely and accurate space weather information to operators and decision-makers across Australian industry sectors and the community to ensure any potential effects could be mitigated. No significant impacts due to the event were reported, although widespread auroras were visible across most of the country.

Space weather forecaster monitoring conditions on the Sun.

Building the foundations of the water markets data and systems framework

As part of the Australian Government's Water Markets Reform Roadmap, the Bureau is implementing a water markets data and systems framework. The framework will support the Government's commitment to increased transparency of water markets in the Murray–Darling Basin and give water users access to the water market information they need.

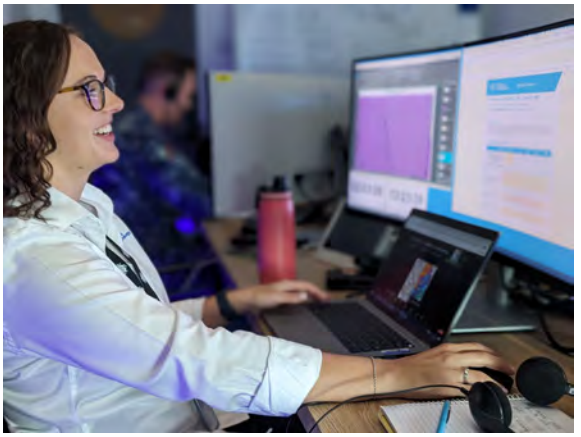
The reforms will be implemented as part of a 4-year program which commenced in July. The Bureau's contribution to the reforms include:

- a new Water Data Hub – a digital platform to centralise national water market data
- a new Water Markets website – for the first time allowing market participants and the community to access live water market updates
- a new Water Markets Data Standard – enabling transparency and compliance of data being provided to the Bureau.

2023–24 saw extensive consultation with water market participants to inform the new Water Markets Data Standard, and the establishment of the hosting arrangements for the new Water Data Hub. Development of a new Water Markets website will commence from 2024–25 onwards, informed by user consultation.

Growing spaceflight capability to support emerging launch providers and operators

The Bureau continued to grow its service offering to the national security and space industry and government entities during 2023–24. After successfully completing a 2-week trial to support space situational awareness, the Bureau's National Security and Space Program facilitated the signing of an agreement with US Defence Space Force for the Bureau to provide daily space weather briefings to the Pacific Cell of the Joint Commercial Operations (JCO), a global space domain awareness initiative. The JCO Australia lead confirmed that the Bureau's briefings have greatly enhanced the context for space domain awareness operators and their understanding of the effects of space weather on watched objects.



Urshla Connor, Meteorologist, providing dedicated meteorological support to the Joint Commercial Operations during a trial period.

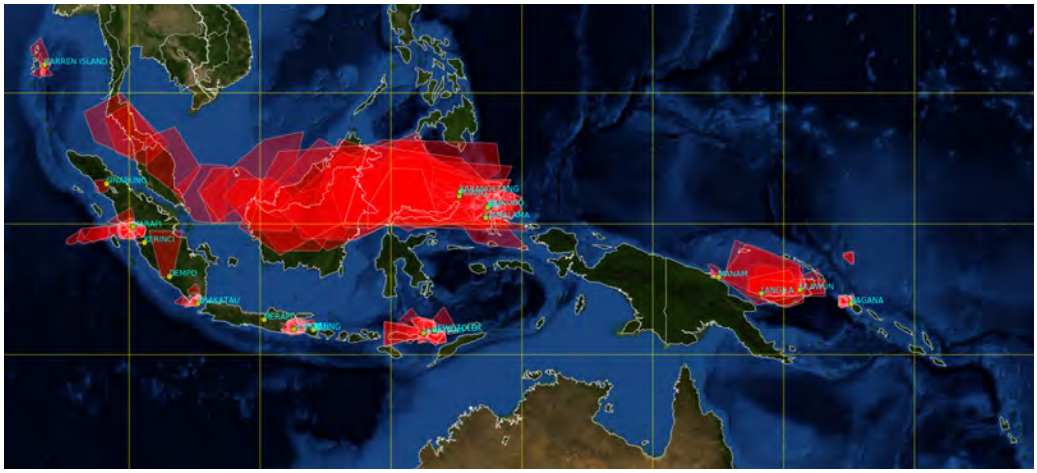
The Bureau also established an agreement between the Governments of Australia and India to share real-time meteorological and oceanographic observations, analysis, forecasts, and warnings in support of the Gaganyaan Mission – India's first human spaceflight program. The Bureau also supported the inaugural rocket launch by Southern Launch in May 2024. Daily sharing of accurate and timely meteorological intelligence (both space and terrestrial) ensures the Bureau's customers have the best available information at the right time to achieve their space outcomes, from launch, in-orbit events, return and re-entry.

Launch of the HyImpulse SR75 rocket at Koonibba, South Australia, Friday 3 May 2024. Credit: Southern Launch.

Understanding space weather impacts on spacecraft

Australians rely on space-based technology for almost everything, from navigation to firefighting. Space weather can disrupt spacecraft in many ways, including temporary loss of communication and damage to sensitive electronics. As part of the Australian Space Agency's Civil Space Monitoring Centre (Pathfinder) project, the Bureau completed a collaborative project to better define the impacts of space weather on satellites in a variety of orbital regimes. This included developing a comprehensive report, along with a risk matrix to enable quick assessment of potential space weather risks posed to a spacecraft of interest. This project will help improve the resilience of Australian spacecraft, by ensuring the Agency has the means to make informed decisions about Australian space assets.

Protecting aircraft, passengers and crew from volcanic ash impacts



Location of volcanoes for which volcanic ash advisories were issued by the Bureau in 2023–24. The red polygons represent the extent of ash dispersion for which advisories were issued.

The Bureau's Volcanic Ash Advisory Centre (VAAC Darwin) provides advice to the aviation industry about the location and movement of potentially hazardous volcanic ash. VAAC Darwin is staffed by meteorologists who are specially trained in the detection and forecast movement of volcanic ash, which is a known hazard to aviation.

In 2023–24, VAAC Darwin issued 4,628 volcanic ash advisories (a 62 per cent increase compared to the 2015–2024 average) in relation to 21 different volcanoes (compared to 15 in 2022–23).

VAAC Darwin issues advisories for high impact events, which generally have discernible or visible ash that is impacting or expected to impact aircraft at cruising levels or international aerodromes. During 2023–24 there were 4 high impact events from 3 volcanoes:

- Ulawun in Papua New Guinea from 20 November
- Marapi in Indonesia from 3 December
- Ruang in Indonesia from 17 April and 29 April.

Delivering on the Pacific's weather and climate roadmap

The Bureau played a key role in supporting the realisation and initial implementation of Weather Ready Pacific (WRP), the Pacific's roadmap for developing weather and climate services across the region over the next decade and beyond. Through its role on the Pacific Meteorological Council and targeted support to the Secretariat of the Pacific Environment Programme, the Bureau ensured finalisation of the governance arrangements and the implementation plan for WRP in August. The Bureau also commenced some of the first activities under WRP in February, training 3 Samoan candidates through the Bureau's Graduate Diploma in Meteorology course.

Weather Ready Pacific supports fundamental observations as seen here in upper air balloon launches in Kiribati.

Supporting aviation in Australia

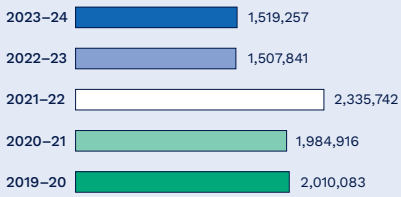
In Australia, aviation connects communities through domestic and regional flights, contributes significantly to national and international supply chains, and supports industries in achieving their daily outcomes. The Bureau's meteorological services play an essential role in the safe and efficient operation of Australia's aviation sector.

The Bureau provides aeronautical meteorological observation, forecast, and warning services for Australian airspace, which spans 11% of the globe. It also offers critical aviation hazard services, such as for volcanic ash, to the Asia-Pacific region.

In 2023–24, the Bureau established a decision support team in the new Airservices Australia National Operations Management Centre in Melbourne. This team leads the meteorological collaborative decision-making process and is a core contributor in collaborative decision making, improving air traffic flow management.

Over
1.5 million
aviation forecasts delivered

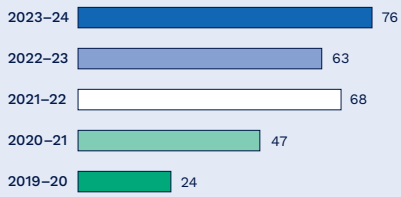
Aviation forecast products delivered



* Note that the method used to calculate forecast products delivered was revised in 2022–23 resulting in a lower number of products compared to previous years.

More than
70
Search and Rescue forecasts delivered

Search and Rescue forecasts delivered



The Bureau also deployed a new aviation verification system, which provides airlines with access to performance statistics on aerodrome forecasts, and upgraded its centralised automated weather information service, which provide pilots with access to real-time observations at airports.

Celebrating 20 years of Bluelink Ocean Forecasting

This year marked 20 years of partnering with the Royal Australian Navy and CSIRO in Bluelink – the world-leading forecasting effort that focuses on global ocean dynamics. This partnership continues to develop and deliver reliable forecasts for complex motions of ocean temperature, surface elevation, salinity and currents, with accuracy previously unimaginable. The forecasts support decisions about deep water and feed a variety of downstream prediction systems.

Highlights and significant events

Commencing the Flood Warning Infrastructure Network (FWIN) Program

Nationally, the Bureau owns around one-third of the gauges it relies on to deliver flood forecasts and warnings. As part of the 2023–24 Federal Budget, the 10-year national Flood Warning Infrastructure Network (FWIN) Program was established to simplify ownership and improve maintenance of the flood network across Australia.

The river level gauge at Kamerunga Bridge on the Barron River in Cairns suffered extensive damage during tropical cyclone Jasper in December and is an important forecast location that impacts Cairns Airport. Credit: Teague Cullis.

Works commenced during the year in Queensland, where almost half of the nation's rain and river gauges the Bureau relies on for flood forecasting are located. There are more than 70 owners of the sites in Queensland, most of which are local government. FWIN will relieve councils of the requirement to own and maintain selected flood warning infrastructure.

In the first half of 2024, FWIN's stakeholder engagement team spoke to each of the 64 Queensland councils in scope for the program, to build understanding of the flood warning network and communities' needs. Regional workshops with councils followed across the state, resulting in a list of sites to be acquired under the program.

Two pilot projects were commenced during the year, designed to test FWIN's processes. The first to test acquisition and remediation processes and the second, to test the program's end-to-end processes.

The river level gauge at Kamerunga Bridge in Cairns was identified as the site for the first pilot. The site suffered extensive damage during tropical cyclone Jasper in December and is an important forecast location for Cairns Airport. The Bureau acquired the equipment from the Cairns Regional Council and gained permits from the site owner in June.

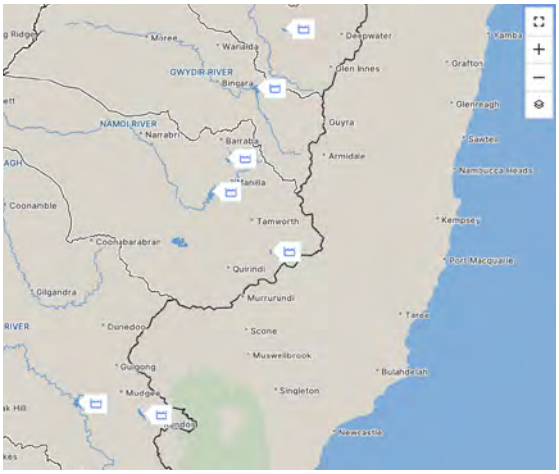
The second pilot location is the Burrum Cherwell catchment, southwest of Bundaberg. This pilot will test the end-to-end processes from initial asset selection to full transition of the equipment into the Bureau's business-as-usual operations. Site investigations were completed in May for the 13 sites to be acquired under the program.

Increasing transparency and access to water information

The Murray–Darling Basin Water Information Portal was first released in 2021 as a central source of water information for the Murray–Darling Basin, and has been progressively developed through 5 staged releases, each with new features and functionality added in response to user feedback.

The final release of the Portal was completed in 2023–24 with the addition of:

- cultural information for the lands of the Gomeroi / Kamilaroi nations
- annual actual water take information (prepared as part of the Murray–Darling Basin Authority's (MDBA) Water Take Report).



View of the Murray-Darling Basin Water Information Portal showing catchments on the map that can be selected to display related information, such as storage information.

The portal provides greater transparency and easier access to Basin-wide information and brings together information about water availability, water in storages, groundwater, streamflow, allocation volumes, water take, water markets, and water quality. It presents this information through interactive river diagrams for the Basin with photographs of rivers, storage infrastructure and significant locations.

The cultural information provides a unique insight into the extensive knowledge of and connection to Country held by First Nations people. It includes recordings in which the elders recall their experiences growing up on missions, such as Toomelah, One Mile and Top Camp, share their connection to Country, and explain the important role waterways play in creating their sense of identity. Accompanying the recording are photos and stories of culturally significant sites, including Boobera Lagoon, known to local First Nations people as the resting place of Garriya, the Rainbow Serpent.

The Portal was developed by the Bureau in partnership with the MDBA, the Department of Climate Change, Energy, the Environment and Water, and Basin state government agencies.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 1 include:

- beginning physical remediation of flood warning infrastructure in Queensland to enhance forecasts and warnings and support emergency preparedness, response and recovery
- delivering water sector capability to underpin national water security and water supply services, including supporting water markets reform in the Murray-Darling Basin
- leveraging the Meteorological Five Eyes partnership with key allies to share weather information and meteorology and oceanography capabilities to improve Australia's defence, security and resilience.

Outcome 2: Secure and expand new ‘flagship projects’ using a standardised Opportunity Management approach and ensure we grow the path to impact and value.

Achieving the outcome

Extending climate services for agriculture

My Climate View (originally released as ‘Climate Services for Agriculture’) is the flagship tool for the Climate Services for Agriculture (CSA) program.

It is a free digital product that helps farmers and land managers understand what the future climate might look like for their location and commodity, at a 5 km^2 resolution.

There have been many innovations to the product since the first release in June 2021, with recent features including:

- an overview page which provides a snapshot of localised future climate information
- the ability to download a report comparing past (1994–2023) and projected (out to 2050) seasonal climate information such as rainfall for spring and autumn pasture growth, temperature, and the number of heat stress days.

Using My Climate View from left: Troy Lovett Project Officer, Gunditg Mirring Traditional Owners Aboriginal Corporation, Damien Skurrie, Wotjobaluk Cultural Burns Officer, and Levi Lovett, Gunditj Mara Mob Cultural Burns Officer.

The CSA program is a collaboration between CSIRO and the Bureau and is part of the Australian Government’s Future Drought Fund investment into the development of better climate information for Australia’s agriculture sector.

In early 2024, the Future Drought Fund renewed its commitment to extend the investment in the program for a further 4 years, through to mid-2028.

Translating research to operations for the resources sector

During the year, the Bureau made significant advancements in translating research insights into practical applications for the resources sector. The primary focus was to develop world-leading solar and wind nowcasting and forecasting technologies (see p.101) that are critical to supporting the sector’s net zero ambitions.

Informed by industry insights, research was undertaken to tackle the major emerging scientific challenges facing the resources sector as it moves towards green energy sources and ambitious net zero goals. On the back of early research success, the Bureau’s Energy and Resources Program worked in partnership with leading sector organisations to support them in addressing their energy transition challenges through operational deployment of world-leading forecast technologies.

Strengthening our relationship with Powerlink for enhanced energy operations

In November, the Bureau and Powerlink renewed their Strategic Relationship Agreement (SRA) for another 3 years. Powerlink delivers electricity to more than 5 million Queenslanders and will be pivotal in Australia's transition to a lower emissions energy system. The initial SRA (2020–2023) enabled both organisations to collaborate closely and renewal will ensure the Bureau can continue to deliver benefits to Powerlink through improved weather-related decision-making.

Bureau CEO and Director of Meteorology Dr Andrew Johnson and Powerlink CEO Professor Paul Simshauser after signing the renewed Strategic Relationship Agreement. Credit: Powerlink.

One of the initiatives being implemented under the agreement is the Energy Futures workstream – a collaborative project between technical experts from the Bureau and Powerlink. Using the Bureau's reanalysis dataset (BARRA), the project team is developing a better understanding of weather conditions that give rise to power system stress, and how well these conditions can be forecast. These insights will lead to more efficient network planning and operations.

Collaboration under this SRA will enhance energy affordability, security, and reliability, and build resilience to future weather and climate impacts.

Highlights and significant events

Supporting the National Supply Chain

The Bureau supports the national supply chain by providing weather and climate advice to the Australian Rail Track Corporation (ARTC).

In March, a significant rain event was forecast to develop across the Nullarbor. Heavy rain fell over several days, resulting in widespread accumulated rainfall totals of greater than 300 mm. With no river systems to remove the water from the area, the rainfall ponded, causing prolonged inundation of the rail track of up to 1.5 m in sections.

The Trans-Australian Railway Line was cut for 3 weeks after flooding at Rawlinna on the Nullarbor in March 2024. Credit: Australian Rail Track Corporation.

The Bureau proactively engaged with ARTC and emergency management partners to ensure that the national supply chain was prepared for the event. Creating a shared understanding of the likely impacts of the event on land transport networks was critical for coordination and recovery efforts. This early warning advice enabled the national supply chain stakeholders to work together and implement plans to mitigate disruption.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 2 include:

- continuing to evolve aviation products to meet the future needs of the aviation industry
- identifying, coordinating and delivering products and services that materially advance Australia's foreign policy, security, and international development goals in the Asia-Pacific region
- supporting the National Electricity Market to operate safely at very high instantaneous penetration of wind and solar generation, and the resources sector to operate safely and more productively.

Outcome 3: Sustain delivery of existing essential services and grow our capacity to mobilise the Bureau's capability in service of creating impact and value by meeting defined customer needs.

Achieving the outcome

Supporting Exercise Southern Sunrise

The Bureau's National Security and Space Program's Defence Weather Meteorologists were invited by the Royal Australian Air Force (RAAF) No.2 Flying Training School to support Exercise Southern Sunrise on-site from Busselton in Western Australia. The Busselton Aero Club was transformed into a temporary Defence Weather Services Office (DWSO) for the exercise.

The Bureau's embedded meteorologist allowed flying instructors to manage operational risk in real-time by providing a responsive aerodrome forecast for Busselton, constant monitoring of airfield conditions and on-demand briefings for aircrews. This is the highest level of support the Bureau offers to military aviation units and replicates the service provided by one of the Bureau's DWSOs at established air bases.

Reaffirming our relationship with Defence

In May, the Bureau and Defence signed a new 10-year Strategic Relationship Agreement, replacing the existing Strategic Partnering Agreement. The new agreement strengthens and streamlines the Bureau's collaboration with Defence and will the enable Bureau to support Defence users in a more holistic manner, improving outcomes at both tactical and strategic levels.

HMAS Canberra's MH-60R 'Mayhem' during Indo-Pacific Endeavour 2023. Credit: Department of Defence.

Preparing for extreme space weather

On 22 and 23 May, government and industry came together for Exercise Aurora, which aimed to better prepare Australia for extreme space weather events. The exercise was hosted by the National Emergency Management Agency in partnership with the Bureau, Geoscience Australia and the Department of Home Affairs.

Exercise Aurora enabled government agencies, industry leaders and international counterparts to practice preparation and response to an extreme space weather event. Exercise Aurora was a valuable opportunity for the Australian Space Weather Forecasting Centre, the Bureau's space weather capability and stakeholders in the sector to lead a simulation of monitoring and reporting of space weather conditions and their possible effects.

The Bureau's support enabled government and the critical infrastructure sector to test emergency management arrangements, better understand infrastructure vulnerabilities and identify steps to prepare and respond to these events.

Bureau staff participating in Exercise Aurora.

Delivering the Bureau's Water Act functions

Under the *Water Act 2007* (Water Act) the Bureau is responsible for collecting, holding, managing, interpreting and disseminating Australia's water information. The Bureau is also the regulator under Part 7 of the *Water Regulations 2008*, which requires over 200 organisations to provide their water information to the Bureau.

Consistent with its regulatory functions under the Water Act, the Bureau published the latest National Water Account in June.

The latest 3 reports provide a comprehensive analysis of the use, supply and storage of Australia's water resources over a financial year across 11 significant water-use regions:

- Urban regions (2023) – Adelaide, Canberra, Melbourne, Perth, South East Queensland, Sydney
- Northern Australia regions (2023) – Burdekin, Daly, Fitzroy, Ord
- Murray–Darling Basin region (2022).

The reports detail water stores and flows, water rights, water use, and volumes of water extracted and managed, and enable comparisons at a national level.

The release includes improvements in data presentation and statements from the last 5 years, which allow comparison with the current period. The multi-year data provides insight into changes in the status of our water resources, and into water management and the impact of weather and climate on water use.

Strengthening the safety and preparedness of Queensland's ports

During December, as tropical cyclone Jasper intensified off the Queensland coast, the Bureau's location-specific weather briefings enabled early response and preparation by ports and the maritime sector.

The Bureau provided early warnings to help ports prepare for abnormally high tides and large waves. Critical weather information helped ensure that port safety plans were enacted in a timely manner, and that vessels were either secured – where safe to do so – or relocated to a more suitable area.

The effects of the cyclone on the prevailing wind, waves and sea conditions along the outer edges of Jasper also impacted maritime operations making safe navigation difficult.

During this time, Bureau staff worked with Maritime Safety Queensland and Australian Maritime Safety Authority to support the safety and preparedness of staff and operations, to minimise disruptions from port closures, and to inform risk assessment processes for planned voyages in coastal pilotage areas.

Highlights and significant events

Train the trainer – ensuring sustainable capacity building outcomes in the Pacific

During the year, the Bureau's International Development Program continued to support the Fiji Meteorological Service (FMS) to deliver training in meteorological observations to their neighbouring National Meteorological and Hydrological Services (NMHSs) in the Pacific. The training aims to increase the capability of Pacific NMHS staff to accurately observe, interpret, and report meteorological observations in line with World Meteorological Organization (WMO) and International Civil Aviation Organization (ICAO) standards.

In April, the Bureau supported Mr Sajiva Nand, Head Trainer for FMS, to deliver a 2-week meteorological observers training course for the Nauru Meteorological Service. Ten Nauruan observers participated in the training conducted by FMS in Nauru, which focused on ensuring observers are adequately prepared to tackle the complexities of meteorological observation and reporting. FMS is responsible for delivering accurate and reliable aviation weather forecasts and warnings for the Nauru Flight Information Region. Nauru supports Fiji's efforts through the collection and reporting of meteorological observations that underpin these forecasts.

Ongoing Pacific-led training of this kind, where capacity has been built, is strengthening regional cooperation in weather service provision between countries like Nauru and Fiji. FMS expressed its thanks to the Bureau for its vital role in the initiative and the investment in the professional development of the observers.

Nauru Meteorological Services observers and Mr Sajiva Nand (Head Trainer, Fiji Meteorological Service) following completion of training at Nauru Meteorological Services headquarters. Credit: Sajiva Nand.

Supporting aerial firefighting operations in western Victorian Bushfires

February saw a dramatic escalation in the 2023–24 bushfire season for Victoria, with the Wimmera region seeing the first use of the 'Catastrophic' rating in Victoria since 2019–20. Fires erupted in the region of Pomonal and Dadswells Bridge on the edge of the Grampians (Gariwerd) National Park on 13 February 2024.

Weather plays a major role in the safety of aerial firefighting operations, with poor visibility, turbulence and windshear all potential hazards for firefighting aircraft operating at low altitude. When an urgent request for an emergency ad-hoc Aerodrome Forecast (TAF) for Stawell Aerodrome was received from an Agair pilot flying with the Country Fire Authority (CFA), the Bureau's Melbourne Aviation Forecast Centre responded immediately. The TAF provided 24/7 forecast coverage for the aerodrome until aerial firefighting operations had ceased. The Stawell TAF was reinstated twice more before the end of the fire season, with aviation meteorologists working closely with Agair, Microflite, and CFA pilots.

During the first TAF stand-up, over 550,000 L of retardant were flown out of Stawell Aerodrome. This enabled aircraft to carry less fuel and significantly more fire retardant. The TAF also supported critical decisions on

Aerial firefighting – a pilot's view of a Victoria fire event in February. Credit: Rob Boschen.

resourcing and where to locate aircraft overnight, to ensure flying could resume the next morning, without aircraft being left grounded due to the presence of fog or low cloud. The Stawell TAF was described as “priceless” by one CFA representative.

The Bureau’s Transport Customer Engagement and Decision Support Services teams continue to work with the National Aerial Firefighting Centre and state fire agencies, to uplift the services in support of aerial firefighting for the upcoming 2024–25 season.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 3 include:

- enhancing the agriculture sector’s capacity to foresee and manage weather and climate-related opportunities and risks, to support productivity and enhance rural mental health and wellbeing
- ensuring the Bureau’s aviation, land and maritime transport customers understand weather risks and opportunities to enable them to operate safely and economically
- supporting Australia’s space industry by delivering space weather and space flight advice.

Data and Digital

Goal: To provide our customers and colleagues an outstanding experience all day, every day.

The Data and Digital Group (DDG) is responsible for the Bureau's data, observation and information technology that underpins the Bureau's core operations through to production and dissemination to customers. The group's focus is to efficiently manage service-focused, secure, resilient and adaptive information and observations technology portfolios that leverage emerging technologies and data, enabling the Bureau to deliver personalised services and products.

For 2023–24 the group consisted of 6 programs.

Program	Responsibilities
Planning and Architecture	• Technology policies and standards • DDG planning uplift • Demand and pipeline management • Enterprise architecture
Observing Systems and Operations	• Operation of the observing network • Observations planning and delivery • Maintenance and sustainment of the network
Data	• Data governance, advice and standards • Data management specialised services • Data requirements and quality • Managing data partnerships • Data services
Digital Channels and Customer Experience Design	• Customer research and user experience design • User design and prototyping • Digital channel development and operations • Digital customer analytics • Digital planning
Application Services	• Delivery of ICT applications and platforms • Enterprise Resource Planning services • Digital workplace services • Enterprise Application Lifecycle services • Establishment of core functions and capabilities: software coding standards, testing, release and quality assurance

Program	Responsibilities
Service and Infrastructure Management	• Reliable and secure ICT operations • High-performance computing • ICT support services • Cyber operations

Throughout 2023–24, the group focused on delivering 4 outcomes that support the achievement of the Bureau's Strategy and purpose. The group's achievement in delivering each of these outcomes is discussed below.

Outcome 1: Strengthen our customer focus to maximise the Bureau's technology (IT & OT) and data capabilities to meet the needs of Bureau customers both now and into the future in collaboration with our colleagues who engage with customers.

Achieving the outcome

Enhancing the BOM Weather app

The Bureau continued to improve its digital channels to meet customer needs. The BOM Weather app was updated throughout the year giving users:

- additional home screen widgets for iOS including hourly forecasts
- daily highs and lows for maximum and minimum temperatures, rain and wind gust in past weather screen
- coastal hazard warnings and notifications.

In the November release, the BOM Weather app included a bespoke 'toast' (pop-up) notification feature to keep customers informed when there are issues with data flow to the app, such as scheduled maintenance or unplanned outages.

The app continues to see millions of daily active users, with a high level of customer satisfaction (see p.160).

New BOM Weather app features: left, daily highs and lows and right, the iOS widget.

Building the Bureau's new website

The Bureau is building a new secure, stable and resilient website that will enhance the delivery of trusted services to all Australians, when it matters most. After successful private beta testing, the public test website – beta.bom.gov.au – was released on 25 June 2024. The beta testing phase provides ample time to gain feedback to ensure the site meets the needs and expectations of those who rely on it.

Restoring essential equipment after disaster

In December, the deluge associated with tropical cyclone Jasper created significant flooding in the Cairns region, including at the Cairns Airport where the Bureau's automatic weather station (AWS) was severely damaged. In response to the needs of the aviation sector, Bureau staff assisted with the re-build of the AWS within 4 days after flood waters receded. In addition, a quick installation was required of a new barometer at the Cairns Racecourse AWS to serve the community while the airport AWS was down.

The Bureau's Mark Tell in front of the previously wooden-pole-mounted power transformer.

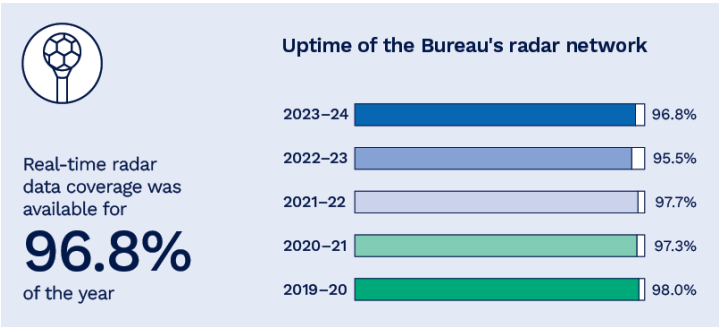
Close collaboration between Queensland Fire and Emergency Services (QFES) and Bureau staff in Cairns helped restore services to the Mt Isa radar during fires in February. Power supply to the radar was cut off as power lines were burnt to the ground. Although all Bureau radars have generators, the radar eventually ran out of fuel because fire debris on the ground rendered it inaccessible. Working with QFES, the Bureau was able to access the site and restore services within 2 days.

Highlights and significant events

Enhancing weather surveillance for improved community outcomes

Following a significant technology upgrade to the Mackay radar, deployment was fast tracked enabling the new radar to commence operation on 8 December, providing significant benefits for the communities in the Mackay region at risk from tropical cyclone Jasper. The new technology provides better image resolution, better visibility of weather systems and less image interference. Radars are one of the many tools the Bureau uses to track the movement of tropical cyclones, which then feeds into tropical cyclone track maps and warnings.

A new radar in Toowoomba – in the Darling Downs region of Queensland – was also delivered during the year. Going live in April, the new radar added coverage to previous gaps to the west and south-west of Toowoomba including surrounding river catchments, and the mining



and resources precinct around Chinchilla. Further radar replacements were undertaken at Gove in the East Arnhem Land region of the Northern Territory, and at Brisbane (Marburg) in Queensland. All of these radars now have dual-polarised Doppler capability for improved weather surveillance, with the Gove and Brisbane radars coming online in July and November, respectively.

In addition to the radar replacements, 2 of the Bureau's radars were upgraded during the year – with Cairns in northern Queensland completed in August and Carnarvon in the Gascoyne region of Western Australia completed in April. The work at Carnarvon was complex and not without its hurdles, including multiple severe weather events.

Radar improvements bolster the Bureau's ability to conduct precise weather observations, issue timely warnings about severe weather events, and enhance situational awareness for local communities. They also support local industries by providing access to real-time rainfall observations for agriculture and industry and enabling businesses to make better decisions when preparing for severe weather. Radar imagery is available to customers via the Bureau's website and BOM Weather app.

The completed radar at Carnarvon in Western Australia.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 1 include:

- continuing to enhance the beta website as well as monitoring community feedback to identify further improvements
- continuing to enhance the BOM Weather app based on customer feedback and the Bureau's Digital Channels Roadmap.

Outcome 2: Information technology, observations technology and data operations delivering resilient and secure services all day every day.

Achieving the outcome

Updating our roadmap for future observations

Work continued on updating and delivering the Bureau Observations Ecosystem Roadmap, which describes the key activities towards enhancing and improving the Bureau's delivery of and access to observational data. During 2023–24, a major refresh of the Roadmap was completed. This was based on wide consultation with both internal and external stakeholders, data users and data providers.

Promoting environmental sustainability in observations

For several years, the Bureau has been working to reduce the impact of its operations on the environment. This year, in collaboration with its supplier, the Bureau completed a series of test launches of biodegradable radiosonde covers and insulation, which will further lessen the impact of weather balloons on the environment. The testing assessed the quality of the biodegradable sondes, which included:

- submerging and anchoring the sondes in sea water at Willis Island for extended periods
- a direct data comparison trial, launching 2 radiosondes side by side, under the same balloon
- an operational trial, releasing balloons at 3 sites during the wet season.

The progressive rollout of the new radiosondes from July 2024 will be another step towards achieving the Bureau's sustainability goals.

To share its experiences and achievements, Bureau representatives contributed to an Environmental Sustainability of Observing Systems and Methods virtual workshop, hosted by the World Meteorological Organization in September. The Bureau's Bryan Hodge, General Manager Observing Systems Operations, gave a keynote address titled: The impact of technology choice on the environmental impact of measurement technology – radar case study. Renae Baker, Environmental Sustainability Lead, presented a paper on the Bureau's efforts to reduce the environmental impact of weather balloons.

Overseeing and ensuring the Bureau's data integrity

The Bureau's Data Integrity Advisory Committee – an external committee of independent experts – met twice during the year to provide advice and assurance to the Bureau on matters including metrology, observational processes, data collection and management, data analysis, quality control and quality assurance. As a prelude to the delivery of new AWS and Stevenson screen instrument shelters across the Bureau's network, the committee focused on the planning for a major parallel observations project that will determine the suitability of the new local processor unit for field operations under the range of climatic conditions and zones within the Australian and Antarctic networks.

Delivering sea level projects in Australia and the Pacific

Over a 6-month period to May 2024, a coordinated effort involving the Bureau's Sea Level Network Operations team, several observing hubs, the Bureau's International Development Program, the Pacific community, and a technical team from Niue and Nauru Meteorological Services saw the completion of several sea level projects.

The program of work included station rebuilds, infrastructure installations, maintenance, verifications, repairs and station recommissioning at Cocos Island, Niue and Nauru, as well as at Geraldton, Hillarys Boat Harbour and Esperance in Western Australia. The teams faced environmental and logistical challenges, travelling vast distance to complete the projects.

The technical team comprising staff from the Bureau and the Pacific community in front of the newly rebuilt Niue sea level station after being destroyed by tropical cyclone Tino in January 2020.

The successful completion of this work has been instrumental in enhancing the effectiveness of the Australian and Pacific region sea level networks, supporting the safety and preparedness of coastal communities.

Automating observations at capital city airports

The Automation of Capital City Airports project – being undertaken at Adelaide, Brisbane, Darwin, Hobart, Melbourne, Perth and Sydney – was progressed during the year including the first installation of an automatic meteorological balloon launching systems (AMBLS) in Hobart in May.

Weather observations taken at airports contribute to the forecasts and warnings used by the aviation industry for flight planning and resourcing. Automated observation systems give the Bureau real-time 24-hour access to observations and can be tasked to take non-routine observations if required – enhancing the Bureau's ability to update forecasts and warnings during significant weather events. These automated observations also reduce health risks associated with shift work and benefit the aviation industry by reducing Bureau costs for the provision of manual observations.

Improving upper-air observations capability

To improve its upper-air observations capability in the Northern Territory, the Bureau installed 2 new AMBLS. In October, the Bureau commenced operation of AMBLS at its new East Arnhem site based at the Arnhem Space Centre. This replaces upper air observations taken at the Bureau's former Nhulunbuy (Gove) site. In June, at the Bureau's Alice Springs site, an AMBLS replaced the existing remote balloon launcher. A new AMBLS was also delivered at Clifton Beach in northern Queensland to provide enhanced upper-air observations of the region.

Achievements of the Observing System Strategy

The installation of AMBLS at East Arnhem and Alice Springs marked the full automation of all 24 field stations in scope for the Observing System Strategy (OSS), and closure of the project which ran from 2014 to 30 June 2024. The OSS addressed ageing infrastructure, a dispersed and isolated workforce with limited career pathways, facilities no longer fit for purpose, reliance on manual observations processes, limited remote monitoring capability and costly operations.

Observing operations hubs were established in Cairns and 6 capital cities, with Sydney due for completion in 2025. The hubs are strategically located to ensure return to service activities are effective and efficient.

With dedicated mechanical and electrical workshops, warehouse and office space and an uplift in amenities, secure field laptops, communications and remote monitoring capabilities, hubs provide Bureau technicians with improved ways of working and a great uplift of capability through technology and knowledge sharing.

The automation involved successful transition of 51 field staff. These transitions included relocating staff and their families around the country to their chosen hubs or offices or supported separation from the Bureau. With fewer staff isolated in remote locations, health and wellbeing issues are reduced.

To support staff a range of Observing Network Competency Frameworks were developed and operationalised to ensure hub staff have the training, skills and competencies required to maintain observing networks. The hub staffing structure improves career pathways for staff and more opportunities for cross skilling and mentoring.

Highlights and significant events

Closing the ROBUST Program

During 2015 and 2016, the fragility of Bureau systems was publicly exposed through a cyber security breach and major technology outages.

Independent reviews identified several critical issues such as ageing information technology infrastructure, applications, observations network and telemetry, in addition to lack of automation, integration, scalability and system support.

In recognition of the growing risk of system failure, the Bureau's upgrade plans were fast-tracked through funding in the 2017–18 and subsequent Australian Government budgets.

This vital investment has enabled the Bureau to fundamentally transform the security, stability and resilience of its operations while maintaining the critical service it provides to the Australian community.

The ROBUST Program was a 7-year transformation program to improve the security, stability and resilience of the Bureau's information and observing technologies. The primary objective was to secure and strengthen the Bureau's operating environment to ensure continuous availability of critical services.

The ROBUST Program formally closed on 30 June 2024. It has delivered fundamental improvements to the Bureau's technology, security and capability, as well as its capacity to develop and support improved products, data and services.

Many of the ROBUST Program benefits will drive efficiencies in how we deliver services to the Australian community in the long term.

ROBUST Program outcomes will ensure the Bureau can continue to deliver trusted products and services as follows:

- the Bureau's security position has improved with its heightened ability to prevent, detect and respond to cyberattacks, and embedded security behaviours
- the Bureau has greater stability in information technology operations and service delivery through more reliable infrastructure and increased technology automation
- the Bureau's resilience has improved continuity of its services and the ability to recover quickly from service disruptions.

ROBUST is the most complex technological transformation undertaken by the Bureau and will enable it to evolve, adapt and continue providing customers and colleagues with outstanding experiences, all day, every day.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 2 include:

- consolidating the Bureau's Data Centre capability
- continuing the sustainment and planned upgrades to observing and information technology assets and operations
- continuing to mature the Bureau's data management capabilities.

Outcomes of the ROBUST Program

Secure, stable and resilient infrastructure and platforms

2
new data centres established

Network redesigns enabling better connectivity between Bureau field sites, offices and international partners

Data and Integration platforms redesigned and rebuilt, with improved system monitoring, support and incident response capability

Secure, stable and resilient software applications

Upgraded software applications
Software applications underpinning critical business services for meteorological data display, space weather, tropical cyclone and flood were re-platformed, remediated and/or replaced

Security hardening and resilience remediation
Priority software applications for tropical cyclone, forecaster situational awareness, observations data capture, satellite data ingestion, data archiving and links to other security and research agencies had security hardened and were remediated to improve resilience

20+
Legacy software applications decommissioned
Many replaced by commercial off-the-shelf solutions with built-in support, lifecycle and cost management

Observation network resilience and security enhancements

12
weather radars upgraded

2
new radars installed

27
radars with resilience uplift

6
upgraded space weather ionosondes

14
new automatic balloon launching systems (AMBLS)

4
upgraded wind profilers

16
sites with flood warning network upgrades

687
sites with access control and management

42
sites with closed circuit television monitoring

10
sites with new, replaced or repaired fences

3
sites with new equipment shelters

A new secure, stable and resilient website

After successful private Beta testing, the public test website – beta.bom.gov.au – was released on 25 June 2024

The new website:

- ✓ is underpinned by secure and stable infrastructure
- ✓ meets HTTPS security protocols
- ✓ meets Web Content Accessibility Guidelines

Enhanced security measures

Infrastructure and end-user security

- ✓ User identity management
- ✓ Multi-factor authentication

Oversight and governance

- ✓ Chief Information Security Officer (CISO) established
- ✓ Cyber Security Operations Centre (CSOC) established

Security management and monitoring

- ✓ Security hardware
- ✓ Software
- ✓ Tools
- ✓ Monitoring capabilities
- ✓ Business processes

Updated security policies and procedures

- ✓ Supported by Bureau-wide security training

A new disaster recovery and resilience capability

High-performance computer for disaster recovery installed at the Bureau's new secondary data centre

- ✓ Delivers redundancy for the primary supercomputer in case of a critical failure
- ✓ To be used for advanced weather and climate research
- ✓ Better connectivity between Bureau sites has been established, improving the Bureau's disaster recovery capability

Enhanced business practices

Major investment and uplift in Information Technology, Observations Technology and enterprise services enabled:

- ✓ Program and change management
- ✓ Procurement
- ✓ Architecture
- ✓ Business and process analysis
- ✓ Data management
- ✓ Testing and release management
- ✓ Product management
- ✓ Asset management
- ✓ Service delivery management
- ✓ Vendor management

Outcome 3: Cultivate our partner ecosystem to optimise resource utilisation for information and observations technology and data delivery.

Achieving the outcome

Applying our measurement expertise on the global stage

Dr Jane Warne, Lead of Field Measurements and Standardisation and Principal Metrologist, was nominated and appointed as Chair of the World Meteorological Organization (WMO) Standing Committee on Measurements, Instrumentation and Traceability. The focus of the committee is to promote standardisation of meteorological and related observations and to ensure the uniform publication of observations and statistics. Dr Warne will serve as chair for a period of 4 years starting in 2023.

Providing peer support to our Pacific Island neighbours

Staff from the Samoa Meteorological Division and the Bureau inspecting a weather station in Apia.

The Bureau has completed its initial commitment under the Readiness Phase of the WMO Systematic Observations Financing Facility (SOFF) to act as Peer Advisor to 6 Pacific Nations. Supported financially and technically by a UN donor fund, the Bureau assisted each National Meteorological and Hydrological Service (NMHS) to identify the gaps in their meteorological observing networks. Addressing these gaps through SOFF donor funding will help ensure that these nations can adequately contribute required observations to regional and global forecast applications and meet global observation network standards.

During 2023–24, the Bureau visited each country, working side-by-side with local NMHS staff to prepare a series of reports that describe the current status of their observations networks and the requirements to uplift them to meet the Global Basic Observations Network standard.

Two of the partner countries, Solomon Islands and Kiribati, have now been awarded funding from SOFF for the investment phase. This will enable both countries to expand their surface and upper-air observing networks, upgrade ICT systems to enable the data to be shared internationally, and develop their human capability to maintain and operate the networks.

The Bureau will continue to support the 2 NMHS as a Peer Advisor throughout this investment program. The other 4 nations being supported through this initiative are Samoa, Papua New Guinea, Fiji and Nauru. Upgrade works for these countries will commence in 2024–25 or 2025–26, subject to funding from SOFF.

Working with international partners on measurement standards

Representatives from the Japan International Cooperation Agency and the Fiji Meteorological Service visited the Bureau's Standards and Metrology Lab in November to see a working Regional Instrument Centre (RIC) and learn about the Bureau's role in assessing and calibrating meteorological instruments to the exacting standards required by the WMO. The Japanese are assisting Fiji to develop a RIC at their headquarters in Nadi. The goal is for Fiji to operate a complementary RIC within WMO Region V (South-West Pacific) to enhance trust in the observations required for accurate weather forecasting and global climate monitoring.

This gathering provided an important opportunity to build and share expertise in metrology, deepen the Bureau's relationship with a long-standing Pacific partner, and enhance cooperation in efforts to assist our Pacific neighbours.

Members of the visiting delegations with Bureau staff.

Highlights and significant events

Partnering with the United States to unlock secrets of the atmosphere

Observing Systems and Operations have partnered with the US Department of Energy Atmospheric Radiation Measurement (ARM) to undertake a new science project to solve the secrets of 'supercooled' clouds in the Southern Ocean. The ARM mobile measurement facility was set up and the project officially launched at the Kennaook / Cape Grim Baseline Air Pollution Station in April. The new project is called CAPE-k (Cloud And Precipitation Experiment at kennaook), and US and Australian researchers are joining forces to better understand the role of aerosols that form Southern Ocean clouds.

The ARM mobile facility consists of a collection of advanced meteorological sensors that can be installed temporarily at a selected location to advance scientific understanding of meteorological processes, particularly relating to clouds, precipitation and solar radiation.

Station colleagues and visitors at the official launch of CAPE-k at Kennaook / Cape Grim in April.

The campaign is expected to lead to improved understanding of Southern Hemisphere mid-latitude clouds and precipitation, their interaction with Southern Ocean aerosols and consequent impacts on energy flow through the atmosphere. This improved understanding will lead to enhanced numerical weather prediction and better performance of climate models, particularly in the Southern Hemisphere.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 3 include:

- continuing to meet requirements of the water regulations
- continuing to work with partners to uplift observing and information technology operational outcomes.

Outcome 4: Build and sustain distinctive capabilities and a workforce for the future

Achieving the outcome

Strengthening our operating models for greater efficiency

The DDG Operating Model encapsulates a continuous improvement approach to working. The Observing Systems and Operations Program made significant progress towards realising their target operating model to provide staff with better clarity of roles and responsibilities. Achievements included: increased visibility of the pipeline of observing system projects and improved resource allocation, plus a planning and scheduling capability which will drive national consistency. The Service and Infrastructure Management Program updated their workforce plan and operating model with implementation of changes to commence from July 2024. The Application Services Program continuous improvement approach resulted in integrated workforce planning, application lifecycle planning, and partner ecosystem support functions into a regular operating rhythm supporting the delivery of the Applications Plan 2023–2026.

The Delivery Office capability developed under the ROBUST Program was successfully transitioned into DDG as a central delivery capability to improve the execution of strategic transformation initiatives across information and observations technology. The Delivery Office is responsible for the oversight and execution of DDG's portfolio of programs, projects and major enhancements such as delivering new radars, implementing new AWS, upgrading infrastructure and platforms or delivering modern applications.

Uplifting electrical safety of observing infrastructure

Many components of the Bureau's vast observing network contain complex electrical systems that need to be documented for future maintenance and control. In October, an engineering drawing, document and media management system was rolled out at the Bureau to support the effective management of these documents.

This system is now the single source of truth for all as built documentation. Implementation has improved safety, compliance, governance and control as well as increasing productivity for staff and contractors by providing easy access to the right information when in the office or the field, through web and mobile applications. In addition, electrical audits were completed at 96 priority sites, enabling urgent upgrades to electrical circuits and prioritisation of further remediation.

Co-piloting generative AI

In December, the Bureau embarked on a journey with the Digital Transformation Agency (DTA) and AI in Government Taskforce to explore the safe and responsible use of generative AI in the public service in partnership with Microsoft.

The trial of Copilot for M365 placed the Australian Government and its participating agencies such as the Bureau, as one of the first in the world to deploy a generative AI service.

The M365 Copilot trial is informing Bureau considerations for the longer-term AI use and associated positive impacts for the Bureau's customers and operations.

Setting up our remote workforce for success

Staff are based at the Bureau's remote observing stations for 4–12 month periods and staff changeover and station resupply involve complex logistics.

Willis Island, located about 450 km off the coast of Cairns in the Coral Sea, is home to one of the most remote staffed meteorological stations in the world. Every 6 months during resupply, several contractors also head out to the island to carry out routine checks and repairs to the station. These include maintenance of the life support systems including air conditioning, water desalination and purification, power generation, sewerage treatment, and refrigeration, as well as important external repairs to building infrastructure.

All supplies and fittings must be brought on the same journey by boat. When the changeover was completed in April, the Island's population expanded from 4 to 22 people, with the new Bureau crew incoming, and several contractors.

Giles Weather Station in Western Australia is in the foothills of the Rawlinson Ranges, about 750 km west-south-west of Alice Springs and 330 km west of Uluru. The nearest township is the Warakurna Aboriginal settlement (population 180). In 2023–24, the Giles station staff, in addition to their observing duties, assisted with numerous community events. This included assisting the Indigenous Desert Alliance in surveying the vulnerable Tjakura (Australian Great Desert Skink) with school children, accompanying community service providers and Yarnangu (Traditional Owners) on bush trips to find honey ants, hosting night campouts for school kids at the station (including stargazing and storytelling), and assisting with blue light discos.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 4 include:

- implementing the DDG Workforce Plan
- reviewing OT and IT asset plans for sustainment
- reviewing the DDG operating model aligned to future resourcing.

Science and Innovation

Goal: Through research and innovation, to continually improve our systems to enable the Bureau to deliver world class services and insights to our customers and deliver shared value with our partners.

The Science and Innovation Group is responsible for research and innovation supporting Bureau services and delivering shared value for our partners. The group's focus is on world class science and development that enables the Bureau to deliver better weather, water, climate, ocean, space weather and Earth system information and insights. The group also has stewardship of the Bureau's Innovation Framework.

For 2023–24 the group consisted of 2 programs with the following areas of responsibility:

Program	Responsibilities
Research	• Earth system modelling • Observations and data science • Applications science • Seamless prediction science • Hydrology science
Research to Operations	• Transfer of research outputs to operations • Validation and verification of models and model output • Data assimilation and post processing

Throughout 2023–24, the group focused on delivering 2 outcomes that support the achievement of the Bureau's Strategy and purpose. The group's achievement in delivering each of these outcomes is discussed below.

Outcome 1: Research and development which ensures the Bureau meets the needs of its customers both now and into the future.

Achieving the outcome

Creating satellite based solar nowcasts

The Bureau has developed a solar nowcasting system based on satellite observations of cloud, and a year of nowcasts has been generated for Australia. This is important because a sudden, widespread, decrease (or increase) in power output by rooftop solar systems has the potential to cause disruption to Australia's energy grid. Early warning of these rapid changes improves the Australian Energy Market Operator's (AEMO) ability to manage the energy grid and avoid power outages.

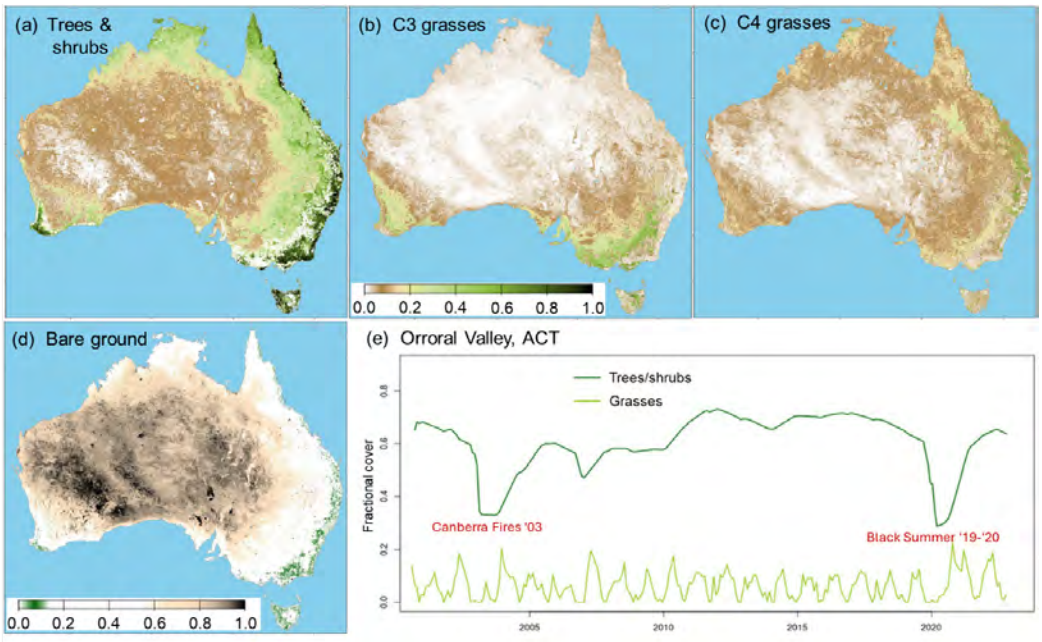
In collaboration with the Bureau's Energy and Resources Program (see p.81), the team developed visualisations and metrics to detect significant variability in these nowcasts using several case studies. The results from this work will be used across industry to assist Australia's energy transformation.

Predicting seasonal sea level for coastal hazard early warnings

In 2023–24, the Bureau developed a prototype seasonal forecast system for predicting coastal sea level at Australian tide gauge locations. The prototype predicts the risk of threshold exceedance over the next 1–12 months at selected locations using a combination of tide predictions, sea level rise estimates, seasonal sea level anomalies from the Bureau's seasonal prediction system (ACCESS-S2) and climatological storm surge variability. Prototype products are available to the Australian Climate Service and Bureau forecasters to support early warning of periods of increased coastal hazard risk.

Improving vegetation information for enhanced hydrological modelling

Bureau researchers have derived a 20+ year time series of monthly vegetation cover for the Australian continent. Existing, overseas-developed products of vegetation cover used by the Bureau's land surface model (known as JULES) poorly represent the extent and dynamics of Australian vegetation. This work aims to improve hydrological processes within JULES by, in the first instance, using these newly derived vegetation fractions. By having the right cover fractions – that reflect the right vegetation type at the right location – the Bureau can improve its modelling of water resources through better representation of land-atmosphere exchanges. As well as providing improved hydrological predictions, there are potential benefits more broadly within the Bureau's numerical weather prediction and climate modelling applications.



Average fraction cover for 2022: (a) trees and shrubs, (b-c) C3 and C4 herbaceous species, and (d) bare ground; and (e) time series for Orroral Valley in southern ACT showing 2 big fire events on woody cover fractions.

Using third party automatic weather stations for improved forecasts

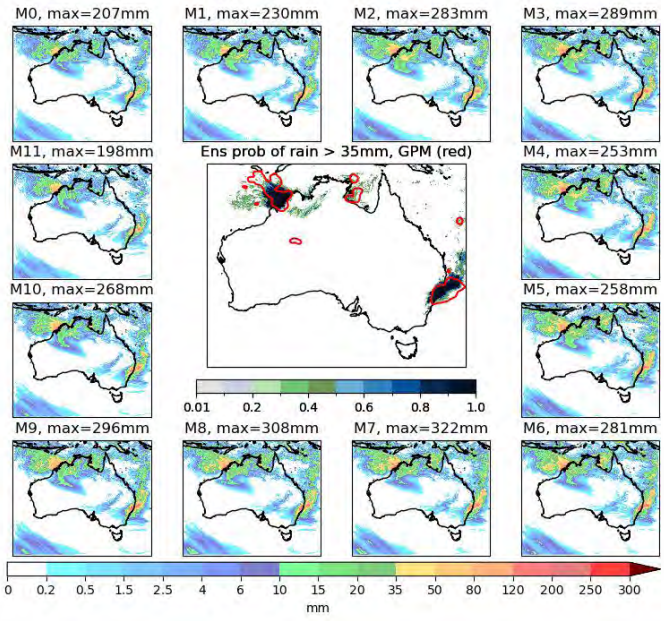
With a view to enhancing its Numerical Weather Prediction forecasts, the Bureau has been exploring the value of supplementing its own network data with that of third party automatic weather station providers. Assimilation of more observational data generally means better forecasts locally, provided the data is of sufficient quality. Trial wind, temperature and dew point data was supplied from Conditions Over the Land's (COtL) mesonet network of automated weather stations covering south-western South Australia, which was compared to Bureau observations and then trialled in assimilation into our forecasts. The quality of data from the COtL stations was found to be similar to that of the Bureau's, with the trial showing promise in terms of more accurately representing local conditions.

Developing national storm-scale forecasts for improved extreme weather prediction

A prototype model at 1.5 km resolution (ACCESS-A) has been developed for Australia and its surrounding seas to replace the current set of seven separate city models that are used to produce high resolution forecasts out to 2 days. Case studies show the model can effectively predict extreme events and for the first time, this model will cover the whole of Australia, simplifying the Bureau's operational suite and improving efficiency.

These high-resolution kilometre-scale weather models better represent storm processes, enabling the prediction of thunderstorms and their hazards such as heavy rain, hail and wind gusts. Ensembles of high-resolution numerical forecasts improve hazard prediction by providing estimates of the forecast uncertainty.

Building on ACCESS-A and the success of the ACCESS-City ensemble system for high-resolution probabilistic forecasts of the main population centres, the Bureau has developed ACCESS-AE, a prototype national storm-scale ensemble system that quantifies forecast uncertainties and enables the probabilistic prediction of high-impact weather across the entire country. ACCESS-AE will provide unprecedented forecast guidance for the nation, helping forecasters better assess risk and provide accurate warning information.



ACCESS-AE ensemble members showing the range of likely forecast outcomes (outside) and exceedance probabilities (centre) for 24-hour precipitation accumulations for a heavy rainfall event in March 2021. Red lines show regions where observed events occurred.

Developing site-based forecasts for energy and resource sectors

The Bureau employs various statistical methods to convert area-averaged forecasts (e.g. 1.5 km^2) to forecasts for a specific site. This is known as site-based forecasting. To simplify the process, a new approach based on machine learning has been developed in collaboration with the energy and resources sector. The new approach uses fewer inputs and is shown to be effective regardless of the choice of forecast model and can be adapted to third-party data applications. The simplicity and robustness of the machine learning results make it a promising approach for broader adoption within the Bureau.

One of the next steps is to incorporate real time data into the machine learning to further improve accuracy. The Bureau may also look to expand this approach to other forecast variables not currently provided for specific locations.

Highlights and significant events

Mapping flood inundation for improved community safety

Probabilistic flood maps are required for effective decision-making in flood risk management and for informing public warning services. To better support customers in understanding location-specific risk of floods, the Bureau has developed a seamless probabilistic flood inundation mapping framework using a multi-step approach. First, gridded modelled runoff outputs from the Bureau's national operational hydrological modelling system are converted into water level information using a hydrodynamic model. Next, the water levels are combined with topographic and river network information from a digital elevation model to calculate flood inundation extent. Finally, remote sensing data detecting water from space is used to validate the modelling approach and to further refine the modelling chain.

This approach has significantly advanced the Bureau's ability to predict and project floods across Australia for the benefit of emergency services customers and the Australian community. Using this framework, flood inundation mapping products are being used support multiple decision-making tools and help to better manage flood risks across Australia. For example:

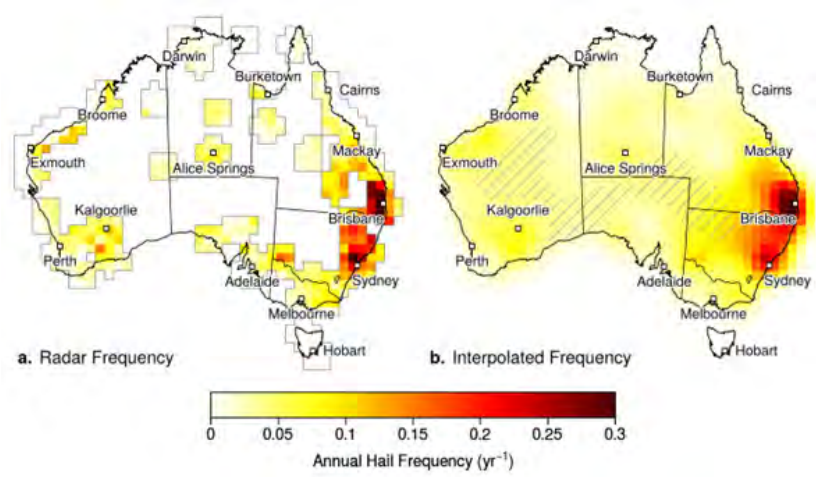
- 5 m resolution historical flood annual exceedance probability maps have been produced for priority catchments for the Hazard and Insurance Partnership and the National Emergency Management Agency.
- Flood inundation extent maps at 1%, 2%, and 5% annual exceedance probability have been developed for different global warming levels, leveraging the Bureau's National Hydrological Projection dataset to investigate the risk of future floods for the National Climate Risk Assessment.

Flood extent maps of the Hawksbury – Nepean Valley for the March 2022 flood event using different lead times (from 72 to 0 hours).

Creating a radar-based hail climatology of Australia

Hailstorms are a major public safety and economic risk in Australia, where they are considered the most damaging natural hazard in terms of annual insured losses. We have used the Bureau's weather radar network to create the first national radar-based hail climatology. The radar-based methodology permits more direct measurements of hailstorms, resulting in an accurate quantification of hail frequency, along with other unique insights such as storm size, direction, and their regional/seasonal fluctuations.

The national climatology showed that hail occurs most frequently on the east coast, where severe hailstorms occur once every 3–5 years on average. Elevated hail frequencies also occur on the north-west coast and inland stretches of south-west Australia, but are less than half as frequent as those on the east coast. Tropical hailstorms were found to be infrequent, short-lived, and rarely spread offshore. The occurrence of subtropical hailstorms on the east coast appeared to shift south throughout the summer, mainly starting in Queensland in November and progressing toward Sydney by March. These outcomes are important for customers in a range of industries, such as agricultural planning, insurance pricing, and infrastructure management for energy providers.



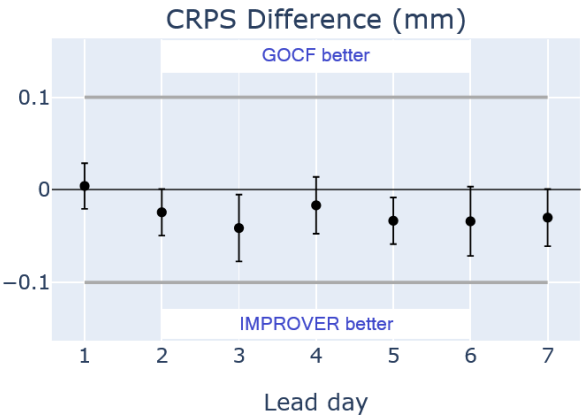
Climatological hail frequencies for Australia (a) in areas with radar data coverage, outlined in grey, and (b) interpolated hail frequencies in areas with limited radar data coverage, hatched in grey.

Improving rainfall predictions

This year, the Bureau began using IMPROVER (Integrated Model post-PRocessing VERification) rainfall guidance as the primary guidance source for public weather rainfall forecasts. This technology is replacing the legacy Gridded Operational Consensus Forecast (GOCF) guidance used by the Bureau for the last decade.

IMPROVER is a suite of advanced statistical and machine learning methods that enhance ensemble weather model forecasts, addressing biases and uncertainties inherent in the raw model data. IMPROVER rainfall guidance is the first machine learning-based guidance the Bureau has operationalised. A clear benefit of this advanced technology is its ability to produce more accurate and reliable probabilistic forecasts, which are crucial for effective decision-making in various weather-sensitive industries, such as agriculture, aviation, and emergency management. Adoption of IMPROVER rainfall guidance for public weather forecasts marks a significant milestone in the modernisation of the Bureau's forecast guidance and underscores the importance of continuous innovation in meteorology to meet the growing demands for precise and probabilistic weather information.

After extensive testing and trialling, IMPROVER rainfall skill is demonstrated to be at or above the skill of existing daily rainfall guidance and above the skill of existing sub-daily rainfall guidance.

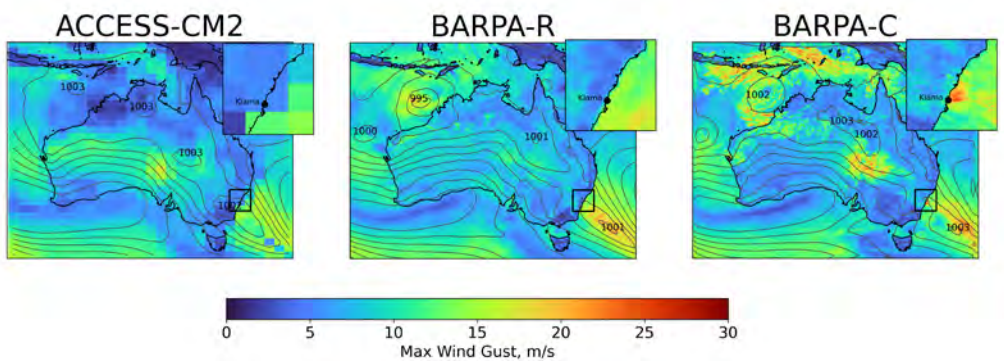


The relative difference in skill (Continuous Ranked Probability Score - CPRS) between IMPROVER and GOCF for daily rainfall forecasts for Summer 2024 (December 2023 to February 2024). Points below 0 show IMPROVER is more skilful than GOCF.

Delivering downscaled climate change projections for Australia

Working with CSIRO, the Bureau has developed new downscaled projections for Australia to support climate risk assessment and adaptation as part of the Coupled Model Intercomparison Project 6 (CMIP6). The Bureau contributions make use of the BARPA climate model, an extension of the Bureau's historical reanalysis (BARRA) and forecast (ACCESS) system. Developed through the Australian Climate Service (ACS), the first set of high-resolution projections from the Bureau's regional climate downscaling model, BARPA-R, were published in early 2024 (see p.123).

The BARPA-R ensemble features projections until end of the 21st century on a 15 km grid, covering 16 possible pathways of future change based on 3 warming scenarios. Importantly, it contributes to the assembly of the next generation of local climate projections through Australia's National Partnership for Projections and international World Climate Research Program Coordinated Regional Downscaling Experiment (CORDEX) initiative. BARPA-R is now being used to generate hazard projections of bushfires, cyclones, heatwaves and extreme rainfall across the Australian region for the ACS.



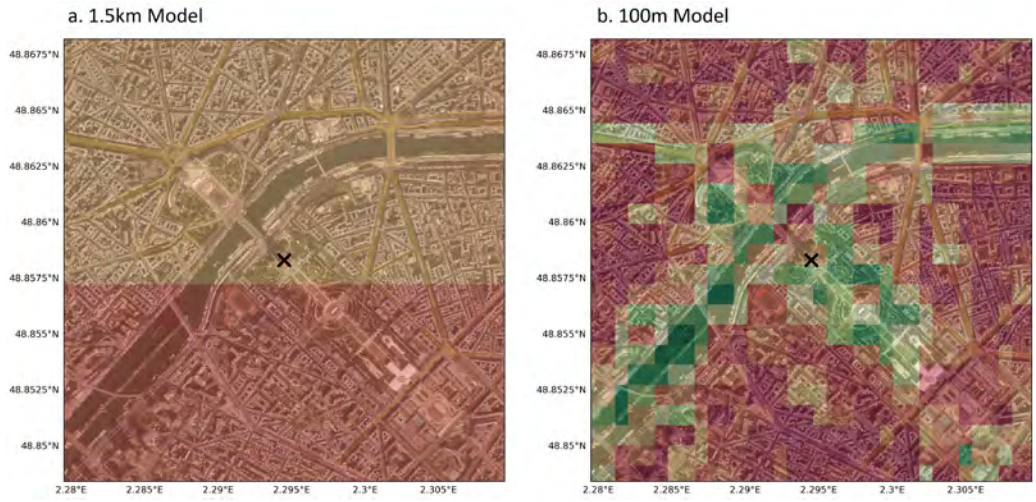
Case study of wind gusts from a sample synthetic day downscaled from the ACCESS-CM2 global climate model (left) with BARPA-R (centre) and BARPA-C (right) during a simulated cloud-band event with an offshore tropical low. Inset: A plausible wind maximum near Kiama is simulated in BARPA-C but not BARPA-R or ACCESS-CM2.

System development and testing on the next stage of BARPA is complete, with the higher resolution BARPA-C moving into production. BARPA-C will produce climate projections that better represent coastlines, cities, storms and 3D atmospheric motion, and will be available on a 4 km grid. These additional simulations are crucial for the projection of short-duration high intensity rainfall into warmer climates. Tropical cyclones, sub-daily extreme rainfall and high percentile wind gusts have been shown to be further improved in the new system.

Partnering globally for sustainable cities and communities

To deliver more localised weather and climate information for cities, higher resolution weather models are required that can more accurately forecast hazards on a neighbourhood scale. For the past 3 years, Bureau researchers have been actively involved in the Paris 2024 Olympics Research Demonstration Project – an international initiative focussed on advancing research on future meteorological forecasting systems at sub-kilometre resolution for urban areas.

As part of this project, the Bureau has developed a 100 m horizontal grid length weather model for Paris, and along with other international meteorological centres, has provided modelled forecasts of high-impact weather events to benchmark and compare the science with other urban-scale weather models. This is the first time that international weather models have been compared at such high spatial resolutions. This research allows the Bureau to lay the foundation for future weather models for Australian cities.



A comparison showing how weather models with horizontal grid lengths of 1.5 km and 100 m represent a small area around the Eiffel Tower in Paris (marked by the black cross in both plots). The 100 m model resolves dense built-up areas (red coloured squares), the parks and the Seine River (green squares), whereas the 1.5 km fails to do so because of its coarse grid length. This additional information in the 100 m model can help to provide more accurate weather information across cities.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 1 include:

- migrating the Bureau's current HPC modelling ecosystem to the Eastern Data Centre, including all forecast modelling capability
- operationalising BARRA to provide up-to-date reanalysis consistent with historical datasets
- developing data assimilation schemes to allow greater use of high-resolution satellite observations

- undertaking pre-operational trials of ACCESS-A and ACCESS-AE for potential operational implementation in 2026
- undertaking pre-operational trials of the new ocean forecasting system OceanMAPS-4.2, which for the first time includes the forecasting of Antarctic sea ice
- developing, running parallel trials and operationalising the Land Surface Model (JULES) for Australian conditions.

Outcome 2: A collaborative and customer-driven science capability that drives innovation and delivers tangible improvements to the Bureau's operations.

Achieving the outcome

Demystifying Innovation and AI

Continuing the uplift of our innovation culture, the Bureau hosted guest speaker Justyna Dabrowska for World Creativity and Innovation Day (WCID) in April. An Innovation Research Fellow at RMIT, Justyna shared insights from her current research on digital transformation and provided practical applications of AI in the workplace and strategies to navigate the complexities of digital transformation.

In an era where artificial intelligence (AI) and digital transformation are not just buzzwords but essential tools for many companies, understanding the nuances of innovation becomes critical. Justyna's talk took Bureau staff on a journey through the landscape of modern innovation, highlighting how emergent thinking and innovation can act as catalysts for creative problem-solving and an efficient work environment.

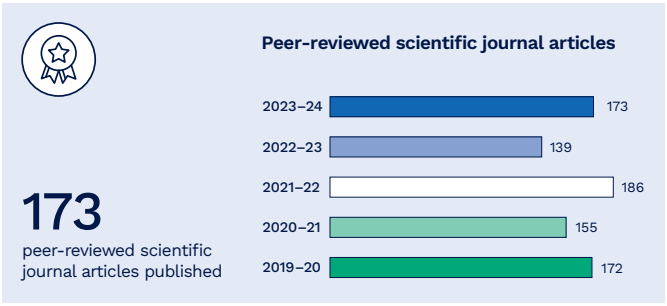
Bureau Science Advisory Committee commends our performance

In December, the Bureau Science Advisory Committee (BSAC) met for the third time, but the first time in person. The committee was established to provide a mechanism for peer review and international benchmarking of the Bureau's scientific progress, aligned with delivery of its Research and Development Plan 2020–2030.

The committee strongly commended the Bureau for its achievements over the past year, highlighting that the Bureau's regional, high-resolution, convection-scale models (ACCESS-A/AE) are world leading and that the implementation of community health-related warnings has had a real impact on community health outcomes. They also noted the quality of the Bureau's regional reanalysis work (BARRA) and its importance to the Australian Climate Service.

BSAC Committee Members and Bureau staff (from left): Prof Christian Jakob (Weather for the 21st Century ARC Centre of Excellence and Monash University), Cameron Smith (Bureau), Independent Chair Dr Helen Cleugh (Honorary Professor, Australian National University), Dr Robert Argent (Bureau), Dr Natacha Bernier (Canada Met Office), Dr Gilbert Brunet (Bureau), Dr Peter Bauer (European Centre for Medium-Range Weather Forecasts (ECMWF)), Prof Stephen Belcher (UK Met Office) and Dr Bertrand Timbal (Bureau).

The Committee also made recommendations around exploring the feasibility of a cross-organisational artificial intelligence/machine learning plan, broadening engagement with academia, continuing to focus on managing and prioritising the portfolio of current and planned research work and continuing the sustainment of core expertise in numerical weather prediction. The next BSAC meeting is scheduled for December 2024.



Highlights and significant events

Showcasing our science capabilities to government

In February, as one of the 24 Australian Public Service (APS) agencies with science or research capability, the Bureau participated in an exciting science event at Parliament House in Canberra. The event enabled each agency to showcase its research capabilities to parliamentarians, chief scientists and CEOs of other agencies, departmental secretaries and other peak research bodies.

The Bureau's Chief Customer Officer, Dr Peter Stone, and Chief Scientist, Dr Gilbert Brunet, ready to talk to attendees about giant hail and space weather.

At the event, the Bureau showcased its expertise in understanding giant hail formation, and its work to strengthen warnings to minimise the potentially catastrophic damage to lives and properties. To demonstrate the enormity of some of these hailstones, life-size 3D printed versions were on display, along with a section of one showing how the hail forms. Alongside conversations about space weather inspired by our sun mascot Hairy McFlarey, the event was successful in raising awareness of the Bureau's research capabilities.

The event was conceived by the Parliamentary Friends of Science and the Office of the Chief Scientist (Department of Industry, Science and Resources), who facilitate the Government Scientists Group, of which the Bureau is a member. The group brings together all the Chief Scientists from within the APS to drive collaboration across the service. The Bureau is one of the 2 oldest scientific public service agencies in Australia, along with the Bureau of Statistics.

Forecasting futures: students gauge their passion for meteorology

In June, the Bureau hosted an inspiring industry immersion day for 38 year 10 and 11 students from Brentwood Secondary College and Wellington Secondary College in Melbourne. The event was facilitated by Monash Tech School, one of 16 educational institutions funded by the Victorian Government as part of The Education State Tech Schools Initiative to deliver industry sector-specific programs to students from participating schools.

The day provided a platform for students to explore the exciting world of science, technology, engineering, and mathematics (STEM) and shape their thinking around career options. Through a series of practical workshops and discussions, the students gained invaluable insights into the work of the Bureau in observations, meteorology and climate science.

The 3 rotations, each critical workforce pipelines for the Bureau, were carefully crafted to show the interdependence between these areas and the range of skills that go into weather forecasting, with options for students considering either a vocational qualification or higher degree. Each rotation covered some technical skills and how the interpretation of that information translated into products that were used by different customer sectors such as agriculture, government and aviation, to make decisions.

A particular highlight of the day was the live-cross Q&A with Bureau colleagues in Antarctica, Willis Island and at Giles in central Australia, which gave the students an appreciation for the variety of locations and types of work they could be involved in.

Feedback from students on the day showed that 100% of students agreed they gained new knowledge, while 60% of students expressed a continued or heightened interest in pursuing STEM courses and careers following this experience.

Students witnessing the release of a weather balloon at the Bureau of Meteorology Training Centre during the industry immersion day.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 2 include:

- continuing to strengthen the Bureau's Academic Partnerships and leveraging skills and expertise within academia to support delivery of the decadal Research and Development Plan
- looking for future opportunities where artificial intelligence and machine learning can be utilised to further science capabilities across the Bureau and its partners
- continuing to utilise the technical experience and knowledge of the Bureau's Science Advisory Committee to pursue greater collaboration with complementary organisations for the benefit of the Australian community.

Enterprise Services

Goal: A trusted partner that best positions the Bureau to execute its Strategy and deliver for Australia – all day, every day.

The Enterprise Services Group is responsible for designing and delivering integrated enterprise-wide solutions to support the delivery of the Bureau's Strategy 2022–2027. As trusted strategic partners, the group develops the Bureau's strategic, people, change, governance, product management, customer engagement, communications, project, financial, and risk management capabilities including workforce planning and development to enable the Bureau's staff to work in a safe and secure environment.

The group ensures effective controls are in place and that the corporate services, systems, and processes are accessible, fit for purpose, and enable the Bureau to govern and manage its business well.

For 2023–24 the group consisted of 6 programs with the following responsibilities:

Program	Responsibilities
Strategy and Performance	• Strategy integration • Strategic policy • Planning and performance
Portfolio Management	• Enterprise program and project management • Procurement, contract and vendor management • Protective security
Communications	• External communications • Internal communications • Government relations • Strategic content and media • Creative
Business Management	• Finance • Customer engagement • Product management • Property services
Organisational Resilience	• Meteorological Authority Office • Legal services • Freedom of information and privacy • Risk management, internal audit and organisational resilience • Quality management system assurance • Health and safety • Environment

Program	Responsibilities
Organisational Development	• Workforce planning and reporting • Talent management and recruitment • Employee engagement • Workplace relations • Enterprise transformation • Diversity and inclusion • Health and injury case management • Learning and development • Meteorological technical training • Payroll

Throughout 2023–24, the group focused on the delivery of 3 outcomes that support the delivery of the Bureau's Strategy and purpose. The group's achievement in delivering each of these outcomes is discussed below.

Outcome 1: Enterprise planning and investments ensure the Bureau delivers strategic outcomes to its customers and stakeholders.

Achieving the outcome

Investigating the potential of Artificial Intelligence (AI)

The Bureau has been using rules-based AI such as automation and machine learning for a long time to prepare data into forecast information. However, the emergence of generative AI holds the potential to transform the Bureau's public service delivery, enhance user experience and increase community outcomes.

To investigate the potential, a dedicated, multidisciplinary team was established during the year to provide a clear strategic direction for the Bureau's adoption of AI and Machine Learning. The objective of the AI Taskforce is to consider longer-term AI use that will have the greatest impact and value for Bureau customers and operations, in line with best practice and Australian Government priorities. The Taskforce will also identify strategic priorities and suitable opportunities and will establish a sustainable framework for Bureau's engagement with AI. The Taskforce delivered its first key artefact in 2023–24 – an initial list of priority business needs – and will continue its work in 2024–25.

Planning for a reduced-emissions future

In 2024, all APS agencies were required to develop an emissions reduction plan. The goal of this plan is to help the Bureau contribute to the APS Net Zero 2030 target by reducing emissions across its operations. The plan includes both existing and new priorities and actions aimed at minimising greenhouse gas emissions within the Bureau's control. This involves addressing both direct emissions and indirect emissions through behavioural and process changes, such as limiting unnecessary travel. Emissions reporting and the reduction plan work together to enhance environmental performance by monitoring progress toward emission reduction targets (for the Bureau's emissions reporting see p.170).

Communicating everywhere, every day

In 2023–24, the Bureau's Communications Plan was refreshed with a focus on enabling and supporting all Bureau staff to apply communications principles consistently in their work as they communicate with customers, partners and stakeholders. Clear and consistent communication amplifies the work of the Bureau, maintaining its position of trust, helping reach all Australians when it matters most.

A section of the Communications Plan focused on the Bureau's audience, the channels it uses to reach Australians and the measures it uses to assess the effectiveness of its communications.

The plan sets the strategic direction for communications activity across the Bureau and provides a framework for positively positioning the Bureau and its products and services, and actively engaging with media and other partners to get critical information out to all Australians, every day.

Adopting the Product Management Lifecycle

The Bureau generates more than 480 routine products every day with a view to delivering genuine value and impact for its customers. The needs of the Bureau's customers however are constantly evolving and are doing so at an accelerated rate. To be responsive and deliver the solutions needed, in 2023–24 the Bureau adopted a Product Management Lifecycle, based on the international Product Management and Marketing Body of Knowledge.

The Product Management Lifecycle improves the customer experience by incorporating feedback and insights in product design and maintenance, speeds up delivery and drives efficiency. It allows the Bureau to prioritise and coordinate its resources, effort and investment to get solutions into the hands of customers faster. Products are regularly reviewed to test their value and benefit to the customer, with products added, upgraded or removed when they are no longer useful.

Improving the Bureau's program and project management maturity

The Bureau depends on its ability to effectively manage projects in order to replace assets, develop and implement new capabilities, and to produce products and services for all Australians. In June, the Bureau completed the Projectisation Program, a series of works to improve the maturity and capability of program and project management across the organisation.

The Projectisation Program developed and implemented a suite of reforms, including 2 core frameworks, the Bureau Delivery Framework which guides project delivery approaches, and the Portfolio Management Framework which sets standards for developing ideas into projects and how those projects are resourced as part of a broader investment portfolio. These new ways of working are supported by the Enterprise Portfolio Management Office, which provides guidance and assurance for the portfolio of work.

Long term project planning is now informed by 10-year asset network plans, which cover the Bureau's extensive asset base including numerical forecasting models, property, technology, and observations assets. This planning is used to map resource demand for future asset projects, improving project delivery, efficiency and supply contract planning.

Enhancing customer outcomes through data-driven decision-making

In 2023–24, the Bureau developed a new reporting suite using data from its customer relationship management system (CRM). The suite maximises the data the Bureau already has by presenting it in new ways, empowering the organisation to make data-driven decisions for better customer experiences and improved organisation outcomes.

By combining Power BI with CRM data, the Bureau is able to generate insights, identify trends and better understand customer needs. A customer intelligence report presents information and feedback obtained from direct engagement with customers. An engagement report, presented as a dashboard, provides an overview of interactions customers have across the Bureau in a given period. This highlights customer touchpoints and drives collaboration across the Bureau. These insights also support prioritisation of work when customer demand is high.

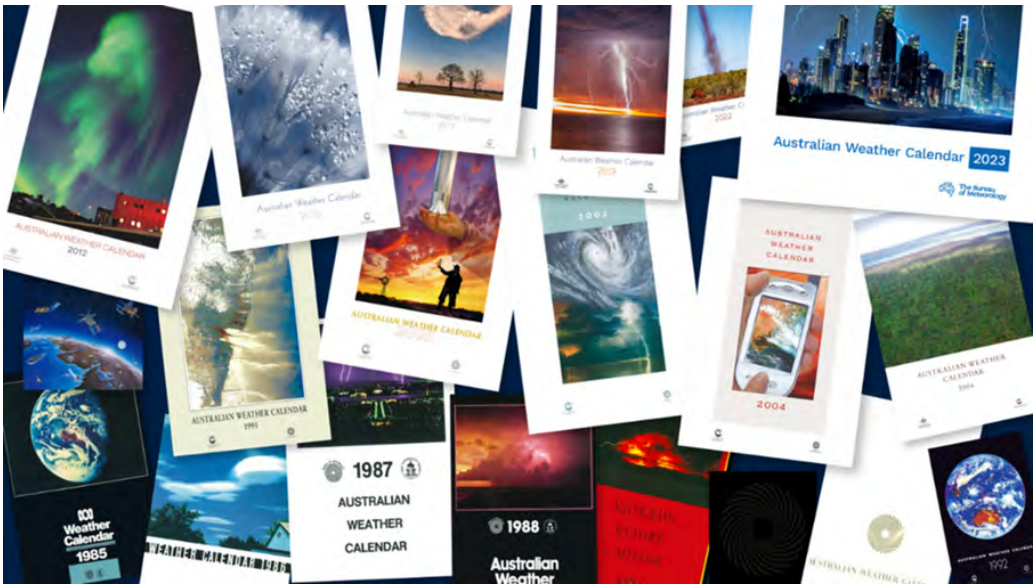
Highlights and significant events

Celebrating 40 years of the Australian Weather Calendar

In 2024 the Bureau was proud to celebrate the 40th edition of its award winning and much-loved Australian Weather Calendar. The stunning, high-quality product showcases extraordinary weather images from across Australia, alongside educational content on the featured meteorological phenomena. It also details many of the Bureau's critical products and services and celebrates our links to a range of sectors and communities.

Weather clearly plays a significant role in people's safety and productivity, but many people also appreciate the weather for the spectacle it can provide – from thunderstorms to rainbows, colourful sunsets to crystalline frosts. With an annual national photography competition to find the incredible images, each edition features 13 unique images, including the story behind how the image was taken, and the photographer who took them.

The first edition of the Australian Weather Calendar went on sale in 1984. Since then, the Bureau has proudly celebrated the beauty and drama of Australian weather with customers across the



Covers of the Australian Weather Calendar over the years.

globe. The calendar is also received each year by our network of Volunteer Observers, who play a vital role in the collection and recording of data across the country.

The Weather Calendar provides an excellent vehicle for public education, outreach, and engagement. Since its inception, one of the key goals of the Weather Calendar has been to fulfil the Bureau's obligations under the *Meteorology Act 1955*, specifically, on the promotion of the use of meteorological information and the promotion of the advancement of meteorological science. It is ideally positioned to highlight the ongoing, dedicated role the Bureau has in safeguarding the lives of every Australian.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 1 include:

- continuing to investigate Artificial Intelligence and machine learning and consider implications for the Bureau's strategic direction
- implementing the Bureau's customer experience measures framework and delivering the next phase of Distribution Channel Plan treatments.

Outcome 2: The Bureau's people are customer-focused, capable, and engaged; contributing to a safe, secure, productive, inclusive and sustainable environment.

Achieving the outcome

Continuing our reconciliation journey

In January, the Bureau established a First Nations Office to support the Bureau's vision for reconciliation, as an agency that values and respects First Nations peoples and their continuing connection to Country. The Office is focused on progressing the development of an Indigenous Employment Plan and transitioning from the 2021–2023 Reconciliation Action Plan (RAP).

As part of the transition to the new RAP, senior leaders reflected on the organisation's journey across each of the RAP pillars: Relationships, Respect, Opportunities, Governance. Seventy-four RAP deliverables were achieved, which has progressed relationships with Aboriginal and Torres Strait Islander employees, stakeholders, suppliers, and communities.

Notable highlights of the 2021–2023 RAP include:

- launching the First Nations Community Engagement Guidelines
- partnering with remote communities to provide severe weather warnings 'in Language'

Cover of the Bureau's First Nations Community Engagement Guidelines. Cover artwork 'Nakiliko Parai (Awabakal Language) See or Read Country' by Saretta Fielding.

- continued promotion of indigenous weather knowledge with the addition of 2 new Indigenous calendars
- becoming a Supply Nation member, employing an Indigenous Procurement Officer, and establishing an Indigenous Procurement Strategy
- providing greater visibility to important dates on the Bureau's Recognised Days calendar
- supporting more than 200 staff build their cultural capability through CORE Yarning Circles.

This reflection informed development of the Bureau's next RAP, which aims to build cultural maturity and drive better reconciliation outcomes. The Bureau continues to learn from its collective experiences by sharpening its focus on areas for improvement and setting more achievable ambitions.

Uplifting the Bureau's integrity arrangements

To support the Commonwealth Government's legislative and policy reform agenda focusing on public sector integrity, including the implementation of the National Anti-Corruption Commission (NACC), the Bureau has undertaken a comprehensive review and uplift of its integrity arrangements. In 2023–24, the Bureau successfully completed several integrity maturity activities including:

- the establishment of an Integrity and Compliance Advisory Group to ensure coordination of integrity activities with input from subject matter experts across relevant specialisations including legal, security, finance and human resource management
- the completion of a Bureau Integrity Maturity Assessment against the Commonwealth Integrity Maturity Framework, and the development of an Integrity Maturity Action Plan
- revision of the Bureau's Fraud and Corruption Control arrangements, including policy and procedures, to incorporate the changes to the Commonwealth Fraud and Corruption Control Framework.
- roll out of a Bureau-wide Integrity Awareness Campaign to increase Bureau staff knowledge and awareness about integrity including real-world examples.

Celebrating diversity with expert insights

The Bureau has an endorsed list of dates and events that were formally recognised throughout 2023–24. These align with the Bureau Strategy and contribute to success measure 4.1 Provide a safe, diverse, respectful, inclusive, secure and flexible working environment, where our staff excel and their contributions are valued.

Diversity events broaden our understanding by drawing on the lived experience of our own people and external speakers by sharing different perspectives and showcasing partnerships with community and stakeholder groups. It's a way to engage with our people and provide information about work delivering the Bureau's Strategy, recognise achievements, and celebrate our people and diversity.

A selection of promotional material from the Bureau's diversity events.

The events aim to foster a sense of belonging and inclusion and raise awareness about different cultures and backgrounds. They provide an opportunity for learning and reflection and staff are encouraged to have conversations about how the Bureau can individually and collectively progress efforts to deliver improved outcomes for our organisation. For more information on this year's events see p.162.

Highlights and significant events

Negotiating and implementing the Bureau of Meteorology Enterprise Agreement 2024

As part of the broader 2023 Australian Public Service-wide enterprise bargaining negotiations, the Bureau commenced agency specific bargaining on 6 June 2023 to develop the Bureau of Meteorology Enterprise Agreement 2024 (EA).

Over the course of 6 months and 25 formal bargaining meetings, more than 170 claims raised by union and employee bargaining representatives were considered and negotiated. To ensure employees were kept informed during the bargaining process, the Bureau developed an enterprise agreement intranet site to provide information and updates, provided a weekly newsletter, encouraged employees to send questions to the bargaining team and delivered over 40 information sessions.

The outcome of the negotiations and communications led to 84.5% of employees choosing to vote and out of this, 96% voting yes. The new EA came into effect on 28 March and to support its implementation the Bureau:

Cover of the Bureau of Meteorology Enterprise Agreement 2024.

- automated pay and conditions within the human resources information system before the EA came into effect
- developed an EA Explainer Series, each week highlighting the intent and application of a specific condition
- held information sessions on new APS-wide common conditions
- developed and consulted on new procedures and guidelines to support the application of new conditions and developed fact sheets that provided additional guidance
- developed a new e-learning module for managers to understand the conditions as part of their decision-making
- developed an automated and streamlined process for the request and approval of flexible working arrangements.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 2 include:

- focusing on the development and launch of the 2024-26 Reconciliation Action Plan
- developing and delivering the Bureau's Diversity and Inclusion Plan
- implementing the Bureau's action plan as part of the Respect@Work and psychosocial risk legislative reforms
- continuing to support managers and employees to understand the new conditions in the enterprise agreement.

Outcome 3: The advice and services provided by the Enterprise Services Group are accessible, fit-for-purpose, and enable the Bureau to govern and manage its business well.

Achieving the outcome

Relocating the Bureau's Darwin office for greater collaboration and efficiency

In April, the Bureau's Property Services team successfully relocated the Darwin office from the suburb of Casuarina to the Darwin CBD. The old office in Casuarina no longer met the Bureau's requirements with excess floor space, an aged fit-out, and its location making engagement with customers and stakeholders difficult. Having secured a lease on a new office in the Mitchell Centre in the Darwin CBD, the Property Services Project team undertook the fit-out works of the new office.

Feedback from staff following the relocation has been extremely positive. In an area roughly half the size of the old office, the new office provides a modern collaborative workspace accompanied by breakout areas and dedicated end of trip facilities, enabling Bureau teams to better engage with customers and operate at their productive best.

Ensuring the effectiveness of Australia's aviation meteorological services

As a signatory to the Convention on International Civil Aviation, known as the Chicago Convention, Australia is required to participate in compliance activities conducted by the International Civil Aviation Organisation (ICAO). ICAO carried out an audit of Australia's aviation safety system in September, which included aviation meteorological services. As the authorised provider of aviation meteorological services in Australia, the Bureau was required to participate in the audit, alongside other Australian aviation government agencies.

The purpose of the ICAO audit was to determine the effective implementation of the critical elements of Australia's aviation safety oversight system, Australia's

The Bureau is the authorised provider of aviation meteorological services in Australia.

compliance with the provisions of the Chicago Convention and its implementation of ICAO's safety-related standards and recommended practices. The Bureau's Meteorological Authority Office led preparations and represented the Bureau at the ICAO audit of Australia from 11–19 September. ICAO audit findings will help drive improvements to Australia's aviation safety oversight system over the coming years, enhancing global and national civil aviation safety.

Sticking to our sustainability principles

The Bureau is dedicated to environmentally sustainable practices. To reinforce this commitment, 6 Environmental Sustainability Principles were established to guide the Bureau's operations. These principles provide guidance for each key focus area and articulate what environmental sustainability success and best practices mean within the context of the Bureau. They will continue to be applied across Bureau operations to improve environmental outcomes in routine practices and projects, supporting the Bureau's efforts to meet the APS Net Zero in Government Operations strategy.

Maturing our finance function

To ensure all expenditure decisions are made in accordance with the *Public Governance, Performance and Accountability Act 2013* (PGPA Act) and are targeted to Bureau priorities, several initiatives were delivered during the year to strengthen the Bureau's financial governance, including:

- requiring all Bureau staff to undertake authorisations and delegations training to ensure a higher level of integrity and accountability in financial decision making
- improving the transparency and accuracy of capital projects through new processes for capturing and validating effort spent on projects
- improving controls to better capture the Bureau's diverse revenue arrangements
- implementing a new budget process, with a focus on transparency and a timelier approval process.
- improving financial reporting to provide senior leaders with better data on their budget and expenditure
- uplifting financial records management to store documents electronically and ensure a discoverable audit trail is maintained.

In addition to governance improvements, several projects were successfully delivered that focus on ensuring suppliers are paid on time while also improving efficiency. These included electronic processes for the payment of invoices under $10,000 and automation of contractor timesheets and invoicing.

Continuing our business systems transformation

The Business Systems Transformation program continued to uplift and streamline finance and human resources systems and processes for the Bureau. System improvements made during the year have enabled greater automation of leave and allowance processes, automated payment processing to labour hire agencies, automated invoice workflows and approvals, standardised management of finance documents, centralised security clearance information and streamlined external reporting through automated capture of workforce data.

These improvements are delivering many benefits for the Bureau, such as reducing time and effort on routine processes, improving payment accuracy and timeliness, improved tracking of workflows and enhanced security.

Highlights and significant events

Building quality assurance expertise in the Pacific

During the year, the Bureau's Quality Assurance Unit in collaboration with the International Development Program supported international development activities for the Pacific Island states of Kiribati, Papua New Guinea and Samoa under the Support for Aviation Weather Services program funded by the Department of Foreign Affairs and Trade.

The activity included the provision of a 5-day Management Systems Auditor training workshop in Fiji during May, followed by a 5-day Lead Auditor training workshop in June. The workshops provided Pacific Island participants with the knowledge and skills required to audit management systems in accordance with ISO 19011:2018. The 12 participants successfully completed the formal assessments and are now internationally recognised as Lead Auditors.

The 12 training participants from Kiribati, Papua New Guinea and Samoa with the trainers from Australia.

The activity helped to build interrelationships between workshop participants from the 3 Pacific nations and provided a solid foundation for the longer-term engagement on interregional quality management activities.

In-country visits to perform ISO 9001 gap analyses were also conducted to assist each nation to develop and implement a quality management system for their own meteorological service using the expertise and knowledge of Bureau staff.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 3 include:

- continuing the uplift of financial capability in the Bureau, new self-service reporting will be delivered that enables Bureau staff with financial responsibility to access reporting on demand
- continuing to build the business process maturity across the Bureau to ensure processes are systematic, repeatable, controlled and continually improved
- continuing to proactively plan and respond to legislative and Government policy and reform changes to ensure the Bureau complies with legislation.

Australian Climate Service

Goal: Improve access to integrated, authoritative, trusted data, information and expert advice; build and enhance national climate and weather hazard intelligence capability.

The Australian Climate Service (ACS) is responsible for providing data, intelligence and expert advice on climate and natural hazard risks and their impacts to inform decision-making. The ACS vision is to advance information and knowledge that is used to support a safer, adaptive and prosperous Australia that is resilient and prepared for climate challenges and natural hazards.

The ACS is made up of world-leading expertise from the Bureau, CSIRO, the Australian Bureau of Statistics and Geoscience Australia. The partnership draws together the national data, systems and expertise needed to inform climate and natural disaster decision-making. Each of the partners brings knowledge and expertise to the partnership and collectively this knowledge and expertise provides better information for decision-makers.

Bureau of Meteorology	CSIRO
The Bureau of Meteorology is the national weather, climate and water agency. It provides observational, meteorological, hydrological, oceanographic and space weather services.	CSIRO, as Australia's national science agency, brings its world leading research, science and innovation with a focus on climate observations and modelling, projections, resilience, adaption and transformation science and practice.
Australian Bureau of Statistics	**Geoscience Australia**
The Australian Bureau of Statistics brings critical social and economic information to the partnership, enabling an improved picture of the vulnerability of communities and how these are changing across Australia.	Geoscience Australia, a trusted advisor on national geology and geography, brings national hazard and exposure information, and geospatial and location services.

The Australian Climate Service partners.

The ACS is included in this Annual Report as the Bureau of Meteorology hosts the ACS. The Bureau's CEO and Director of Meteorology is the Accountable Authority and Senior Responsible Officer for the ACS.

The ACS seeks to achieve 2 main outcomes. The achievements in delivering these are discussed below.

Outcome 1: Enhanced national climate and weather hazard intelligence capability.

Achieving the outcome

Building understanding of Australia's climate risks and their impacts

As Australia's climate becomes more challenging with more extremes, our understanding of the risks posed by these extremes and their potential impacts requires greater use of earth system models of the ocean, atmosphere and hydrology. Many hazards including heatwaves, dangerous fire weather, and coastal inundation are increasing in frequency and peak intensity.

In 2023–24, the ACS defined priorities for its hazard work and is developing long-range forecasts and projections for each of these hazards. Outputs included practical and accessible information on the characteristics of natural hazards, including past occurrence and impacts, and how they will change under a range of climate scenarios into the future.

Assembling authoritative climate intelligence for greater insights

In 2023–24, the ACS brought together data, skills and expertise from across the partnership to build a new capability for the Australian Government. There is a high demand for trusted, authoritative information that brings together climate and hazard information with information on conditions across Australia and how they are changing over time. This capability will provide decision-makers with greater insights into climate and disaster risks and their potential impacts.

Requests from decision-makers are complex, and require not only data, but analysis on what the data is showing, what is important and guidance on when and how it should be used. The ACS invested in the data inputs, as well as the technology (including the ACS platform), methods, tools, people and processes to provide this guidance. The ACS digital platform is a key enabler for this integration, using a federated model to curate, analyse and interpret data and information of national significance from across different agencies. Importantly, as the ACS matures, the digital platform is scalable and could connect with many data sources and users to ensure the best available data and information is being used to inform decision-makers.

Simulating Australia's future climate

Climate projections simulate Earth's climate into future decades based on assumed scenarios of future carbon emissions. Developed through the ACS, the first set of high-resolution projections from the Bureau's regional climate downscaling model, BARPA-R, were published in early 2024 (see p.106). The projections reach until end of the 21st century on a 15 km grid, covering 16 possible pathways of future change based on 3 warming scenarios. The BARPA-R model is now being used to generate hazard projections of bushfires, cyclones, heatwaves, and extreme rainfall across the Australian region as the hazard data layers of ACS.

Development on the next stage of the project is underway with a higher resolution model to provide greater accuracy. The ACS aims to publish its next projections by June 2025. The projections will also form a primary input into the National Climate Risk Assessment with hazard projections to be provided across 10 regions, and 4 global warming levels (GWL).

Highlights and significant events

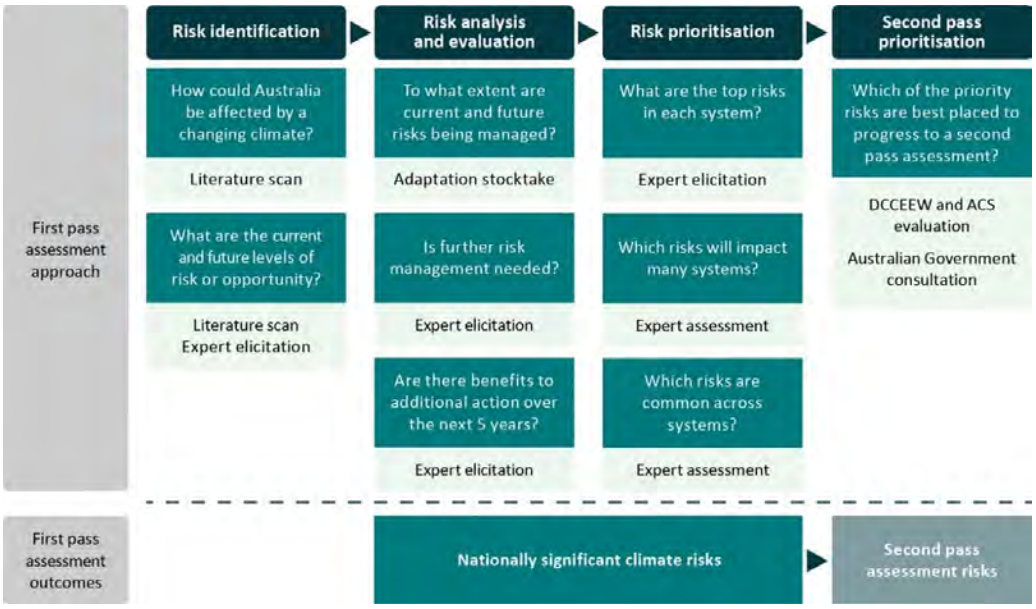
Identifying Australia's climate risks through the National Climate Risk Assessment first pass

During 2023–24, the ACS collaborated with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) to deliver the First Pass Assessment of Australia's climate risk. The first pass was released on 12 March 2024 and made available to all Australians via the DCCEEW website.

The purpose of the Risk Assessment is to provide an understanding of nationally significant climate risks to Australia from climate change impacts. It will provide a shared national framework to inform Australia's national priorities for climate adaptation and will enable consistent monitoring of climate risk across all Australian jurisdictions. This is a collaborative effort that integrates expertise across the ACS partnership with other Australian Government resources.

This Risk Assessment provides a qualitative analysis of 56 risks to Australia's nationally significant systems. The assessment was highly consultative, drawing on expertise from over 300 climate risk and domain experts, as well as best practice domestic and international approaches. Eleven of the 56 risks are being considered for deeper analysis in the second pass of the Risk Assessment, planned for delivery by December 2024. This will provide a more data-driven, analytical analysis, and will also consider how risks interact.

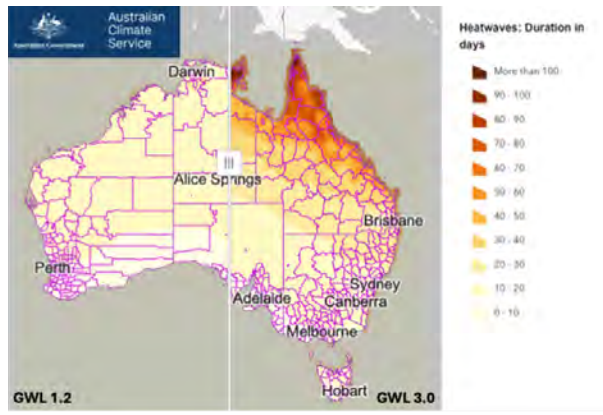
This work supports decision-making for Australian Government adaptation planning processes, and the assessment of priority risks used by many Australian Government agencies, including the National Emergency Management Agency (NEMA). The national assessment also informs other governments, industries and communities.



Overview of the first pass risk assessment approach and outcomes. Credit: DCCEEW.

Demonstrating our prototype data and information application

In line with the Australian Government's expectations for the ACS to share data and insights across government agencies and with the public, the ACS released a prototype web application in December that showcases some of the information and capability it currently has available.



Example of hazard scenarios provided through the ACS Regional Explorer showcasing duration of the longest heatwave in days for global warming level (GWL). 1.2 (left of the slider) and GWL 3.0 (right of the slider).

The prototype allows users to compare how heatwaves, extreme temperature and bushfire weather may change across different climate futures. It enables users to explore people, assets and systems across social, economic, built and natural environments at a regional scale. This is done by layering data from different climate hazards, under different climate futures with regional information. It helps to show where Australia could be headed and demonstrate how integrating climate and hazard data with information about Australia's different environments can provide a rich evidence base to support decision-makers.

The ACS continues to consult with climate information users and experts across different sectors to develop a structured approach to integrating and synthesising climate information and develop approaches to improve accessibility.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 1 include:

- improving ACS capacity to simulate the impact of climate change on natural, built and human systems to provide insights and advice
- delivering the science and data that will support DCCEEW to complete the Second Pass of the National Climate Risk Assessment to identify priorities and provide supporting evidence for the National Adaptation Plan
- enhancing data, intelligence, and analytical frameworks across natural, economic, social, and built domains to support decision-making and Australia's disaster risk reduction and resilience capacity
- uplifting climate and natural hazard data sets and intelligence to support advanced disaster forecasting for critical infrastructure and communities.

Outcome 2: Improved access to integrated, authoritative, trusted data, information and expert advice.

Achieving the outcome

Collaborating across and beyond the Australian Government

Throughout the reporting period, the ACS has been consulting broadly with the Australian government, state and territory governments, industry and academic stakeholders. As part of this consultation, the ACS has identified a range of strategic partnerships that would build national capability and create mutual benefits. For example, the ACS has been negotiating data sharing arrangements with agencies such as the Australian Competition and Consumer Commission, the Australian Prudential Regulation Authority and the Australian Reinsurance Pool Corporation to leverage insurance data already held by the government.

Through the Hazards Insurance Partnership, the ACS is collaborating with NEMA and the insurance sector to improve national understanding of flood risk. The ACS sought input from over 300 technical experts to contribute to the National Climate Risk Assessment. A new strategic agreement is being discussed with Treasury to support data sharing and joint projects.

The ACS partnered with the National Partnership for Climate Projections to work with state and territory government agencies to deliver consistent national climate modelling. The ACS continues to explore options for data standardisation and harmonisation with state and territory governments. The National Bushfire Intelligence Capability has been a successful model for working with states and territories to provide a standardised and harmonised historical bushfire footprint database.

Finalising the National Disaster Risk Reduction Baseline Assessment

The ACS is providing data and advice to support NEMA's risk reduction and resilience priorities. This includes supporting Australia's implementation and reporting of the Sendai Framework for Disaster Risk Reduction, the National Disaster Risk Reduction Framework and Second National Adaptation Plan, and the Disaster Ready Fund.

The ACS delivered a project that supported NEMA to establish the National Disaster Risk Reduction Systemic monitoring, evaluation and learning (SysMEL) approach. In addition to developing the overall approach, the project supported a first national baseline report highlighting how Australia is performing in delivering disaster risk reduction activities, and an implementation plan for monitoring and evaluating progress over time. The first baseline report was delivered to the Australian Government in December, and the ACS is working with NEMA to consider the next steps to support implementing the SysMEL.

Strengthening our support for natural disaster management

When there is a natural hazard event, a key role of the ACS is to provide detailed briefings to NEMA and the Australian Government's National Situation Room. These briefings are delivered daily when requested and include available information customised to the needs of decision-makers. Through the support of the ACS, weather and hazard services and expertise from the Bureau are embedded in the National Situation Room, enabling access to direct support to help preparedness for and response to natural disaster situations.

ACS Impact Briefs serve as a comprehensive synthesis of data, insights and intelligence from various sources, presenting all impact-related information in a practical and accessible format.

ACS Impact Briefs are delivered directly to decision-makers within NEMA. Notable projects like the National Bushfire Intelligence Capability and supply chain analysis through CSIRO Transport Network Strategic Investment Tool (TraNSIT) continually enhance their outputs. Geoscience Australia, through uplift of its situational awareness products, also contributed to the ongoing improvement of Impact Briefs by leveraging the best available inputs from across the ACS.

Highlights and significant events

Supporting the National Situation Room through tropical cyclone Jasper

Tropical cyclone Jasper was the wettest tropical cyclone in Australian history, initially forming on 2 December, before intensifying and becoming a Category 5 tropical cyclone on 7 December.

Drawing on the diverse expertise of the partnership, the ACS assisted the National Situation Room in responding to the event and the flooding that occurred in the Northern Queensland region, providing a profile of the communities affected by the floods to help in planning the evacuation of vulnerable residents and the delivery of essential supplies.

Geoscience Australia, on behalf of ACS, procured near real time flood extent and impact mapping service to inform response efforts by Commonwealth and state government agencies. Exposure and vulnerability data was provided from the Australian Bureau of Statistics and Geoscience Australia. The CSIRO TraNSIT team provided supply chain impact information for both scenario planning in the lead up to, and daily information during the event. Local briefing and preparedness assessments were provided on the ground through the North Queensland ACS team based in Townsville.

Satellite image of tropical cyclone Jasper as it approaches the Queensland coast. Credit: NASA Visible Earth.

ACS data and information was used to brief the Prime Minister and the Queensland Premier, and support the information needs of the:

- Queensland Police Service
- Queensland Department of Resources
- National Emergency Management Agency
- Australian Geospatial-Intelligence Organisation
- Australian Reinsurance Pool Corporation
- Services Australia

Independent Review of the Australian Climate Service

In 2023–24, the Australian Government appointed an independent panel to review the ACS. The review evaluated the performance of the ACS and its suitability to meet Australia's current and future climate information needs. This included:

- reviewing the performance of the ACS since establishment, its governance arrangements, resourcing and capabilities
- assessing Australia's future climate information needs and the suitability of the ACS to deliver on them.

The review's report was publicly released on 19 June 2024, and the panel made 11 recommendations including:

- transferring responsibility for emergency management support functions from the ACS to NEMA
- ensuring the future ACS is service-oriented with a focus on providing practical products and services to all Australians

Positioning the ACS to respond to Australia's future climate information needs.

- establishing a digital platform for climate products and services that builds over time and provides up-to-date climate information that is easy to understand.

The Australian Government accepted the recommendation by the independent panel to transfer responsibility for emergency management support functions from the ACS to NEMA ahead of the 2024–25 Higher Risk Weather Season.

The Government is considering the remaining recommendations with a taskforce being established in DCCEEW to support the Government to deliver a thorough and comprehensive response to the review in late 2024.

During this time, the ACS will prioritise support to the National Climate Risk Assessment, the Hazard Insurance Partnership and progressing key enablers to build national capability – such as the digital platform and climate information improvements – where these can support climate adaptation decision-making.

Next steps

Key activities to be delivered in 2024–25 to help achieve Outcome 2 include:

- applying ACS Digital Platform capabilities and fit for purpose data governance to support real-time decision-making and action by ACS customers and broader users
- effectively engaging and managing customer (and other key stakeholder) relationships to support decision-making.

Recognition of performance

Throughout 2023–24, the Bureau continued to recognise the excellent work of individual staff, volunteers and teams who contribute to the delivery of trusted, reliable and responsive weather, water, climate, ocean and space weather services to all Australians.

Recognising and celebrating our people is an important part of our workplace culture. Through its Recognition and Rewards Framework, the Bureau recognises staff formally or informally, ranging from 'cause for applause' moments in team meetings to formal awards.

Bureau Excellence Awards

In September, we recognised and celebrated outstanding achievements by teams and individuals across the organisation at the 2023 Bureau Excellence Awards. Established in 1987, the Awards are an opportunity to highlight excellence across the Bureau through successful projects, initiatives or delivering our services during extreme weather.

The Bureau's CEO and Director of Meteorology, Dr Andrew Johnson, presented awards across 5 categories: the Director's Choice Award and awards representing achievements aligned with the Bureau's 4 pillars of success – Impact and value, Operational excellence, Insight and innovation and the Bureau way.

2023 award	Recipient(s)
Director's Choice	Cross-enterprise team for delivery of national precipitation products For excellence in enhancing the Bureau's national precipitation services, building community resilience to high impact rain events.
Director's Choice	Louise Wicks, Manager, International Relations For exemplary leadership, dedication and diplomacy in support of the Bureau of Meteorology's and Australia's international responsibilities.
Impact and value	Australian Space Weather Forecasting Centre (Business Solutions) For excellence in transforming the Bureau's capability to safeguard the Australian community and industry from the effects of space weather.
Impact and value	Australian Energy Market Operator Decision Support Meteorologists (Business Solutions) For outstanding contributions to the Bureau's embedded decision support enabling greater reliability and resilience of Australia's energy system.
Operational excellence	Enterprise Scheduling Tool team (Data & Digital Group) For significantly improving systems and processes through implementing the Enterprise Rostering Tool to support the efficiency and effectiveness of our teams.

2023 award	Recipient(s)
Operational excellence	JetStream Project Capability team (Business Solutions) For outstanding contributions to the establishment of the JetStream platform enabling secure and efficient access to large geospatial datasets for customers in the national security sector.
Insight and innovation	Process Integration team (Community Services) For sustained leadership, commitment and passion to improve processes and ways of working in the Community Services Group delivering innovative outcomes for customers.
The Bureau way	Storm Pride Network Member Council For outstanding leadership, contributing significantly to an equitable and diverse Bureau where our people are safe and can bring their authentic selves.

Australia Day Achievement Awards

Every year the Bureau recognises the achievements of our people through the Australia Day Achievement Awards for outstanding performance on a project that has made a significant contribution to the nation, or for outstanding performance of core duties.

The Bureau's CEO and Director of Meteorology, Dr Andrew Johnson, presented the first 2024 Australia Day Achievement Award to Dr Beth Ebert for her outstanding leadership in applied meteorology through the development of groundbreaking forecast verification processes which have led to improved forecast accuracy and efficiency and greater impact and value to our customers. The second Achievement Award was awarded to the Strategic Policy and Finance Teams for their outstanding efforts in translating complex technical issues into strategic policy advice and developing strong business cases to support the Government's agenda.

With their awards, from left, Dr Beth Ebert with Group Executive Science and Innovation, Dr Gilbert Brunet and Margarita Tan, from the Bureau's Finance team.

Public Service Medal

The Bureau's CEO and Director of Meteorology, Dr Andrew Johnson, was awarded a Public Service Medal in the 2024 Australia Day Honours.

The Public Service Medal recognises those who have consistently performed demanding jobs to the highest standards and have made a major contribution to the Australian community.

The Public Service Medal recognises Andrew's outstanding public service through leadership in developing and stewarding Australia's capability in the environmental and physical sciences.

Dr Andrew Johnson after receiving his Public Service Medal.

World Meteorological Day – Long Service Awards

In March, the Bureau celebrated World Meteorological Day 2024, which commemorates the Convention establishing the World Meteorological Organization (WMO) coming into force in 1950.

As part of World Meteorological Day celebrations, the Bureau recognised 6 staff members who have contributed more than 40 years of service to the Bureau and our customers.

Volunteer Rainfall Observer Excellence Awards

Manual rainfall observations are collected from across Australia and transmitted to the Bureau by around 3,100 volunteers who form an integral part of the Bureau's composite observations systems. The Bureau recognises the dedicated and sustained commitment of its long-serving volunteer rainfall observers by presenting them with excellence awards for 50 and 100 years of service.

In 2023–24, the following awards were presented to:

- Brian Duffy for 50 years of continual rainfall observations at Nyah, Victoria (station 076044)
- The Holzapfel family for 100 years of continual rainfall observations at Mount Cotton West, Queensland (station 040141).

Presentation of the 100-year excellence award to Neil Holzapfel by Sally Wintour from the Bureau's Brisbane Hub in March.

Australian Meteorological and Oceanographic Society Awards

In November, 2 Bureau scientists were recognised for their outstanding work by the prestigious Australian Meteorological and Oceanographic Society (AMOS) Awards.

Bureau scientist Jim Fraser was awarded the Christopher Taylor Award for his exceptional contributions to operational forecasting services. Over many years as a modelling expert, Jim has played a crucial role in setting up and supporting our atmospheric numerical weather prediction systems. Jim famously extended the colour palette of Bureau ACCESS charts to include 2 shades of 'deep purple' for temperatures above 50 °C, a change that was featured in the National Museum of Australia's Defining Moments in Australian History for 2013.

Dr Harry Hendon, who retired from the Bureau in 2020, was honoured with the Zillman Medal, acknowledging his outstanding record of innovative and transformative research. Harry's research significantly advanced the science of multi-week to seasonal prediction, enabling the Bureau to rely on coupled dynamical models for season prediction.

AMOS Fellow

In December, Bureau scientist, Dr Pandora Hope was elected to the ranks at AMOS. This prestigious fellowship is awarded to a select group of scientists who have made major contributions to the AMOS disciplines over several years.

Pandora has spent over 2 decades conducting research at the Bureau, where she has advanced the science of climate variability and climate change in Australia and the Southern Hemisphere. Pandora is one of Australia's foremost experts on the science of extreme event attribution and is currently leading a project in the Climate Systems Hub of the Australian Government's National Environmental Science Program.

AMOS Fellow Dr Pandora Hope.

Australian Business Awards

Each year, the Australian Business Awards honour and celebrate private and public organisations that demonstrate world-class business innovation, product innovation, technological achievement, and employee engagement.

In August, the Bureau's Energy and Resources Program received awards in the following categories:

- Business excellence – for organisations that have successfully implemented initiatives that demonstrate excellence in business management
- Business innovation – for organisations that have successfully implemented initiatives that demonstrate leadership and commitment to business innovation.

The awards are recognition of the business excellence and innovation of the Energy and Resources Program and the value the Program creates for its customers.

2023 Commonwealth Procurement and Contract Management Awards for Excellence

The Commonwealth Procurement and Contract Management Awards for Excellence help promote the important role procurement and contract management plays in delivering services and outcomes for government, the business community and the Australian public.

The Bureau was awarded Gold (overall winner) in the Building Entity Capability category, demonstrating leadership and excellence in building procurement capability within the Bureau to ensure value for money is delivered throughout the procurement lifecycle.

The Bureau demonstrated the design, development and delivery of a new enterprise-wide procurement capability enhancement supported by its new procurement Service Model. The Service Model incorporates varying levels of engagement, from the provision of self-service guidance material to a full end-to-end assisted service where the Procurement and Contracts team becomes progressively more engaged towards a facilitated and expert-led approach to the Bureau's most complex procurements. The Bureau demonstrated how the new Service Model changed perceptions and approaches to procurement across the organisation and delivered savings in procurements undertaken by the Bureau.

The Assistant Minister to the Prime Minister, Assistant Minister for the Public Service, the Hon Patrick Gorman MP with the Bureau's Michelle Wickham, Ben Haydon and Colby Au at the 2023 Commonwealth Procurement and Contract Management Awards for Excellence. Credit: Department of Finance.

Australasian Reporting Awards

The Australasian Reporting Awards acknowledge organisations that produce high quality annual reporting. The Awards provide organisations an opportunity to benchmark their reports against their peers across the Asia-Pacific region.

The Bureau was awarded the Best of Industry Sector award in the 'Public Administration – National' category for its Annual Report 2022–23 at the Awards in May. The Bureau's Annual Report 2022–23 was also recognised with its sixth consecutive Gold Award.

The Award recognises the clarity, transparency and commitment of the Bureau's reporting and confirms that it continues to benchmark well against the annual reports of businesses and governments across Australia, New Zealand and beyond.

The Bureau's Sandina Bailey, Manager Health, Safety & Environment, accepting the Best of Industry Sector award for the Annual Report 2022–23.

Section 4:

Organisational management

Organisational chart

As at 30 June 2024


Business Solutions
Peter Stone
Agriculture and Water
Elizabeth Johnson A/g
Aviation, Land and Maritime Transport
James Lannan
Energy and Resources
Stephen Duggan
International Development
Andrew Jones
National Security and Space
Kristen Reeson
Flood Warning Infrastructure Network
Ella Harrison
Community Services
Piero Chessa
Decision Support Services
Chantal Donnelly
Environmental Prediction Services
Matthew Collopy
National Production Services
Michael Logan
CEO and Director of Meteorology
Andrew Johnson
Office of the CEO
Enterprise Services
Paula Goodwin
Business Management
Kate Dalton
Communications
Timothy McLean
Organisational Development
Tim Abrahams
Organisational Resilience
Astrid Heward
Portfolio Management
Ben Haydon
Strategy and Performance
Katie Timmins A/g
Science & Innovation
Gilbert Brunet
Research
Bertrand Timbal
Research to Operations
Robert Argent

Corporate governance

Corporate governance framework

The Bureau's corporate governance framework provides a sound basis for decision-making, defines mechanisms for accountability and stewardship, and supports the Bureau's strategic direction and leadership.

The framework is based on:

- the legislative foundation provided by the *Meteorology Act 1955*, the *Water Act 2007*, the *Public Service Act 1999*, and the *Public Governance, Performance and Accountability Act 2013* (PGPA Act)
- a clearly defined executive and management structure
- a comprehensive planning, performance and reporting framework
- various mechanisms for stakeholder input and review
- detailed financial and asset management policies, procedures and guidelines
- thorough risk management and fraud control strategies
- an Audit Committee and internal audit function to provide independent advice and assurance on the Bureau's activities.

Accountable Authority

The Bureau's Accountable Authority during the report period 2023–24 was as follows:

		Period as the Accountable Authority or member within the reporting period	
Name	**Position title/Position held**	**Start date**	**End date**
Dr Andrew Johnson	Chief Executive Officer and Director of Meteorology	1 July 2023	30 June 2024

Executive and management structure

At 30 June, the Bureau comprised:

- the Executive Team (CEO and Director of Meteorology and 6 Group Executives)
- 5 groups, comprising 23 programs, that are collectively responsible for delivering the Bureau's Strategy 2022–2027
- the Australian Climate Service
- the ROBUST Program
- 8 state and territory offices, located in the capital cities
- 35 field observing offices, Defence weather services offices, observing hubs and other specialist facilities across Australia, its offshore islands and Antarctica.

In addition to the general group and program structure, several specialist roles are attached to senior positions, including:

- Chief Customer Officer, performed by the Group Executive, Business Solutions
- Chief Operating Officer and Chief Security Officer, performed by the Group Executive, Enterprise Services
- Chief Information and Technology Officer and ROBUST Program Director, performed by the Group Executive, Data and Digital
- Chief Scientist, performed by the Group Executive, Science and Innovation
- Chief Engineer, performed by the General Manager, Observing Systems and Operations
- Chief Data Officer, performed by the General Manager, Data
- Chief Architect, performed by the General Manager, Planning and Architecture
- General Counsel and Chief Risk Officer, performed by the General Manager Organisational Resilience
- Chief Financial Officer
- Chief Information Security Officer
- Chief Statistician.

The Executive

The Bureau's Executive Team (the Executive) comprises the CEO and Director of Meteorology (Director) and 6 Group Executives. The role of the Executive is to consider and promulgate decisions on program, policy, financial and people management issues across the Bureau and to provide leadership under the authority of the Director as the Accountable Authority for the agency (under the PGPA Act). The Executive has responsibility for setting the Bureau's strategic policies and priorities and for optimising the use of its resources.

Dr Andrew Johnson

Chief Executive Officer and Director of Meteorology

Andrew was appointed CEO of the Bureau of Meteorology in 2016 and re-appointed for a further 5-year term in 2021. He is Australia's Permanent Representative to the World Meteorological Organization and the Accountable Authority for the Australian Climate Service.

Andrew's career spans multiple sectors and geographies, especially primary industries, energy, water, emergency management, national security and the environment.

Prior to joining the Bureau, Andrew founded Johnson & Associates Consulting to provide environmental and agricultural knowledge services to government and industry. For nearly a decade he was a member of CSIRO's Executive Team where he led their water, land, climate, marine and urban work. At CSIRO he held a range of other senior technical and operational leadership roles. Andrew has also held several non-executive director roles across a range of domains in the private, government and not-for-profit sectors, both in Australia and internationally.

Andrew has a PhD from the University of Queensland and a Masters from the Kennedy School at Harvard University. He is a Fellow of the Australian Academy of Technical Sciences & Engineering and Australian Institute of Company Directors. He was awarded a Public Service Medal in the 2024 Australia Day Honours.

Mr Piero Chessa

Group Executive Community Services

Piero joined the Bureau in March 2020 after spending 13 years at the Boeing Company, where he held senior positions in operations and data science activities.

A physicist, Piero moved from theoretical physics to atmospheric dynamics and accepted the challenge to build a Regional Meteorological Service in Italy. He then moved to the European Centre for Medium-Range Weather Forecasts in the United Kingdom as a Senior Scientist and later joined the Boeing Company where he covered various senior management roles in the Digital Aviation Business division.

Piero combines a strong domain competence and an established experience in public services, with a deep and varied knowledge of operations in multinational corporations. Piero is the Bureau's Multicultural Access and Equity Champion.

Dr Peter Stone

Chief Customer Officer and Group Executive, Business Solutions

Peter joined the Bureau in July 2017. Peter's work in industry and government, in Australia and abroad, has focused on understanding customer needs and creating science-based partnerships and programs that meet them.

Peter has contributed to advances in policy, planning and practice in the fields of infrastructure, regional development, natural resource management and food processing. He has a master's degree in agriculture and a PhD from the University of Melbourne. Peter has a decade-long commitment to Scientists in Schools and is the Bureau's Indigenous Champion.

Ms Nichole Brinsmead

Chief Information and Technology Officer and Group Executive, Data and Digital

Nichole commenced with the Bureau in February 2018 as Group Executive Data and Digital, and Chief Information and Technology Officer. In this position Nichole is accountable for the operations, security and delivery of the data, infrastructure and systems that underpin the Bureau's operations. She is a member of the Bureau Executive Committee and Chairs the Bureau's Security, Risk and Business Continuity Committee. In September 2021 Nichole also took on responsibility for the delivery of the ROBUST Program.

She has had over 20 years' experience in a diverse range of roles across several business and technology domains in the financial services, higher education, professional services, emergency services and government sectors.

Nichole has an outstanding track record of delivery in complex operating environments both in Australia and overseas. She has led a number of successful enterprise-wide transformations that have resulted in significant uplifts in performance. She was appointed to the Board of Australia's Integrated Marine Observing System (IMOS) in 2019, is an advisor to the Bureau's partner in the Joint Australian Tsunami Warning Centre, and was appointed as the Australian National Focal Point to UNESCO Intergovernmental Oceanographic Committee in 2020.

Dr Gilbert Brunet

Chief Scientist and Group Executive, Science and Innovation

Gilbert joined the Bureau in December 2018 after 12 years as Director of the Meteorological Research Division (MRD) of Environment and Climate Change Canada, which included a secondment as Director Weather Science at the UK Met Office (2012–15). Gilbert is responsible for the delivery of the Bureau's decadal Research and Development Plan 2020–2030 and has stewardship for the implementation of the Bureau's Innovation Framework.

Gilbert is recognised as an expert in weather and climate dynamics with a PhD in meteorology from McGill University (1989). Gilbert has also previously led the Numerical Prediction Research Section of Environment and Climate Change Canada. Gilbert is currently Chair of the WMO Scientific Advisory Panel, Chair of the UK Met Office's Scientific Advisory Committee and a member of the International Scientific Advisory Panel (ISAP) of the Centre for Climate Research Singapore (CCRS). Gilbert previously chaired the Scientific Steering Committee of the WMO World Weather Research Program. Gilbert is the Bureau's Accessibility Champion and STEM Champion.

Ms Paula Goodwin

Chief Operating Officer, Chief Security Officer and Group Executive, Enterprise Services

Paula joined the Bureau in March 2020 and is responsible for human resources/organisational development, finance, health, safety, environment, government relations, corporate communications, strategy and performance, legal and commercial, product management and customer engagement, protective security and cyber security assurance, portfolio management, procurement, risk, assurance and audit. Paula is also the Chief Security Officer.

Paula has experience in leading corporate teams and supporting organisations through strategic and organisational transformations. She has previously worked with the Department of Agriculture, Water and the Environment and its predecessor the Department of Environment and Energy, as well as the Department of Immigration and Border Protection, the Australian Customs and Border Protection Service and the Australian Crime Commission.

Paula is a Fellow of the Australian Institute of Human Resources and has a Master of National Security Policy from the Australian National University, as well as a Master of Human Resource Management, a Graduate Certificate in Employment Relations, and Bachelor of Arts Information Management and Human Resource Management from the University of Canberra.

Ms Vicki Woodburn

Group Executive, Australian Climate Service

Vicki joined the Bureau in 2021 and leads the Australian Climate Service. She has had a distinguished track record of leadership in both the public and private sector. Her work has focused on improving resilience and profitability in Australian industries, communities and natural resources.

Vicki was previously part of the executive leadership team at the Murray-Darling Basin Authority (MDBA). She was instrumental in implementing complex water reforms and transforming its engagement, science and policy functions. Before joining MDBA, Vicki held technical and leadership roles with the Rural Industries Research and Development Corporation, private sector consulting businesses and the Australian Government's Department of Agriculture, Fisheries and Forestry. In these roles she led a range of cross-sector partnerships. These were in the areas of soils, climate change, rural policy, agricultural extension, digital innovation, and primary industry health and safety.

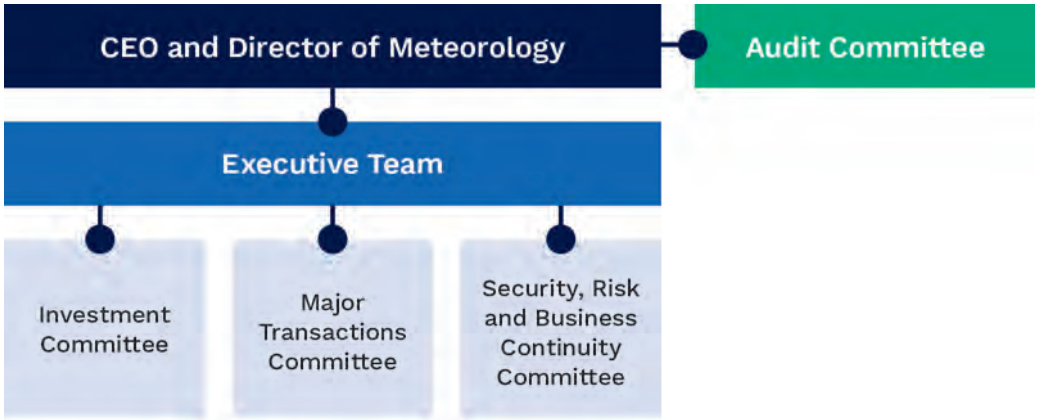
Vicki has a Bachelor's Degree in Applied Science from the Australian National University. Vicki is the Bureau's LGBTQIA+ Champion.

Committees

The Bureau Executive is the highest-level decision-making body within the organisation. Executive meetings are chaired by the Director and are held each month.

The Executive is supported by 3 sub-committees: the Investment Committee, the Major Transactions Committee and the Security, Risk and Business Continuity Committee. Each Committee is governed by a Charter and is chaired by a member of the Executive. The Bureau's Audit Committee provides independent assurance on the Bureau's risks, controls and compliance.

In addition to the sub-committees, the Bureau's senior managers meet monthly to discuss key issues and progress. These Senior Leadership Team meetings involve the Director, Group Executives, General Managers, State Responsible Officers and the Chief Financial Officer.



The Investment Committee

The Investment Committee supports the Bureau Executive in the development of organisational plans and converting strategic priorities into investment decisions. The Committee makes recommendations regarding the allocation of resources in alignment with the Bureau Strategy, customer needs, statutory responsibilities and/or international and treaty obligations. The Committee advises the Executive on the performance of Group Plans and associated resource allocations. In 2023–24, the Investment Committee was chaired by the Chief Operating Officer.

The Major Transactions Committee

The Major Transactions Committee supports the Bureau Executive to direct and control the Bureau's involvement in major transactions and related matters to ensure alignment with the Strategy and that value for money is achieved from Bureau investments. In 2023–24, the Major Transactions Committee was chaired by the Chief Customer Officer.

The Security, Risk and Business Continuity Committee

The Security, Risk and Business Continuity Committee supports the Bureau Executive in the effective management of strategic and operational risk, and advises on the effectiveness of security, business continuity and resilience matters. The committee also ensures that security and business continuity activities are well planned and executed and that Bureau investments support organisational resilience. In 2023–24, the Security, Risk and Business Continuity Committee was chaired by the Chief Information and Technology Officer.

The Audit Committee

The Director of Meteorology convenes the Bureau of Meteorology's Audit Committee in compliance with section 45 of the PGPA Act. The Audit Committee is governed by its charter (http://www.bom.gov.au/inside/2023-Bureau-audit-committee-charter-2019-v2.pdf), which requires the committee to review and provide independent assurance on the appropriateness of the Bureau's financial reporting, performance reporting, system of risk oversight and management and system of internal control in accordance with section 17 of the *Public Governance, Performance and Accountability Rule 2014* (PGPA Rule).

Collectively, committee members possess the knowledge, skills and experience required to ensure these functions are appropriately performed. Throughout 2023–24, the committee was chaired by Mr Matt Cahill.

The Audit Committee held 4 meetings in 2023–24. The committee considered financial and performance statements, provided advice on the Bureau's assurance activities, reviewed the Bureau's Internal Audit Plan and associated audit reports.

Audit Committee membership and meeting attendance

Member name	Qualifications, knowledge, skills or experience	Number of meetings attended/ total number of meetings	Total annual remuneration (GST inc.)	Additional Information (including role on the committee)
Matt Cahill	Matt is a former Australian Public Service Deputy Secretary, with over 20 years' experience as a senior executive in multiple Commonwealth Public Service portfolios. Matt has diverse experience in operational, program, regulatory, policy, corporate and assurance leadership roles. Matt has held Chief Operating Officer and Chief Information Officer positions, as well as senior executive positions focused on financial capability and agency funding. He has deep audit experience, having overseen the performance audit program at the Australian National Audit Office and currently chairs and is a member of several audit and risk committees. Matt is a Certified Practising Accountant with fellow status (FCPA) and an Australian Institute of Company Directors graduate. He has a Master of Business Administration and undergraduate degrees in Economics and Science.	4/4	$36,203	Chair of the Bureau of Meteorology Audit Committee (BMAC)

Member name	Qualifications, knowledge, skills or experience	Number of meetings attended/ total number of meetings	Total annual remuneration (GST inc.)	Additional Information (including role on the committee)
Sue Friend	Sue is a Chartered Accountant with experience in business valuations, risk assessment and financial analysis. Sue provides consulting services to corporate, legal and regulatory clients through Sapere Research Group. She is also an experienced board director with board and audit committee roles in the public sector. Sue is currently a director of the Melbourne Market Authority and a member of Courts Council, the governing body of Court Services Victoria. She chairs the audit and risk committees of both organisations. Sue is a graduate of the Australian Institute of Company Directors.	4/4	$27,152	BMAC member Deputy Chair & member of the Financial Statements Sub-Committee (FSSC)
Paula Allen	Paula has over 25 years' experience across services, finance, technology, governance and strategy for business, government, and international organisations. Paula is a Fellow Chartered Accountant, Chartered Financial Analyst, a AICD Graduate, as well as holding their Advanced Diploma in Mastering the Boardroom. She has studied more broadly including across leadership, new technology, big data, and ethics. She maintains various private clients.	4/4	$27,152	BMAC member & Chair of the FSSC

Member name	Qualifications, knowledge, skills or experience	Number of meetings attended/ total number of meetings	Total annual remuneration (GST inc.)	Additional Information (including role on the committee)
Peter Qui	Peter is the Chief Information Officer at the Department of Finance. He been delivering ICT systems and solutions for over 30 years, largely in the social services portfolio of the Australian Government. This has featured roles in design, implementation, assessment, development and risk management of nationally significant programs of work. His experience includes administering the core ICT systems underpinning Centrelink, Medicare, Child Support and Aged Care (including their delivery of disaster support payments across COVID-19, bushfires and flood events); managing Machinery of Government integration of departments; leading the development of the Whole of Government grants capability; and managing the ICT solution implemented for the Aged Care Gateway.	4/4	$0	BMAC member
Geoff Leeper	Geoff Leeper, with a distinguished public service career and successful consultancy business, joined the Bureau of Meteorology Audit Committee in July 2023. He previously chaired the Audit Committee in the Department of Human Services (2005-2007) and the Department of Families, Housing, Community Services and Indigenous Affairs (2007-2009). Geoff has served on various commercial and non-profit boards, including Hartley Lifecare ACT (2010-2019). His APS experience spans policy, program, ICT, project and program implementation, and corporate affairs. As a consultant, he has performed governance, assurance, and leadership assignments across over 20 agencies. Currently, he is a member of Change and Implementation committees in DEWR, Health, Services Australia, and Education, and has conducted over 25 Gateway Reviews.	4/4	$27,152	BMAC member

Partnerships

The Bureau partners with Australian Government agencies and other organisations to manage the delivery of common outcomes. At 30 June, these partnership arrangements included:

- the Australian Climate Service partnership with CSIRO, the Australian Bureau of Statistics and Geoscience Australia (established through a head agreement between the 4 parties)
- a strategic relationship agreement for the provision of meteorological and oceanographic services to support the Department of Defence
- memorandums of understanding with a range of Defence stakeholders, including: the Navy, Army and Air Force, Headquarters Joint Operations Command, Defence Estate and Infrastructure Group and the Defence Science and Technology Group
- a memorandum of understanding and agency agreement with Airservices Australia
- strategic relationship agreements with keystone energy sector organisations including the Australian Energy Market Operator, Powerlink Queensland and Hydro Tasmania
- a strategic relationship agreement with the European Centre for Medium-Range Weather Forecasts (ECMWF) on collaboration, data sharing and capability exchange programs
- a consortium agreement with partners from the United Kingdom, New Zealand, India and Singapore on a next generation modelling systems program, known as Momentum
- a strategic agreement with the Climate Change Authority
- a memorandum of understanding with the Australian Antarctic Division
- a memorandum of understanding with CSIRO and the Australian Nuclear Science and Technology Organisation in the context of the Australian Antarctic Program
- a collaborative relationship understanding with CSIRO
- a collaborative head agreement with Geosciences Australia
- strategic relationship agreement with the Queensland Department of Transport and Main Roads
- an unincorporated joint venture with the University of Tasmania as Lead Agent for the Integrated Marine Observing System (IMOS)
- an Intergovernmental Agreement between the Bureau and all state and territory emergency services agencies.

Corporate planning and evaluation

At the highest level, the Bureau's future direction is guided by the Strategy 2022–2027. The Strategy is a blueprint for the future direction of the Bureau and guides all other planning and performance activities. The Strategy outlines the Bureau's strategic objectives, actions and success measures.

The Corporate Plan 2023–24 was published on the Bureau's website in August. Prepared in accordance with requirements of the PGPA Act, the Plan sets out the Bureau's priorities, planned achievements and success measures for 2023–24 and the outlook to 2026–27.

Operational planning within the Bureau is undertaken at group and program levels. The evaluation of performance against plans is an important component of the annual planning cycle. Progress against the Bureau's success measures is regularly monitored through reports to the Bureau Executive. Overall performance against the success measures for 2023–24 is presented in the Annual Performance Statement (see p.33).

All corporate planning and evaluation activities are undertaken in accordance with the Bureau's Planning, Performance and Reporting Framework.

Enterprise risk management

Effective risk management plays a key role in shaping the Bureau's strategic direction and successfully delivering on its purpose: To provide trusted, reliable and responsive weather, water, climate, ocean and space weather services for Australia – all day, every day. Failure to effectively identify, assess, treat and monitor risk may adversely impact customer experience and outcomes, the safety of our staff and the public, the Bureau's reputation and financial position.

The Bureau's Risk Management Framework sets out the Bureau's consistent, standardised approach to risk assessment and management, supported by policies, procedures and tools. Risks are identified, assessed, treated, monitored and reported in accordance with the framework.

The Bureau manages 15 enterprise risks across 8 risk categories. Enterprise risks are owned and managed by the Executive and are defined as those risks with the greatest potential to affect the Bureau's ability to achieve its mission and strategic objectives.

Risk category	Key risks
Customer impact and value	Quality and reliability of products and services Product and service innovation
Health and safety	Staff safety and wellbeing
Security	Cyber security Physical security Personnel security
Legal and regulatory	Legal and regulatory non-compliance
Financial	Corruption and fraud External budget allocation Internal budget management
Reputation	Reputational damage
Systems and assets	Systems and asset disruption Technological innovation
Workforce	Workforce availability Workforce attraction and retention

Oversight of the Bureau's risks, controls and treatment strategies occurs via regular reporting to the Executive Team and the Security, Risk and Business Continuity Committee. The Bureau of Meteorology Audit Committee provides independent advice to the Director of Meteorology on the appropriateness of the Bureau's system of risk oversight and management, and system of internal control.

Climate risk management

The Bureau is responsive to the threat of climate change and is engaged with organisational and whole-of-government initiatives to manage climate risks and opportunities.

Under the Bureau's Risk Management Framework, climate change is considered in relation to the following:

- risks from changes to our customers' appetite for products and services (forecasts, warnings, water, climate)

- increased risks to our operations and infrastructure from severe weather (for example, property damage, impact on instrument tolerance)
- increased risks to staff safety (for example, heat exposure and fatigue)
- risks associated with our contribution to carbon emissions.

The Bureau will undertake a climate risk and opportunity assessment and continue to consider its climate risk disclosure obligations as part of the implementation of the Australian Government's Climate Risk and Opportunity Management Program.

Resilience

Through its Strategy, the Bureau contributes to a safe, prosperous, secure and healthy Australia. As part of the Bureau's purpose– to provide trusted, reliable and responsive weather, water, climate, ocean and space weather services all day, every day – the organisation must be able to continue to provide critical products and services, and protect our people and assets, in the face of any disruption.

During a business disruption, effective and timely action and communication, both within the Bureau and to external customers, helps to protect lives, service the community and uphold the Bureau's long-term integrity and reputation.

Continuing to strengthen, mature and expand the Bureau's resilience and business continuity capacity is a key focus for the organisation. Continued efforts to uplift Bureau business continuity maturity are improving the organisation's overall capability to effectively respond to, and recover from a disruptive incident, regardless of its cause, size, location or complexity. Business continuity and incident management arrangements have been established and tested to support the Bureau's response to any disruptive event, ensure continual improvement, and embed lessons learned across the organisation.

Fraud control

The Bureau's Fraud Control Plan provides the basis for its fraud prevention, detection and investigation activities in compliance with the Commonwealth Fraud Control Framework and Section 10 of the PGPA Rule. The Bureau conducts regular fraud risk assessments to inform appropriate responses.

The Bureau uses various strategies and mechanisms to prevent fraud including:

- independent assurance from the Audit Committee to the Director about fraud control
- mandatory online induction training modules for staff including on accountable and ethical decision-making; ICT Security; and APS Values, Code of Conduct and employment principles
- financial delegations requiring co-authorisation of spending and assurance that spending is within the approved budget
- involvement in Commonwealth fraud prevention and anti-corruption activities including information sharing, education and training through the Commonwealth Fraud Prevention Centre.

The Bureau has several mechanisms in place to detect potential fraud, including:

- the Bureau's internal audit program undertaking compliance and financial propriety audits to identify and report any control weakness or other concerns
- scrutinising a vendor master listing and ledger and verifying listed or disclosed business registrations with the Australian Taxation Office and the Australian Securities and Investment Commission
- an audit tool within the Bureau's expense management system to highlight outliers and enable the investigation of items of concern
- the Australian National Audit Office auditing the Bureau's financial statements

- periodic audits of purchasing cards, expense management and other sources of fraud and corruption risk
- regular financial compliance monitoring and reporting.

Where the Bureau determines that an allegation of potentially fraudulent or corrupt activity needs to be investigated, it will:

- follow the Australian Government Investigations Standards 2022 for all fraud and corruption investigation activities
- investigate the allegation using an internal (or outsourced) investigation officer or through referral of serious or complex fraud matters to the Australian Federal Police
- maintain an integrity register for the purposes of registering possible fraud and corruption incidents. All known incidents are investigated, and any material matters are formally reported to the Bureau's Audit Committee.

External scrutiny

The following matters were dealt with in 2023–24, with the Bureau providing submissions and evidence to the:

- Environment and Communications Legislation Committee's Inquiry into the Water Amendment (Restoring our Rivers) Bill 2023
- Parliament of Victoria's Inquiry into the 2022 flood event in Victoria
- South Australian Legislative Council's Inquiry into the 2022–23 River Murray flood event
- Joint Committee of Public Accounts and Audit's Inquiry into Commonwealth Financial Statements 2022–23
- Joint Standing Committee on the National Capital and External Territories' Inquiry into the importance of Antarctica to Australia's national interests
- Queensland Inspector-General of Emergency Management 2023–24 Severe Weather Season Review.

Freedom of information

Entities subject to the *Freedom of Information Act 1982* (FOI Act) are required to publish information to the public as part of the Information Publication Scheme (IPS). Part II of the FOI Act requires each agency to display on its website a plan showing what information it publishes in accordance with the IPS requirements. The information provided by the Bureau in response to the IPS is available at www.bom.gov.au/foi/ips.shtml

In 2023–24, the Bureau received 30 requests under FOI and carried over 3 requests from 2022–23. Of these, 30 were completed by 30 June 2024 and 3 remained in progress.

Corrections

In its 2022–23 Annual Report, the Bureau:

- stated its number of Facebook followers and total social media followers in 2022–23 was over 1.394 million and over 2.45 million respectively (p.11, p.40 and p.164). The correct figures were 1.016 million for Facebook followers and over 2.073 million for total social media followers.
- stated the national timeliness of Severe Weather Warnings in 2022–23 was 87% (p.41 and p.45). The correct figure was 89%.
- stated the average accuracy of the operational chance of above median seasonal forecasts was 76% for rainfall, 74% for maximum temperature and 75% minimum temperature for 2022–23 (p.45). The correct figures were 66% for rainfall, 62% for maximum temperature and 49% for minimum temperature, against a target of 60%.
- stated it issued 60 tsunami threats in 2022–23. This should have read 60 tsunami 'No Threat' bulletins.

Corporate responsibility

Responsibility to the Australian community

Inherent in its vision and mission, the Bureau has a responsibility to the Australian community to support a safe, prosperous, secure and healthy Australia. The Bureau's focus is on providing trusted, reliable and responsive weather, water, climate, ocean and space weather services that benefit the Australian community and drive competitive advantage for business and industry.

The Bureau is accountable to the Australian Government for fulfilling its legislative mandate with the resources invested in it but is ultimately answerable to the Australian community. Under the *Meteorology Act 1955*, the Bureau performs its functions in the public interest as well as for sectors such as defence, shipping and aviation, and in support of primary production, industry, trade and commerce.

Under the *Water Act 2007*, the Bureau is responsible for collecting, holding, managing, interpreting and disseminating Australia's water information. The Bureau is also the regulator under Part 7 of the *Water Regulations 2008*, which requires over 200 organisations to provide their water information to the Bureau. As part of its regulatory function, the Bureau is required to deliver and publish the National Water Account in a form readily accessible by the public.

Throughout 2023–24, the Bureau continued to provide warnings, forecasts, information and advice on which Australians depend – providing round-the-clock services to support informed decision-making by governments, emergency services, industry and the community. The value of these services is expanding as Australians become increasingly vulnerable to a range of severe weather events due to changes in climate, population, settlement patterns and the growth of infrastructure.

The Bureau's services are particularly crucial when conditions are extreme. The organisation continues to assist Australians to better prepare for and respond to the impacts of their natural environment, including drought, floods, fires, storms, tsunamis and tropical cyclones. The Bureau's warnings and advice to the emergency services support essential decision-making that further benefits the Australian community when people and property are under threat.

In fulfilling its duties, the Bureau remains committed to:

- providing the best possible information about Australia's weather, climate, water, oceans and space weather
- providing timely information to allow preparedness and response to impending weather and water natural hazard events
- presenting information clearly, using plain English and easy-to-understand graphics, and making it accessible to vulnerable communities
- meeting increasing user expectations by incorporating relevant advances in science and technology, and enhancing its products and services in line with community needs
- identifying any limitations in its products and services, and providing information regarding the source, reliability, completeness and currency of any data supplied
- notifying users of service changes and interruptions at the earliest opportunity.

National outreach

The Bureau's presence and capability within Australia's states and territories remains vital to how services are delivered, integrating local knowledge into Bureau services and focusing on local and regional needs. This is especially crucial given the variability of climate across Australia (see map on p.156).

The Bureau's Decision Support Services Program leads national, regional and local engagement to contribute to hazard preparedness and response in the Australian community and in the emergency management sector. The program has staff deployed across 3 regions: East (New South Wales, the Australian Capital Territory and Queensland), South (Tasmania, Victoria and South Australia) and North and West (Western Australia and the Northern Territory), as well as a national team (based in Canberra).

Staff work alongside federal, state and local emergency service agencies as part of the emergency management and disaster mitigation networks within their respective jurisdictions. Bureau briefings and intelligence play a key role in enabling the Australian Warning System, and associated action-based warnings for the community, delivered by state and local emergency management agencies. This includes outposted decision support staff within several response agencies and emergency management centres providing direct access to the Bureau's expertise and specialisation. Staff within the program also continually inform the Australian community through television, radio and social media channels.

At the national level, the Hazard Preparedness and Response (HPR) National Operations Support unit embedded in the National Situation Room delivers tailored services encompassing weather, climate and hydrology supporting the National Emergency Management Agency (NEMA) to coordinate Australian Government response in support of the wider community.

Northern Territory

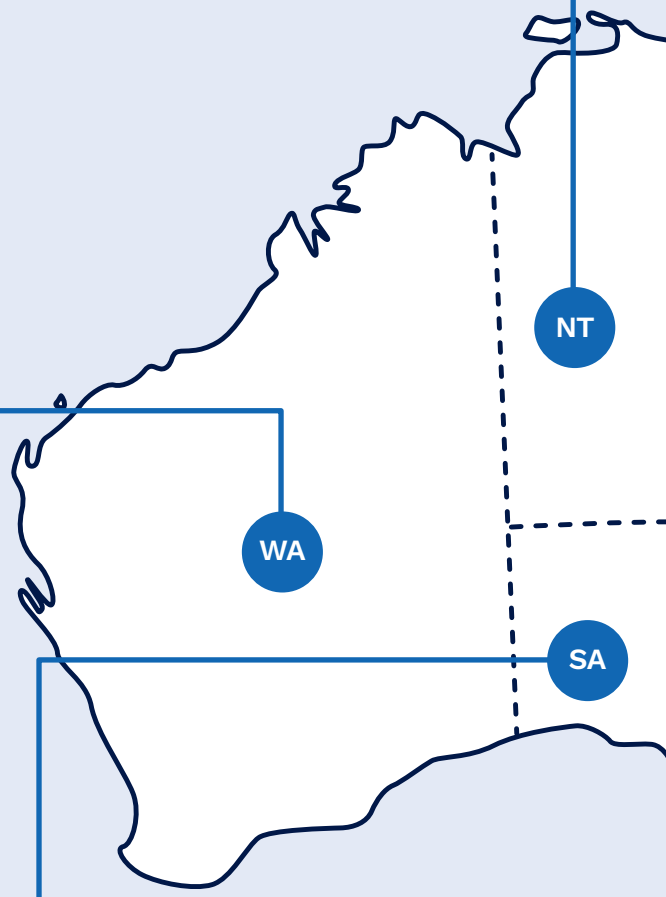
The Top End of Australia has a tropical climate characterised by a wet season from October to April and a dry season from May to September. At different times of the year, parts of the Northern Territory experience severe thunderstorms, wildfires and widespread flooding. All coastal areas are subject to tropical cyclone landfall.

Western Australia

Western Australia is susceptible to a wide range of severe weather events all year round. The warmer months are characterised by heavy rain, tropical lows and cyclones in the north, and extreme heat and bushfires in the south. During the cooler months, bushfires occur in the north while cold fronts with destructive winds and heavy rain are common in the south.

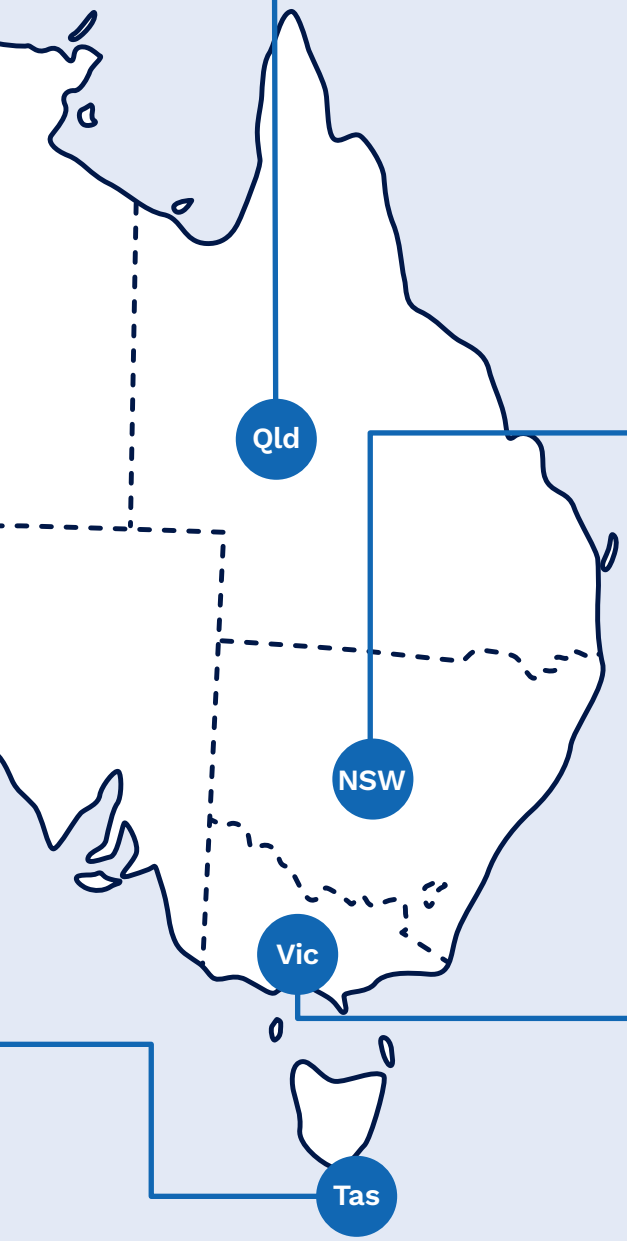
South Australia

South Australia's climate is characterised by relatively hot and dry summers featuring heatwaves, bushfires and thunderstorms with damaging winds, large hail and flash flooding. In the south of the state, cold fronts and low pressure systems in the winter months bring cold, wet and windy conditions. Across the inland north of the State winters are mild but often dry. Rainfall in these parts is usually sporadic and can be driven by tropical systems in the summer and northwest cloud bands in the winter.



Tasmania

Tasmania's location in the path of the 'roaring forties' westerly wind belt brings heavy and reliable rain to the western half of the island and much warmer and drier conditions to the sheltered east coast. Snow can fall any time of year in the highlands, but summer heatwaves and windy weather fronts bring dangerous fire conditions to the east and south.



Queensland

The meteorology of Queensland extends from the deep tropics through to temperate and arid regimes, and encompasses coastal waters that include the Great Barrier Reef, the Torres Strait Islands and the eastern Gulf of Carpentaria. The large and dispersed population is vulnerable to risks posed by tropical cyclones, flooding, severe thunderstorms and bushfires. The State's strong agricultural sector grapples with droughts and other broadscale impacts of climate

New South Wales

The diversity of New South Wales' weather and climate reflects its many landscapes; from the highest alpine areas in Australia to some of the country's most productive agricultural areas to its offshore islands. New South Wales is often affected by heatwaves, drought, bushfires (and their smoke), intense coastal storm systems, severe thunderstorms and hailstorms. Weather on the coastal strip is influenced by the steep coastal escarpment and ranges, which accentuate heavy rains and bring major flooding to coastal rivers.

Victoria

Victoria is renowned for its very changeable and challenging weather events. These include heatwaves, extreme fire weather, and the effects of bushfire smoke in summer; damaging winds from winter storms; and rain, severe thunderstorms, and floods in all seasons. Victoria is also vulnerable to thunderstorm asthma events, when the right weather conditions and fine grass pollen can combine to cause acute asthma episodes.

Public education and community engagement

Helping Australians understand and use its products and services is one of the Bureau's core responsibilities under the Meteorology Act. The aim is to give Australians timely weather, water, climate, ocean and space weather information, education and updates across a range of channels, particularly when conditions put lives and property in danger.

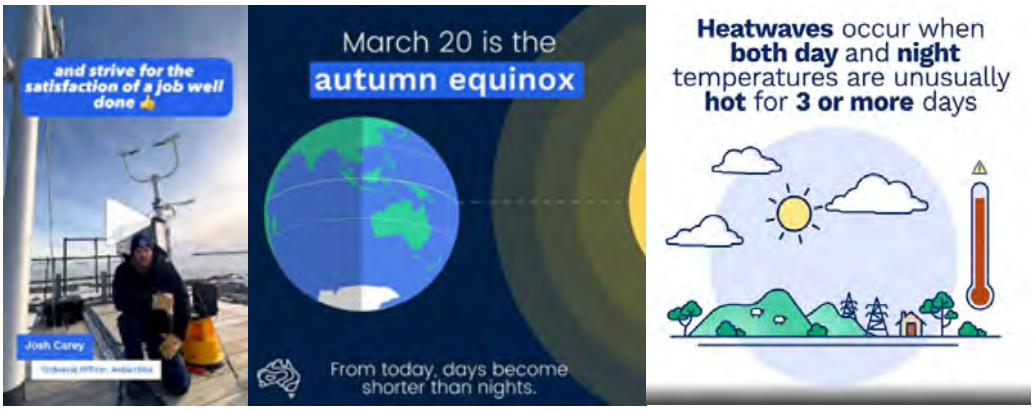
Through a prolonged severe weather season, the Bureau's structured and agile approach to communicating with customers in impacted communities across multiple states was clear and timely. In collaboration with governments and key emergency services partners across states and territories, the Bureau's advice was clear, informative and action oriented.

The Bureau works closely with traditional media and emergency partners to ensure that communication with the Australian community is timely and accurate and that forecasts and warnings are broadcast widely. Staff interact with a broad range of stakeholders and provide a focal point for the delivery of services to local industry and government customers, supporting the Bureau's sectoral leaders to engage with customers and provide high-quality and clear information.

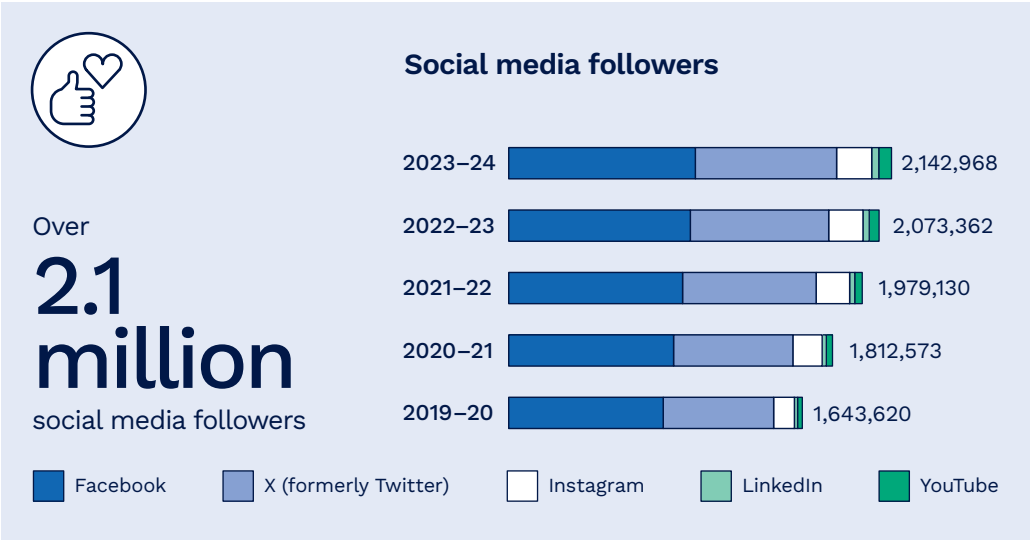
During 2023–24 the Bureau received over 6,680 media enquiries, issued more than 250 media releases including video and audio news releases, and delivered over 80 proactive media projects to keep the community informed and up to date on forecasts and warnings as well as a range of climate and weather-related topics and events. The Bureau also continued to engage and collaborate with national media outlets, including Indigenous media outlets, to assist in delivering broadcast messaging ahead of and during severe weather events.

Throughout the year, the Bureau's social media channels proved especially effective in promoting public-safety campaigns on the risks and impacts of severe weather as well as building understanding of our forecasting and warning services and hazards including space weather and geomagnetic storms. During the geomagnetic storm between 10–13 May, the Bureau had an unprecedented level of interest on social media channels with posts explaining space weather and the associated auroras. This included reach of over 3.5 million generated by 3 Bureau Facebook posts.

During severe weather, the Bureau's public communications point the community to our website and BOM Weather app as the trusted source for forecasts and warnings. Performance data showed a 187% increase (year-on-year) in traffic to the warning section of the website across December and January, and we saw more than 350,000 downloads of the app in that time.



A selection of the Bureau's informative social media posts.



The average engagement rate for Bureau social media posts – which includes likes, comments and shares – was maintained at 6.71% across 5,591 posts on the Bureau's platforms. Campaign posts for the Antarctic recruitment and the Australian Weather Calendar had high engagement as did our satellite image weather forecast posts, El Nino explainer video, winter solstice and autumn equinox explainer posts and the Mt Ruang eruption post. At 30 June 2024 the total number of followers across all the Bureau's social media platforms increased to over 2.1 million.

The Bureau also supports the community in accessing information about weather and related phenomena through its Weather Connect customer service centre and through direct information emails to customers.

During 2023–24, the Bureau of Meteorology Training Centre continued its public education program in delivering 25 Introduction to Meteorology courses to members of the public and key stakeholders. The courses provide expert insight into weather fundamentals and weather information, helping to inform decision-making.

Stakeholder participation

Third-party participation in the Bureau's policy formulation and service provision is facilitated through:

- the Australia–New Zealand Emergency Management Committee and its working subcommittees (Community Outcomes and Recovery, Mitigation and Risk) and related groups including the Australian Tsunami Advisory Group, the National Flood Risk Advisory Group, the Australian Tropical Cyclone Advisory Group, and the National Heatwave Working Group
- National Council for Fire and Emergency Services
- the Bureau of Meteorology Hazard Services Forum
- the Jurisdictional Reference Group on Water Information
- state and territory consultative committees for flood, marine, and climate
- consultative meetings with private meteorological service providers, the aviation industry and Defence
- state, territory and local government emergency management and disaster mitigation committees
- Australian Government and regional international development programs
- intragovernmental forums on water and energy management
- national research and science forums and programs.

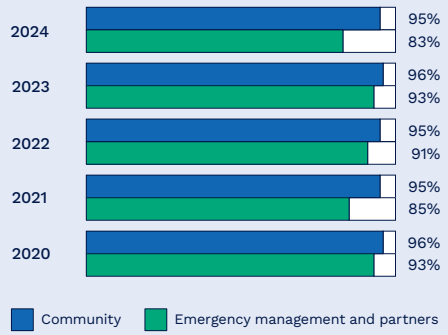
The Bureau's Hazards Services Forum continued to demonstrate the productive collaboration between the Bureau and its federal, state and territory emergency management partners. Co-chaired by the Bureau and the National Emergency Management Agency, the Hazards Services Forum provides the opportunity for senior emergency services representatives to provide forthright feedback on the current and future direction of the Bureau's hazards services (see p.60).

Following the mid-term review of the Intergovernmental Agreement on the Provision of Bureau of Meteorology Hazard Services to the States and Territories, the areas of focus for the Hazards Services Forum in 2023–24 were the endorsement of revised service schedules and initial consultation on new service requests for flash flood, data access and fire related services.

Customer feedback and response

The Bureau uses a range of surveys and feedback mechanisms to ensure its products and services meet the growing needs of its customers. In 2023–24, the Bureau monitored and evaluated feedback from the general community and emergency management customers and partners, focusing on the 4 performance areas of preference, experience, impact and reputation.

95%
of community respondents reported the Bureau's services are easy to use



Four community surveys were undertaken in September, December, March and June, helping to identify areas for improvement and inform service development. Overall performance was largely consistent with the previous year's results. The surveys of more than 2,400 community users found that Bureau products and services are continuing to provide a positive experience, with the experience score of 80% in 2024 (compared with 81% in 2023). 95% of community users rated their most recent experience with the Bureau as 'easy' or 'very easy', compared with 96% in 2023.

Community users also reported high levels of satisfaction across all aspects of the Bureau's forecast and warning services, including the convenience of getting information (79%), the speed of accessing information (77%) and the ease of finding information (77%).

A survey of more than 200 emergency management customers and partners was undertaken in May. When compared with 2023, scores for this cohort were generally lower in 2024.

A limitation of the survey methodology for this cohort is a relatively small respondent pool that can vary significantly in composition, making year-on-year comparison challenging. The Bureau is refining its survey methodology for this cohort in 2024–25, which will improve future data comparison and trend analysis.

The 2024 survey found that 79% of emergency management customers and partners who used the Bureau's services in the past month said that service helped them do what they needed to do to a 'great' or 'very great' extent, compared with 87% the previous year (81% in 2021). 83% of emergency management customers and partners rated their most recent experience as 'easy' or 'very easy', compared with 93% in 2023 (85% in 2021).

Emergency management customers and partners also reported high satisfaction with the services provided by Bureau staff, with 83% satisfied with their professionalism. These results continue to highlight the significance that Bureau products and services have in helping to facilitate the important roles of these customers.

The Bureau uses the net promoter score index (ranging from -100 to +100) as a way of gauging the willingness of its customers to recommend products or services to others. In 2024, the Bureau's forecast and warning service achieved an average net promoter score of +43 from community customers and +45 from emergency management customers and partners. These results are around the top quarter of the range of possible scores, indicating strong customer satisfaction and loyalty. For community customers, their belief that the Bureau acts in the best interest of all Australians was strongly linked to their likelihood to recommend its services. For emergency management customers and partners, this was linked to their trust in the Bureau's ability to provide accurate forecasts and its effectiveness in its role as Australia's national forecaster. More customer survey results are included in the performance section of the Annual Report (see p.33).

As of 30 June, the BOM Weather app had 13.9 million downloads since its release and was used by over 1.4 million users on average each day.

September 2023 saw the BOM Weather app reach its highest ever customer satisfaction (CSAT) score of 87.7% – 86.8% for Android devices and 88.3% for iOS devices – with CSAT averaging 85% over the year. It has recorded an average rating of 4.6 in the Google Play Store and an all-time high of 4.7 stars in the Apple App Store (compared with 3.8 and 4.5 respectively in 2022–23).

In 2023–24, the Bureau received over 1.8 million pieces of feedback on the app, spanning 4 key categories: Customer experience, Technical, Feature request, and Usability. This feedback enabled the Bureau to prioritise enhancements to the app, including technical upgrades to resolve technical and performance issues, changes to the settings page, and an increase in warnings and alerts.

The Bureau continued to enhance its approach to gathering and reporting feedback from its digital channels in 2023–24, including through the development of its test website, which launched on 25 June with a feedback function.

At 30 June 2024, the Bureau's online research community had 4,238 registered testers and BOMIdeas was used to invite customers to participate in online surveys and testing to provide feedback on potential service enhancements or ideas.

International engagement

International cooperation is an essential and integral part of the Bureau's operations. Through reciprocal relationships and knowledge-sharing with countries and agencies around the globe, the Bureau leverages scientific expertise and technological and operational developments and collects and exchanges information critical for monitoring and predicting the state of the atmosphere and hydrosphere. The Bureau is deeply engaged in international activities that provide direct and indirect benefits to the organisation and to the broader Australian and international community.

In 2023–24, as part of the Bureau's responsibilities on behalf of Australia to the World Meteorological Organization (WMO) and the UNESCO's Intergovernmental Oceanographic Commission (IOC), Bureau experts and operational teams continued to make significant contributions to the global coordination, exchange of data and development of standards for weather, water, climate and tsunami products and services. In particular, the Bureau under WMO's Systematic Observations Financing Facility (SOFF), provided peer advisory services to 6 Pacific Island countries as part of building their observing infrastructure capability (see p.97).

The Bureau has several bilateral and multi-lateral agreements with overseas agencies and actively cooperated throughout 2023–24 with counterpart meteorological and hydrological agencies on a range of mutual and complimentary fields of technical and scientific expertise. Highlights included:

- the renewal of a consortium agreement with partners from the United Kingdom, New Zealand, India and Singapore on a next generation modelling systems program, known as Momentum
- entering into a 5-year strategic relationship agreement with the European Centre for Medium-Range Weather Forecasts (ECMWF) to ensure long-range global forecasts from the Bureau's ACCESS suite of models are added to the Copernicus multi-model global ensemble (see p.64)
- hosting short-term visits by staff from partner National Meteorological and Hydrological Services such as from the UK Met Office, and US National Oceanic and Atmospheric Administration's Space Weather Prediction Center to strengthen collaboration in space weather, and from the UK Met Office, to explore and develop opportunities in future shared resource model and business continuity arrangements.

In 2023–24, the Bureau strengthened its commitment under the Meteorological Five Eyes (MET5) Community of Practice comprising Australia, Canada, New Zealand, the United Kingdom and the United States. The MET5 share climate monitoring data, space weather, meteorology and oceanographic capabilities, focussing efforts on objectives that improve defence and national security. In 2023–24, the Bureau and Canada piloted a new cloud-based data sharing capability that will be implemented by all MET5 nations (see p.74).

Australian aid-funded capacity development programs represent a significant component of the Bureau's international activities. The Bureau has a long history of supporting counterpart meteorological and hydrological services in the Pacific. These engagements strengthen organisational capabilities and skills and contribute to broader whole-of-government objectives. In 2023–24, the Bureau:

- worked with Pacific National Meteorological Services on all aspects of the Weather Ready Pacific Program (WRP), including formalising the governance, developing an implementation plan and commencing support for the Pacific with the training of 3 Samoan candidates through the Bureau's Met Course
- commenced the next phase of the Climate and Oceans Support Program in the Pacific
- expanded support to the Aviation Weather Services across Pacific Island Countries, with the installation of aviation sensors at selected aerodromes and training
- provided targeted observational infrastructure and systems capacity building support to the Papua New Guinea National Weather Service through a twinning arrangement supported by the Australian High Commission in Port Moresby
- undertook a scoping mission to Indonesia, Vietnam and Thailand at the request of the Department of Foreign Affairs and Trade, to determine potential avenues for capacity building support in Southeast Asia.

Diversity and inclusion

The Bureau strives to be the model of an inclusive culture where diversity of thought and background is valued to provide better outcomes for staff, customers and the community. Success is based on creating an inclusive environment where people feel respected and valued, share a sense of fairness and of belonging, and are encouraged to make a unique and meaningful contribution.

The Bureau values the diversity of its staff, respecting differences that include – but are not limited to – gender, ethnicity, religion, age, ability or disability, sexual orientation, language, skills, experience, education, industry sector and thinking approaches.

The Bureau brings its commitment to life by:

- developing and promoting an equitable, respectful and inclusive workplace culture where staff are engaged, are valued for their uniqueness and feel like they belong
- bringing together people with different backgrounds and ways of thinking, which helps to drive better decision-making, innovation and overall performance
- ensuring recruitment from the broadest talent pool that reflects the Bureau's customers and communities with which it works
- supporting the use of flexible work arrangements at all levels to enable staff to balance their personal and professional commitments.

In 2023–24, the Bureau made significant progress on its enterprise Diversity and Inclusion Plan. A comprehensive analysis of the Bureau's workforce and consultation with staff was undertaken to understand and improve experiences. This has informed priority areas, including equal access to development and career opportunities, stronger governance, and greater visibility on progressing actions.

Several staff events were held throughout 2023–24 to celebrate diversity and foster inclusion within the Bureau including:

- NAIDOC Week, celebrated on 5 July to showcase activities and the role Elders play informing and guiding the Bureau's work
- Wear it Purple, celebrated on 25 August to support young LGBTQIA+ people in the workplace, their families, and in the communities that we serve
- International Day of People with Disability, celebrated on 4 December to recognise people with a disability, focused on the digital tools available to make employee experiences more accessible and inclusive
- International Women's Day, celebrated on 7 March to recognise the achievements of women and raise awareness about issues impacting women's equality
- Harmony Day, celebrated on 25 March to recognise Australia's multiculturalism in connection with the United Nations recognised day for the Elimination of Racial Discrimination
- International Day Against Homophobia, Biphobia and Transphobia (IDAHOBIT), celebrated on 17 May to promote creating workplaces where all colleagues are equal in dignity and rights
- National Reconciliation Week celebrated on 30 May to support reconciliation, learn about Australia's shared histories, cultures, and achievements, and to help shape the Bureau's collective journey towards reconciliation.

Disability reporting

Australia's Disability Strategy 2021–2031 (the Strategy) is the overarching framework for inclusive policies, programs and infrastructure that will support people with disability to participate in all areas of Australian life. The Strategy sets out where practical changes will be made to improve the lives of people with disability in Australia. It acts to ensure the principles underpinning the United Nations Convention on the Rights of Persons with Disabilities are incorporated into Australia's policies and programs that affect people with disability, their families and carers. All levels of government have committed to deliver more comprehensive and visible reporting under the Strategy. A range of reports on progress of the Strategy's actions and outcome areas will be published and available at https://www.disabilitygateway.gov.au/ads.

Disability reporting is included the Australian Public Service Commission's State of the Service reports and the APS Statistical Bulletin. These reports are available at https://www.apsc.gov.au.

Ethical standards

The Bureau supports a safe, inclusive and respectful work culture that reflects the diversity of the community it serves. It operates within the context of Australia being a signatory to the 7 key human rights treaties, with human rights being protected and promoted through domestic legislation, policies, practices and independent bodies. The Bureau undertakes a range of activities to meet this commitment, including:

- promoting APS Values, Code of Conduct and Employment Principles, and awareness of workplace discrimination, through communication with staff, training and induction packages for new employees
- endorsing the Public Interest Disclosure Framework, through communication with staff and supporting policy documents
- supporting the Commonwealth Child Safe Framework which sets the minimum standards for creating and maintaining a child safe culture and practice in Australian Government entities
- providing an online training course entitled APS Values and Code of Conduct at the Bureau, which covers topics such as accountable and ethical decision-making
- providing employees with access to information on ethical standards via the intranet, and through the APS Commission's website
- issuing APS Code of Conduct guidelines for Bureau staff, and providing guidance and policies with respect to duty of care, making public comment, conflicts of interests and the performance of outside work/employment
- developing a new Unacceptable Behaviours and Complaint Handling Procedure to complement the existing procedures that document the ethical standards expected of staff
- reviewing and refreshing the established internal Harassment Contact Officer network, ensuring that these Officers are appropriately trained with access to relevant support material
- initiating disciplinary processes, including counselling and investigations when allegations relating to breaches of the APS Code of Conduct were reported
- making available a review-of-action process, as provided for in section 33 of the *Public Service Act 1999*, to aggrieved employees
- initiating investigation processes into disclosures received under the *Public Interest Disclosure Act 2013*
- initiating a review and uplift of Bureau integrity arrangements, in support of the Government's integrity agenda and the establishment of the National Anti-Corruption Commission (NACC).

Supporting sustainable development

The Bureau recognises the opportunity and privilege it has to support sustainable development in Australia and beyond, contributing to prosperous, fair, healthy and sustainable communities. Both in the way it conducts its operations, and in the vast array of products and services it provides for the community, the Bureau's work supports Australia's commitment to the United Nation's 2030 Agenda for Sustainable Development, and the achievement of the Sustainable Development Goals (SDGs). Throughout 2023–24, the work of the Bureau has contributed to 15 of the 17 goals as follows.

Goal	Bureau contribution
2. Zero hunger 	• help graziers and horticulturalists determine optimum crops, timing around planting and harvesting, fertilisation and chemical spraying • help meat and livestock farmers control stocking rates, and pre-empt health issues in livestock • alert farmers to conditions such as frost, hail, storms and floods • optimise agricultural water use productivity through regional specific information on current and forecast water availability • support government drought assistance programs
3. Good health and well-being 	• help Australians protect themselves from cyclones, floods, severe storms and bushfires • support authorities in making evacuation decisions to get people at risk to safety • help Australians avoid dangerous ultraviolet (UV) exposure, to protect against skin cancer • help protect vulnerable Australians against heat exhaustion and extreme cold • alert health authorities to periods of heightened demand • help Australians plan their sporting and outdoor activities • support management of biohazards, airborne allergens and diseases
4. Quality education 	• provide quality education in meteorology including capacity building in neighbouring countries • help the community understand Australia's weather, ocean and climate-related risks • contribute to the global knowledge base in the meteorological sciences and contribute to cutting-edge developments • promote ongoing learning and development for Bureau staff
5. Gender equality 	• promote gender equality through implementation of the Bureau's Gender Equality Action Plan • provide family-friendly working conditions including flexible working options for all staff • provide training and development to managers on inclusive leadership and unconscious bias
6. Clean water and sanitation 	• coordinate national water information standards, and collection and dissemination of Australia's water information, including water quality information • help governments and water authorities in planning and water management • aid decision-making in water supply and the management of water allocations and rights • support dam management and the protection of water and sanitation infrastructure, particularly during severe weather events • inform the design of new water infrastructure

Goal	Bureau contribution
7. Affordable and clean energy 	• enable the Australian energy market to forecast power demand, particularly during heat and cold extremes • support renewable energy generation by informing production potential and energy output estimates • support operations and efficiency in Australia's offshore oil and gas industry • support improved planning and mitigation of disrupted electricity supply due to severe weather events • invest in energy efficiency and renewable energy projects within the Bureau's property portfolio
8. Decent work and economic growth 	• provide economic benefits in the order of 11.6:1 (for every dollar spent by the Bureau on delivering services, there is a return of $11.60 to the Australian economy) • support economic growth in key sectors (see Goal 9) • provide good employment opportunities for Bureau staff
9. Industry, innovation and infrastructure 	• support safe and efficient air travel in Australian airspace, inform routing and fuel load decisions and help protect aircraft from volcanic ash • help businesses manage the impact of weather on their operations and minimise disruption from severe weather events • provide valuable information to the financial and insurance services sector • support the construction of climate-appropriate infrastructure and help protect infrastructure from weather and climate-related events • provide information products as a basis for innovation and value-adding by industry
10. Reduced inequalities 	• provide consistent, comprehensive services for all Australians, including in rural and remote areas • promote Australian Indigenous culture through the Indigenous Weather Knowledge website and support reconciliation through the Reconciliation Action Plan • implement initiatives that promote Diversity and Inclusion • support capacity building and development of Pacific Island nations to manage severe weather impacts and mitigate climate change • assist Pacific and Indian Ocean countries prepare for and respond to tsunamis

Goal	Bureau contribution
11. Sustainable cities and communities 	• support the emergency services in carrying out effective emergency and disaster preparation, response and recovery • warn communities to prepare for hazardous weather events, to protect housing and community infrastructure, and to make timely evacuations • allow emergency services to pre-position personnel and equipment to minimise infrastructure damage and to restore essential services following an emergency • help individuals and communities to organise their activities and daily commute • support management of public and private green spaces
12. Responsible consumption and production 	• implement a Bureau environmental framework to minimise the effect of operations on the environment • support responsible purchasing policies, efficient use of natural resources, and the management of chemicals and wastes through their lifecycle
13. Climate action 	• help Australians understand the nation's climate patterns, trends and variations in climate, and climate-related risks • provide climate research, modelling and forecasting to support policy decisions and mitigation strategies • help Pacific Island nations measure and respond to climate change impacts
14. Life below water 	• support marine management including sustainable fishing and aquaculture • support safety at sea and inform search and rescue operations • support response to ocean environmental incidents (such as oil spills) • implement changes to the Bureau's balloon program to reduce the likelihood of ingestion by marine birds and turtles
15. Life on land 	• support the management of ecosystems • support bushfire mitigation including controlled burns • institute ecological protection measures for Bureau operations at environmentally sensitive sites

Goal	Bureau contribution
17. Partnerships for the goals 	• contribute to the activities of the World Meteorological Organization, the Intergovernmental Oceanographic Commission of UNESCO, and the International Civil Aviation Organization • collaborate with counterpart meteorological and hydrological agencies of other countries through bilateral agreements • partner with local, regional, state and territory and national emergency management authorities

Environmental sustainability

The Bureau is committed to leadership in environmentally sustainable practices and managing potentially adverse impact from operations, with the pursuit of a high level of environmental sustainability a success measure of the Bureau's Strategy. The Bureau's environmental management system aligns with international standard ISO 14001:2015 and provides the framework for managing environmental risks and optimising opportunities to improve environmental performance.

The Bureau also supports the principles of ecological sustainable development as outlined in the *Environmental Protection and Biodiversity Conservation Act 1999*. The broad range of Bureau products, services and advice empowers stakeholders to make informed decisions on matters of ecosystem and biodiversity conservation, both now and for the future.

Management of key impacts

The Bureau's operations are diverse, encompassing land, water, atmosphere and oceans across Australia and its external territories. In 2023–24, the Bureau implemented 6 Environmental Sustainability Principles (see p.119) to guide its operations and addressed a diverse range of impacts associated with its property and operational footprint, including:

- consideration of environmental impacts for site works including equipment upgrades and the relocation of observational infrastructure
- light pollution mitigation measures installed on Willis Island (see p.169)
- inclusion of environmental sustainability deliverables in the Observation Ecosystem Roadmap refresh
- drafting of a new Biosecurity Procedure
- ongoing collaboration with local groups to manage weeds in sensitive sites.

Improving sustainability

Organisational demand on natural resources comes in many forms at the Bureau, from general office activities to waste generation, equipment and instrument use through to the transport of goods. The Bureau aims to incorporate sustainability into procurement practices to avoid unnecessary consumption and minimise the environmental impact of goods and services over whole of life. In 2023–24 the Bureau:

- installed a 50kw solar system at the Hobart Observing Operations Hub and installed an EV charging point
- implemented improvements to site induction information at sensitive sites
- worked with building owners and landlords to continue to uplift base building sustainability

initiatives such as the installation of solar panels at some core sites
- ran a staff campaign to encourage use of eco-friendly stationery
- provided information to staff on the green hire car initiative.

Illuminating the issue of light pollution

Although we often associate light pollution with terrestrial landscapes, recognising the increasing threat of light pollution to marine ecosystems is crucial as it can impact marine animals in various ways, affecting:

- navigation – disrupting natural navigation cues
- reproduction and recruitment – interfering with natural population processes
- predator-prey interactions – confusing predator-prey dynamics.
- communication – impacting organisms that rely on light signals for communication.

In 2023–24, the Bureau considered these issues in relation to its weather station on Willis Island in the Coral Sea. Encircled by a fringing reef, Willis Island along with nearby Middle Islet, serve as habitats for thousands of birds and are important nesting sites for turtles.

As part of the Bureau's station operations, there is a need to illuminate offices, external work areas, and pathways for safety. The Bureau collaborated with Parks Australia to investigate how light pollution could be mitigated on Willis Island to balance safety requirements with environmental conservation.

The solutions implemented to minimise light pollution were:

- changing the position of some building mounted external lights
- installing downward facing light shades on selected external light fixtures
- replacing pathway light bollards with wildlife friendly bollards which deflect light downwards
- replacing bright white LED lights in bollards with orange-glow bulbs of lower output
- installing block-out blinds on all windows
- adjusting the brightness of lights in external living areas
- maintaining vigilance to ensure lights are switched off when not in use.

These mitigation measures contribute to the Bureau's environmental sustainability principles of Protecting the Environment from the risk associated with Bureau Operations and Using best practice land management at our sites.

New light bollard on the right, old on the left showing the difference in brightness.

APS Net Zero 2030

APS Net Zero 2030 is the Government's policy for the Australian Public Service (APS) to reduce its greenhouse gas emissions to net zero by 2030, and transparently report on its emissions. As part of the Net Zero in Government Operations Strategy, non-corporate Commonwealth entities, corporate Commonwealth entities and Commonwealth companies are required to report on their operational greenhouse gas emissions.

The Greenhouse Gas Emissions Inventory presents greenhouse gas emissions over the 2023–24 period. Results are presented based on Carbon Dioxide Equivalent (CO_2-e) emissions. Greenhouse gas emissions have been calculated in line with the APS Net Zero Emissions Reporting Framework, consistent with the Whole-of-Australian Government approach as part of the APS Net Zero 2030 policy. Not all data sources were available at the time of the report and amendments to data may be required in future reports.

2023–24 Greenhouse Gas Emissions Inventory – Location-based method

Emission Source	Scope 1 t CO_2-e	Scope 2 t CO_2-e	Scope 3 t CO_2-e	Total t CO_2-e
Electricity (location-based approach)	N/A	14,997.226	1,387.329	16,384.555
Natural gas	0.368	N/A	0.029	0.397
Solid waste*	N/A	N/A	128.174	128.174
Refrigerants*†	0.000	N/A	N/A	0.000
Fleet and other vehicles	276.330	N/A	68.098	344.428
Domestic commercial flights	N/A	N/A	1,267.666	1,267.666
Domestic hire car*	N/A	N/A	39.871	39.871
Domestic travel accommodation*	N/A	N/A	680.921	680.921
Other energy	195.100	N/A	48.080	243.180
Total t CO2-e	471.798	14,997.226	3,620.168	19,089.192

Note: the table above presents emissions related to electricity usage using the location-based accounting method. CO_2-e = Carbon Dioxide Equivalent.

* indicates emission sources collected for the first time in 2023–24. Waste data was estimated based on industry average. Emissions from hire cars for 2023–24 have been sourced from a third party and may be incomplete due to a lack of robust data. Further, any hire car entries with pickup dates outside of 2023–24 were not included in the emissions calculations. The quality of data is expected to improve over time as emissions reporting matures.

† indicates optional emission source for 2023–24 emissions reporting.

2023–24 Electricity Greenhouse Gas Emissions				
Emission Source	**Scope 2 t CO_2-e**	**Scope 3 t CO_2-e**	**Total t CO_2-e**	**Percentage of electricity use**
Electricity (location-based approach)	14,997.226	1,387.329	16,384.555	100%
Market-based electricity emissions	10,982.915	1,355.915	12,338.830	62.52%
Total renewable electricity	-	-	-	37.48%
Mandatory renewables[1]	-	-	-	18.72%
Voluntary renewables[2]	-	-	-	18.76%

Note: the table above presents emissions related to electricity usage using both the location-based and the market-based accounting methods. CO_2-e = Carbon Dioxide Equivalent.

1 Mandatory renewables are the portion of electricity consumed from the grid that is generated by renewable sources. This includes the renewable power percentage.

2 Voluntary renewables reflect the eligible carbon credit units surrendered by the entity. This may include purchased large-scale generation certificates, power purchasing agreements, GreenPower and the jurisdictional renewable power percentage (ACT only).

Heritage

The Bureau has a demonstrated commitment to record and preserve significant parts of its own more than 100-year history in delivering meteorological services to Australia. The heritage values associated with sites owned or controlled by the Bureau is quite broad. Some sites have long-term associations with weather and meteorology, some sites are places of first use of significant technology such as radar, while others were key to major meteorological events. The Bureau continues to manage its heritage obligations in accordance with the *Environmental Protection and Biodiversity Conservation Regulations 2000*.

People management

Effectiveness in managing and developing employees

The design, development and delivery of enterprise strategies supporting culture, leadership, organisational capability, diversity and inclusion and talent management were priorities in 2023–24.

The Bureau took a systematic approach to identifying and developing leadership capability through the Talent Development Framework and commenced cascade implementation to support leadership and career development and succession planning.

The internal 'Bureau Way' Manager program developed leadership skills through 360° feedback, coaching and on-the-job application, with Manager Fundamental workshops supporting everyday capability in areas such as managing psychosocial hazards, giving and receiving feedback, and fostering a growth mindset.

Mandatory learning was streamlined and harmonised into an all-in-one suite, ensuring employees and contractors understand their core APS responsibilities and obligations, achieving a 95% completion rate in 2023–24. Online CORE eLearning modules and facilitated Yarning Circles continued to build cultural awareness and capability. Staff also engaged with learning experiences offered by the APS Academy and other online libraries to develop skills identified in their individual learning plans.

The Bureau is embedding an organisational culture that is led and owned by our people. The Bureau's 2023 Agency Action Plan demonstrates our commitment to building a strong organisational culture. The plan provides visibility on the enterprise response to staff feedback from the 2023 APS Census and outlines priority actions being delivered against each target area for innovation, communication, risk management and change, and activities to support team culture.

Senior leaders were supported to explore the 2023 APS Census and Culture Survey data and respond to identified themes through facilitated workshops and develop team Culture Action Plans. Culture workshops were held for people leaders on strategies to strengthen the connection between individual and team contribution with organisational direction. The workshops provided tools and processes to build clarity and the leader behaviours needed to drive team engagement and motivation.

Strategy-in-Action workshops for the Bureau's extended leadership cohort were held in-person in Melbourne in September and November and virtually in March and June. The workshops continue to play an important role in building leadership capability and cohesion, sharing learning and experiences, and lifting culture and momentum around implementation and delivery of the Bureau's Strategy.

Performance management and development also remains critical to the Bureau's strategic objectives. Participation rates for the miPDS performance development scheme continue to be high, with 98% of employees having an agreement in place at the end of June 2024.

The Bureau's participation rate in the 2024 Australian Public Service (APS) Census was 69%, which is an increase from 67% in 2023. Results indicate that staff:

- strongly believe in the purpose and objectives of the Bureau and the APS
- have clarity on how their role contributes to achieving an outcome for the Australian public
- understand that customer centricity guides our strategy and operations
- suggest ideas to improve ways of working and actively participate and contribute to team Culture Action Plans.

Workforce snapshot			
Employment	**2022–23**	**2023–24**	**Difference**
Number of staff employed (APS)	1,797	1,882	+85
Total employee expenditure	$210.568m	$244.598m	+$34.030m
The diversity of our workforce*			
Women (% of the total workforce)	37.1	37.5	+0.4
People with a disability (% of the total workforce)	2.4	2.8	+0.4
Aboriginal and Torres Strait Islander peoples (% of the total workforce)	1.2	1.2	0
Staff with English as a second language (% of the total workforce)	15.8	16.0	+0.2
Staff with English and another language (% of the total workforce)	9.2	9.7	+0.5
Staff health and well-being			
Work health and safety incident reports	381	319	-62
Number of Health and Safety Representatives	25	24	+1
Training and education			
Staff undertaking support studies (% of the total workforce)	1.4	1.1	-0.3

*Note disclosure of personal aspects of identity or background is voluntary and therefore not always reflected in the Bureau's employee data.

Training and development

The Bureau has continued a strong and sustained commitment to developing STEM careers. In 2023–24, the Bureau of Meteorology Training Centre facilitated learning programs to support organisational capability, and licensing and compliance requirements. The Graduate Diploma in Meteorology course – the initial training program for meteorologists – saw 36 Bureau students graduate from the 2023 intake, as well as students completing the program from the Royal Australian Navy and Singapore.

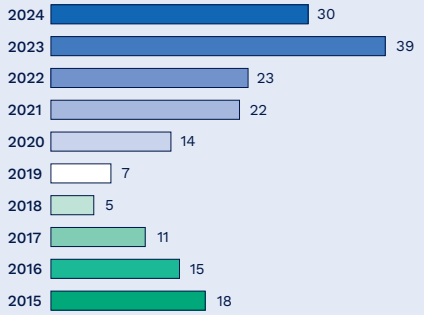
The 2023 Graduate Diploma in Meteorology course graduation in November.

A total of 42 students commenced the 2024 program, including 30 Bureau staff alongside students from the Royal Australian Navy, Royal New Zealand Navy, Samoa, Singapore and Tonga.

Continued development and delivery of online material provided all staff with greater access to training opportunities, particularly for those located in regional and remote locations, with over 3,000 online courses completed in the Bureau's learning management system.

A total of
36
staff successfully completed the Graduate Diploma in Meteorology course in the class of 2023 and have joined the ranks of Bureau forecasters across the country.

Number of Bureau trainees undertaking the Graduate Diploma in Meteorology



Specialist technical in-service training was also provided, with 446 meteorologist competencies awarded across fields such as fire weather, severe thunderstorms, tropical cyclones and aviation forecasting specialist classifications. In 2023–24, a high seas forecasting competency was introduced for the first time, supporting the delivery of Bureau services that enhance the safety of life and property at sea. Implementation of a holistic review of the fire weather competencies was completed in 2023–24, improving alignment with recent service improvements. Subsequently, recertification of 198 fire weather qualifications held by Bureau meteorologists was completed.

The Bureau's Introduction to Meteorology course was delivered to a record 449 participants in 2023–24 through facilitated courses run by Bureau meteorologist trainers. All participants were external customers from key agencies and partners, predominately from the emergency management sector. An on-demand online version of the course was completed by 204 external customers and 356 internal stakeholders during the year. Training in meteorology and Bureau services remains highly valued by key partners, with 25 courses delivered to agencies including the National Emergency Management Agency, Queensland Fire and Emergency Services and the Australian Institute for Disaster Resilience.

In support of the Bureau's Observing System Strategy, training was delivered to 85 technical staff covering automatic weather station (AWS) operational support, AWS site inspection, remote stations observations and maintenance, aeronautical meteorological observations and dual polarisation radar maintenance. In addition to internal training, aeronautical meteorological observations training was provided to staff from Airservices Australia, Royal Australian Air Force, Royal Australian Navy and Australian Antarctic Division to support aviation operations.

Work health and safety (WHS)

The Bureau is committed to ensuring the health and safety of its staff through effective risk management and a positive safety culture with a focus on embedding health and safety practices in day-to-day operations and activities.

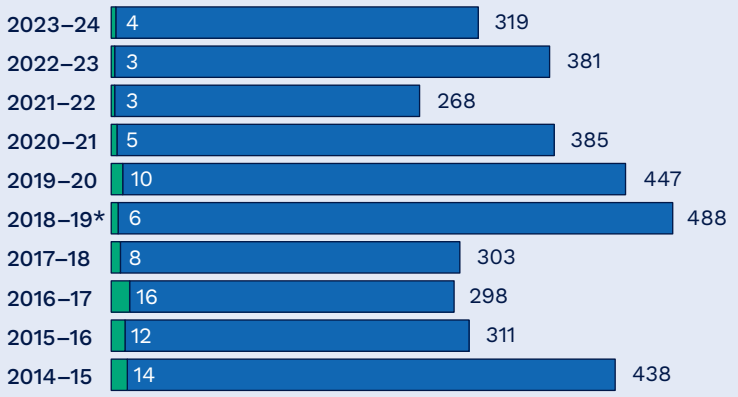
The Health Safety and Environment (HSE) team continued to provide health and safety advice to support management and staff to 'know and manage' their risks and respond to and investigate incidents.

Highlights from 2023–24 included:

- introduction of group WHS Risk Profiles and WHS performance reporting
- uplift of the health and safety management information system for hazard and incident reporting and recording of various health and safety corrective actions and compliance activities
- completion of a Psychosocial Risk Assessment including Bureau-wide consultation and awareness education for managers
- achievement of a compliant rating from Comcare Proactive Inspection of the Bureau's Incident Management
- refinement of Senior Leadership Safety Conversations to directly focus on risk awareness and management
- completion of the 2-year Safety Essentials Campaign to increase awareness of health and safety risks
- enhancement of health and safety induction programs for expeditioners being deployed to remote posting sites (e.g. Willis Island Meteorological Station and Giles Meteorological Station)
- improved governance through the development and update of over 15 health and safety procedures.

Lead WHS indicators	Lag WHS indicators
• As of 30 June, 24 Health and Safety Representatives (HSRs) and 18 Deputy HSRs represented 25 work groups. • Senior Leadership completed 369 Safety Conversations, an average of 30 per month. • Bureau Executive provided with bi-monthly comprehensive WHS briefs.	• Comcare was notified of 2 incidents. A serious illness under Regulation 699, Section 36 and a dangerous incident under Section 37 of the *Work Health and Safety Act 2011* (Cth). • Hazard and incident reporting decreased, with 319 HSE hazard/incident reports lodged, compared with 381 in 2022–23. • Proactive reporting of hazards and near miss incidents remained comparable at 71% of all reports recorded, compared to 76% in 2022–23. • Average time to report was 8.1 days, with a median of 1.0 days, compared to 4.3 days in 2022–23. Changes in the WHS management information system date comparison may account for some variance, however worker timeliness and system access when working in the field are also contributing factors. • The Bureau's annual lost time injury frequency rate (LTIFR) for all reports was 3.64, fractionally higher than the LTIFR of 3.5 in 2022–23. The LTIFR for workers' compensation claims was 0.36 compared to the Australian industry benchmark of 3.1 for Professional, Scientific and Technical Services (Safe Work Australia). • 4 workers' compensation claims were accepted for 2023–24 (0.21 claims per 100 staff). • The Bureau had 1 lost-time workers' compensation claim.

WHS incident reports and compensable injuries



Compensable injuries based on date injury accepted

* In 2018-19 Bureau implemented an online reporting system and associated communications that led to a significant increase in reports

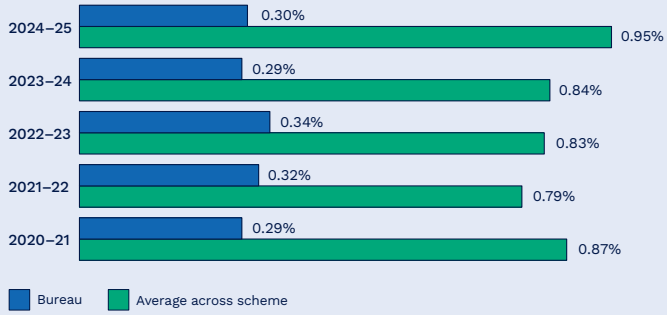
Consultation

The Bureau recognises that staff engagement and participation improve decision-making for health and safety matters, and help reduce work-related incidents, injuries and illness. The Bureau has formal health and safety consultative arrangements and circulates WHS procedures and risk assessments to staff for consultation prior to finalisation.

Rehabilitation and compensation

In 2023–24, 7 compensation claims were lodged with Comcare of which 4 were accepted. Of the accepted claims 3 related to physical injuries and one related to psychological injury. There was one accepted claim with time loss and for all other accepted claims, staff returned to work. The Bureau achieved a return-to-work rate of 75% for accepted claims.

Comcare insurance premiums



The Bureau's Comcare premium rate for 2023–24 was 0.29%, for 2024–25 is 0.30% and well below the overall scheme premium rate of 0.95%.

The Wellbeing team continued to work towards positive return to work outcomes for compensable and non-compensable claims through the engagement of effective rehabilitation providers, dedicated managers, the Wellbeing team support, and the positive approach of injured staff. A proactive and early intervention approach for injured or ill employees resulted in minimal lost time for compensable and non-compensable matters. This involved managers and supervisors establishing immediate supportive contact with employees who required further assistance. The Wellbeing team worked with all parties to support the return-to-work process in a

collaborative way.

The Bureau's Employee Assistance Program (EAP) utilisation rate for 2023–24 was 15%, which is 6.9% above industry average of 8.1%. The Wellbeing team has been actively educating Bureau staff on the services available to maintain awareness and increase use. The Bureau expects this trend to increase above industry average in the coming year.

Employment arrangements

At 30 June, the Bureau had 1,711 ongoing staff and 170 non-ongoing staff employed under the *Public Service Act 1999*. These figures include 26 Senior Executive Service (SES) and equivalent staff but exclude the Head of Agency. Apart from the SES and the Head of Agency, all staff are covered under the Bureau of Meteorology Enterprise Agreement (EA). The salary bands under the EA and non-salary benefits are outlined below. There were 81 staff with individual flexibility agreements pursuant to the EA – each of these individual flexibility arrangements dealt with matters of remuneration or allowances.

Non-salary benefits

Non-salary benefits for employees include:

- flexible working arrangements, such as flex time, executive-level time off in lieu, part-time and home-based work, compressed hours and negotiable working time within the span of hours
- assistance to employees who are in, have left, or are preparing to leave situations which are affected by family and domestic violence
- provision for leave, including recreation leave, long service leave, personal/carer's leave, compassionate leave, war service sick leave, pregnancy leave, maternity leave, adoption leave, supporting partner leave, study leave, employee-funded extra leave, ceremonial leave, defence leave, jury service leave, purchased leave and community leave (with and without pay)
- study assistance
- relocation support
- access to an employee assistance program
- access to the flexible remuneration packaging scheme
- provision of business-related equipment
- career guidance and development services.

Australian Public Service Act employment arrangements – Current report period (2023–24)

	SES	Non-SES	Total
Bureau of Meteorology Enterprise Agreement 2024	0	1,855	1,855
SES (and equivalent) Employment Contracts	26	0	26
Total	26	1,855	1,881

Note: Includes staff on leave without pay and excludes the Head of Agency.

Australian Public Service Act employment salary ranges by classification level (minimum/maximum) – Current report period (2023–24)

	Minimum Salary $	Maximum Salary $
SES 3	N/A	N/A
SES 2	268,907	300,099
SES 1	223,061	244,817
EL 2 *	130,445	201,197
EL 1	110,115	120,760
APS 6	90,199	101,022
APS 5	80,341	87,572
APS 4	71,633	78,553
APS 3 #	63,907	74,794
APS 2	57,666	63,200
APS 1	52,000	55,576
Other ^	52,000	55,576
Minimum/Maximum range	52,000	300,099

* Includes Research Scientists
# Includes Technical Officers
^ Includes Graduate, Cadet and Trainee staff

Australian Public Service Act employment performance pay by classification level – Current report period (2023-24)

No Bureau employees received performance pay during 2023–24.

Executive remuneration

The payment of salary and administration of conditions for the Head of Agency is derived from the relevant Remuneration Tribunal determination. The Bureau has an SES remuneration framework that applies to the SES (and equivalent) staff. At 30 June 2024, there were 26 common law contracts for SES (and equivalent) staff. These contracts also provided for non-salary benefits, such as business equipment (home computing facilities and mobile phone) and airline club membership. The Bureau has no staff on Australian Workplace Agreements and is not subject to any determinations under subsection 24(3) of the Public Service Act.

Information about remuneration for key management personnel

The Bureau's key management personnel include the CEO as its Accountable Authority, and members of the Bureau Executive who report directly to the CEO. Remuneration information for key management personnel is provided below. Remuneration figures for key management personnel, senior executives and other highly paid staff are comprised of base salary, other benefits and allowances, long service leave and superannuation contributions, and termination benefits where applicable. The figures include pro-rata amounts for personnel who were not employed at the Bureau for the full financial year.

		Short-term benefits $			Post-employment benefits $	Other long-term benefits $		Termination benefits $	Total remuneration $
Name	Position title	Base salary	Bonuses	Other benefits and allowances	Superannuation contributions	Long service leave	Other long-term benefits		
Andrew Johnson	CEO & Director of Meteorology	483,018	-	-	71,155	16,753	-	-	**570,926**
Gilbert Brunet	Group Executive Science and Innovation	309,838	-	36,038	52,364	9,944	-	-	**408,184**
Nichole Brinsmead	Group Executive Data and Digital	305,711	-	76,725	56,046	10,118	-	-	**448,600**
Paula Goodwin	Group Executive Enterprise Services	301,405	-	30,540	51,271	(8,803)	-	-	**374,413**
Peter Stone	Group Executive Business Solutions	295,683	-	35,007	64,769	12,808	-	-	**408,267**
Piero Chessa	Group Executive Community Services	285,119	-	33,267	51,382	9,636	-	-	**379,404**
Vicki Woodburn	Group Executive Australian Climate Service	320,328	-	35,453	63,682	10,763	-	-	**430,226**

Information about remuneration for senior executives

The average total remuneration of senior executives, excluding key management personnel, during the reporting period is provided below. The figures include pro-rata amounts for personnel who were not employed at the Bureau for the full financial year.

		Short-term benefits $			Post-employment benefits $	Other long-term benefits $		Termination benefits $	Total remuneration $
Total remuneration bands	Number of senior executives	Average base salary	Average bonuses	Average other benefits and allowances	Average superannuation contributions	Average long service leave	Average other long term benefits	Average termination benefits	Average total remuneration
$0- $220,000	3	95,672	0	6,768	19,185	2,866	0	0	**124,491**
$220,001- $245,000	2	190,903	0	7,786	24,398	6,232	0	0	**229,319**
$245,001- $270,000	4	202,842	0	13,626	39,097	7,599	0	0	**263,164**
$270,001- $295,000	4	223,268	0	14,776	36,036	10,169	0	0	**284,249**
$295,001- $320,000	6	231,051	0	20,480	40,553	11,652	0	0	**303,736**
$320,001- $345,000	3	241,805	0	27,379	38,961	15,611	0	0	**323,756**
$345,001- $370,000	0	-	-	-	-	-	-	-	**-**
$370,001- $395,000	0	-	-	-	-	-	-	-	**-**
$395,001- $420,000	0	-	-	-	-	-	-	-	**-**
$420,001- $445,000	0	-	-	-	-	-	-	-	**-**
$445,001- $470,000	0	-	-	-	-	-	-	-	**-**
$470,001- $495,000	0	-	-	-	-	-	-	-	**-**
$495,001-	0	-	-	-	-	-	-	-	**-**

Information about remuneration for other highly paid staff

Remuneration of staff who are neither key management personnel nor senior executives, and whose total remuneration exceeds the threshold amount for the reporting period ($250,000) is also provided below.

		Short-term benefits $			Post-employment benefits $	Other long-term benefits $		Termination benefits $	Total remuneration $
Total remuneration bands	Number of other highly paid staff	Average base salary	Average bonuses	Average other benefits and allowances	Average superannuation contributions	Average long service leave	Average other long term benefits	Average termination benefits	Average total remuneration
$250,000- $270,000	4	158,432	0	55,267	34,874	10,381	0	0	**258,954**
$270,001- $295,000	4	152,114	0	87,397	33,253	5,991	0	0	**278,755**
$295,001- $320,000	3	168,916	0	89,773	40,001	9,068	0	0	**307,759**
$320,001- $345,000	0	-	-	-	-	-	-	-	**-**
$345,001- $370,000	0	-	-	-	-	-	-	-	**-**
$370,001- $395,000	0	-	-	-	-	-	-	-	**-**
$395,001- $420,000	0	-	-	-	-	-	-	-	**-**
$420,001- $445,000	0	-	-	-	-	-	-	-	**-**
$445,001- $470,000	0	-	-	-	-	-	-	-	**-**
$470,001- $495,000	0	-	-	-	-	-	-	-	**-**
$495,001-	0	-	-	-	-	-	-	-	**-**

Workforce profile (staffing statistics)

All statistics are as of 30 June 2024 unless otherwise stated.

External territories include Australian Antarctic Territory, Norfolk Island and Cocos Islands. Macquarie Island is included in Tasmania, Willis Island in Queensland and Lord Howe Island in New South Wales.

The Bureau did not collect data against all gender categories in 2023–24 and has reported 'indeterminate' as 'uses a different term'.

All ongoing employees – Current report period (2023–24)

	Man/Male			Woman/Female			Non-binary			Prefers not to answer			Uses a different term			Total
	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	
NSW	69	4	73	28	10	38	0	0	0	1	0	1	0	0	0	**112**
Qld	152	9	161	75	12	87	0	0	0	0	0	0	2	0	2	**250**
SA	46	5	51	23	8	31	0	0	0	0	0	0	1	0	1	**83**
Tas	47	5	52	17	6	23	0	0	0	0	0	0	0	0	0	**75**
Vic	570	34	604	276	70	346	0	0	0	3	1	4	7	1	8	**962**
WA	54	5	59	28	8	36	0	0	0	0	1	1	1	0	1	**97**
ACT	43	1	44	40	10	50	0	0	0	0	0	0	0	1	1	**95**
NT	19	3	22	10	3	13	0	0	0	0	0	0	0	0	0	**35**
External Territories	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Overseas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**1,002**	**66**	**1,068**	**497**	**127**	**624**	**0**	**0**	**0**	**4**	**2**	**6**	**11**	**2**	**13**	**1,711**

All non-ongoing employees – Current report period (2023-24)

	Man/Male			Woman/Female			Non-binary			Prefers not to answer			Uses a different term			Total
	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	
NSW	3	3	6	5	2	7	0	0	0	0	0	0	0	0	0	**13**
Qld	9	1	10	6	2	8	0	0	0	0	0	0	0	0	0	**18**
SA	6	3	9	4	0	4	0	0	0	0	0	0	0	0	0	**13**
Tas	7	2	9	10	0	10	0	0	0	0	0	0	0	0	0	**19**
Vic	26	16	42	30	5	35	0	0	0	0	0	0	3	0	3	**80**
WA	3	1	4	5	0	5	0	0	0	0	0	0	0	0	0	**9**
ACT	1	0	1	7	3	10	0	0	0	0	0	0	0	0	0	**11**
NT	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0	**4**
External Territories	3	0	3	1	0	1	0	0	0	0	0	0	0	0	0	**4**
Overseas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**59**	**27**	**86**	**69**	**13**	**82**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	**171**

All ongoing employees – Previous report period (2022–23)

	Man/Male			Woman/Female			Non-binary			Prefers not to answer			Uses a different term			Total
	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	
NSW	63	5	68	22	8	30	0	0	0	0	0	0	0	0	0	**98**
Qld	139	6	145	73	10	83	0	0	0	0	0	0	0	0	0	**228**
SA	42	2	44	22	6	28	0	0	0	0	0	0	0	0	0	**72**
Tas	41	5	46	14	8	22	0	0	0	0	0	0	0	0	0	**68**
Vic	533	34	567	257	68	325	0	0	0	0	0	0	6	1	7	**899**
WA	50	5	55	20	8	28	0	0	0	0	0	0	0	0	0	**83**
ACT	40	4	44	47	5	52	0	0	0	0	0	0	0	1	1	**97**
NT	21	3	24	8	2	10	0	0	0	0	0	0	1	0	1	**35**
External Territories	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Overseas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**932**	**64**	**996**	**463**	**115**	**578**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**2**	**9**	**1,583**

All non-ongoing employees – Previous report period (2022–23)

	Man/Male			Woman/Female			Non-binary			Prefers not to answer			Uses a different term			Total
	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	
NSW	7	3	10	6	0	6	0	0	0	0	0	0	0	0	0	**16**
Qld	16	2	18	7	2	9	0	0	0	0	0	0	0	0	0	**27**
SA	6	4	10	3	0	3	0	0	0	0	0	0	0	0	0	**13**
Tas	1	2	3	2	1	3	0	0	0	0	0	0	0	0	0	**6**
Vic	46	18	64	41	13	54	0	0	0	0	0	0	2	1	3	**121**
WA	4	2	6	4	0	4	0	0	0	0	0	0	0	0	0	**10**
ACT	4	0	4	4	2	6	0	0	0	0	0	0	0	0	0	**10**
NT	1	2	3	2	0	2	0	0	0	0	0	0	0	0	0	**5**
External Territories	4	0	4	2	0	2	0	0	0	0	0	0	0	0	0	**6**
Overseas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**89**	**33**	**122**	**71**	**18**	**89**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**3**	**214**

Australian Public Service Act ongoing employees – Current report period (2023–24)

	Man/Male			Woman/Female			Non-binary			Prefers not to answer			Uses a different term			Total
	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	
SES 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
SES 2	3	0	3	3	0	3	0	0	0	0	0	0	0	0	0	**6**
SES 1	14	0	14	5	0	5	0	0	0	0	0	0	0	0	0	**19**
EL 2	196	9	205	113	20	133	0	0	0	0	0	0	1	0	1	**339**
EL 1	371	33	404	166	55	221	0	0	0	2	1	3	1	0	1	**629**
APS 6	221	17	238	108	41	149	0	0	0	1	1	2	3	2	5	**394**
APS 5	92	4	96	38	8	46	0	0	0	0	0	0	0	0	0	**142**
APS 4	58	0	58	51	1	52	0	0	0	1	0	1	5	0	5	**116**
APS 3	22	2	24	7	2	9	0	0	0	0	0	0	0	0	0	**33**
APS 2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
APS 1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Other	24	0	24	6	0	6	0	0	0	0	0	0	1	0	1	**31**
Total	**1,002**	**66**	**1,068**	**497**	**127**	**624**	**0**	**0**	**0**	**4**	**2**	**6**	**11**	**2**	**13**	**1,711**

Australian Public Service Act non-ongoing employees – Current report period (2023–24)

	Man/Male			Woman/Female			Non-binary			Prefers not to answer			Uses a different term			Total
	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	
SES 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
SES 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
SES 1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	**1**
EL 2	2	3	5	2	1	3	0	0	0	0	0	0	0	0	0	**8**
EL 1	23	12	35	23	6	29	0	0	0	0	0	0	1	0	1	**65**
APS 6	13	8	21	18	2	20	0	0	0	0	0	0	1	0	1	**42**
APS 5	5	2	7	9	2	11	0	0	0	0	0	0	0	0	0	**18**
APS 4	1	1	2	7	1	8	0	0	0	0	0	0	0	0	0	**10**
APS 3	14	1	15	9	1	10	0	0	0	0	0	0	1	0	1	**26**
APS 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
APS 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**58**	**27**	**85**	**69**	**13**	**82**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	**170**

Australian Public Service Act ongoing employees – Previous report period (2022–23)

	Man/Male			Woman/Female			Non-binary			Prefers not to answer			Uses a different term			Total
	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	
SES 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
SES 2	3	0	3	3	0	3	0	0	0	0	0	0	0	0	0	**6**
SES 1	14	0	14	3	0	3	0	0	0	0	0	0	0	0	0	**17**
EL 2	182	10	192	113	18	131	0	0	0	0	0	0	2	0	2	**325**
EL 1	331	31	362	153	48	201	0	0	0	0	0	0	2	0	2	**565**
APS 6	215	15	230	96	38	134	0	0	0	0	0	0	2	1	3	**367**
APS 5	87	4	91	37	7	44	0	0	0	0	0	0	0	0	0	**135**
APS 4	21	0	21	35	1	36	0	0	0	0	0	0	0	1	1	**58**
APS 3	46	4	50	15	2	17	0	0	0	0	0	0	1	0	1	**68**
APS 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
APS 1	1	0	1	1	1	2	0	0	0	0	0	0	0	0	0	**3**
Other	32	0	32	7	0	7	0	0	0	0	0	0	0	0	0	**39**
Total	**932**	**64**	**996**	**463**	**115**	**578**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**2**	**9**	1,583

Australian Public Service Act non-ongoing employees – Previous report period (2022–23)

	Man/Male			Woman/Female			Non-binary			Prefers not to answer			Uses a different term			Total
	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	Full time	Part time	Total	
SES 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
SES 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
SES 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
EL 2	7	6	13	5	1	6	0	0	0	0	0	0	0	0	0	**19**
EL 1	40	9	49	25	7	32	0	0	0	0	0	0	0	0	0	**81**
APS 6	19	12	31	17	4	21	0	0	0	0	0	0	2	0	2	**54**
APS 5	6	2	8	12	1	13	0	0	0	0	0	0	0	0	0	**21**
APS 4	3	1	4	6	1	7	0	0	0	0	0	0	0	0	0	**11**
APS 3	13	2	15	6	3	9	0	0	0	0	0	0	1	0	1	**25**
APS 2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	**1**
APS 1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**88**	**33**	**121**	**71**	**18**	**89**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	**213**

Australian Public Service Act employees by full-time and part-time status – Current report period (2023–24)

	Ongoing			Non-ongoing			Total
	Full time	Part time	Total	Full time	Part time	Total	
SES 3	0	0	0	0	0	0	**0**
SES 2	6	0	6	0	0	0	**6**
SES 1	19	0	19	1	0	1	**20**
EL 2	310	0	310	4	4	8	**318**
EL 1	540	29	569	47	18	65	**634**
APS 6	333	89	422	32	10	42	**464**
APS 5	130	61	191	14	4	18	**209**
APS 4	115	12	127	8	2	10	**137**
APS 3	29	1	30	24	2	26	**56**
APS 2	0	4	4	0	0	0	**4**
APS 1	1	1	2	0	0	0	**2**
Other	31	0	31	0	0	0	**31**
Total	**1,514**	**197**	**1,711**	**130**	**40**	**170**	**1,881**

Australian Public Service Act employees by full-time and part-time status – Previous report period (2022–23)

	Ongoing			Non-ongoing			Total
	Full time	Part time	Total	Full time	Part time	Total	
SES 3	0	0	0	0	0	0	**0**
SES 2	6	0	6	0	0	0	**6**
SES 1	17	0	17	0	0	0	**17**
EL 2	297	28	325	12	7	19	**344**
EL 1	486	79	565	65	16	81	**646**
APS 6	313	54	367	38	16	54	**421**
APS 5	124	11	135	18	3	21	**156**
APS 4	56	2	58	9	2	11	**69**
APS 3	62	6	68	20	5	25	**93**
APS 2	0	0	0	0	1	1	**1**
APS 1	2	1	3	0	1	1	**4**
Other	39	0	39	0	0	0	**39**
Total	**1,402**	**181**	**1,583**	**162**	**51**	**213**	**1,796**

Australian Public Service Act employment type by location – Current report period (2023–24)

	Ongoing	Non-ongoing	Total
NSW	112	13	**125**
Qld	250	17	**267**
SA	83	13	**96**
Tas	75	19	**94**
Vic	962	80	**1,042**
WA	97	9	**106**
ACT	95	11	**106**
NT	35	4	**39**
External Territories	2	4	**6**
Overseas	0	0	**0**
Total	**1,711**	**170**	**1,881**

Australian Public Service Act employment type by location – Previous report period (2022–23)

	Ongoing	Non-ongoing	Total
NSW	98	16	**114**
Qld	228	26	**254**
SA	72	13	**85**
Tas	68	6	**74**
Vic	899	121	**1,020**
WA	83	10	**93**
ACT	97	10	**107**
NT	35	5	**40**
External Territories	3	6	**9**
Overseas	0	0	**0**
Total	**1,583**	**213**	**1,796**

Australian Public Service Act Indigenous employment – Current report period (2023–24)

	Total
Ongoing	**21**
Non-ongoing	**2**
Total	**23**

Australian Public Service Act Indigenous employment – Previous report period (2022–23)

	Total
Ongoing	**19**
Non-ongoing	**3**
Total	**22**

Financial resource management

Financial performance

During 2023–24, the Bureau reported an increase to own source revenue. This was largely related to the aviation sector where cost recovery arrangements were reinstated following a period of supplementation from government due to the COVID-19 pandemic.

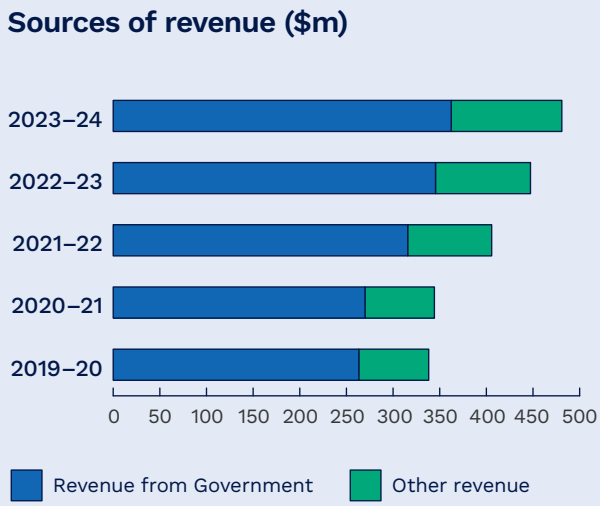
Appropriation increased for 2 new measures relating to:

- $5.0 million for the flood warning infrastructure network to establish a national, reliable flood warning network
- $16.4 million for the Australian Climate Service the national climate adaptation and risk program.

Own-source income contributed

$118.6 million

to the Bureau



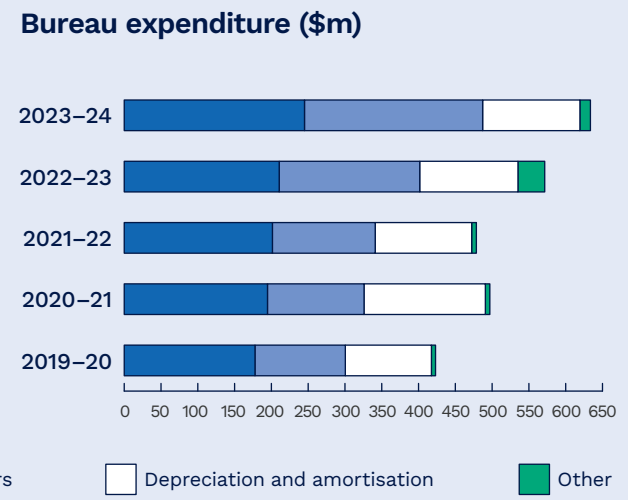
The Bureau reported a net cash operating deficit of $41.5 million for 2023–24. This deficit is largely due to pressure across the expense base, driven by resource costs and increased communication and consumable costs associated with running the Observation network, software licences, maintenance and Information Technology (IT) service delivery costs reflecting transition and implementation of IT transformation projects.

The loss was funded from prior year appropriation and a range of saving measures have been implemented to manage costs into the 2024–25 financial year.

Expenditure of

$633.6 million

(including depreciation)



Significant non-compliance

In 2023-24 the Bureau did not report any significant issues relating to non-compliance with the finance law to the Minister for the Environment and Water under paragraph 19(1)(e) of the *Public Governance, Performance and Accountability Act 2013*.

Resource Statement Summary – Current report period (2023–24)

	Current available appropriation (a)	Payments made (b)	Balance remaining (a) – (b)
	$'000	$'000	$'000
Departmental			
Annual appropriations – ordinary annual services	458,251	362,086	96,165
Prior year appropriations available – ordinary annual services	104,936	104,936	-
Annual appropriations – other services – non-operating	10,788	-	10,788
Prior year appropriations available – other services – non-operating	133,013	113,831	19,182
Total departmental annual appropriations (c)	**706,988**	**580,853**	**126,135**
Total special appropriations (d)	**-**	**-**	**-**
Opening balance – special accounts	1,882	1,792	90
Special account receipts	1,373	-	1,373
Total special accounts (e)	**3,255**	**1,792**	**1,463**
less departmental appropriations drawn from annual/special appropriations and credited to special accounts **(f)**	-	-	-
Total departmental resourcing (c+d+e+f)	**710,243**	**582,645**	**127,598**
Administered			
Annual appropriations – ordinary annual services	-	-	-
Prior year appropriations available – ordinary annual services	-	-	-
Annual appropriations – other services – non-operating	-	-	-
Prior year appropriations available – other services – non-operating	-	-	-
Annual appropriations – other services – specific payments to States, ACT, NT and local government	-	-	-
Prior year appropriations available other services - specific payments to States, ACT, NT and local government	-	-	-
Annual appropriations – other services – new administered expenses	-	-	-
Prior year appropriations available - other services - new administered expenses	-	-	-
Total administered annual appropriations (g)	**-**	**-**	**-**
Total administered special appropriations (h)	**-**	**-**	**-**
Opening balance – special accounts	-	-	-
Special account receipts	-	-	-
Total special accounts receipts (i)	**-**	**-**	**-**
less administered appropriations drawn from annual/special appropriations and credited to special accounts **(j)**	-	-	-
less payments to corporate entities from annual/ special appropriations **(k)**	-	-	-
Total administered resourcing (g+h+i+j+k)	**-**	**-**	**-**
Total resourcing and payments for the Bureau of Meteorology	**710,243**	**582,645**	**127,598**

Expenses by Outcome – Current report period (2023–24)

Expenses for Outcome 1

Outcome 1: Enabling a safe, prosperous, secure and healthy Australia through the provision of weather, water, climate, ocean and space weather services.	Budget* 2023–24 $'000 (a)	Actual expenses 2023–24 $'000 (b)	Variation 2023–24 $'000 (a) – (b)
Program 1.1: Bureau of Meteorology			
Administered expenses			
Ordinary annual services (Appropriation Act No. 1)	-	-	-
Other services (Appropriation Act Nos. 2, 4 and 6)	-	-	-
s74 External Revenue[1]	-	-	-
Special appropriations	-	-	-
Special accounts	-	-	-
Payments to corporate entities	-	-	-
Expenses not requiring appropriation in the Budget year[2]	-	-	-
Administered total	**-**	**-**	**-**
Departmental expenses			
Departmental appropriation	317,761	357,720	(39,959)
s74 External Revenue[1]	99,638	133,612	(33,974)
Special appropriations	-	-	-
Special accounts	-	1,686	(1,686)
Expenses not requiring appropriation in the Budget year[2]	111,423	140,598	(29,175)
Departmental total	**528,822**	**633,616**	**(104,794)**
Total expenses for Outcome 1	**528,822**	**633,616**	**(104,794)**

	2023–24	2023–24	
Average staffing level (number)	**1,754**	**1,722**	

* Full-year budget, including any subsequent adjustment made to the 2023–24 budget at Additional Estimates.

1 Estimated expenses incurred in relation to receipts retained under section 74 of the PGPA Act 2013.

2 Expenses not requiring appropriation in the Budget year are made up of depreciation expenses, amortisation expenses, make good expenses, audit fees, write down of assets, and foreign exchange losses.

Asset management

The Bureau manages its assets according to relevant accounting standards and Department of Finance requirements. The agency's asset management policies and procedures cover whole-of-life asset management.

The asset base comprises observation equipment, software, leasehold improvements, data centre equipment and right-of-use assets associated with accounting standard AASB 16 Leases relating mainly to property leases.

Asset network plans were developed that specify the activities that are intended to be undertaken for a specific network across the lifecycle. The plans detail timescales, costs and responsibilities for delivery.

In addition, a suite of lifecycle delivery plans exists that includes all operational plans including maintenance plans, capital delivery plans and detailed project plans. This is the most practical component of asset management and covers systems engineering, reliability engineering, maintenance delivery, fault and incident response, acquisition, disposal and decommission.

The Bureau's property portfolio is managed through the strategic property management plan to ensure its workplaces and facilities are maintained to a suitable standard.

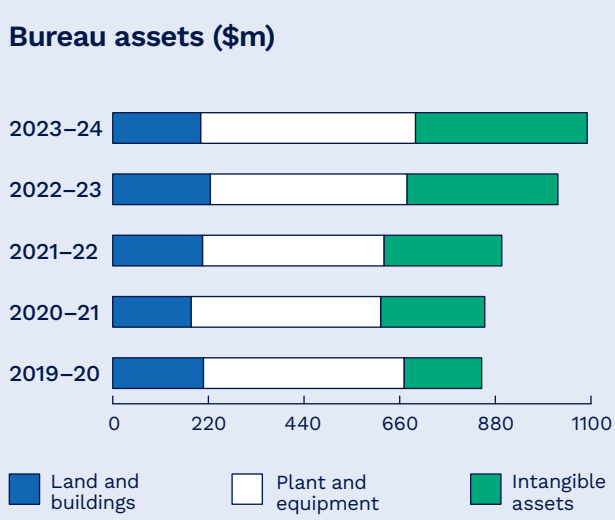
The Bureau uses an asset management system to manage its observing network assets and related IT equipment, including:

- providing reports on asset performance
- scheduling preventive maintenance, inspections and calibrations
- planning, scheduling, assigning and executing work in a safe and efficient manner
- tracking rotables, spare parts and consumables.

More than

$1 billion

in assets were operated and maintained to deliver services to the Australian community



Procurement

Value for money is the core principle underpinning all procurement. The Bureau's Accountable Authority Instructions provide internal control of procurement within the agency, and are aligned with the PGPA Act, the Commonwealth Procurement Rules and broader Australian Government policy. The Bureau is committed to assessing and addressing modern slavery risks and this is reflected in the procurement framework. The Bureau also contributes to the annual Commonwealth Modern Slavery Statement and regularly updates its contractual and tendering templates to include obligations under the *Modern Slavery Act 2018*.

There were no instances of contracts of $100,000 or more (inclusive of GST) entered into 2023–24 that precluded the Auditor-General from accessing the contractor's premises.

For details of standard clauses that provide the Australian National Audit Office (ANAO) with access to contractors' information, refer to: www.finance.gov.au/procurement/clausebank.

There was one contract in excess of $10,000 (inclusive of GST) that was exempted by the Accountable Authority from being published on AusTender on the basis that they would disclose exempt matters under the *Freedom of Information Act 1982*.

Information on procurements expected to be undertaken in the coming year is in the Bureau's annual procurement plan, available from the AusTender website: www.tenders.gov.au.

Procurement initiatives to support small business and Indigenous-owned businesses

The Bureau supports small business participation in the Commonwealth Government procurement market. Small and Medium Enterprises (SME) and Small Enterprise participation statistics are available on the Department of Finance's website: www.finance.gov.au/government/procurement/statistics-australian-government-procurement-contracts-.

The Bureau's measures to support SMEs include:

- complying with the Commonwealth Procurement Framework
- using standardised contracts for low-risk procurements valued under $200,000
- implementing the Indigenous Procurement Policy, noting that many Indigenous businesses are also SMEs
- using the Australian Industry Participation policies and programs to encourage SME engagement opportunities
- using credit cards for procurements valued below $10,000
- complying with the Government's Supplier Pay On-Time or Pay Interest Policy
- including at least one SME when seeking a quote from the Management Advisory Services Panel or People Panels.

The Bureau recognises the importance of ensuring that small businesses are paid on time. The results of the Survey of Australian Government Payments to Small Business are available on the Treasury's website: www.treasury.gov.au.

The Bureau supports the goals of the Australian Government's Indigenous Procurement Policy and achieved its Indigenous procurement volume target for 2023–24. More information is available on the Department of the Prime Minister and Cabinet's website: www.pmc.gov.au.

Consultancies and reportable non-consultancies

The selection and engagement of consultants was conducted in accordance with the PGPA Act, Commonwealth Procurement Rules and internal policy and procedures. Of the 32 consultancy contracts reported, 9 used a limited tender procurement method and 23 used an open tender method, of which 23 used a panel arrangement.

During 2023–24, 19 new reportable consultancy contracts were entered into involving total actual expenditure of $3,803,086. In addition, 13 ongoing reportable consultancy contracts were active during the period, involving total actual expenditure of $2,567,342.

The main categories of purpose for which consultants were engaged were management advisory services, audit services and management support services.

Annual reports contain information about actual expenditure on reportable consultancy contracts. Information on the value of contracts and consultancies is available on the AusTender website: www.tenders.gov.au.

Expenditure on Reportable Consultancy Contracts – Current report period (2023–24)

	Number	Expenditure $'000 (GST inc.)
New contracts entered into during the reporting period	19	$3,803
Ongoing contracts entered into during a previous reporting period	13	$2,567
Total	**32**	**$6,370**

Organisations receiving a share of Reportable Consultancy Contract Expenditure – Current report period (2023–24)

Name of Organisation	Organisation ABN	Expenditure $'000 (GST inc.)
Synergy Group Australia Pty Ltd	ABN: 65 119 369 827	$2,788
Chartertech Pty Ltd	ABN: 30 617 464 990	$887
PricewaterhouseCoopers Consulting	ABN: 20 607 773 295	$546
KPMG HOUSE	ABN: 51 194 660 183	$526
Protiviti Pty Ltd	ABN: 27 108 473 909	$404
Total of largest shares		**$5,152**

During 2023–24, 1,018 new non-consultancy contracts were entered into involving total actual expenditure of $175,289,550. In addition, 758 ongoing non-consultancy contracts were active during the period, involving total actual expenditure of $243,835,420.

Annual reports contain information about actual expenditure on reportable non-consultancy contracts. Information on the value of reportable non-consultancy contracts is available on the AusTender website: www.tenders.gov.au.

Expenditure on Reportable Non-Consultancy Contracts – Current report period (2023–24)

	Number	Expenditure $'000 (GST inc.)
New contracts entered into during the reporting period	1,018	$175,290
Ongoing contracts entered into during a previous reporting period	758	$243,835
Total	**1,776**	**$419,125**

Note: This includes operating and equity contracts.

Organisations receiving a share of Reportable Non-Consultancy Contract Expenditure – Current report period (2023–24)

Name of Organisation	Organisation ABN	Expenditure $'000 (GST inc.)
Ventia Property Pty Ltd	ABN: 16 618 028 676	$39,595
Hewlett Packard Australia P/L	ABN: 74 004 394 763	$32,866
Hays Specialist Recruitment	ABN: 47 001 407 281	$21,680
UNISYS Australia Pty Ltd	ABN: 31 105 642 902	$20,605
Leidos	ABN: 79 612 590 155	$17,391
Total of largest shares		**$132,137**

Advertising and market research

Under section 311A of the *Commonwealth Electoral Act 1918*, the Bureau is required to disclose payments for advertising and market research.

Advertising and market research over the reporting threshold of $16,300 (GST inclusive) were undertaken to the value of $145,238 and $212,973 respectively, in 2023–24. Details are provided below.

The Bureau did not undertake any polling, direct mail or advertising campaigns during 2023–24.

Organisation	Purpose	Expenditure ($, GST inclusive)
Media advertising organisations		
Universal McCann (ABN: 19 002 966 001)	Recruitment Advertising	$145,238
Market research organisations		
Queensland University of Technology (ABN: 83 791 724 622)	Market Research for public safety campaign	$79,910
ORIMA RESEARCH PTY LTD (ABN: 77 076 347 914)	Market research into trust and experience	$74,179
Ernst & Young (ABN: 75 288 172 749)	Market research for key performance measures	$58,884
Total		**$358,211**


MELBOURNE 214km

Section 5:
Financial Statements

For the period ending
30 June 2024

BUREAU OF METEOROLOGY
for the period ended 30 June 2024

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Australian National Audit Office

INDEPENDENT AUDITOR'S REPORT

To the Minister for Environment and Water

Opinion

In my opinion, the financial statements of the Bureau of Meteorology (the Entity) for the year ended 30 June 2024:

(a) comply with Australian Accounting Standards – Simplified Disclosures and the *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015*; and

(b) present fairly the financial position of the Entity as at 30 June 2024 and its financial performance and cash flows for the year then ended.

The financial statements of the Entity, which I have audited, comprise the following as at 30 June 2024 and for the year then ended:

- Statement by the Accountable Authority and Chief Financial Officer;
- Statement of Comprehensive Income;
- Statement of Financial Position;
- Statement of Changes in Equity;
- Cash Flow Statement; and
- Notes to the financial statements, comprising material accounting policy information and other explanatory information.

Basis for opinion

I conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. My responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of my report. I am independent of the Entity in accordance with the relevant ethical requirements for financial statement audits conducted by the Auditor-General and their delegates. These include the relevant independence requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants (including Independence Standards)* (the Code) to the extent that they are not in conflict with the *Auditor-General Act 1997*. I have also fulfilled my other responsibilities in accordance with the Code. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Accountable Authority's responsibility for the financial statements

As the Accountable Authority of the Entity, the Chief Executive Officer and Director of Meteorology is responsible under the *Public Governance, Performance and Accountability Act 2013* (the Act) for the preparation and fair presentation of annual financial statements that comply with Australian Accounting Standards – Simplified Disclosures and the rules made under the Act. The Chief Executive Officer and Director of Meteorology is also responsible for such internal control as the Chief Executive Officer and Director of Meteorology determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Chief Executive Officer and Director of Meteorology is responsible for assessing the ability of the Entity to continue as a going concern, taking into account whether the Entity's operations will cease as a result of an administrative restructure or for any other reason. The Chief Executive Officer and Director of Meteorology is also responsible for disclosing, as applicable, matters related to going concern and using the going concern basis of accounting, unless the assessment indicates that it is not appropriate.

GPO Box 707, Canberra ACT 2601
38 Sydney Avenue, Forrest ACT 2603
Phone (02) 6203 7300

Auditor's responsibilities for the audit of the financial statements

My objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian National Audit Office Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

As part of an audit in accordance with the Australian National Audit Office Auditing Standards, I exercise professional judgement and maintain professional scepticism throughout the audit. I also:

- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Entity's internal control;
- evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Accountable Authority;
- conclude on the appropriateness of the Accountable Authority's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Entity's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Entity to cease to continue as a going concern; and
- evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

I communicate with the Accountable Authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

Australian National Audit Office

Bradley Medina
Senior Executive Director
Delegate of the Auditor-General

Canberra
3 September 2024

BUREAU OF METEOROLOGY
STATEMENT BY THE ACCOUNTABLE AUTHORITY AND CHIEF FINANCIAL OFFICER

In our opinion, the attached financial statements for the year ended 30 June 2024 comply with subsection 42(2) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act), and are based on properly maintained financial records as per subsection 41(2) of the PGPA Act.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Bureau of Meteorology will be able to pay its debts as and when they fall due.

Signed

Dr. A. Johnson
Chief Executive Officer and
Director of Meteorology

2 September 2024

Signed

J. Stone
Chief Financial Officer

2 September 2024

BUREAU OF METEOROLOGY
Statement of Comprehensive Income
for the period ended 30 June 2024

	Notes	2024 $'000	2023 $'000	Original Budget 2024 $'000
NET COST OF SERVICES				
Expenses				
Employee Benefits	1.1A	**244,958**	210,568	217,267
Supplier Expenses	1.1B	**242,052**	191,008	176,653
Depreciation and Amortisation	2.2A	**132,211**	133,474	131,256
Finance Costs	1.1C	**3,277**	2,352	656
Write-Down and Impairment of Assets	1.1D	**8,161**	31,434	1
Foreign Exchange Losses		**121**	227	-
Contributions to WMO and IOC[1]		**2,836**	2,473	1,974
Total expenses		**633,616**	571,536	527,807
Own-source income				
Own-source revenue				
Revenue from Contracts with Customers	1.2A	**63,660**	64,994	50,413
Aviation Industry	1.2B	**54,347**	33,269	48,811
Other Revenue	1.2C	**119**	560	414
Total own-source revenue		**118,126**	98,823	99,638
Gains				
Sale of Assets		**93**	133	-
Foreign Exchange Gains		**358**	519	-
Other Gains		**-**	2,354	-
Total gains		**451**	3,006	-
Total own-source income		**118,577**	101,829	99,638
Net (cost of) services		**(515,039)**	(469,707)	(428,169)
Revenue from Government	1.2D	**362,286**	345,500	317,761
Deficit		**(152,753)**	(124,207)	(110,408)
OTHER COMPREHENSIVE INCOME				
Changes in Asset Revaluation Reserve		**-**	49,758	-
Total comprehensive loss		**(152,753)**	(74,449)	(110,408)

1. Contributions to World Meteorological Organization (WMO) and Inter-Governmental Oceanographic Commission (IOC).

The above statement should be read in conjunction with the accompanying notes.

BUREAU OF METEOROLOGY
Statement of Comprehensive Income
for the period ended 30 June 2024

Budget Variances Commentary

Employee Expenses
The variance relates to the actual average ASL cost being higher than the original budget as the budget has not kept pace with Enterprise Agreement increases, marginally offset by lower ASL.

Supplier Expenses
The variance relates to contractor expenses that were originally budgeted and appropriated as capital and corrected through the 2023-24 Appropriation reclassification. In addition, increased ongoing communication and consumable costs associated with running the Observation network, software licences, maintenance and Information Technology (IT) service delivery costs reflecting transition and implementation of IT transformation projects.

Write-Down and Impairment of Other Assets
Actual expenses reflect the outcome of the Bureau's stocktake and Make Good valuation. Budgets are not created for these items due to their uncertainty.

Revenue from Contracts with Customers
Higher revenue from contracts reflects additional cost recovery arrangements from business and government entities.

Aviation Industry
Higher than budgeted Aviation Industry own-source income reflects transition back to full cost recovery following cessation of supplementation funding from Government during the COVID-19 pandemic.

Sale of Assets
Sale of property assets were not known during the development of the budget.

BUREAU OF METEOROLOGY
Statement of Financial Position
for the period ended 30 June 2024

	Notes	2024 $'000	2023 $'000	Original Budget 2024 $'000
ASSETS				
Financial Assets				
Cash and Cash Equivalents	2.1A	**1,959**	3,230	430
Trade and Other Receivables	2.1B	**147,208**	254,786	140,730
Accrued Revenue		**6,654**	6,690	3,671
Total Financial Assets		**155,821**	264,706	144,831
Non-Financial Assets[1]				
Land	2.2A	**14,536**	14,826	14,651
Buildings	2.2A	**187,558**	209,661	147,560
Plant and Equipment	2.2A	**494,144**	452,036	543,721
Computer Software	2.2A	**395,055**	346,431	455,700
Other Intangibles	2.2A	**-**	861	-
Inventories	2.2B	**6,767**	4,818	4,446
Prepayments		**11,411**	15,643	16,771
Total Non-Financial Assets		**1,109,471**	1,044,276	1,182,849
Total Assets		**1,265,292**	1,308,982	1,327,680
LIABILITIES				
Payables				
Suppliers Payable	2.3A	**84,595**	75,426	51,998
Other Payables	2.3B	**6,502**	6,127	48,263
Total Payables		**91,097**	81,553	100,261
Interest Bearing Liabilities				
Leases	2.4A	**129,284**	147,570	96,748
Total Interest Bearing Liabilities		**129,284**	147,570	96,748
Provisions				
Employee Provisions	4.1	**74,443**	70,252	67,177
Provision for Restoration	2.5	**35,173**	28,312	26,965
Total Provisions		**109,616**	98,564	94,142
Total Liabilities		**329,997**	327,687	291,151
Net Assets		**935,295**	981,295	1,036,529
EQUITY				
Contributed Equity		**1,796,418**	1,689,665	1,840,417
Reserves		**383,807**	383,807	334,049
Accumulated Deficit		**(1,244,930)**	(1,092,177)	(1,137,937)
Total Equity		**935,295**	981,295	1,036,529

1. Right-of-use assets are included in the following line items: Land and Buildings.

The above statement should be read in conjunction with the accompanying notes.

BUREAU OF METEOROLOGY
Statement of Financial Position
for the period ended 30 June 2024

Budget Variances Commentary

Cash
The balance in the Cash in Special Account was higher than budgeted at 30 June 2024 due to a large receipt in June related to funding for 2024-25.

Trade and Other Receivables
Receivables from goods and services higher than budgeted at 30 June 2024, offset in part by lower than budgeted ordinary annual appropriation balances due to the operating loss.

Accrued Revenue
Accrued revenue includes an accrual for the Defence arrangement that was budgeted to have been received during the financial year.

Non-Financial Assets
The Bureau's stocktake and Make Good valuation resulted in partially or fully impairing assets and write-off and disposal of assets that impacted the non-financial asset movement.

Other Payables
The variance reflects timing of payments to suppliers.

Leases
Addition of new lease, and adjustments to reflect adjustments made on review of right of use asset and liabilities not known during development of the budget.

Employee Provisions
Variance reflects impact of Bureau of Meteorology Enterprise Agreement 2024 pay increases not known during development of the budget.

BUREAU OF METEOROLOGY
Statement of Changes in Equity
for the period ended 30 June 2024

	2024 $'000	2023 $'000	Original Budget 2024 $'000
CONTRIBUTED EQUITY			
Balance carried forward from previous period	**1,689,665**	1,499,868	1,689,664
Adjusted opening balance	**1,689,665**	1,499,868	1,689,664
Transactions with owners			
Contributions by owners			
Equity injection - Appropriations	**10,788**	130,218	25,788
Departmental capital budget	**95,965**	59,579	124,965
Total transactions with owners	**106,753**	189,797	150,753
Closing balance as at 30 June	**1,796,418**	1,689,665	1,840,417
RETAINED EARNINGS			
Opening balance			
Balance carried forward from previous period	**(1,092,177)**	(967,431)	(1,027,529)
Adjusted opening balance	**(1,092,177)**	(967,431)	(1,027,529)
Comprehensive income			
Deficit for the period	**(152,753)**	(124,207)	(110,408)
Total comprehensive income	**(152,753)**	(124,207)	(110,408)
Transactions with owners			
Distributions to owners			
Other	**-**	(539)	-
Total transactions with owners	**-**	(539)	-
Closing balance as at 30 June	**(1,244,930)**	(1,092,177)	(1,137,937)
ASSET REVALUATION RESERVE			
Opening balance			
Balance carried forward from previous period	**383,807**	334,049	334,049
Adjusted opening balance	**383,807**	334,049	334,049
Comprehensive income			
Change in asset revaluation reserve	**-**	49,758	-
Total comprehensive income	**-**	49,758	-
Closing balance as at 30 June	**383,807**	383,807	334,049

BUREAU OF METEOROLOGY
Statement of Changes in Equity
for the period ended 30 June 2024

	2024 $'000	2023 $'000	Original Budget 2024 $'000
TOTAL EQUITY			
Opening balance			
Balance carried forward from previous period	**981,295**	866,486	996,184
Adjusted opening balance	**981,295**	866,486	996,184
Comprehensive income			
Deficit for the period	**(152,753)**	(124,207)	(110,408)
Total comprehensive income	**(152,753)**	(124,207)	(110,408)
Other comprehensive income			
Change to asset revaluation reserve	**-**	49,758	-
Total other comprehensive income	**-**	49,758	-
Transactions with owners			
Distributions to owners			
Returns of capital			
Other	**-**	(539)	-
Contributions by owners			
Equity injection - Appropriations	**10,788**	130,218	25,788
Departmental capital budget	**95,965**	59,579	124,965
Total transactions with owners	**106,753**	189,258	150,753
Closing balance as at 30 June	**935,295**	981,295	1,036,529

The above statement should be read in conjunction with the accompanying notes.

Accounting Policy

Equity Injections
Amounts appropriated which are designated as 'equity injections' for a year (less any formal reductions) and Departmental Capital Budgets (DCBs), are recognised directly in contributed equity in that year.

Other Distributions to Owners
The Financial Reporting Rule requires that distributions to owners be debited to contributed equity unless it is in the nature of a dividend.

BUREAU OF METEOROLOGY
Cash Flow Statement
for the period ended 30 June 2024

	Notes	2024 $'000	2023 $'000	Original Budget 2024 $'000
OPERATING ACTIVITIES				
Cash received				
Appropriations		**545,499**	461,308	413,649
Sales of goods and rendering of services		**129,022**	95,289	99,637
Other		**1,725**	-	-
GST received		**31,800**	24,668	-
Total cash received		**708,046**	581,265	513,286
Cash used				
Employees		**(240,376)**	(208,076)	(216,517)
Suppliers		**(227,168)**	(218,838)	(176,653)
Interest payments on lease liabilities		**(2,339)**	(1,617)	(656)
Section 74 receipts transferred to the OPA		**(172,612)**	(113,780)	(99,638)
GST paid		**(30,243)**	-	(1,974)
Total cash used		**(672,738)**	(542,311)	(495,438)
Net cash from operating activities		**35,308**	38,954	17,848
INVESTING ACTIVITIES				
Cash received				
Proceeds from sales of property, plant and equipment and assets held for sale		**594**	1,153	1,225
Total cash received		**594**	1,153	1,225
Cash used				
Purchase of property, plant and equipment and intangibles		**(224,187)**	(202,016)	(234,552)
Total cash used		**(224,187)**	(202,016)	(234,552)
Net cash used by investing activities		**(223,593)**	(200,863)	(233,327)
FINANCING ACTIVITIES				
Cash received				
Departmental capital budget		**94,136**	58,263	-
Contributed equity		**113,830**	134,611	230,766
Total cash received		**207,966**	192,874	230,766
Cash used				
Principal payments of lease liabilities		**(20,952)**	(27,626)	(15,287)
Other		**-**	(539)	-
Total cash used		**(20,952)**	(28,165)	(15,287)
Net cash from financing activities		**187,014**	164,709	215,479
Net increase/(decrease) in cash held		**(1,271)**	2,800	-
Cash and equivalents at the beginning of the reporting period		**3,230**	430	430
Cash and equivalents at the end of the reporting period	2.1A	**1,959**	3,230	430

The above statement should be read in conjunction with the accompanying notes.

BUREAU OF METEOROLOGY
Cash Flow Statement
for the period ended 30 June 2024

Budget Variances Commentary

Cashflow

Appropriations

Appropriations drawdown higher than budgeted reflecting the drawdown of the appropriation reclassification and increased supplier payments.

Sale of goods

Receipts higher than budgeted reflecting new arrangements for project activity for own source revenue contracts.

GST and Suppliers

The budget reflects GST as a net figure where the cash flow presents gross GST received and GST paid separately.

Section 74 receipts transferred to the Official Public Account (OPA)

Transfers to OPA higher than budget reflecting value of receipts for external contracts and timing of receipts.

Cash received Departmental Capital Budget (DCB) and Equity

Lower drawdown of DCB/ Equity associated with purchase of Property Plant and Equipment.

Principle payments on lease liabilities

Cashflow presents principle lease payments on right of use asset and liabilities that were not budgeted for.

Overview

Objectives of the Entity
The Bureau of Meteorology (the Bureau) is Australia's national weather, climate and water information agency operating under the authority of the *Meteorology Act 1955* and the *Water Act 2007.*

The Bureau is an Executive Agency under the *Public Service Act 1999*, and a non-corporate Commonwealth entity under the PGPA Act. The Bureau operates under the Climate Change, Energy, the Environment and Water Portfolio and reports to the Minister for the Environment and Water.

The Bureau enables a safe, prosperous, secure and healthy Australia through the provision of weather, water, climate, ocean and space weather services.

The Bureau's work directly informs decisions by governments and the community and supports industry in key sectors such as emergency management, aviation, transport, water management, agriculture and environmental management.

The Basis of Preparation
The financial statements are required by section 42 of the PGPA Act.

The financial statements have been prepared in accordance with:

a) *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015 (FRR)*; and

b) *Australian Accounting Standards and Interpretations* - including simplified disclosures for Tier 2 Entities under AASB 1060 issued by the Australian Accounting Standards Board (AASB) that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position. The financial statements are presented in Australian dollars.

New Accounting Standards
The Bureau has not adopted any new Australian Accounting Standards in the 2024 financial statements.

Taxation
The Bureau is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

Events After the Reporting Period
There has been no subsequent event that had the potential to significantly affect the ongoing structure and financial activities of the Bureau.

Financial Performance

This section analyses the financial performance of the Bureau of Meteorology for the year ended 2024.

1.1 Expenses

	2024 $'000	2023 $'000
1.1A: Employee Benefits		
Wages and salaries	**179,152**	148,426
Superannuation		
Defined contribution plans	**24,810**	21,510
Defined benefit plans	**9,549**	10,359
Leave and other entitlements	**28,180**	26,230
Separation and redundancies	**2,808**	3,002
Other	**459**	1,041
Total employee benefits	**244,958**	210,568

Accounting Policy

Accounting policies for employee related expenses are contained in the People and Relationships section (Note 4.1).

	2024 $'000	2023 $'000
1.1B: Supplier Expenses		
Goods and services supplied or rendered		
Consultants	**7,722**	1,879
Contractors	**54,643**	45,527
External professional provider services	**47,641**	53,750
Communication and consumables - observing network	**38,334**	26,206
IT Licence and maintenance	**53,525**	38,337
Property operating expenses	**9,949**	7,880
IT services	**3,639**	4,244
Office expenses	**1,144**	1,426
Other	**8,633**	4,441
Total goods and services supplied or rendered	**225,230**	183,690
Goods supplied	**12,149**	14,075
Services rendered	**213,081**	169,615
Total goods and services supplied or rendered	**225,230**	183,690
Other suppliers		
Property other	**15,809**	5,747
Workers compensation expenses	**670**	846
Short-term leases	**-**	725
Low value leases	**343**	-
Total other suppliers	**16,822**	7,318
Total suppliers	**242,052**	191,008

The Bureau has low value lease commitments of $342,530 and no short-term lease commitments as at 30 June 2024.

The above lease disclosures should be read in conjunction with the accompanying Notes 1.1C, 2.2A and 2.4A.

Accounting Policy

Short-term Leases and Leases of Low-value Assets

The Bureau has elected not to recognise right-of-use assets and lease liabilities for short-term leases of assets that have a lease term of 12 months or less and leases of low-value assets (less than $10,000). The Bureau recognises the lease payments associated with these leases as an expense on a straight-line basis over the lease term.

	2024 $'000	2023 $'000
1.1C: Finance Costs		
Unwinding of discount	**938**	735
Interest on lease liabilities	**2,339**	1,617
Total finance costs	**3,277**	2,352

The above lease disclosures should be read in conjunction with the accompanying Notes 1.1B, 2.2A and 2.4A.

	2024 $'000	2023 $'000
1.1D: Write-Down and Impairment of Assets		
Trade and other receivables	**307**	263
Property, plant and equipment	**2,073**	23,317
Intangibles	**3,206**	7,364
Other	**2,575**	490
Total write-down and impairment of assets	**8,161**	31,434

Write-down of property, plant and equipment and intangibles includes, stocktake adjustments $1.520m, software impairment assessment $3.206m, and assets under construction $0.553m.

1.2 Own-Source Revenue

	2024 $'000	2023 $'000
1.2A: Revenue from Contracts with Customers		
Sale of goods	**1,310**	1,629
Rendering of services	**62,350**	63,365
Total revenue from sale of goods and services	**63,660**	64,994
Disaggregation of revenue		
Major product / service line:		
Defence weather services	**19,320**	21,549
Consultative services	**26,273**	24,778
Research	**4,756**	7,244
Other revenue	**13,311**	11,423
	63,660	64,994

Accounting Policy

Revenue from the sale of goods is recognised when control has been transferred to the buyer.

A contract is in scope of AASB 15 when it is probable that the Bureau will collect the consideration to which it will be entitled based on the existing relationship with, and knowledge of, the customer's ability and intention to pay the consideration.

Defence weather, consultative and research services - Recognition is contingent on the terms of the individual contract. Due to the nature of the services, revenue is recognised upon delivery of services or performance obligations over time in line with the term of the contract as per AASB 15.

The transaction price is the total amount of consideration to which the entity expects to be entitled in exchange for transferring promised goods or services to a customer. The consideration promised in a contract with a customer may include fixed amounts, variable amounts, or both.

Receivables for goods and services, which have 30 day terms, are recognised at the nominal amounts due less any impairment allowance. Collectability of debts is reviewed at end of the reporting period. Allowances are made when collectability of the debt is no longer probable.

Aviation revenue falls under the scope of AASB 1058. Aviation weather services relate to the provision of meteorological services in support of the Civil Aviation, the costs for which is recovered pursuant to the *Meteorology Act 1955*.

	2024 $'000	2023 $'000
1.2B: Aviation Industry		
Revenue from Aviation	**54,347**	33,269
Total other revenue	**54,347**	33,269

	2024 $'000	2023 $'000
1.2C: Other Revenue		
Resources received free of charge		
Remuneration of auditors	**105**	105
Inventory received free of charge[1]	**-**	232
Insurance refunds	**-**	214
Other	**14**	9
Total other revenue	**119**	560

1. Consists of bathythermographs gifted from the United States Navy and Japanese Navy, radiosondes as replacement for faulty products and project stock donated for general use.

Accounting Policy

Resources Received Free of Charge

Resources received free of charge are recognised as revenue when, and only when, a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense. Resources received free of charge are recorded as either revenue or gains depending on their nature.

	2024 $'000	2023 $'000
1.2D: Revenue from Government		
Appropriations		
Departmental appropriations	**362,286**	345,500
Total revenue from Government	**362,286**	345,500

Accounting Policy

Revenue from Government

Amounts appropriated for departmental appropriations for the year (adjusted for any formal additions and reductions) are recognised as Revenue from Government when the Bureau gains control of the appropriation, except for certain amounts that relate to activities that are reciprocal in nature, in which case revenue is recognised only when it has been earned. Appropriations receivable are recognised at their nominal amounts.

Financial Position

This section analyses the Bureau of Meteorology's assets used to conduct its operations and the operating liabilities incurred as a result. Employee related information is disclosed in the People and Relationships section.

2.1 Financial Assets

	2024 $'000	2023 $'000
2.1A: Cash and Cash Equivalents		
Cash on hand or on deposit	**496**	1,348
Cash in special accounts	**1,463**	1,882
Total cash and cash equivalents	**1,959**	3,230

Accounting policy

Cash is recognised at its nominal amount. Cash and cash equivalents includes:

a) Cash on hand.

b) Cash in special accounts.

	2024 $'000	2023 $'000
2.1B: Trade and Other Receivables		
Goods and services receivables		
Goods and Services	**8,903**	5,439
Contract assets from contracts with customers	**9,100**	7,142
Total goods and services receivables	**18,003**	12,581
Appropriation receivables		
For ordinary annual appropriation	**93,019**	103,620
For capital - capital budget	**3,145**	1,316
For equity injection	**29,971**	133,013
Total appropriation receivables	**126,135**	237,949
Other receivables		
GST receivable from the Australian Taxation Office	**2,775**	4,331
Other	**359**	14
Total other receivables	**3,134**	4,345
Total trade and other receivables (gross)	**147,272**	254,875
Less expected credit loss allowance	**(64)**	(89)
Total trade and other receivables (net)	**147,208**	254,786

Accounting Policy

Financial Assets

Trade receivables and other receivables that are held for the purpose of collecting the contractual cash flows where the cash flows are solely payments of principal and interest, that are not provided at below-market interest rates, are subsequently measured at amortised cost using the effective interest method adjusted for any loss allowance.

Credit terms for goods and services were 30 days (2023: 30 days).

Refer Note 2.3A for information relating to contract liabilities, for contracts with customers.

2.2 Non-Financial Assets

2.2A: Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment and Intangibles

	Land	Buildings	Plant and equipment	Computer software	Other intangibles	Total
	$'000	$'000	$'000	$'000	$'000	$'000
Total as at 1 July 2023						
Gross book value	15,817	282,493	482,669	499,969	1,786	1,282,734
Accumulated depreciation and amortisation	(991)	(72,832)	(30,633)	(153,538)	(925)	(258,919)
Adjusted total as at 1 July 2023	**14,826**	**209,661**	**452,036**	**346,431**	**861**	**1,023,815**
Additions						
Purchase or Internally developed	-	3,977	106,642	96,548	-	207,167
Right-of-use assets	299	2,614	-	-	-	2,913
Depreciation and amortisation	-	(2,160)	(52,969)	(52,980)	(308)	(108,417)
Depreciation on right-of-use assets	(389)	(23,405)	-	-	-	(23,794)
Disposals	(200)	(1,936)	(75)	(3,206)	(553)	(5,970)
Disposals of right-of-use assets	-	(31)	-	-	-	(31)
Other movements	-	(1,162)	(11,490)	8,262	-	(4,390)
Total as at 30 June 2024	**14,536**	**187,558**	**494,144**	**395,055**	**-**	**1,091,293**
Total as at 30 June 2024 represented by:						
Gross book value	15,916	280,150	576,282	601,573	-	1,473,921
Accumulated depreciation and amortisation	(1,380)	(92,592)	(82,138)	(206,518)	-	(382,628)
Total as at 30 June 2024	**14,536**	**187,558**	**494,144**	**395,055**	**-**	**1,091,293**
Carrying amount of right-of-use assets	**4,297**	**112,269**	**-**	**-**	**-**	**116,566**

Contractual commitments for the acquisitions of property, plant and equipment and intangible assets

	2024 $'000	2023 $'000
Capital commitments		
Property, plant and equipment		
Within 1 year	**9,256**	148,482
Between 1 to 5 years	**59**	2,018
Computer software		
Within 1 year	**539**	1,399
Between 1 to 5 years	**3,059**	-
Total capital commitments	**12,913**	151,899

Reclassification made to 2023 commitment bands.

Accounting Policy

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Non-financial assets are initially measured at their fair value plus transaction costs where appropriate.

Assets acquired at no cost, or for nominal consideration, are initially recognised as assets and income at their fair value at the date of acquisition, unless acquired as a consequence of restructuring of administrative arrangements. In the latter case, assets are initially recognised as contributions by owners at the amounts at which they were recognised in the transferor's accounts immediately prior to the restructuring.

Asset Recognition Threshold

The following thresholds apply for the recognition of purchases of property, plant and equipment in the Statement of Financial Position. The cost of an asset includes an estimate of the cost of dismantling and removing the item and restoring the site on which it is located. This is particularly relevant to Make Good provisions in property leases taken up by the Bureau where there exists an obligation to restore the property to its original condition. These costs are included in the value of the Bureau's leasehold improvements and relevant assets with a corresponding liability recognised as a provision for 'Make Good' (Note 2.5).

Asset Type	Threshold	
	2024	2023
Land	No threshold	No threshold
Buildings	$50,000	$50,000
Plant and equipment	$5,000	$5,000
Computer software	$50,000	$50,000
Other intangibles	$50,000	$50,000

Lease Right-of-Use (ROU) Assets

Lease ROU assets are capitalised at the commencement date of the lease and comprise of the initial lease liability amount, initial direct costs incurred when entering into the lease less any lease incentives received. After the commencement date, ROU assets are measured at cost less any accumulated depreciation and accumulated losses and adjusted for any re-measurement of the lease liability. These assets are accounted for by the Bureau as separate asset classes to corresponding assets owned outright, but included in the same column as where the corresponding underlying assets would be presented if they were owned.

Revaluations

Following initial recognition at cost, land, buildings, property, plant and equipment (excluding ROU assets) are carried at fair value (or an amount not materially different from fair value) less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets do not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depended upon the volatility of movements in market values for the relevant assets.

Revaluation adjustments are made on a class basis. Any revaluation increment is credited to equity under the heading of asset revaluation reserve except to the extent that it reversed a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit. Revaluation decrements for a class of assets are recognised directly in the surplus/deficit except to the extent that they reversed a previous revaluation increment for that class.

Any accumulated depreciation as at the revaluation date was eliminated against the gross carrying amount of the asset and the asset restated to the revalued amount.

In 2023 the Bureau engaged the service of ValQuip Consulting Pty Ltd (ValQuip) together with CIVAS (NSW) Pty Ltd (a subsidiary to Colliers) to carry out an independent valuation of certain property, plant, and equipment assets. The valuation for financial reporting was conducted in accordance with AASB 13 Fair Value Measurement.

The following methods were used to estimate Fair Value:

- Market approach - was used to estimate value from an analysis of actual transactions or offerings for economically comparable assets available as of the valuation date. The process was essentially that of comparison and correlation between the subject asset and similar assets that were sold or were offered for sale in the market. The transaction or offering prices of the comparable assets were adjusted for dissimilarities in characteristics including location, age, time of sale, size, and utility, among others. The adjusted prices of the comparable assets provided an indication of value for the subject asset.
- Cost approach - was based on the principle of substitution, which suggested that a prudent buyer will pay no more for an asset than the cost to acquire a substitute asset of equal utility. When the cost to reproduce an asset exceeds the cost to replace it, if measurable, the cost of replacement is normally the appropriate starting point to develop an indication of value using the cost approach. The cost approach was used to determine values in circumstances where it was not possible to determine values using a market approach or an income approach.

Land and buildings were valued using the market and cost approach.

Plant and equipment primarily used the cost approach.

In 2024 Management has assessed the fair value of assets and no indicators of impairment were noted.

Make Good Valuation
The Bureau of Meteorology (the Bureau) engaged ValQuip Consulting Pty Ltd (ValQuip) to carry out an independent assessment of Make Good obligation at specific Bureau leasehold locations and provision values as at 30 June 2024 for financial reporting purposes.

The Make Good assessment for financial reporting has been conducted in accordance with AASB 116 Property, Plant and Equipment (PPE), AASB 16 Leases, AASB 13 Fair Value Measurement and AASB 137 Provisions, Contingent Liabilities & Contingent Assets.

Leases taken up by the Bureau, where an obligation exists to restore the property to its original condition, are included in the value of the Bureau's relevant assets and a corresponding liability recognised as a restoration obligation or Make Good provision.

Make Good obligations are measured at the best estimate of the expenditure required to settle the present obligation at the reporting date, including the risks and uncertainties specific to the liabilities.

Make Good assets were updated to reflect the valuation as provided by the ValQuip resulting in both addition and disposal of associated Make Good assets.

Depreciation
Depreciable property, plant and equipment assets are written-off to their estimated residual values over their estimated useful lives to the Bureau using, in all cases, the straight-line method of depreciation.

Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

Depreciation rates applying to each class of depreciable asset, excluding ROU assets, are based on the following useful lives:

	2024	2023
Buildings on freehold land	**5 to 52 Years**	5 to 52 Years
Leasehold improvements	**Lease term**	Lease term
Property, plant and equipment	**2 to 50 Years**	2 to 50 Years

The depreciation rates for ROU assets are based on the commencement date to the earlier of either the end of the useful life of the ROU asset or the end of the lease term.

Impairment
All assets, including intangible assets, were assessed for impairment at 30 June 2024. Where indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

The recoverable amount of an asset is the higher of its fair value less costs of disposal and its value in use. Value in use is the present value of the future cash flows expected to be derived from the asset. Where the future economic benefit of an asset is not primarily dependent on the asset's ability to generate future cash flows and the asset would be replaced if the Bureau were deprived of the asset, its value in use is taken to be its depreciated replacement cost.

Derecognition
An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

Intangibles
The Bureau's intangibles comprise computer software which is carried at cost less accumulated amortisation and accumulated impairment losses.

Software is amortised on a straight-line basis over its anticipated useful life. The useful lives of the Bureau's software is predominately 3 to 5 years.

	2024 $'000	2023 $'000
2.2B: Inventories		
Inventories held for distribution	**9,991**	7,912
less: provision for obsolescence	**(3,224)**	(3,094)
Total inventories	**6,767**	4,818

During 2024, impairment losses of $0.388m were recognised in profit or loss (2023: $0.489m).

Assessment of the loss of service potential of inventories held for distribution was based on frequency of usage, potential obsolescence and overstocking.

Accounting Policy

Inventories held for distribution are valued at cost, adjusted for any loss of service potential.

The Bureau's inventory holding consists of items utilised in the installation of sites, or the repair/maintenance of its equipment.

Items held for the purposes of major spare parts or as stand-by equipment are classified in the Bureau's accounts and records as property, plant and equipment in accordance with AASB 116.

2.3 Payables

	2024 $'000	2023 $'000
2.3A: Suppliers Payable		
Trade creditors and accruals	**49,496**	58,653
Contract liabilities from contracts with customers	**35,099**	16,773
Total suppliers payable	**84,595**	75,426

The payment terms for goods and services were 20 calendar days from the receipt of a correctly rendered invoice (2022: 30 days).

Refer Note 2.1B for information relating to contract assets from contracts with customers.

	2024 $'000	2023 $'000
2.3B: Other Payables		
Wages and salaries	**5,972**	5,707
Superannuation	**530**	156
Separation and redundancies	**-**	264
Total other payables	**6,502**	6,127

2.4 Interest Bearing Liabilities

	2024 $'000	2023 $'000
2.4A: Leases		
Lease liabilities		
Land	**4,580**	4,584
Buildings	**124,704**	142,986
Total leases	**129,284**	147,570
Maturity analysis – contractual undiscounted cash flows		
Within 1 year	**23,606**	21,490
Between 1 to 5 years	**64,015**	75,332
More than 5 years	**61,263**	73,387
Total leases	**148,884**	170,209

Total cash outflow for leases for the year ended 30 June 2024 was $23.290m (2023: $29.243m).

Significant lease arrangements:

- Main Data Centre – 15 year lease term expiring 14 April 2039. Contains annual price increases based on CPI rates.
- Backup Data Centre – 6 year lease term, with 3 option periods up to 01 October 2037. Contains annual price increases based on CPI rates.
- 700 Collins Street, Docklands VIC – 10 year lease term expiring 31 July 2026. Contains annual fixed price increases based on 3.5% annual fixed rate review.

The Bureau in its capacity as lessee does not have any significant leasing arrangements with below market terms.

The above lease disclosures should be read in conjunction with the accompanying notes 1.1B, 1.1C and 2.2A.

Accounting Policy

For all new contracts entered into, the Bureau considers whether the contract is, or contains a lease. A lease is defined as 'a contract, or part of a contract, that conveys the right to use an asset (the underlying asset) for a period of time in exchange for consideration'.

Once it has been determined that a contract is, or contains a lease, the lease liability is initially measured at the present value of the remaining lease payments unpaid at the commencement date, discounted using the interest rate implicit in the lease, if that rate is readily determinable, or the department's incremental borrowing rate.

Subsequent to initial measurement, the liability will be reduced for payments made and increased for interest. It is remeasured to reflect any reassessment or modification to the lease. When the lease liability is remeasured, the corresponding adjustment is reflected in the right-of-use asset or profit and loss depending on the nature of the reassessment or modification.

2.5 Provision for Restoration

	2024 $'000	2023 $'000
As at 1 July	**28,312**	26,965
Additional provisions made	**11,483**	612
Amounts used / revaluation	**(5,560)**	-
Unwinding of discount or change in discount rate	**938**	735
Total as at 30 June	**35,173**	28,312

Accounting Judgements and Estimates

Make Good

A provision for restoration obligation (Make Good) is recognised if, as a result of a past event, the Bureau has a present obligation (legal or constructive) that can be estimated reliably and it is probable that an outflow of economic benefits will be required to settle the obligation. Make Good provisions are measured at the best estimate of the expenditure required to settle the present obligation at reporting date, including the risks and uncertainties specific to the liabilities.

Make Good provisions are discounted to present value when the time value of money is material.

ValQuip undertook an external revaluation of Make Good, provisions for restoration as at 30 June 2024.

Refer Note 2.2A.

Funding

This section identifies the Bureau of Meteorology's funding structure.

3.1 Appropriations

3.1A: Annual Appropriations

Annual Appropriations for 2024

	Annual Appropriations	Adjustments to Appropriations[1]	Total Appropriations	Appropriation applied in 2024 (current and prior years)	Variance[2]
	$'000	$'000	$'000	$'000	$'000
Departmental					
Ordinary annual services	362,286	172,612	534,898	(546,348)	(11,450)
Capital budget[3]	95,965	-	95,965	(94,136)	1,829
Other services					
Equity injections	10,788	-	10,788	(113,830)	(103,042)
Total Departmental	**469,039**	**172,612**	**641,651**	**(754,314)**	**(112,663)**

1. The adjustments to appropriations includes adjustments to current year annual appropriations including the PGPA Act Section 74 Receipts.
2. The variances disclosed are made up of the movement in cash, appropriation receivable.
3. Departmental and Administered Capital Budgets are appropriated through Appropriation Acts (No.1,3,5). They form part of ordinary annual services and are not separately identified in the Appropriation Acts.

Annual Appropriations for 2023

	Annual Appropriations	Adjustments to Appropriations[1]	Total Appropriations	Appropriation applied in 2023 (current and prior years)	Variance[2]
	$'000	$'000	$'000	$'000	$'000
Departmental					
Ordinary annual services	348,941	113,780	462,721	(458,456)	4,265
Capital budget[3]	59,579	-	59,579	(58,263)	1,316
Other services					
Equity injections	130,218	-	130,218	(134,611)	(4,393)
Total Departmental	**538,738**	**113,780**	**652,518**	**(651,330)**	**1,188**

1. The adjustment to appropriations includes adjustments to current year annual appropriations including the PGPA Act Section 74 Receipts.
2. The variances disclosed are made up of the movement in cash and appropriation receivable.
3. Departmental and Administered Capital Budgets are appropriated through Appropriation Acts (No.1,3,5). They form part of ordinary annual services and are not separately identified in the Appropriation Acts.

	2024 $'000	2023 $'000
3.1B: Unspent Annual Appropriations ('Recoverable GST exclusive')		
Departmental		
Appropriation Act (No 1) - Operating - 2023-24	**48,494**	-
Appropriation Act (No 3) - Operating - 2023-24	**15,525**	-
Ordinary Annual Services of the Government - Appropriation Act (No. 5) - Operating	**29,000**	-
DCB Appropriation Act (No.1) 2023 -2024	**3,145**	-
Appropriation Act (No.2) Equity 2023-2024	**10,788**	-
Supply Act (No.4) Equity 2023-2024	**19,183**	-
Appropriation Act (No 1) - Operating - 2022-23	**-**	42,482
Supply Act (No. 3) - Operating - 2022-23	**-**	61,138
DCB Supply Act (No.3) 2022 -2023	**-**	1,316
Appropriation Act (No.2) Equity 2022-2023	**-**	58,557
Appropriation Act (No.4) Equity 2022-2023	**-**	71,661
Appropriation Act (No.2) Equity 2021-2022	**-**	2,626
Appropriation Act (No.4) Equity 2020-2021	**-**	169
Cash and cash equivalents	**496**	1,347
Total departmental	**126,631**	239,296

3.2 Special Accounts

	Services for Other Entities and Trust Moneys - Bureau of Meteorology Special Account[1]	
	2024 $'000	2023 $'000
Balance brought forward from previous period	**1,882**	1,108
Increases	**1,373**	1,424
Available for payments	**3,255**	2,532
Decreases	**(1,792)**	(650)
Total Departmental	**1,463**	1,882
Total balance carried to the next period	**1,463**	1,882
Balance represented by:		
Cash held in the Official Public Account	**1,463**	1,882
Total balance carried to the next period	**1,463**	1,882

1. Appropriation: *Public Governance, Performance and Accountability Act 2013, Section 78.*

Establishing Instrument: *Financial Management and Accountability Determination 2010/02.*

Purpose: To enable the Bureau to hold and expend amounts on behalf of persons or entities other than the Commonwealth.

3.3 Net Cash Appropriation Arrangements

	2024 $'000	2023 $'000
3.3: Net Cash Appropriation Arrangements		
Total comprehensive income/(loss) - as per the Statement of Comprehensive Income	**(152,753)**	(74,449)
Plus: depreciation/amortisation of assets funded through appropriations (departmental capital budget funding and/or equity injections)	**108,417**	107,764
Plus: depreciation right-of-use assets	**23,794**	25,710
Less: lease principal repayments	**(20,952)**	(26,009)
Net Cash Operating Surplus/(Deficit) attributable to the Bureau[1]	**(41,494)**	33,016

From 2010-11, the Government introduced net cash appropriation arrangements where revenue appropriations for depreciation/amortisation expenses of non-corporate Commonwealth entities and selected corporate Commonwealth entities were replaced with a separate capital budget provided through equity appropriations. Capital budgets are to be appropriated in the period when cash payment for capital expenditure is required.

The inclusion of depreciation/amortisation expenses related to ROU leased assets and the lease liability principal repayment amount reflects the impact of AASB 16 Leases, which does not directly reflect a change in appropriation arrangements.

1. The Net Cash Operating Deficit includes $8.2m in unbudgeted write-downs and impairment of non-financial assets.

People and Relationships

This section describes a range of employment and post employment benefits provided to our people and our relationships with other key people.

4.1 Employee Provisions

	2024 $'000	2023 $'000
4.1: Employee Provisions		
Leave	**74,409**	70,218
FBT payable	**34**	34
Total employee provisions	**74,443**	70,252

Accounting Policy

Liabilities for 'short-term employee benefits' and termination benefits expected within twelve months of the end of reporting period are measured at their nominal amounts.

Other long term employee benefits are measured as net total of the present value of the defined benefit obligation at the end of the reporting period minus the fair value at the end of the reporting period of plan assets (if any) out of which the obligations are to be settled directly.

Leave
The liability for employee benefits includes provision for annual leave and long service leave.

The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied at the time leave is taken, including the Bureau's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liabilities for annual leave and long service leave have been determined by reference to the work of an actuary as at 30 June 2024. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

Separation and redundancy
Provision is made for separation and redundancy benefit payments. The Bureau recognises a provision for termination when it has developed a detailed formal plan for the terminations and has informed those employees affected that it will carry out the terminations.

Termination benefits
An employee whose employment is terminated under section 29(3) of the Public Service Act following their agreement to be voluntarily retrenched is entitled to be paid a severance benefit of an amount equal to two weeks' salary for each completed year of continuous service, plus a pro-rata payment for completed months of service since the last completed year of service, subject to any minimum amount the employee is entitled to under the National Employment Standards (NES). Separation payments for the year ended 30 June 2024 were $0.636m (2023: $0).

Superannuation
Staff of the Bureau are members of the Commonwealth Superannuation Scheme (CSS), the Public Sector Superannuation Scheme (PSS), the PSS accumulation plan (PSSap) and other superannuation funds held outside the Australian Government. The CSS and PSS are defined benefit schemes for the Australian Government. The PSSap is a defined contribution scheme.

The liability for defined benefits is recognised in the financial statements of the Australian Government and is settled by the Australian Government in due course. This liability is reported in the Department of Finance's administered schedules and notes.

The Bureau makes employer contributions to the employees' superannuation scheme at rates determined by an actuary to be sufficient to meet the current cost to the Government. The Bureau accounts for the contributions as if they were contributions to defined contribution plans.

The liability for superannuation recognised as at 30 June 2024 represents outstanding contributions.

4.2 Key Management Personnel Remuneration

Key management personnel are those persons having authority and responsibility for planning, directing and controlling the activities of the Bureau, directly or indirectly, including any director (whether executive or otherwise) of the Bureau. The Bureau has determined the key management personnel to be the Director of Meteorology/Chief Executive Officer and Group Executives. Key management personnel remuneration is reported in the table below:

	2024 $'000	2023 $'000
Short-term employee benefits	**2,548**	2,735
Post-employment benefits	**411**	401
Other long-term employee benefits	**61**	49
Total key management personnel remuneration expenses[1]	**3,020**	3,185

The total number of key management personnel that are included in the above table are 7 individuals (2023: 8 individuals however, 1 for only part year).

1. The above key management personnel remuneration excludes the remuneration and other benefits of the Portfolio Minister. The Portfolio Minister's remuneration and other benefits are set by the Remuneration Tribunal and are not paid by the Bureau.

4.3 Related Party Disclosures

Related party relationships:
The Bureau is an Australian Government controlled entity. Related parties to the Bureau are Key Management Personnel including the Portfolio Minister and Executive, and other Australian Government entities.

Transactions with related parties:
Given the breadth of Government activities, related parties may transact with the government sector in the same capacity as ordinary citizens. Such transactions include the payment or refund of taxes, receipt of a Medicare rebate or higher education loans. These transactions have not been separately disclosed in this note.

Significant transactions with related parties can include:

- the payments of grants or loans
- purchases of goods and services
- asset purchases, sales, transfers or leases
- debts forgiven, and
- guarantees.

Giving consideration to relationships with related entities, and transactions entered into during the reporting period by the Bureau, it has been determined that there are no related party transactions to be separately disclosed.

Managing Uncertainties

This section analyses how the Bureau of Meteorology manages financial risks within its operating environment.

5.1 Contingent Assets and Liabilities

	Claim for damages or costs	
	2024 $'000	2023 $'000
5.1A: Contingent Assets and Liabilities		
Contingent assets		
Balance from previous period	**79**	365
New contingent assets recognised	**480**	124
Assets realised	**(102)**	(410)
Total contingent assets	**457**	79
Contingent liabilities		
Balance from previous period	**-**	-
New contingent liabilities recognised	**(24,258)**	-
Total contingent liabilities	**(24,258)**	-
Net contingent assets/(liabilities)	**(23,801)**	79

Quantifiable contingencies

The Bureau has a number of claims with Comcover in respect of motor vehicle damage, radar equipment and property and Make Good.

Unquantifiable contingencies

The Bureau has unquantifiable contingencies relating to ongoing legal matters.

Accounting Policy

Contingent liabilities and contingent assets are not recognised in the Statement of Financial Position but are reported in the notes. They may arise from uncertainty as to the existence of a liability or asset or represent an asset or liability in respect of which the amount cannot be reliably measured.

Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

5.2 Financial Instruments

	2024 $'000	2023 $'000
5.2A: Categories of Financial Instruments		
Financial assets at amortised cost		
Cash and cash equivalents	**1,959**	3,230
Trade receivables	**17,939**	12,492
Total financial assets at amortised cost	**19,898**	15,722
Total financial assets	**19,898**	15,722
Financial liabilities measured at amortised cost		
Supplier payables	**46,390**	31,154
Total financial liabilities measured at amortised cost	**46,390**	31,154
Total financial liabilities	**46,390**	31,154

Accounting Policy

Financial assets

In accordance with AASB 9 Financial Instruments, the Bureau classifies its financial assets in the following categories:

a) financial assets at fair value through profit or loss

b) financial assets at fair value through other comprehensive income, and

c) financial assets measured at amortised cost.

The classification depends on both the entity's business model for managing the financial assets and contractual cash flow characteristics at the time of initial recognition. Financial assets are recognised when the entity becomes a party to the contract and, as a consequence, has a legal right to receive or a legal obligation to pay cash and derecognised when the contractual rights to the cash flows from the financial asset expire or are transferred upon trade date.

Financial Assets at Amortised Cost

Financial assets included in this category need to meet two criteria:

1. the financial asset is held in order to collect the contractual cash flows, and

2. the cash flows are solely payments of principal and interest (SPPI) on the principal outstanding amount.

Amortised cost is determined using the effective interest method.

Effective Interest Method

Income is recognised on an effective interest rate basis for financial assets that are recognised at amortised cost.

Impairment of Financial Assets

Financial assets are assessed for impairment at the end of each reporting period based on Expected Credit Losses, using the general approach which measures the loss allowance based on an amount equal to lifetime expected credit losses where risk has significantly increased, or an amount equal to 12-month expected credit losses if risk has not increased.

The simplified approach for trade, contract and lease receivables is used. This approach always measures the loss allowance as the amount equal to the lifetime expected credit losses.
A write-off constitutes a derecognition event where the write-off directly reduces the gross carrying amount of the financial asset.

Financial liabilities
Financial liabilities are classified as either financial liabilities 'at fair value through profit or loss' or other financial liabilities. Financial liabilities are recognised and derecognised upon 'trade date'.

Financial Liabilities at Amortised Cost
Financial liabilities, including borrowings, are initially measured at fair value, net of transaction costs. These liabilities are subsequently measured at amortised cost using the effective interest method, with interest expense recognised on an effective interest basis.
Supplier and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).

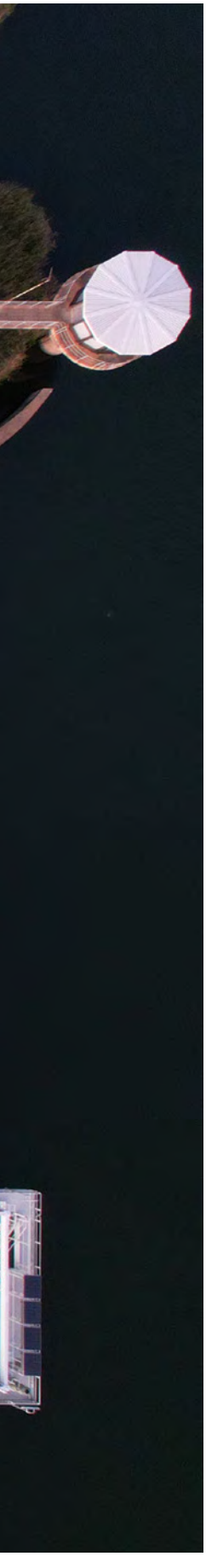
5.2B: Fair Value Measurements

	Fair value measurements at the end of the reporting period	
	2024 $'000	2023 $'000
Non-financial assets		
Land	**10,239**	10,439
Buildings	**75,184**	75,742
Plant and equipment	**267,706**	293,329
	353,129	379,510

Other Information

6.1 Current/Non-Current Distinction for Assets and Liabilities

	2024 $'000	2023 $'000
6.1A: Current/non-current distinction for assets and liabilities		
Assets expected to be recovered in:		
No more than 12 months		
Cash and cash equivalents	**1,959**	3,230
Trade and other receivables	**147,208**	254,786
Accrued revenue	**6,654**	6,690
Prepayments	**11,411**	15,643
Inventories	**6,767**	4,818
Total no more than 12 months	**173,999**	285,167
More than 12 months		
Land	**14,536**	14,826
Buildings	**187,558**	209,661
Plant and equipment	**494,144**	452,036
Computer software	**395,055**	346,431
Other intangibles	**-**	861
Total more than 12 months	**1,091,293**	1,023,815
Total assets	**1,265,292**	1,308,982
Liabilities expected to be settled in:		
No more than 12 months		
Suppliers	**84,595**	75,426
Other payables	**6,502**	6,127
Leases	**23,291**	21,044
Employee provisions	**24,960**	29,493
Other employee provisions	**34**	34
Provisions for restoration	**6,731**	1,347
Total no more than 12 months	**146,113**	133,471
More than 12 months		
Leases	**105,993**	126,526
Employee provisions	**49,449**	40,725
Provisions for restoration	**28,442**	26,965
Total more than 12 months	**183,884**	194,216
Total liabilities	**329,997**	327,687



Section 6:

Appendices

Appendix A

Glossary

A

AASB	Australian Accounting Standards Board
ACCESS	Australian Community Climate and Earth System Simulator
ACCESS-A	a prototype national scale ACCESS model
ACCESS-AE	a prototype ensemble version of ACCESS-A
ACCESS-C	a city scale ACCESS model
ACCESS-S	a seasonal prediction ACCESS model
ACCESS-S2	a seasonal prediction ACCESS model
ACS	Australian Climate Service
ACT	Australian Capital Territory
AEST	Australian Eastern Standard Time
AI	Artificial Intelligence
AMBLS	automated meteorological balloon launching system
AMOS	Australian Meteorological and Oceanographic Society

analysis	the process of creating a snapshot of the current state of the Earth system using the latest available observations and data assimilation techniques
annual exceedance probability	the probability that a given variable (e.g. total rainfall accumulated) will be exceeded in any one year
APS	Australian Public Service
ARM	US Department of Energy Atmospheric Radiation Measurement
ARTC	Australian Rail Track Corporation
ASDS	Australian Smoke Dispersion System
ASWFC	Australian Space Weather Forecasting Centre
ATWS	Australian Tsunami Warning System
Australis	the Bureau's supercomputer
AWS	automatic weather station

B

BARRA	Bureau of Meteorology atmospheric high-resolution regional reanalysis for Australia
BARPA	Bureau of Meteorology Atmospheric Regional Projections for Australia
BARPA-C	2–4 km BARPA convective-scale projections
BARPA-R	12 km BARPA regional downscaled projections
BMAC	Bureau of Meteorology Audit Committee
BOM	Bureau of Meteorology
BOMIdeas	the Bureau's online research community
BSAC	the Bureau's Science Advisory Committee
Bureau	Bureau of Meteorology

C

°C	degrees Celsius
CEO	Chief Executive Officer
CFA	Country Fire Authority (Victoria)
CSA	Climate Services for Agriculture
climatology	the long-term average of a given variable, often over time periods of decades
cm	centimetre
CMIP6	Coupled Model Intercomparison Project 6
convection-scale model	a high-resolution numerical weather model that explicitly simulates small-scale atmospheric convection, allowing for more accurate predictions of localised severe weather events
CO_2	Carbon Dioxide
CO_2-e	Carbon Dioxide Equivalent
COSPPac	Climate and Oceans Support Program for the Pacific
COVID-19	an infectious disease caused by the coronavirus SARS-CoV-2
CRM	Customer relationship management system
CRPS	Continuous Ranked Probability Score
CSA	Climate Services for Agriculture
CSAT	Customer satisfaction score
CSG	Customer Services Group
CSIRO	Commonwealth Scientific and Industrial Research Organisation

D

data assimilation	the process of combining different sources of information (usually Earth system models and observations) to estimate possible states of a system as it evolves in time
DCB	Departmental Capital Budget
DCCEEW	Department of Climate Change, Energy, Environment and Water
DDG	Data and Digital Group
DEW	Department of environment and Water (South Australia)
DFES	Department of Fire and Emergency Services (Western Australia)
downscaled climate projections	translation of large-scale global climate model outputs into smaller spatial scales

E

EAP	Employee Assistance Program
Earth system modelling	a modelling approach that simulates all relevant aspects of the Earth system, including physical, chemical, and biological processes to better understand and predict changes in the Earth's climate and environment
ECMWF	European Centre for Medium-Range Weather Forecasts
EL	Executive Level

El Niño	the extensive warming of the central and eastern tropical Pacific Ocean which leads to a major shift in weather patterns across the Pacific
ensemble	a set of numerical forecasts for the same period or event used to sample potential forecast outcomes

F

FAICD	Fellow of the Australian Institute of Company Directors
FBT	Fringe Benefits Tax
FMS	Fiji Meteorological Service
FOI	Freedom of Information
FOI Act	*Freedom of information Act 1982*
forecast skill	the relative accuracy of the forecast over a reference forecast
forecast verification	the process of assessing the quality of a forecast against a corresponding observation of what occurred
FTSE	Fellow of the Australian Academy of Technological Services and Engineering
FWIN	Flood Warning Infrastructure Network program

G

GOCF	Gridded Operational Consensus Forecast
GST	Goods and Services Tax
GWL	global warming levels

H

HSF	Hazards Services Forum
HSR	Health and Safety Representative
HyFS	Hydrological Forecasting System

I

ICAO	International Civil Aviation Organisation
ICT	Information and communication technology
IGA	Intergovernmental Agreement
IMOS	Integrated Marine Observing System
IMPROVER	Integrated Model post-Processing Verification
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOWave23	an international Indian Ocean-wide tsunami exercise
ISO	International Organization of Standardization
IT	information technology

J

JULES	the Bureau's operational land surface model

K

km	kilometre
km/h	kilometre per hour
km/s	kilometre per second
kW	kilowatt

L

L	litre
LGBTQIA+	people who identify as lesbian, gay, bisexual, transgender, queer, intersex, asexual or otherwise sexually or gender diverse
LTIFR	lost time injury frequency rate

M

M365	a suite of cloud-based Microsoft productivity software
machine learning	a subset of AI that involves training AI models on large volumes of data to analyse, learn patterns and make predictions without specific human instruction
MDBA	Murray–Darling Basin Authority
MET5	Meteorology Five Eyes Community of Practice
Meteorology Act	*Meteorology Act 1955*
m	metre
mm	millimetre

N

NACC	National Anti-Corruption Commission
NAIDOC	National Aborigines and Islanders Day Observance Committee
NEMA	National Emergency Management Agency
NMHS	National Meteorological and Hydrological Service

nowcast	a description of current weather conditions or those within the next 90 minutes
NSW	New South Wales
NT	Northern Territory

O

OceanMAPS	Ocean Modelling Analysis and Prediction System
OPA	Official Public Account
OT	observation technology

P

PBS	Portfolio Budget Statements
PGPA Act	*Public Governance, Performance and Accountability Act 2013*
PGPA Rule	*Public Governance, Performance and Accountability Rule 2014*
PhD	Doctor of Philosophy
post-processing	a range of techniques that can be applied to Earth system models after the initial simulation to improve accuracy
probabilistic forecast	a forecast that specifies the likelihood of occurrence of a specific set of events during a given time frame – ranging from 0.0 (event cannot occur) to 1.0 (event is certain to occur)
PSM	Public Service Medal
PST	Public Services Transformation Program
Public Service Act	*Public Service Act 1999*

Q

Qld	Queensland
QFES	Queensland Fire and Emergency Services

R

R&D	research and development
RAAF	Royal Australian Air Force
RAP	Reconciliation Action Plan
reanalysis	combines historical observations with numerical weather models to generate a spatially and temporally complete history of the atmosphere
ROBUST	a program to transform the security, stability and resilience of the Bureau's information and observing technology
ROU	Right of Use

S

SA	South Australia
SERA	Social and Economic Research Applications Working Group
SES	State Emergency Service
SES	Senior Executive Service
SOFF	Sustained Observing Finance Facility (of WMO)
SSM	Strategic Success Measure
STEM	Science, Technology, Engineering and Mathematics
STEPS	Short Term Ensemble Prediction System
SIA	Strategy in Action workshop
SRA	Strategic Relationship Agreement
Strategy	Strategy 2022–2027

T

TAF	an aerodrome forecast
Tas	Tasmania
TraNSIT	Transport Network Strategic Investment Tool

U

UNESCO	United Nations Educational, Scientific and Cultural Organization
UV	Ultraviolet

V

VAAC	Volcanic Ash Advisory Centre
Vic	Victoria

W

WA	Western Australia
Water Act	*Water Act 2007*
WHS	work health and safety
WMO	World Meteorological Organization
WRP	Weather Ready Pacific
WWRP	World Weather Research Program

Appendix B

List of requirements

This list of requirements is provided in accordance with the *Public Governance, Performance and Accountability Rule 2014*, section 17AJ: Aids to access.

N/A notes that the requirement was not applicable to the Bureau in 2023–24.

PGPA Rule Reference	Description	Requirement	Part of Report	Page
17AD(g)	Letter of transmittal			
17AI	Letter of transmittal	Mandatory	Letter of transmittal	1
17AD(h)	Aids to access			
17AJ(a)	Table of contents	Mandatory	Contents	3
17AJ(b)	Alphabetical index	Mandatory	Appendices	250
17AJ(c)	Glossary of abbreviations and acronyms	Mandatory	Appendices	239
17AJ(d)	List of requirements	Mandatory	Appendices	243
17AJ(e)	Details of contact officer	Mandatory	Inside back cover (IBC)	IBC
17AJ(f)	Entity's website address	Mandatory	Inside back cover	IBC
17AJ(g)	Electronic address of report	Mandatory	Inside back cover	IBC
17AD(a)	Review by Accountable Authority			
17AD(a)	Review by the Accountable Authority	Mandatory	Review by the CEO and Director of Meteorology	21–27
17AD(b)	Overview of the entity			
17AE(1)(a)(i)	Role and functions	Mandatory	Agency overview	28
17AE(1)(a)(ii)	Organisational structure	Mandatory	Corporate governance	138–139
17AE(1)(a)(iii)	Outcome and program administered	Mandatory	The Bureau at a glance	6
17AE(1)(a)(iv)	Purpose	Mandatory	The Bureau at a glance	5

PGPA Rule Reference	Description	Requirement	Part of Report	Page
17AE(1)(aa)(i)	Name of the Accountable Authority	Mandatory	Corporate governance	140
17AE(1)(aa)(ii)	Position title of the Accountable Authority	Mandatory	Corporate governance	140
17AE(1)(aa)(iii)	Period as the Accountable Authority	Mandatory	Corporate governance	140
17AE(1)(b)	An outline of the structure of the portfolio of the entity	Portfolio Dept. mandatory	N/A	–
17AE(2)	Where the outcomes and programs differ from budget statements	If applicable, Mandatory	N/A	–
17AD(c)	Report on the Performance of the entity			
	Annual Performance Statements			
17AD(c)(i); 16F	Annual performance statement in accordance with the PGPA Act and Rule	Mandatory	Annual Performance Statement	33–55
17AD(c)(ii)	Report on Financial Performance			
17AF(1)(a)	A discussion and analysis of the entity's financial performance	Mandatory	Financial resource Management	193–194
17AF(1)(b)	A table summarising the total resources and total payments of the entity	Mandatory	Financial resource Management	195–196
17AF(2)	Significant changes in the financial results during or after the previous or current reporting period	If applicable, Mandatory	Financial resource Management	193–194
17AD(d)	Management and Accountability			
	Corporate Governance			
17AG(2)(a)	Information on compliance with section 10 (fraud systems)	Mandatory	Corporate governance	152–153
17AG(2)(b)(i)	A certification by accountable authority that fraud risk assessments and fraud control plans have been prepared	Mandatory	Letter of transmittal	1
17AG(2)(b)(ii)	A certification by accountable authority that appropriate mechanisms for preventing, detecting incidents of, investigating or otherwise dealing with, and recording or reporting fraud are in place	Mandatory	Letter of transmittal	1

PGPA Rule Reference	Description	Requirement	Part of Report	Page
17AG(2)(b)(iii)	A certification by accountable authority that all reasonable measures have been taken to deal appropriately with fraud relating to the entity	Mandatory	Letter of transmittal	1
17AG(2)(c)	An outline of structures and processes in place for corporate governance	Mandatory	Corporate governance	140–152
17AG(2)(d) – (e)	A statement of significant issues reported to the Minister under paragraph 19(1)(e) of the Act that relates to non compliance with Finance law and remedial action	If applicable, Mandatory	N/A	–
	Audit Committee			
17AG(2A)(a)	Direct electronic address of the audit committee charter	Mandatory	Corporate governance	147
17AG(2A)(b)	The name of each audit committee member	Mandatory	Corporate governance	147–149
17AG(2A)(c)	The qualifications, knowledge, skills or experience of audit committee members	Mandatory	Corporate governance	147–149
17AG(2A)(d)	Information about the attendance of each member of the audit committee at committee meetings	Mandatory	Corporate governance	147–149
17AG(2A)(e)	The remuneration of each member of the audit committee	Mandatory	Corporate governance	147–149
	External Scrutiny			
17AG(3)	Information on the most significant developments in external scrutiny and the entity's response to the scrutiny	Mandatory	Corporate governance	153
17AG(3)(a)	Information on judicial decisions and decisions of administrative tribunals and by the Australian Information Commissioner that may have a significant effect on the operations of the entity	If applicable, Mandatory	N/A	–
17AG(3)(b)	Information on any reports on operations of the entity by the Auditor General, a Parliamentary Committee, or the Commonwealth Ombudsman	If applicable, Mandatory	Corporate governance	153
17AG(3)(c)	Information on any capability reviews that were released during the period	If applicable, Mandatory	N/A	–

PGPA Rule Reference	Description	Requirement	Part of Report	Page
	Management of Human Resources			
17AG(4)(a)	An assessment of the entity's effectiveness in managing and developing employees to achieve entity objectives	Mandatory	People management	172–174
17AG(4)(aa)	Statistics on the entity's employees on an ongoing and non ongoing basis, including the following: (a) statistics on full time employees (b) statistics on part time employees (c) statistics on gender (d) statistics on staff location	Mandatory	People management	182–192
17AG(4)(b)	Statistics on the entity's APS employees on an ongoing and non ongoing basis; including the following: • statistics on staffing classification level • statistics on full time employees • statistics on part time employees • statistics on gender • statistics on staff location • statistics on employees who identify as Indigenous	Mandatory	People management	182–192
17AG(4)(c)	Information on any enterprise agreements, individual flexibility arrangements, Australian workplace agreements, common law contracts and determinations under subsection 24(1) of the *Public Service Act 1999*	Mandatory	People management	177
17AG(4)(c)(i)	Information on the number of SES and non SES employees covered by agreements etc identified in paragraph 17AG(4)(c)	Mandatory	People management	177
17AG(4)(c)(ii)	The salary ranges available for APS employees by classification level	Mandatory	People management	178
17AG(4)(c)(iii)	A description of non salary benefits provided to employees	Mandatory	People management	177
17AG(4)(d)(i)	Information on the number of employees at each classification level who received performance pay	If applicable, Mandatory	People management	178
17AG(4)(d)(ii)	Information on aggregate amounts of performance pay at each classification level	If applicable, Mandatory	N/A	–

PGPA Rule Reference	Description	Requirement	Part of Report	Page
17AG(4)(d)(iii)	Information on the average amount of performance payment, and range of such payments, at each classification level	If applicable, Mandatory	N/A	–
17AG(4)(d)(iv)	Information on aggregate amount of performance payments	If applicable, Mandatory	N/A	–
	Assets Management			
17AG(5)	An assessment of effectiveness of assets management where asset management is a significant part of the entity's activities	If applicable, mandatory	Financial resource management	197
	Purchasing			
17AG(6)	An assessment of entity performance against the *Commonwealth Procurement Rules*	Mandatory	Financial resource management	198
	Reportable consultancy contracts			
17AG(7)(a)	A summary statement detailing the number of new reportable consultancy contracts entered into during the period; the total actual expenditure on all such contracts; the number of ongoing reportable consultancy contracts that were entered into during a previous reporting period; and the total actual expenditure in the reporting period on those ongoing contracts	Mandatory	Financial resource management	199
17AG(7)(b)	Summary statement regarding the engagement of consultants in the format specified at paragraph 17AG (7)(b) of the PGPA Rule	Mandatory	Financial resource management	199
17AG(7)(c)	A summary of the policies and procedures for selecting and engaging consultants and the main categories of purposes for which consultants were selected and engaged	Mandatory	Financial resource management	199
17AG(7)(d)	Statement regarding actual expenditure on contracts for consultancies in the format specified at paragraph 17AG (7)(d) of the PGPA rule	Mandatory	Financial resource management	199

PGPA Rule Reference	Description	Requirement	Part of Report	Page
	Reportable non-consultancy contracts			
17AG(7A)(a)	A summary statement detailing the number of new reportable non-consultancy contracts entered into during the period; the total actual expenditure on such contracts; the number of ongoing reportable non-consultancy contracts that were entered into during a previous reporting period; and the total actual expenditure in the reporting period on those ongoing contracts	Mandatory	Financial resource management	200
17AG(7A)(b)	Statement regarding actual expenditure on reportable non-consultancy contracts in the format specified at paragraph 17AG (7A)(b) of the PGPA rule	Mandatory	Financial resource management	200
17AD(daa)	Additional information about organisations receiving amounts under reportable consultancy contracts or reportable non-consultancy contracts			
17AGA	Additional information, in accordance with section 17AGA, about organisations receiving amounts under reportable consultancy contracts or reportable non-consultancy contracts	Mandatory	Financial resource management	199–200
	Australian National Audit Office Access Clauses			
17AG(8)	Contracts with a value of more than $100,000 (inclusive of GST) that did not provide the Auditor General with access to the contractor's premises	If applicable, Mandatory	Financial resource management	198
	Exempt contracts			
17AG(9)	Statement regarding contracts or standing offers with a value greater than $10,000 (inclusive of GST) that have been exempted from being published in AusTender because it would disclose exempt matters under the FOI Act	If applicable, Mandatory	Financial resource management	198
	Small business			
17AG(10)(a)	Summary statement detailing procurement initiatives supporting small business using the text specified at paragraph 17AG (10)(a) of the PGPA Rule	Mandatory	Financial resource management	198
17AG(10)(b)	An outline of the ways in which the procurement practices of the entity support small and medium enterprises	Mandatory	Financial resource management	198

PGPA Rule Reference	Description	Requirement	Part of Report	Page
17AG(10)(c)	Summary statement regarding timely payments to small businesses using the text specified at paragraph 17AG (10)(c) of the PGPA Rule	If applicable, Mandatory	Financial resource management	198
	Financial Statements			
17AD(e)	Inclusion of the annual financial statements in accordance with subsection 43(4) of the Act	Mandatory	Financial statements	204–237
	Executive Remuneration			
17AD(da)	Information about executive remuneration in accordance with Subdivision C of Division 3A of Part 2-3 of the Rule	Mandatory	People management	178–181
17AD(f)	Other Mandatory Information			
17AH(1)(a)(i)	Statement in relation to advertising campaigns conducted as specified in the PGPA rule	If applicable, Mandatory	N/A	–
17AH(1)(a)(ii)	If the entity did not conduct advertising campaigns, a statement to that effect	If applicable, Mandatory	Financial resource management	201
17AH(1)(b)	Statement on grants awarded for the reporting period, as specified in the PGPA Rule	If applicable, Mandatory	N/A	–
17AH(1)(c)	Mechanisms of disability reporting	Mandatory	Corporate responsibility	163
17AH(1)(d)	Website reference for the entity's Information Publication Scheme statement pursuant to the FOI Act	Mandatory	Corporate governance	153
17AH(1)(e)	Correction of material errors in previous annual report	If applicable, mandatory	Corporate governance	153
17AH(2)	Information required by other legislation:	Mandatory		
	• *Freedom of Information Act 1982*		Corporate governance	153
	• *Environmental Environment Protection and Biodiversity Conservation Act 1999*		Corporate responsibility	168–171
	• *Work Health and Safety Act 2011*		People management	174–176
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