The Bureau of Meteorology

User Guide

GIS2Web Service – Evaluation Account

Information to assist users in understanding and using the Bureau of Meteorology's GIS2Web Service. This service provides access to geospatial data from the Bureau of Meteorology using the Open Geospatial Consortium (OGC) standards of Web Map Services (WMS) and Web Feature Services (WFS).

Version 2.4 (updated 5 November 2025)

Contents

INTRODUCTION

Description

The GIS2Web Service provides access to geospatial data from the Bureau of Meteorology (the Bureau) using the Open Geospatial Consortium (OGC) standards of Web Map Services (WMS) and Web Feature Services (WFS).

This service is only available as a Registered User service. The Bureau of Meteorology provides users access to products outside the Bureau's Basic Product Set at the incremental cost of access. Data generation is funded by the Australian Government.

Evaluation Account and GIS2Web Registered User Subscription

An evaluation account (**bomw0739**) is available so that customers can test the suitability of the GIS2Web service prior to subscription. Customers are welcome to test out the service for up to one month. In order to provide Information to third parties as part of a User product and/or to continue to use the GIS2Web Service after the one month trial period, it is necessary to accept the terms and conditions of the Data Licence Agreement to become a Registered User (please see the catalogue for charges).

GIS2Web Service Conditions of Use and Recommendations

Please note 1.1 e) in the Bureau of Meteorology Data Licence Agreement:

> e) "GIS2Web" meaning that the Licensee agrees that they will not allow web services delivered via the GIS2Web service to be displayed on any of the Licensee's products. However, the Licensee is permitted to display the web service layers via:
> (i) a cache service, or
> (ii) their own systems by re-serving that information,
> provided that in doing so the Licensee protects the GIS2Web service from duplicate end user service requests.

In addition to protecting the GIS2Web Service from duplicate end user service requests, please consider the update frequency of each layer in the GIS2Web service when configuring a system to access the service.

There is a Product Update Frequency section included for each layer in the LAYER EXAMPLES section of this user guide. The highest frequency at which data is updated in the GIS2Web Service is 5 minutes (e.g. Radar Imagery - IDR00010). It is therefore recommended that GIS2Web layer requests be made no more often than every 5 minutes (less often for layers that are scheduled to be updated less frequently). Please note that some layers are only updated once per day (e.g. Heatwave Assessments and Forecasts – IDY10012).

Contact Information

To report a problem or for general service enquiries, please email webreg@bom.gov.au.

When reporting a problem, to assist with our investigations please provide the following details if possible:

	Examples	Customer to complete
User ID	bomw0739	
GIS2Web Layer/s affected	IDZ20010 – Ten-minute Surface Observations WMS (or WFS) layer for GIS2Web	
Start date/time of the problem (including time zone)	5 November 2025 at 9:30 am AEDT	
Screenshots to help illustrate the problem	A screenshot of an error message if the problem is to do with accessing the GIS2Web Service/the bomw0739 account. A screenshot showing data is not up to date in a GIS2Web layer.	
Any other information you think might be relevant e.g. limits to the scope of the problem	The IDZ20010 WFS layer in the GIS2Web Service seems to be working as expected in ArcGIS Pro but not ArcGIS Online.	

Table 1 Template for reporting a problem with the GIS2Web Service

Data Access

To access the data via mapping software (e.g. ArcGIS Pro, QGIS, Google Earth):

1. Connect to the Bureau's Web Map Server (WMS) or Web Feature Server (WFS) with the URL https://spatial.bom.gov.au/cgi-bin/mapserver/users/bomw0739/wxs?
2. Input the User ID (**bomw0739**) and password (this changes automatically on the first Tuesday of each month – please email webreg@bom.gov.au to obtain the current password) when prompted.
3. Select the desired layers and display. Table 2 provides a list of layers and shows which layers are available via WMS, which are available via WFS and which are available as time-enabled layers.

The URL can also be used as the basis for WMS requests in a web browser. These requests include GetCapabilities and GetMap.

Please see https://www.opengeospatial.org/standards/wms for more information about the syntax of WMS requests. You can also use the GetCapabilities request in a web browser to return an XML document of available layers. Legend information for specific layers is available via a GetLegendGraphic request.

Automatic Authentication

If required, automatic authentication for connections from a particular URL can be established. To enable automatic authentication, you will need to supply the Bureau with a static IP address or subnet, or alternatively a domain name (e.g. bom.gov.au).

Adding GIS2Web WMS Layers to Portal for ArcGIS

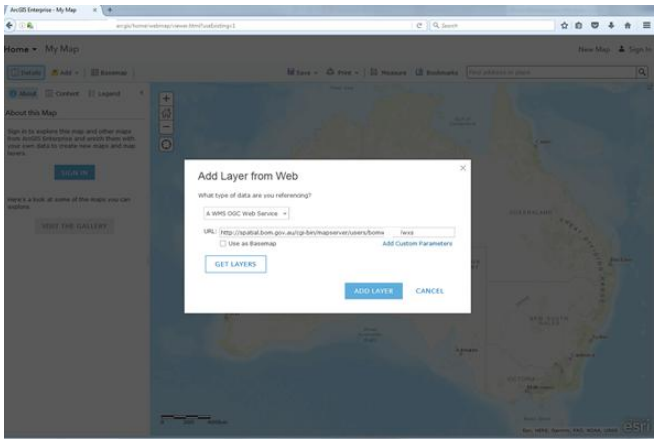
The URL "spatial.bom.gov.au" must be added as a trusted server (under My Organisation > Security) by the Portal Administrator

Likewise, the portal address for the organisation must be supplied to the Bureau to enable Cross-Origin Resource Sharing (CORS) e.g. https://server.myorganisation

Add WMS OGC Web Services to Portal by selecting "Add Layer from Web" from the Add menu.

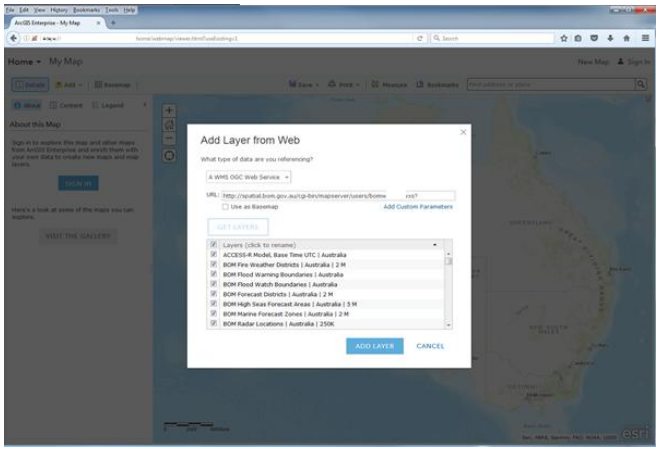
Select "WMS OGC Web Services" and type in the URL:

https://spatial.bom.gov.au/cgi-bin/mapserver/users/bomw0739/wxs



Click on "GET LAYERS", the authentication box will appear. Type in your User ID and password and click "OK".

A list of layers should appear. Uncheck all layers and select those you would like to add to the map.



For the rest of the browser session, you will be able add layers without authenticating again.

Adding GIS2Web WMS Layers to ArcGIS Online (AGOL)

The process for adding layers to AGOL is nearly identical to the ArcGIS for Portal. It is necessary for the user to add "spatial.bom.gov.au" as a Trusted Server in their AGOL account. This option requires Administrator access and can be added from Organization>Settings>Security>Trusted servers.

Likewise, the AGOL address for the organisation must be supplied to the Bureau to enable Cross-Origin Resource Sharing (CORS), e.g. https://(name of organisation).maps.arcgis.com. To add GIS2Web layers, the user needs be a member of the organisation's ArcGIS Online and logged in.

GIS2Web WFS Layers

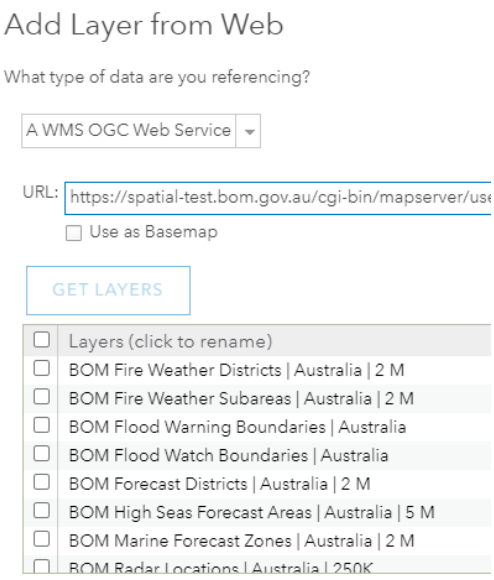
Please note that to enable users to access to WFS layers via AGOL or ArcGIS for Portal the Real-time Data Services team must complete an extra step. To request this, please email webreg@bom.gov.au, providing your organisation's AGOL or ArcGIS for Portal addresses and the GIS2Web account User ID (bomw0739).

ArcGIS Online Viewers

ArcGIS Online has two viewers (Map Viewer Classic and Map Viewer) which perform differently when adding the GIS2Web WMS and WFS. The Map Viewer Classic is set to be retired in early 2026.

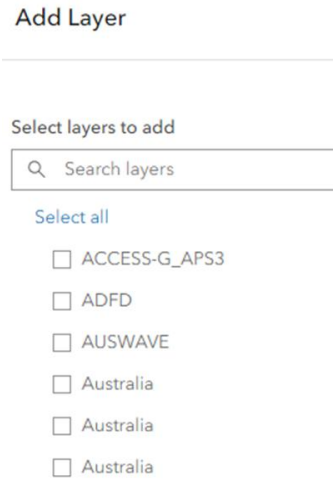
Map Viewer Classic – Adding WMS Layers

When adding the WMS to the Map Viewer Classic, the layers are listed in alphabetical order with no groupings.



Map Viewer - Adding WMS Layers

In the Map Viewer, Groupings are also displayed resulting in duplication. Adding groups is likely to problematic. It is best to add individual layers. Layers can be found easily using the search text box.



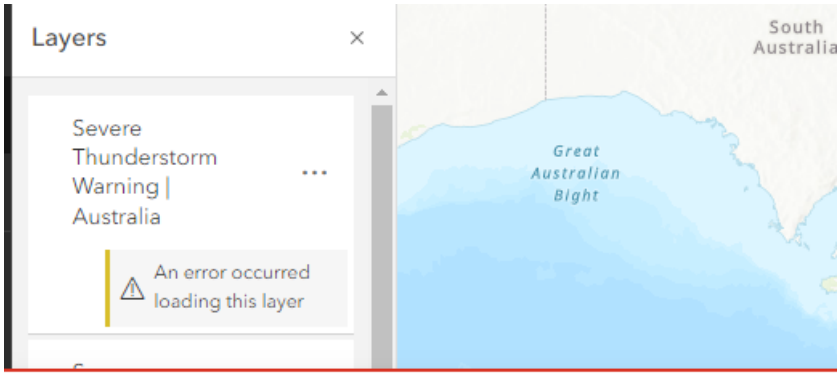
Map Viewer Classic - Adding WFS Layers

The WFS layers do not display in Map Viewer Classic. No error is reported.

Map Viewer – Adding WFS Layers

The WFS displays for any layer that contains features. If there are no features, the error message "geometry type GeometryPropertyType is not supported" shows. To be able to save the Map in the Map Viewer, the workaround is to add the layer in Map Viewer Classic, save the Web Map and

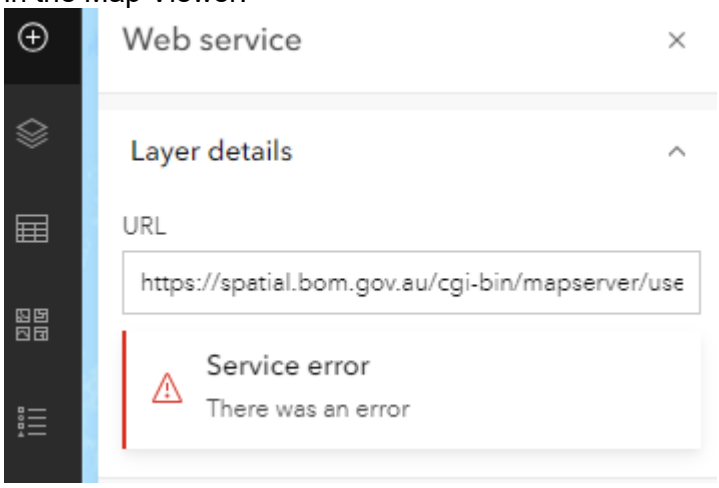
Open in Map Viewer. The layer will still show an error in both the Layers pane and a closable banner at the bottom of the map but will be available when the layer has features.



If there are features and the WFS layer was added in Map Viewer Classic, saved as a Web Map and opened in Map Viewer and saved again, no error is reported in the Map Viewer when the same layer has no features.

ArcGIS Enterprise

The following applies to ArcGIS Enterprise 10.9.1. Earlier and later versions may differ. The big difference between ArcGIS Enterprise and ArcGIS Online is that both WMS and WFS cannot be added directly to the Map Viewer. It must be added to the Map Viewer Classic, saved and opened in the Map Viewer.



WMS layers are visible in both viewers, but only WFS shows in the Map Viewer. In addition, the ability to filter and change symbology for WFS is disabled in the Map Viewer. However, symbology can be changed in the Map Viewer Classic, saved and opened in the Map Viewer.
Pop ups and tables work as expected.

Also, WMS and WFS can be added as items using Content>New Item>URL

Layer List

Table 2 provides a list of layers and shows which layers are available via WMS, which are available via WFS and which are available as time-enabled layers.

Product Code	Layer Description	WMS	WFS	Time-enabled
IDZ20009	Tropical Cyclone Tracks	Y	Y	
IDZ20002	Tsunami Warnings	Y		
IDZ20005	Severe Weather Warnings	Y	Y	
IDZ20023	Coastal Hazard Warnings	Y	Y	
IDZ20006 IDZ20007	Severe Thunderstorm Warnings *(threat areas)* *(storm cells and track direction)*	Y	Y	
IDZ20012	Fire Weather Warnings	Y	Y	
IDZ20016	Flood Watches	Y	Y	
IDZ20013	Flood Warnings	Y	Y	
IDZ20014	Road Weather Alerts	Y	Y	
IDZ20008	Marine Wind Warnings	Y	Y	
IDZ20017	Hazardous Surf Warnings	Y	Y	
IDZ71069	Total Wave Height (ADFD)	Y		Y
IDZ71153	Hazardous Wind Onset (ADFD)	Y		
IDZ20000	Fire Danger Rating (4 Days)	Y		
IDY10012	Heatwave Assessments and Forecasts	Y	Y	
IDY25026	Mean Sea Level Pressure and Surface Wind Forecasts (ACCESS-G)	Y		Y
IDY35100	Total Wave Height (AUSWAVE)	Y		Y
IDYOC050	Sea Surface Temperature Analysis	Y		

Product Code	Layer Description	WMS	WFS	Time-enabled
IDR00010 IDR00009	Radar Imagery *(mosaic)* *(listing of offline radars)*	Y		
IDR00011	Radar Thunderstorm Tracks	Y		
IDZ20010	Surface Observations - Latest	Y	Y	
IDZ20011	Surface Observations - Last 24 Hours		Y	
IDZ20020	River Conditions*	Y	Y	
IDE00431 IDE00432 IDE00433 IDE00435	Satellite Imagery *(IR/Greyscale)* *(Visible)* *(IR/Zehr)* *(True colour)*	Y		
	Administrative Data (e.g. district boundaries)	Y		

Table 2 List of GIS2Web layers *Please note that the following state/territory-based River Condition WMS/WFS layers are currently still included in the GIS2Web service but will be removed (date TBC): IDQ65470, IDN62011, IDD60280, IDS65178, IDV65201, IDW60411 and IDT65010 (the replacement for these is the National River Conditions WMS/WFS layer - IDZ20020 – please use this layer).

Time-enabled Layers

The available times (in UTC) are listed in the GetCapabilities as a dimension. By adding the &time parameter to the GetMap request, the relevant forecast period will be shown. If the layer is requested without a time parameter, or a time not in GetCapabilities, it will default to the current forecast time. For example:


```
▼<Layer queryable="1" opaque="0" cascaded="0">
   <Name>IDZ71069</Name>
   <Title>Total Wave Height | Australia | m | ADFD | 0.05</Title>
   <Abstract>Total Wave Height | Australia | m | ADFD | 0.05</Abstract>
   <CRS>EPSG:4283</CRS>
  ▼<EX_GeographicBoundingBox>
     <westBoundLongitude>111.000000</westBoundLongitude>
     <eastBoundLongitude>158.000000</eastBoundLongitude>
     <southBoundLatitude>-48.000000</southBoundLatitude>
     <northBoundLatitude>-1.000000</northBoundLatitude>
   </EX_GeographicBoundingBox>
   <BoundingBox CRS="EPSG:4283" minx="-48.000000" miny="111.000000" maxx="-1.000000" maxy="158.000000"/>
   <Dimension name="time" units="ISO8601" default="2023-04-18T03:00:00Z" nearestValue="0">2023-04-17T18:00:00Z,2023-04-
   17T21:00:00Z,2023-04-18T00:00:00Z,2023-04-18T03:00:00Z,2023-04-18T06:00:00Z,2023-04-18T09:00:00Z,2023-04-18T12:00:00Z,2023-04-
   18T15:00:00Z,2023-04-18T18:00:00Z,2023-04-18T21:00:00Z,2023-04-19T00:00:00Z,2023-04-19T03:00:00Z,2023-04-19T06:00:00Z,2023-04-
   19T09:00:00Z,2023-04-19T12:00:00Z,2023-04-19T15:00:00Z,2023-04-19T18:00:00Z,2023-04-19T21:00:00Z,2023-04-20T00:00:00Z,2023-04-
   20T03:00:00Z,2023-04-20T06:00:00Z,2023-04-20T09:00:00Z,2023-04-20T12:00:00Z,2023-04-20T15:00:00Z,2023-04-20T18:00:00Z,2023-04-
   20T21:00:00Z,2023-04-21T00:00:00Z,2023-04-21T03:00:00Z,2023-04-21T06:00:00Z,2023-04-21T09:00:00Z,2023-04-
   21T12:00:00Z</Dimension>
```

To view the other times available, the time parameter can be added to the service. For example: service=WMS&version=1.3.0&request=GetMap&bbox=-60,110,0,170&CRS=EPSG:4283&layers=IDZ71069&height=800&width=800&format=image/png&styles=&time=2023-04-19T12:00:00Z

Parameter	Value
time	2023-04-19T12:00:00Z
Add Parameter	

Some software can pick up the times to enable animations.

Underlying Data

The underlying data depicted in the GIS2Web service (and many more datasets) can be accessed via the Bureau's Registered User FTP/SFTP services. For more information, please see the product catalogue.

LAYER EXAMPLES

Please see pages 13 to 39 for examples of layers and links to further information.

Warnings

Tropical Cyclone Tracks

This nationwide layer of Tropical Cyclone Tracks shows past track positions (to 72 hours prior) and forecast positions (to 120 hours ahead).

The layer includes:

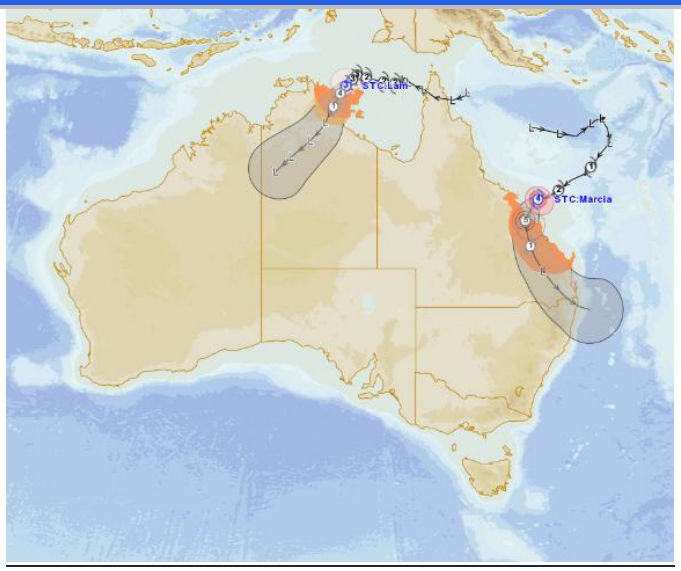
- Fix points
- Track Lines
- Wind Areas
- Forecast of Track Areas
- Warning Areas
- Watch Areas

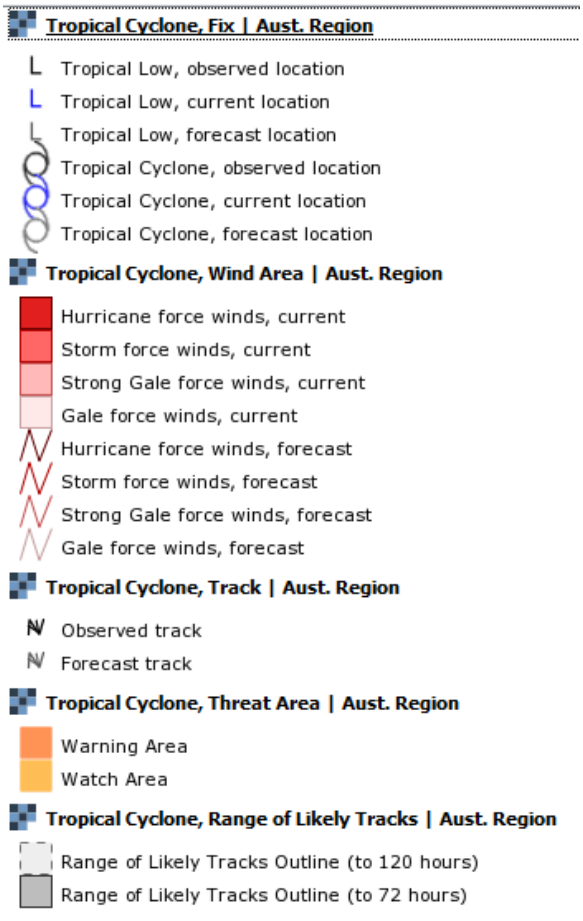
Product Update Frequency: Each time the Tropical Cyclone Forecast Track Map is issued (i.e. hourly, three-hourly or six-hourly).

Layer Product Code: IDZ20009

Further Information:

- About our Tropical Cyclone Warning Services
- Tropical Cyclone Service Level Specification
- Warning products FTP/SFTP user guide





Tsunami Warnings

- Tsunami Warnings are issued by the Joint Australian Tsunami Warning Centre, operated by the Bureau of Meteorology and Geoscience Australia.
- Upon detection of an earthquake, a national Tsunami Watch (IDY68005) or No Threat (IDY68009*) bulletin is issued.
- Upon confirmation of a tsunami threat to the coastline of Australia or its offshore territories, or if any potential first point of impact is within 90 minutes, Tsunami Bulletin Warnings are issued for the coastal zones under threat.
- This layer combines the National Tsunami Watch Bulletin (IDY68005) and the Tsunami Bulletin warnings for Australian states/territories (IDY68025, IDY68026, IDY68027, IDY68028, IDY68029, IDY68030, IDY68031), Australian offshore territories (IDY68032, IDY68033, IDY68034, IDY68035, IDY68036) and Antarctic locations (IDY68074).
  *The National Tsunami No Threat Bulletin (IDY68009) is available via FTP.

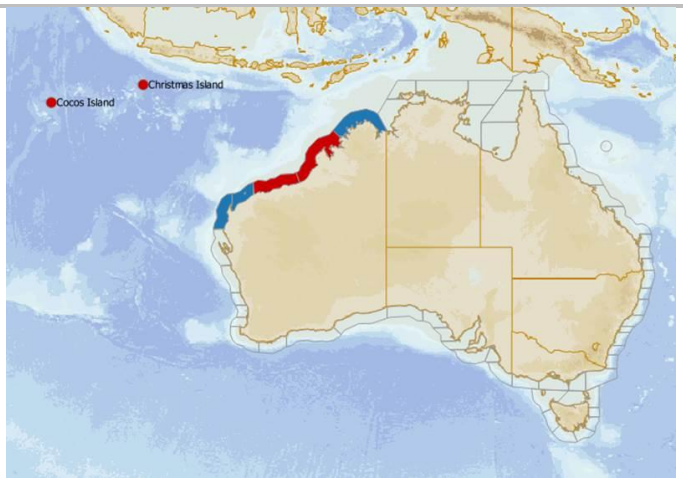
Product Update Frequency: Tsunami Warnings are updated at least hourly. Warnings are cancelled when the tsunami threat has ceased.

Product Code: IDZ20002

Spatial Areas: IDM00003 – Marine Zones

Further Information:

- About Tsunami Warnings
- Warning products FTP/SFTP user guide



Tsunami Warning | Australia and off shore territories

- Land Warning
- Marine Warning
- Watch
- Cancellation
- No warning

For more detailed tsunami warning information, refer to the Joint Australian Tsunami Warning Centre website.

Severe Weather Warnings

Severe Weather Warnings are provided for potentially hazardous or dangerous weather that is not solely related to severe thunderstorms, tropical cyclones or bushfires.

Severe Weather Warnings are issued for:

- Sustained winds of gale force (63 km/h) or more;
- Damaging wind gusts (90 km/h or more, except in Tasmania where they are issued for gusts of 80 km/h or more in easterlies and 100 km/h or more in westerlies);
- Heavy rainfall that may lead to flash flooding;
- Widespread blizzards in alpine areas.

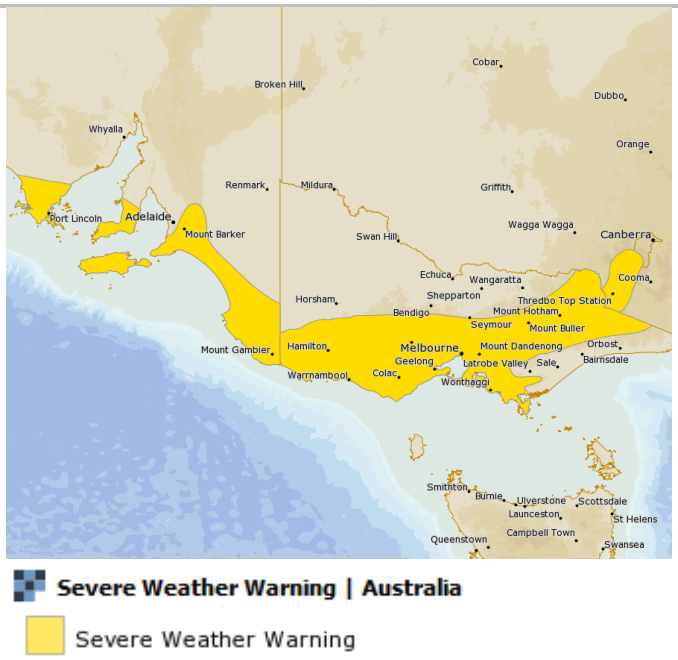
Severe Weather Warnings are issued whenever severe weather is happening in an area or is expected to develop or move into an area. The lead time depends on the weather situation. It can extend from an hour to 36 hours.

Product Update Frequency: Severe Weather Warnings are updated routinely every 6 hours while the threat remains, however more frequent warnings may be issued if required.

Layer Product Code: IDZ20005

Further Information:

- About our Severe Weather Warning Services
- Severe Thunderstorm, Severe Weather and Coastal Hazard Service Level Specification
- Warning products FTP/SFTP user guide



Coastal Hazard Warnings

Coastal Hazard Warnings are issued for:

- Abnormally high tides or storm tides that may be higher than the highest astronomical tide, and could flood low lying coastal areas.
- Damaging surf, when unusually large surf may damage beaches and coastal infrastructure.

Coastal Hazard Warnings are issued whenever a coastal hazard is present in an area or is expected to develop or move into an area. The lead time depends on the weather situation. It can extend from an hour to 36 hours.

Product Update Frequency: Coastal Hazard Warnings are updated routinely every 6 hours while the threat remains, however more frequent warnings may be issued if required.

Layer Product Code: IDZ20023

Further Information:

- About our Coastal Hazard Warning Services
- Severe Thunderstorm, Severe Weather and Coastal Hazard Service Level Specification
- Warning products FTP/SFTP user guide

Coastal Hazard Warning | Australia

Coastal Hazard Warning

Severe Thunderstorm Warnings

Thunderstorms are classified as severe when they produce one or more of these phenomena:

- large hail – 2 cm in diameter or greater
- damaging wind gusts - 90 km/h or greater
- tornadoes
- heavy rainfall that may lead to flash flooding.

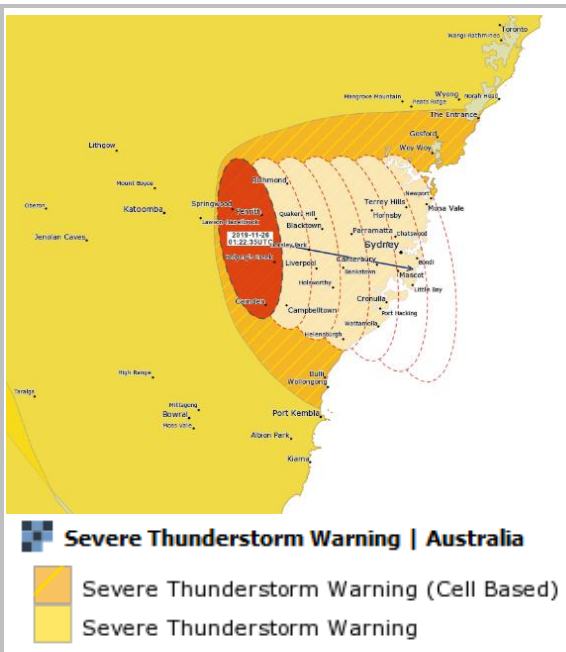
Thunderstorms are classified as 'very dangerous' when they produce one or more of these severe phenomena:

- giant hail – 5 cm in diameter or greater
- destructive wind gusts - 125 km/h or greater
- tornadoes
- intense rainfall that may lead to dangerous and life-threatening flash flooding.

A Severe Thunderstorm Warning is issued when:

- a severe thunderstorm is occurring, likely to occur or is reported
- phenomena such as large hail, giant hail, damaging winds, heavy rainfall, intense rainfall or tornadoes are expected in the warning area
- existing thunderstorms are likely to develop into a severe thunderstorm.

Product Update Frequency: Regional Severe Thunderstorm Warnings are valid for a three-hour period from the issuance time and will be updated routinely every one to two hours but may be updated more frequently during rapidly evolving situations.



There are two types of Severe Thunderstorm Warning:

- Detailed Severe Thunderstorm Warning
- Regional Severe Thunderstorm Warning.

Detailed Severe Thunderstorm Warnings (Cell Based)

These are issued for all capital cities and surrounding areas. They are issued when individual severe thunderstorms are within range of the capital city radars.

Detailed warnings provide time and location-specific information about the threat. The map shows:

- any existing severe thunderstorms as a red ellipse
- the forecast direction of movement for up to 60 minutes
- the Immediate Threat Area, shaded with orange-hash.

Regional Severe Thunderstorm Warnings

These are issued for all Australian states and mainland territories and highlight broad areas where severe thunderstorms are occurring or may occur in the next 3 hours. The map shows areas covered by the warning shaded in yellow.

Severe Thunderstorm Warnings (continued)

Product Update Frequency (continued): Detailed Severe Thunderstorm Warnings are valid for 30 or 60 minutes from the issuance time and are updated routinely every 30 to 60 minutes. If a current Detailed Severe Thunderstorm Warning does not adequately describe the situation, it will be updated immediately.

Layer Product Codes:

IDZ20006 (threat areas)

IDZ20007 (storm cells and track direction)

Further Information:

- About our Severe Thunderstorm Warning Services
- Severe Thunderstorm, Severe Weather and Coastal Hazard Service Level Specification
- Warning products FTP/SFTP user guide

Fire Weather Warnings

- Fire Weather Warnings provide an alert that weather conditions are likely to make the suppression or control of fires difficult, they do not warn of fires themselves.
- Fire Weather Warnings for a Fire Weather District are issued when the Fire Danger Rating is Extreme or greater. They are issued no later than 4:15 pm local time in the afternoon for either the remainder of the current day and/or the following day, with a 5:00 am local time morning update covering the remainder of the current day.

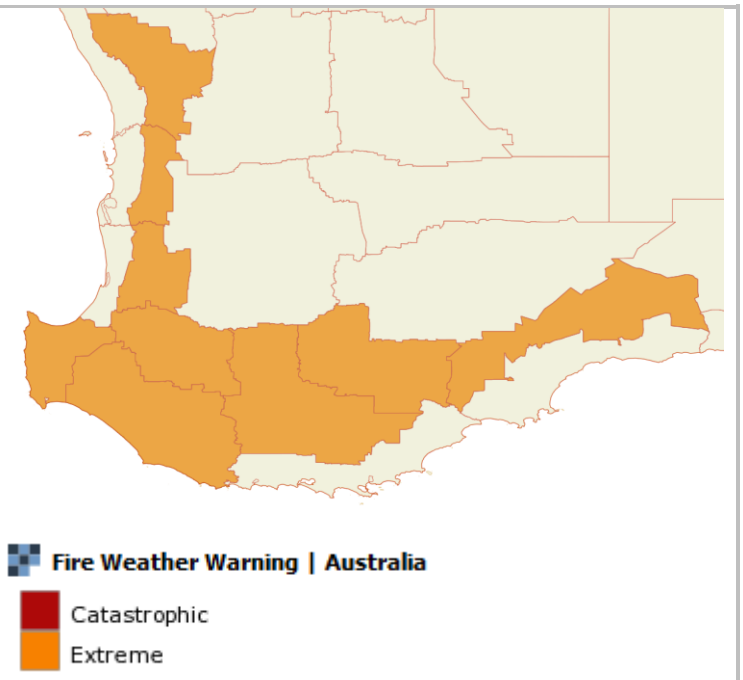
Product Update Frequency: Fire Weather Warnings are monitored and updated as needed at any time of day, in consultation with local fire agencies.

Layer Product Code: IDZ20012

Spatial Areas: IDM00007 – Fire Weather Districts

Further Information:

- About our Fire Weather Services
- Fire Weather Service Level Specification
- Warning products FTP/SFTP user guide



Flood Watches

- A Flood Watch is issued when the combination of forecast rainfall and catchment or other hydrological conditions indicate that riverine flooding is possible (not including flash floods).
- A Flood Watch can be issued up to four days in advance of expected flooding.
- The Flood Watch service covers all catchments in Australia, including catchments without flood forecasting systems and data networks.
- Flood Watch categories are only shown for New South Wales.

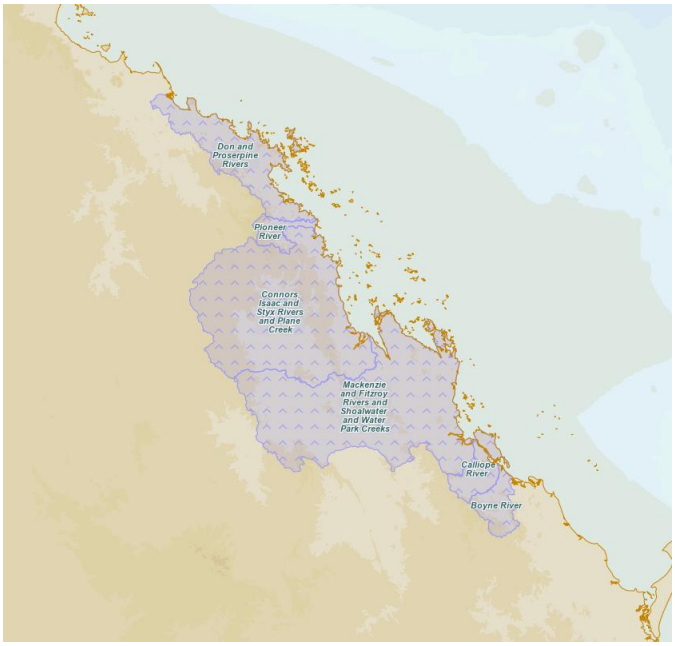
Product Update Frequency: Flood Watches are updated at least daily, or when significant changes occur. They are finalised once the risk of flooding has passed, or Flood Warning products have been issued for all catchments/areas covered by the Flood Watch.

Layer Product Code: IDZ20016

Spatial Areas: IDM00020 – Flood Watch Catchment Areas

Further Information:

- About our Flood Watch and Warning Services
- Service Level Specifications for Flood Forecasting and Warnings Services for each state/territory
- Warning products FTP/SFTP user guide



Flood Watch | Australia

- Major
- Moderate
- Minor
- Unclassified
- Final

Flood Warnings

- A Flood Warning is issued when there is more certainty that riverine flooding is expected to occur in a geographical area.
- Flood Warning classes are minor, moderate or major.
- Generalised Flood Warnings are issued when there is not enough data to make specific predictions, or in the developing stages of a flood.
- Flood Warning Catchment Areas are only delineated where Flood Warnings are produced.

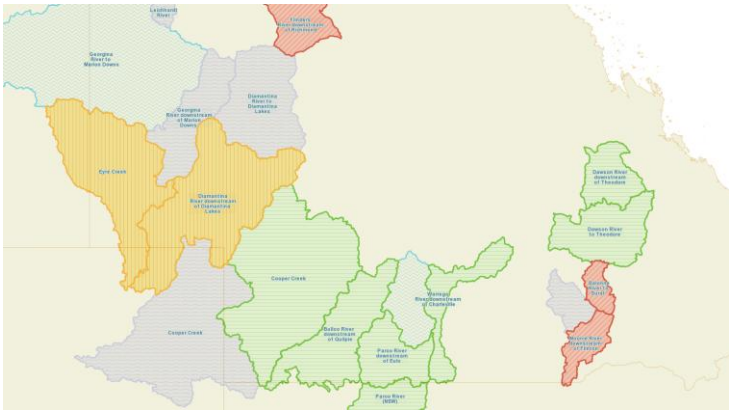
Product Update Frequency: Flood Warnings are updated with varying frequencies. Please see Schedule 10 of the Service Level Specifications for Flood Forecasting and Warnings Services for each state/territory for details.

Layer Product Code: IDZ20013

Spatial Areas: IDM00017 – Flood Warning Catchment Areas

Further Information:

- About our Flood Warning Services
- Service Level Specifications for Flood Forecasting and Warnings Services for each state/territory
- Warning products FTP/SFTP user guide



Road Weather Alerts

- Road Weather Alerts are issued for metropolitan areas (excluding Darwin), or state-wide in Tasmania, when weather is expected to contribute to hazardous driving conditions.
- Road Weather Alerts are issued only when conditions are likely to be worse than normal for the season and location. For example, alerts for ice on roads are not normally issued for alpine districts in winter unless expected to be unusually severe or widespread.
- Road Weather Alerts are typically issued 12 to 18 hours prior to the onset of the hazardous conditions.

Product Update Frequency: Road Weather Alerts are updated every 6 hours, until cancelled.

Layer Product Code: IDZ20014

Spatial Areas:

IDM00014 - Metropolitan Areas

IDM00001 - Public Weather Forecast Districts (Tasmania only).

Further Information:

- Warning products FTP/SFTP user guide

Marine Wind Warnings

- Marine Wind Warnings are issued for coastal and local waters areas whenever strong winds, gales, storm force or hurricane force winds are expected.
- Marine Wind Warnings warn of hazardous wind conditions on either the current or following day and can be issued up to 42 hours in advance.

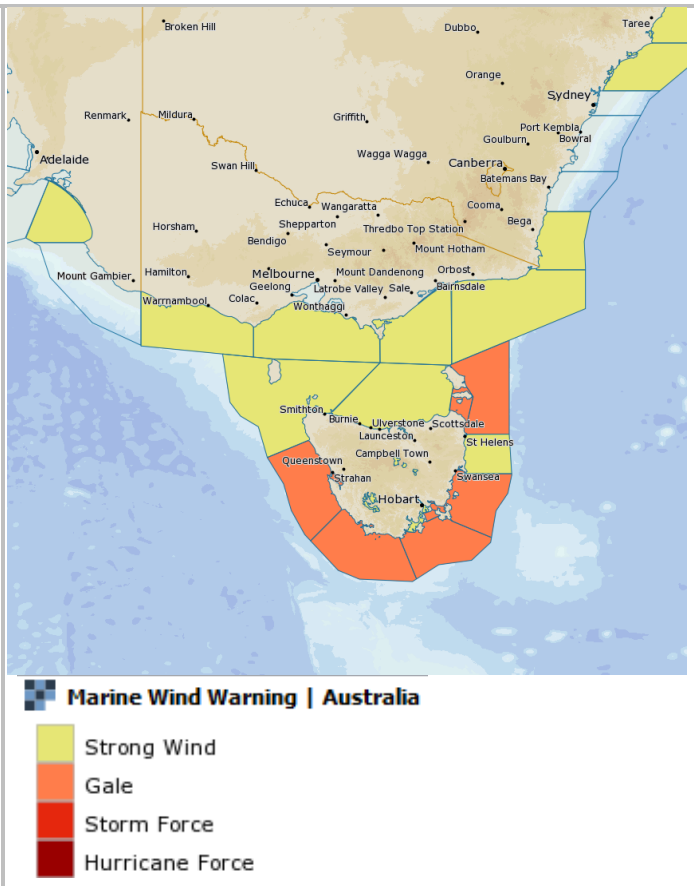
Product Update Frequency: Marine Wind Warnings are updated every six hours when current. However, if conditions develop rapidly, warnings can be issued and updated at any time.

Layer Product Code: IDZ20008

Spatial Areas: IDM00003 – Marine Zones

Further Information:

- About our Marine Wind Warning Services
- Warning products FTP/SFTP user guide



Hazardous Surf Warnings

- Hazardous Surf Warnings are issued for coastal waters areas in New South Wales and southern Queensland when surf conditions are expected to be hazardous for coastal activities.
- The threshold for hazardous surf is based on wave height, swell direction and swell period.
- Hazardous Surf Warnings warn of hazardous conditions on either the current or following day and can be issued up to 42 hours in advance.

Layer Product Code: IDZ20017

Spatial Areas: IDM00003 – Marine Zones

Further Information:

- About our Hazardous Surf Messages

Hazardous Surf Warning

Hazardous surf

Other Warning Types

The following additional types of warnings are available via FTP:

- **Agricultural warnings**, which include frost warnings and sheep graziers' warnings;
- **Bushwalkers alerts** for weather phenomena contributing to hazardous bushwalking conditions (Tasmania only);
- **Ocean wind warnings** for hazardous winds and waves in ocean areas; and
- **Heatwave warnings** for severe or extreme heatwaves.

For more information about these warning products, please see the Bureau of Meteorology Warning Products user guide.

Australian Digital Forecast Database (ADFD)	The ADFD is a database of official weather forecast elements produced by the Bureau of Meteorology. The forecasts use a blend of Australian and international model data with the latest science, technology, and expert meteorologist input to best represent expected weather.

Total Wave Height

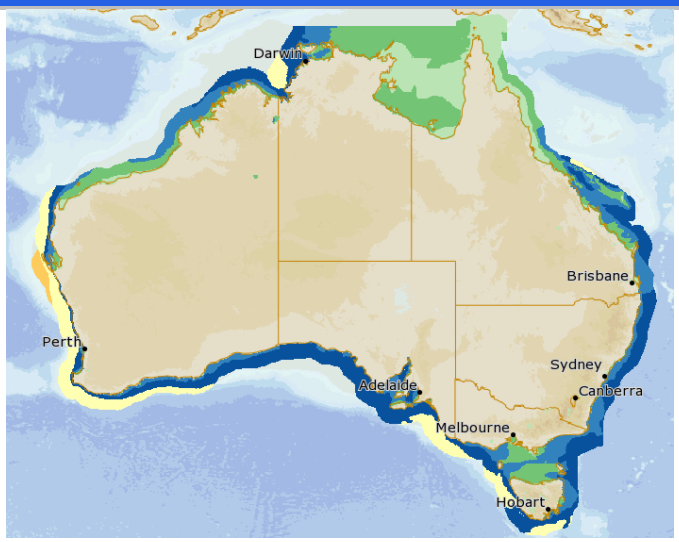
- Total wave height is the combined height of the sea and the swell that mariners experience on open water. It may also be referred as the combined sea and swell or significant wave height. Wave heights describe the average height of the highest third of the waves.
- ADFD total wave height forecasts are provided at three-hourly intervals to +96 hours.
- **Spatial resolution:** The resolution of the Australian grid is 6km (grids at a 3km resolution for Victoria and Tasmania are available via Registered User FTP/SFTP).
- **Units:** metres (m)

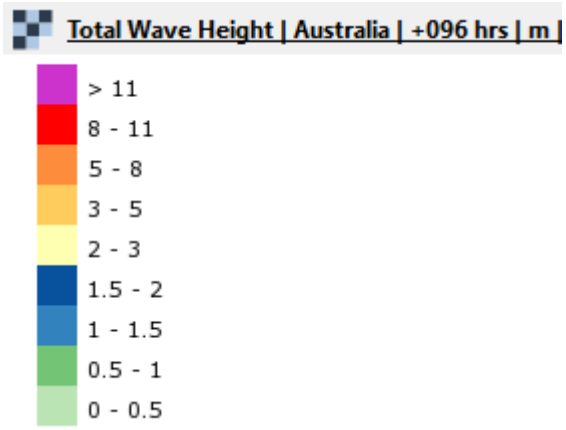
Product Update Frequency: The ADFD files are updated routinely four times per day at around 2300, 0500, 1100 and 1700 UTC and updated at other times as required.

Layer Product Code: IDZ71069

Further Information:

- About wave height
- ADFD grids FTP/SFTP user guide





Hazardous Wind Onset (next 6 hours)

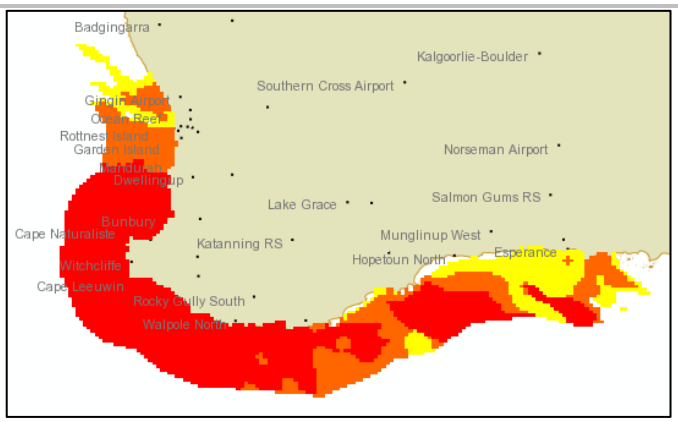
- This forecast element (hazardous wind onset) shows if and when hazardous winds are expected to arrive over the next six hours.
- 'Hazardous' wind is defined as having an average wind speed of 26 knots and above or wind gusts of 42 knots and above.
- **Spatial resolution:** The resolution of the Australian grid is 6km (grids at a 3km resolution for Victoria and Tasmania are available via Registered User FTP).

Product Update Frequency: Unlike other ADFD grids, the Hazardous Wind Onset (next 6 hours) grid is updated hourly and contains no time dimension.

Layer Product Code: IDZ71153

Further Information:

- ADFD grids FTP/SFTP user guide



Fire Danger Rating

Fire Danger Rating (4 Days)

- A 4-day summary of Fire Danger Ratings for each Fire Weather District provides awareness of the extent to which weather conditions will enhance fire related risks.
- 'No Rating' may be shown when there is low risk, during the fire weather season.
- The local fire weather season is year-round in NSW/ACT, NT, Qld and WA. For other states please see the Fire Weather Service Level Specification.

Product Update Frequency: Fire Danger Ratings are issued twice daily during the local fire weather season in NSW/ACT, NT, Vic and WA and in the afternoon in Qld, SA and Tas. For issue times please see Table 3 on page 10 of the Text Forecasts user guide.

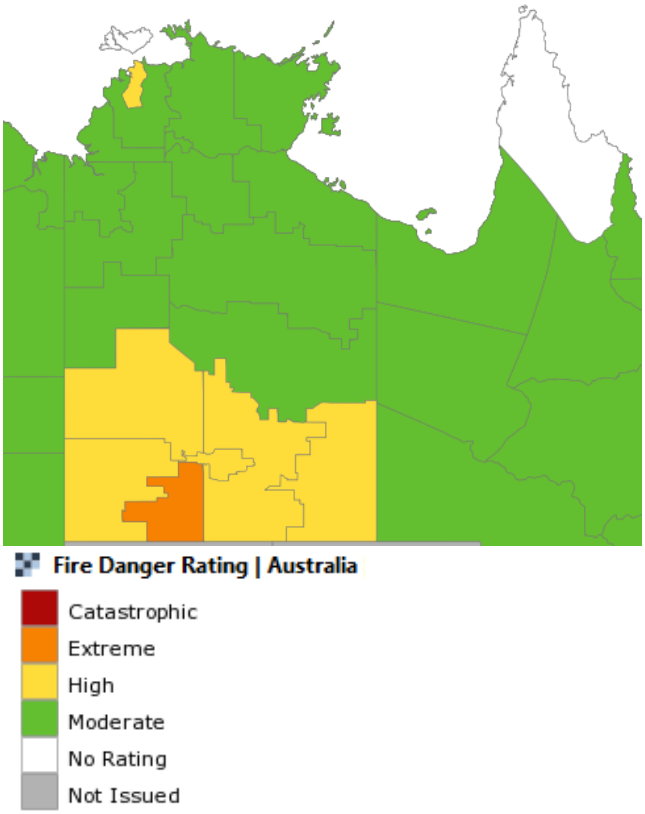
Fire Danger Ratings are valid for the next 4 days when issued in the afternoon and valid for the current day and following 3 days when issued in the morning.

Layer Product Code: IDZ20000

Spatial Areas: IDM00007 – Fire Weather Districts

Further Information:

- About Fire Danger Ratings
- Text forecast products (including 4 Day Fire Danger Ratings) FTP/SFTP user guide



Heatwave Assessment and Forecast

Heatwave Assessment and Forecast

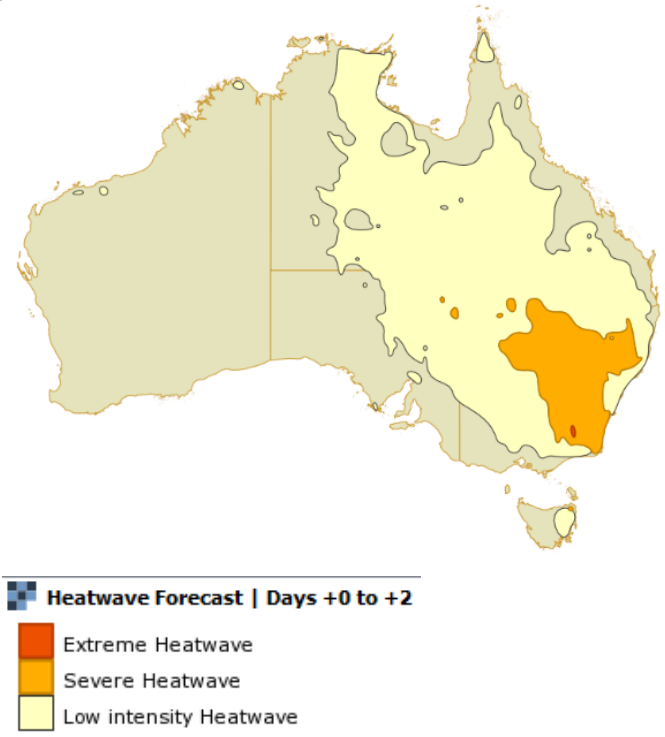
- The Bureau of Meteorology defines a heatwave as three or more days in a row when both maximum and minimum temperatures are unusually high—in relation to the local long-term climate and the recent past.
- Heatwaves are classified into three types, based on intensity: Low-intensity, Severe and Extreme.
- The Assessments show areas of heatwave severity analysed for the previous two three-day periods.
- The Forecasts show areas of forecast heatwave severity for the next five three-day periods.

Product Update Frequency: Daily at approximately 2:15 pm AEST (0415 UTC) from October to the end of March (please note that depending on conditions, the service may start earlier or run later).

Layer Product Code: IDY10012

Further Information:

- About our Heatwave Services
- Heatwave Service Level Specification
- Heatwave Assessment and Forecast grids FTP/SFTP user guide



Numerical Weather Prediction

ACCESS-G - Wind and MSLP

- The ACCESS-G model is run four times per day at 00 UTC, 06 UTC, 12 UTC and 18 UTC and produces hourly forecasts from 0 hours (base time) to 84 hours in hourly time steps.
- Current ACCESS-G layers available are: Mean Sea Level Pressure (MSLP) and wind speed and direction (10 m).
- Please note that as there is no manual input, ACCESS-G forecasts will differ from the Bureau's official forecasts, especially in the vicinity of weather fronts, tropical cyclones or when significant late-breaking observations have become available to forecasters.
- **Spatial domain:** 16.99°N to 65.04°S; 175.43°W to 64.86°E
- **Spatial resolution:** 0.18 x 0.12 degrees
- **Units:** Wind speed – knots (KT); MSLP - hectopascals (hPa)

Product Update Frequency: Four times per day at approximately 0800 UTC (00 UTC model run), 1245 (06 UTC model run), 2000 UTC (12 UTC model run) and 0045 UTC (18 UTC model run).

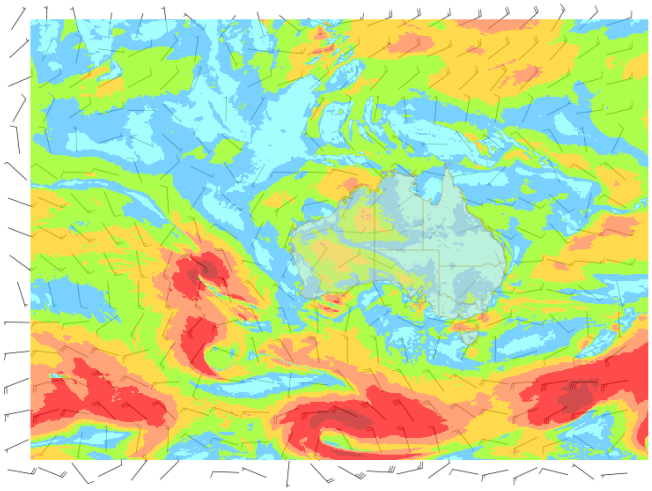
Layer Product Code: IDY25026

Further Information:

- About ACCESS-G data
- ACCESS-G FTP/SFTP user guide (forecasts to 240 hours are available via Cloud (S)FTP for 00 and 12 UTC runs)

MSLP | Aust. Region | hPa | line | ACCESS-G APS3

Mean Sea Level Pressure



Wind Speed (10m) | Aust. Region | knots | raster | ACCESS-G APS3

- 0 - 5 knots
- 5 - 10 knots
- 10 - 15 knots
- 15 - 20 knots
- 20 - 25 knots
- 25 - 34 knots
- 34 - 48 knots
- 48 - 64 knots
- > 64 knots

Wind Barbs (10m) | Aust. Region | knots,degN | point | ACCESS-G APS3

AUSWAVE - Total Wave Height

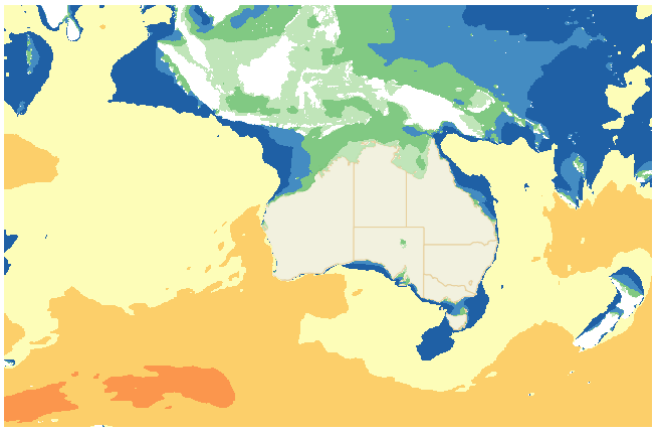
- The AUSWAVE model is run four times per day at 00 UTC, 06 UTC, 12 UTC and 18 UTC and produces hourly forecasts from 0 hours (base time) to 72 hours in hourly time steps.
- Total wave height is the combined height of the sea and the swell that mariners experience on open water. It may also be referred to as the combined sea and swell or significant wave height. Wave heights describe the average height of the highest third of the waves.
- Please note that as there is no manual input, AUSWAVE forecasts will differ from the Bureau's official forecasts, especially in the vicinity of weather fronts, tropical cyclones or when significant late-breaking observations have become available to forecasters.
- **Spatial domain:** 12°N to 60°S; 180 to 69°E
- **Spatial resolution:** 0.0625 x 0.0625 degrees
- **Units:** metres (m)

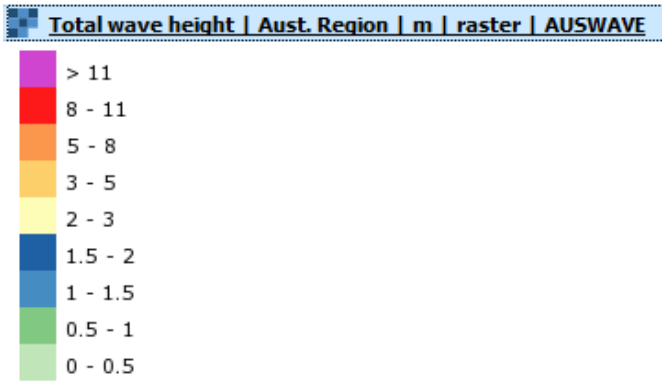
Product Update Frequency: Four times per day at approximately 1100 UTC (00 UTC model run), 1350 (06 UTC model run), 2300 UTC (12 UTC model run) and 0150 UTC (18 UTC model run)

Layer Product Code: IDY35100

Further Information:

- About AUSWAVE forecast data
- AUSWAVE FTP/SFTP user guide





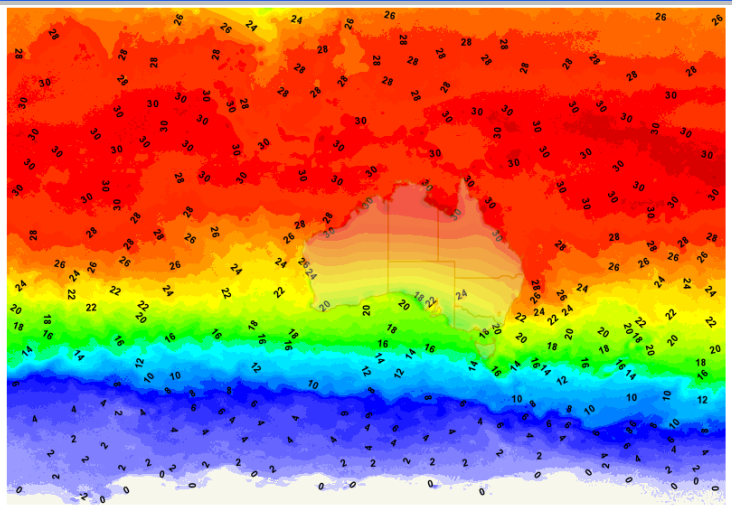
Oceans

Sea Surface Temperature Analysis

- The Sea Surface Temperature data in this layer is sourced from the real-time, high-resolution, Regional Australian Multi-Sensor Sea surface temperature Analysis (RAMSSA) system developed at the Bureau.
- The high-resolution analysis system combines SST data from infrared (AVHRR and AATSR) and microwave (AMSR-E) sensors on polar-orbiting satellites with in-situ measurements to produce daily “foundation” SST estimates (SSTfnd), largely free of nocturnal cooling and diurnal warming effects.
- **Spatial domain:** 20°N to 65°S; 170°W to 60°E
- **Spatial resolution:** 0.0832 x 0.0832 degrees
- **Units:** degrees Celsius

Product Update Frequency: Daily at approximately 2:05 pm AEST (0405 UTC)

Layer Product Code: IDYOC050



SST | Aust. Region | degC | line | 0.0832 deg/SST

Sea Surface Temperature

Radar

Radar Imagery

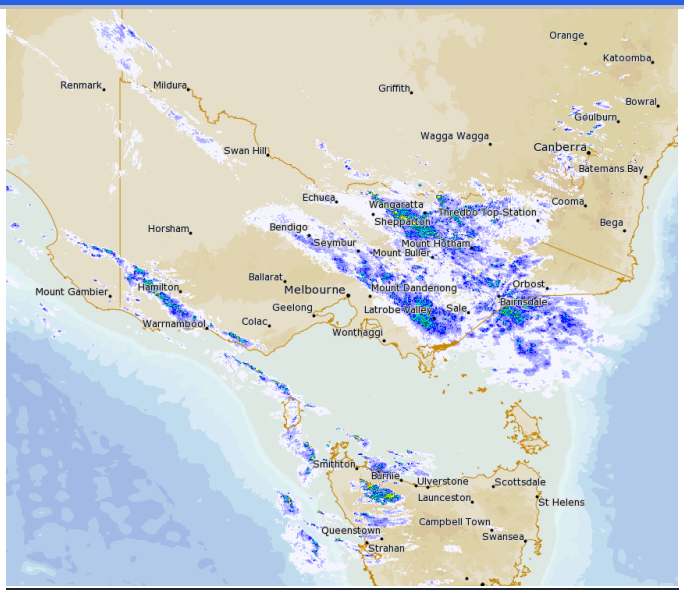
- This layer displays a mosaic of rainfall rates for more than 60 radars across Australia (excluding Norfolk Island, which is available separately because it is so far offshore).
- **Units:** millimetres per hour (mm/hr)

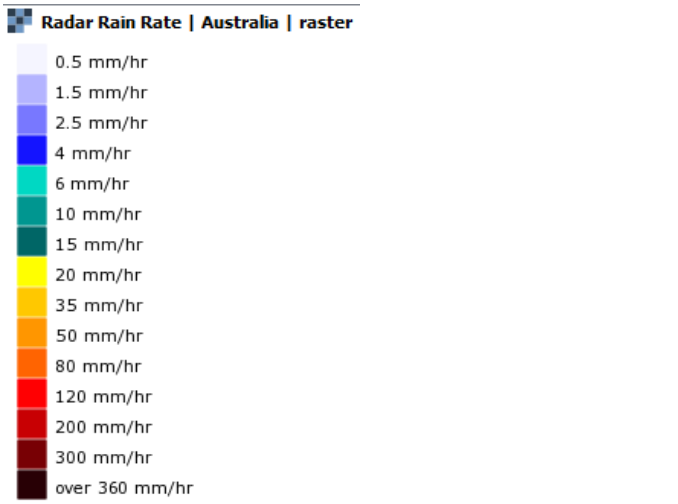
Product Update Frequency: Every 5 minutes.

Layer Product Code: IDR00010

Further Information:

- About Australian Weather Watch Radar
- Radar Images FTP/SFTP user guide (Rainfields ground reflectivity data and volumetric radar data are also available via Registered User FTP/SFTP)

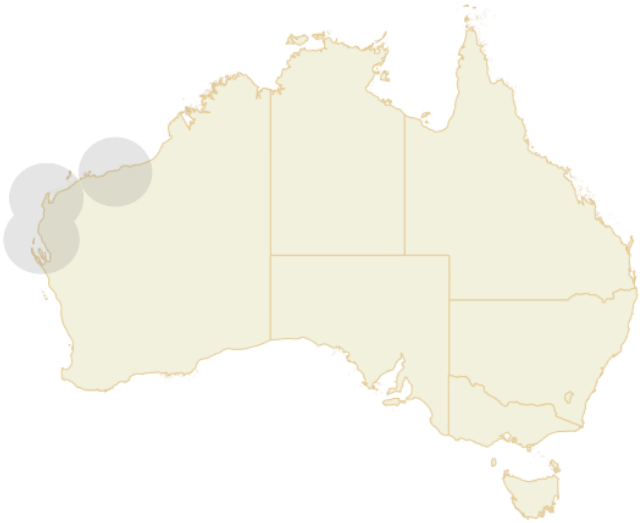




Radar - no data

- This layer shows which radars are offline to help customers distinguish between “no signal” versus “no rain”.
- Offline radars are shown as a grey circle with a radius of 250 km centred on the radar.
- Outages may be due to tracking high-level balloons (part-time radars), routine maintenance or unscheduled outages.

Layer Product Code: IDR00009



Radar - TITAN Tracks

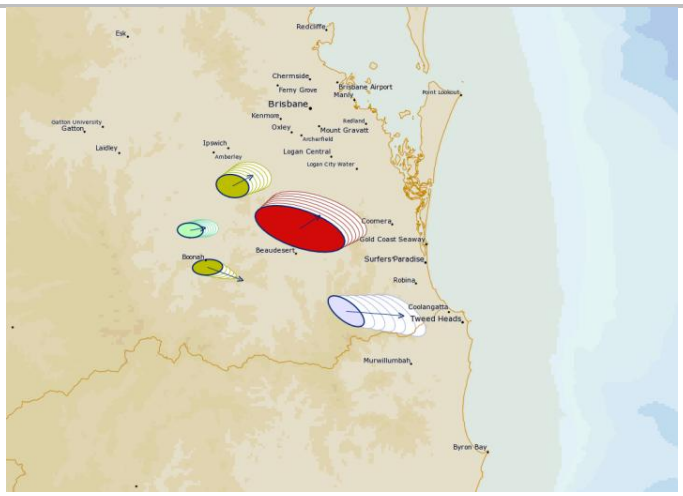
- TITAN (Thunderstorm Identification, Tracking, Analysis and Nowcasting) is an algorithm used to objectively identify and track thunderstorm cells based on their radar signal, developed by Mike Dixon of NCAR.
- The cells are depicted as ellipses (either current or forecast) with track lines showing the direction of the cell movement.
- TITAN tracks are available for ten single radars (Melbourne, Cairns, Alice Springs, Canberra, Katherine, Yarrawonga, Darwin, Bairnsdale, Townsville and Hobart) and six groups of merged radars (NT, SA, NSW, WA, Qld and Vic).
- These radars have been combined into one dataset. In some cases cells derived from neighbouring radars may cause overlapping areas of different severity.
- Please note that TITAN track creation is automated and has no human input.

Product Update Frequency: Every 5 minutes.

Layer Product Code: IDR00011

Further Information:

- About TITAN
- TITAN track FTP/SFTP user guide



Radar Thunderstorm Tracking | Australia

- Very Weak, forecast
- Weak, forecast
- Moderate, forecast
- Strong, forecast
- Very Strong, forecast
- Very Weak, current
- Weak, current
- Moderate, current
- Strong, current
- Very Strong, current

Radar Thunderstorm Track Direction | Australia

Track Direction

Observations

Surface Weather Observations - Latest

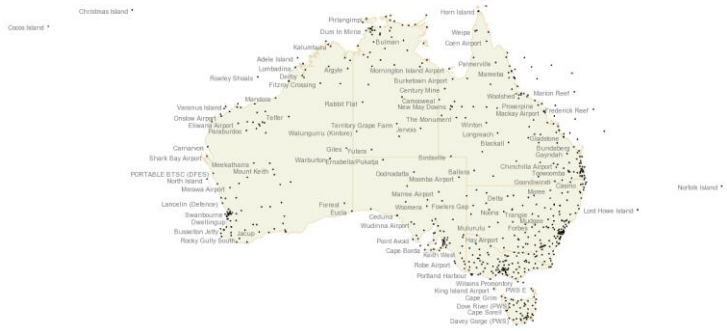
- Data in this layer is sourced from Automatic Weather Stations, including some portable automatic weather stations (PAWS) and from some sites that are manually operated and update less frequently.
- In the example for Hobart Airport, the observation time is shown in UTC, alternatively local time can be displayed.
- The example shows Wind Speed and Direction and Maximum Wind Gust for the last 10 minutes in knots (alternatively the values in km/h can be displayed).
- The arrow alignment of the wind barb gives the direction from which the wind is blowing (i.e. NNE in the example), and the barb gives the speed, where:
  - a pennant barb ( ) would represent 50 knots
  - a feather barb ( ) represents 10 knots (as in the example)
  - a half feather barb ( ) would represent 5 knots

Product Update Frequency: Every 10 minutes (showing the latest reading at each station over the last 60 minutes)

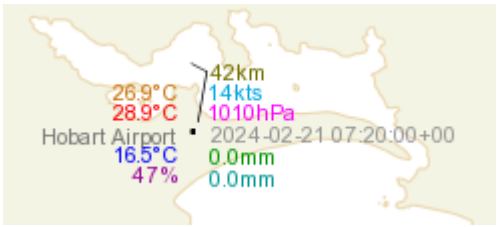
Layer Product Code: IDZ20010

Further Information:

- About weather observations
- 10-minute observation FTP/SFTP user guide



Example:



Wind Speed and Direction:

Apparent Temperature: **26.9°C**

Dry Bulb Temperature: **28.9°C**

Station Name: **Hobart Airport**

Dewpoint Temperature: **16.5°C**

Relative Humidity: **47%**

Visibility: **42km**

Maximum Wind Gust (last 10 minutes): **14kts**

Mean Sea Level Pressure: **1010hPa**

Observation date/time (UTC): **2024-02-21 07:20:00+00**

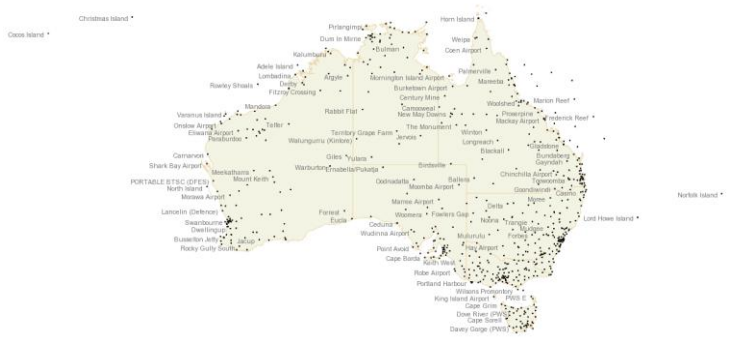
Rainfall since 9 am: **0.0mm**

Rainfall previous 24 hours: **0.0mm**

Surface Weather Observations - 10-minute readings over last 24 hours

The layer includes the following data:

- WMO Station Number (wmoid)
- Bureau Station Number (bomid)
- Station Name (stnname)
- Station Alternate Name (stnaltname)
- Latitude (lat)
- Longitude (lon)
- UTC Date/Time (timeutc)
- Local Date/Time (timeloc)
- Apparent Temperature in °C (apptemp)
- Dry Bulb Temperature in °C (airtemp)
- Dewpoint Temperature in °C (dewpoint)
- Mean Sea Level Pressure in hPa (mslpres)
- Relative Humidity in % (relhum)
- Wind Direction in degrees from N (winddirdeg)
- Wind Speed – 10-minute average from standard height of 10m
  - in km/hr (windspdkmh)
  - in knots (windspd)
- Wind Gust – wind gust measured over 3 seconds from standard height of 10m
  - in km/hr (gustkmh)
  - in knots (gustspd)
- Visibility in km (viskm)
- Rainfall since 9 am local time in mm (rain)
- Rainfall in the last 24 hours before 9 am local time in mm (rain24hr)
- Maximum Air Temperature in °C between 6 am and 9 pm local time (maxairtemp)



- Minimum Air Temperature in °C between 6 pm and 9 am local time (minairtemp)

Product Update Frequency: Every 10 minutes.

Layer Product Code: IDZ20011

Further Information:

- About weather observations
- 10-minute observation FTP/SFTP user guide
- Data in this layer is sourced from Automatic Weather Stations, including some portable automatic weather stations (PAWS) and from some sites that are manually operated and update less frequently.
- Please note that data from some manual stations (e.g. Sweers Island in Queensland which reports once per day at 9 am) may be available in this IDZ20011 layer but not in the IDZ20010 layer (which only shows data that is no older than 60 minutes).

River Conditions

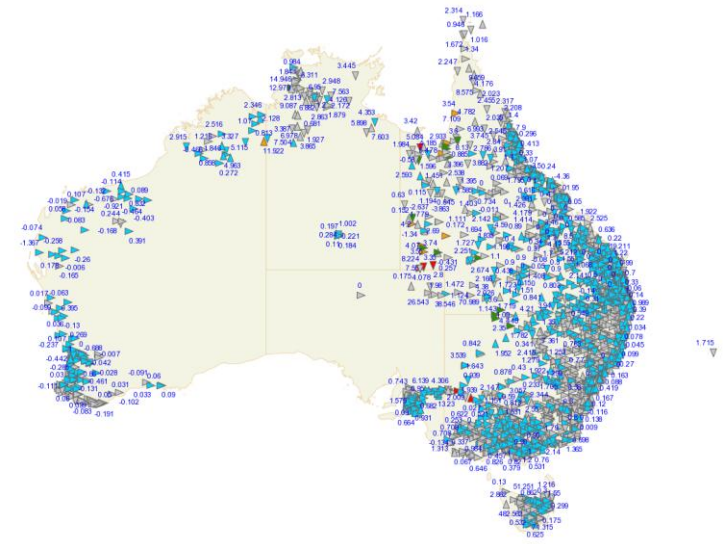
- This layer shows the latest river conditions provided for flood warning purposes; including river heights, flood classifications and tendency.
- River height tendency (rising, falling, steady) is calculated by comparing only the latest observation with the previous observation. During times when the water level is fluctuating, such as during a flood peak, the tendency calculated can sometimes be inaccurate. Looking at the plot of the hydrograph is recommended in this situation.
- Please note that the river data shown in these products includes real-time operational data from automated telemetry systems and has not been quality controlled. Some of the data are the result of interpolation of observations reported at irregular time intervals.

Product Update Frequency: The data are updated every 15 minutes, but all readings may not be updated at this frequency. Please check observation times in the dataset for currency.

Layer Product Code: IDZ20020

Further Information:

- About river height data
- Links to hydrographs for: Qld, NSW, Vic, Tas, SA, NT and WA
- About our Flood Warning Services
- River height and rainfall data FTP/SFTP user guide
- Please note that the following state/territory-based River Condition



River Obs, Flood Level and Tendency (all) | Australia

- No classification, rising
- No classification, falling
- No classification, steady
- No classification, unknown
- Below flood level, rising
- Below flood level, falling
- Below flood level, steady
- Below flood level, unknown
- Minor flooding, rising
- Minor flooding, falling
- Minor flooding, steady
- Minor flooding, unknown
- Moderate flooding, rising
- Moderate flooding, falling
- Moderate flooding, steady
- Moderate flooding, unknown
- Major flooding, rising
- Major flooding, falling
- Major flooding, steady
- Major flooding, unknown

Example:

River Observation Site: Paroo River at Hungerford

Latest River Height: 1.09 metres

Flood Level and Tendency: (Minor flooding, steady)

WMS/WFS layers are currently still included in the GIS2Web service but will be removed (date TBC): IDQ65470, IDN62011, IDD60280, IDS65178, IDV65201, IDW60411 and IDT65010.

Satellite Imagery

- These layers show infrared, visible and composite imagery sourced from the Japanese Meteorological Agency (JMA)'s Himawari-9 satellite.

Product Update Frequency: Every 10 minutes.

Layer Product Codes:

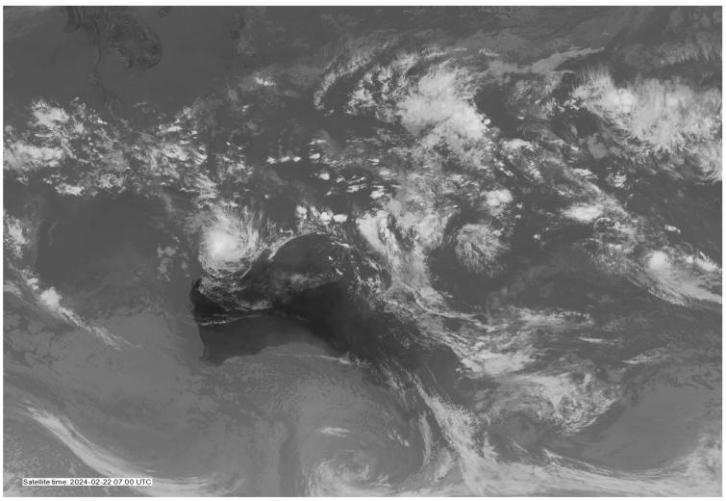
- IDE00431 – Infrared (Greyscale) - 2km
- IDE00432 – Visible (Greyscale) – 2km
- IDE00433 – Infrared (Zehr) – 2km
- IDE00435 - True colour/Infrared composite – 1km

Further Information:

- About satellites
- Satellite image (JPG format) FTP/SFTP user guide
- Satellite image (GeoTIFF format) FTP/SFTP user guide
- Satellite data full disk bundle (NetCDF4 format) user guide
- Meteorological Satellite Center of JMA

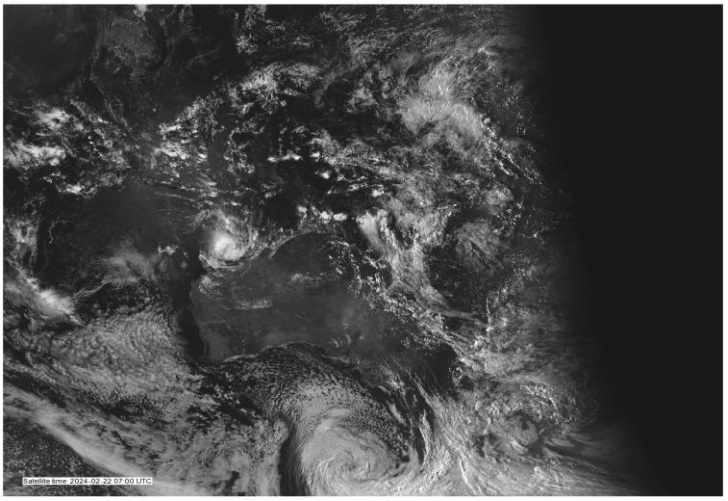
IDE00431 – Infrared (Greyscale):

Dark colours indicate warm regions (low cloud, sea and land) and increasing white shades depict higher, colder clouds.



IDE00432 – Visible (Greyscale):

These images will appear black in regions of no sunlight, i.e. night-time.



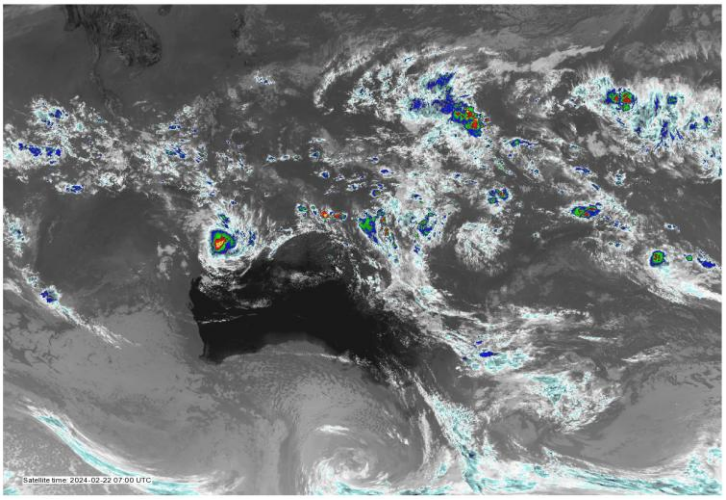
Please see the next page for additional images.

Satellite Imagery (continued)

- Ray Zehr from the US National Oceanic and Atmospheric Administration developed the Zehr enhancement, which applies temperature colour ranges to the cold end of the scale. This highlights deep convection that is generally associated with tropical cyclones and thunderstorms.

- The true-colour images are based on reflected visible light. These are useful, for example, for identifying fog and low cloud, which may not be visible in thermal infrared images because it has a similar temperature to the ground below. The visible light images only show parts of the Earth that are in daylight during the scan. Areas with no sunlight to reflect are replaced with greyscale thermal infrared (IR) imagery.

IDE00433 – Infrared (Zehr):



IDE00435 - True colour/Infrared composite: