State of the Climate 2016

CSIRO

Australian Government
Bureau of Meteorology

Australian Bureau of Meteorology and CSIRO, 2016, State of the Climate 2016, 24pp.
www.bom.gov.au/state-of-the-climate/ | **www.csiro.au/state-of-the-climate**

References and data sources

General climate information and links

State of the Climate 2010
http://www.bom.gov.au/state-of-the-climate/2010/CSIRO-State-of-Climate-2010.pdf

State of the Climate 2012
http://www.bom.gov.au/state-of-the-climate/2012/Climate-Snapshot-2012-Brochure.pdf

State of the Climate 2014
http://www.bom.gov.au/state-of-the-climate/2014/
http://www.csiro.au/en/Research/OandA/Areas/Assessing-our-climate/State-of-the-Climate/2014-SoC-Report

Australian Bureau of Meteorology – Influences on Australia's climate, e.g. El Niño, **http://www.bom.gov.au/climate/about/**

CSIRO & Australian Bureau of Meteorology 2015, 'Climate Change in Australia', *Climate Change in Australia*, **http://www.climatechangeinaustralia.gov.au/en/**

Herring, SC, Hoerling, MP, Kossin, JP, Peterson, TC & Stott, PA (Eds) 2015, 'Explaining Extreme Events of 2014 from a Climate Perspective', *Bulletin of the American Meteorological Society*, vol. 96, no. 12 (suppl), pp. S1–S172, A collection of studies: **http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-ExplainingExtremeEvents2014.1**

Intergovernmental Panel on Climate Change (IPCC) 2012, '*Managing the risks of extreme events and disasters to advance climate change adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change*' Field, CB, Barros, V, Stocker, TF, Qin, D, Dokken, DJ, Ebi, KL, Mastrandrea, MD, Mach, KH, Plannter, G-K, Allen, SK, Tignor, M & Midgley, PM (Eds), Cambridge University Press, **https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf**

IPCC, 2013, '*Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*'. Stocker, TF, Qin, D, Plattner, G-K, Tignor, M, Allen, SK, Boschung, J, Nauels, A, Xia, Y, Bex, V & Midgley, PM (Eds), Cambridge University Press, pp.1535. **http://www.climatechange2013.org/**
http://www.ipcc.ch

Jackson, W, Klekociuk, A, Emmerson, K, Keywood, M, Hibberd, M, Cresswell, I, Murphy, H, Coleman, S, Johnston, E, Clark, G, Argent, R, Mackay, RAM, Metcalfe, D, Evans, K, Bax, N, Smith, DC, Wienecke, B, Cochrane, P & Hatton, T 2016, '*State of the Environment 2016*', **https://www.environment.gov.au/science/soe/**

Keenan, T, Cleugh, H, Braganza, K, Power, S, Trewin, B, Arblaster, J, Timbal, B, Hope, P, Frederiksen, C, McBride, J, Jones, D & Plummer, N 2011, '*Climate Science Update: A Report to the 2011 Garnaut Review*', Melbourne, **http://www.cawcr.gov.au/technical-reports/CTR_036.pdf**

World Meteorological Organization 2016, *WMO 'Statement on the Status of the Global Climate in 2015'*, World Meteorological Organization, **http://library.wmo.int/pmb_ged/wmo_1167_en.pdf**

World Meteorological Organization 2016, '*WMO Greenhouse Gas Bulletin'*, **http://www.wmo.int/pages/prog/arep/gaw/ghg/GHGbulletin.html**

World Meteorological Organization 2016, '*WMO statement on 2011-2015 climate*'. Available after mid November 2016 at **http://www.wmo.int/pages/prog/wcp/wcdmp/CA_2.php**

Key data sources

Australian Bureau of Meteorology Climate Information
http://www.bom.gov.au/climate/change/

Australian Bureau of Meteorology high quality temperature dataset
http://www.bom.gov.au/climate/change/acorn-sat/

Cape Grim greenhouse gas data
https://www.csiro.au/greenhouse-gases/

CSIRO Oceans and Atmosphere: Sea-level data, *Sea-Level Rise*, **http://www.cmar.csiro.au/sealevel/**

Hartmann, DJ, Klein Tank, AMG, Rusticucci, M, Alexander, LV, Brönnimann, S, Charabi, YAR, Dentener, FJ, Dlugokencky, EJ, Easterling, DR, Kaplan, A, Soden, BJ, Thorne, PW, Wild, M & Zhai, P 2013, '*Observations: Atmosphere and Surface*', in: Stocker, TF, Qin, D, Plattner, G-K, Tignor, M, Allen, SK, Boschung, J, Nauels, A, Xia, Y, Bex, V & Midgley, PM (Eds), Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp.159–254.

NOAA Extended Reconstructed Sea Surface Temperature version 4 (ERSST.v4) **http://www.esrl.noaa.gov/psd/data/gridded/data.noaa.ersst.v4**

NOAA Global greenhouse gas reference network
http://www.esrl.noaa.gov/gmd/ccgg/trends/global.html

Status of the Global Observing System for Climate
http://public.wmo.int/en/resources/bulletin/status-of-global-observing-system-climate

Australia's climate

Temperature

Alexander, LV, Hope, P, Collins, D, Trewin, B, Lynch, A & Nicholls, N 2007, 'Trends in Australia's climate means and extremes: a global context', *Australian Meteorological Magazine*, vol. 56, pp. 1–18.

Alexander, LV & Arblaster, JM 2009, 'Assessing trends in observed and modelled climate extremes over Australia in relation to future projections', *International Journal of Climatology*, vol. 29, no. 3, pp. 417–435.

Arblaster, JM, Lim, EP, Hendon, HH, Trewin, BC, Wheeler, MC, Liu, G & Braganza, K, 2014, 'Understanding Australia's hottest spring on record', *Bulletin of the American Meteorological Society*, vol. 96, no. 12, pp. S37–S41.

Bindoff, NL, Stott, PA, AchutaRao, KM, Allen, MR, Gillett, N, Gutzler, D, Hansingo, K, Hegerl, G, Hu, Y, Jain, S, Mokhov, II, Overland, J, Perlwitz, J, Sebbari, R & Zhang, X, 2013. '*Detection and Attribution of Climate Change: from Global to Regional*'. in: Stocker, TF, Qin, D, Plattner, G-K, Tignor, M, Allen, SK, Boschung, J, Nauels, A, Xia, Y, Bex, V & Midgley, PM (Eds), Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 867–952.

Black, MT, Karoly, DJ & King, AD, 2015, 'The contribution of anthropogenic forcing to the Adelaide and Melbourne, Australia, heat waves of January 2014', *Bulletin of the American Meteorological Society*, vol. 96, no. 12, pp. S145–S148.

Dittus, AJ, Karoly, DJ, Lewis, SC & Alexander, LV 2015, 'A multiregional assessment of observed changes in the areal extent of temperature and precipitation extremes', *Journal of Climate*, vol. 28, no. 23, pp. 9206–9220.

Donat, MG, Alexander, L V., Yang, H, Durre, I, Vose, R, Dunn, RJH, Willett, KM, Aguilar, E, Brunet, M, Caesar, J, Hewitson, B, Jack, C, Klein Tank, AMG, Kruger, AC, Marengo, J, Peterson, TC, Renom, M, Oria Rojas, C, Rusticucci, M, Salinger, J, Elrayah, AS, Sekele, SS, Srivastava, AK, Trewin, B, Villarroel, C, Vincent, LA, Zhai, P, Zhang, X & Kitching, S 2013, 'Updated analyses of temperature and precipitation extreme indices since the beginning of the twentieth century: The HadEX2 dataset', *Journal of Geophysical Research: Atmospheres*, vol. 118, no. 5, pp. 2098–2118.

Donat, MG, Alexander, LV, Yang, H, Durre, I, Vose, R & Caesar, J 2013, 'Global land-based datasets for monitoring climatic extremes', *Bulletin of the American Meteorological Society*, vol. 94, no. 7, pp. 997–1006.

Fawcett, RJB, Trewin, BC, Braganza, K, Smalley, R., Jovanovic, B & Jones, DA 2012, *On the sensitivity of Australian temperature trends and variability to analysis methods and observation networks*, CAWCR technical report, No 50. Bureau of Meteorology, Melbourne, accessed from **http://cawcr.gov.au/technical-reports/CTR_050.pdf**

Fawcett, RJ., Trewin, BC, Smalley, R & Braganza, K 2013, 'On the changing nature of Australian monthly and daily temperature anomalies', in *Sense and sensitivity: understanding our changing weather and climate | 19th Annual National Conference of the Australian Meteorological and Oceanographic Society, Melbourne Convention and Exhibition Centre, Melbourne, Victoria, 11-13 February 2013*, p. 317.

Herring, SC, Hoerling, MP, Peterson, TC & Stott, PA (Eds) 2014, 'Explaining extreme events of 2013 from a climate perspective'. *Bulletin of the American Meteorological Society*, vol. 95, no. 9 (suppl), pp.S1-S104. A collection of studies, available at: **http://journals.ametsoc.org/doi/pdf/10.1175/1520-0477-95.9.S1.1**

Hope, P, Lim, E-P, Wang, G, Hendon, HH & Arblaster, JM 2015, 'Contributors to the Record High Temperatures Across Australia in Late Spring 2014', *Bulletin of the American Meteorological Society*, vol. 96, no. 12, pp. S149–S153.

Karoly, DJ & Braganza, K 2005, 'Attribution of recent temperature changes in the Australian region', *Journal of Climate*, vol. 18, no. 3, pp. 457–464.

King, A. D., Lewis, SC, Perkins, SE, Alexander, L V., Donat, MG, Karoly, DJ, Black, MT, Alexander, L V. & Nairn, JR 2012, 'Increasing frequency, intensity and duration of observed global heatwaves and warm spells', *Geophysical Research Letters*, vol. 39, no. 20, pp. 1–5.

Lewis, SC & Karoly, DJ 2013, 'Anthropogenic contributions to Australia's record summer temperatures of 2013', *Geophysical Research Letters*, vol. 40, no. 14, pp. 3708–3709.

Lewis, S, Karoly, D & Yu, M 2014, 'Quantitative estimates of anthropogenic contributions to extreme national and State monthly, seasonal and annual average temperatures for Australia', *Australian Meteorological and Oceanographic Journal*, vol. 64, no. 3, pp. 215–230.

Perkins, SE & Alexander, L V. 2013, 'On the measurement of heat waves', *Journal of Climate*, vol. 26, no. 13, pp. 4500–4517.

Peterson, TC, Hoerling, MP, Stott, PA & Herring, SC (Eds) 2013. 'Explaining extreme events of 2012 from a climate perspective'. *Bulletin of the American Meteorological Society*, 94(9), pp.S1-S74. A collection of studies, available at: **http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-D-13-00085.1**

Peterson, TC, Stott, PA & Herring, S (Eds) 2012, 'Explaining Extreme Events of 2011 from a Climate Perspective' *Bulletin of the American Meteorological Society*, vol. 93, no. 7, pp. 1041–1067.

Rahmstorf, S & Coumou, D 2011, 'Increase of extreme events in a warming world', *Proceedings of the National Academy of Sciences*, vol. 108, no. 44, pp. 17905–17909.

Steffen, W 2013, *The Angry Summer*, accessed from **http://climatecommission.gov.au/wp-content/uploads/Angry-Summer-amended-040313-web.pdf**

Trewin, B & Vermont, H 2010, 'Changes in the frequency of record temperature in Australia, 1957-2009', *Australian Meteorological and Oceanographic Journal*, vol. 60, no. 2, pp. 87–90.

Trewin, B 2013, 'A daily homogenized temperature data set for Australia', *International Journal of Climatology*, vol. 33, no. 6, pp. 1510–1529.

Fire Weather

Clarke, H, Lucas, C & Smith, P 2013, 'Changes in Australian fire weather between 1973 and 2010', *International Journal of Climatology*, vol. 33, no. 4, pp. 931–944.

Lucas, C, Hennessy, K, Mills, G & Bathols, J 2007, *Bushfire Weather in Southeast Australia: Recent Trends and Projected Climate Change Impacts*, Consultancy report for The Climate Institute of Australia by Bushfire CRC, Australian Bureau of Meteorology and CSIRO Marine and Atmospheric Research **http://www.climateinstitute.org.au/verve/_resources/fullreportbushfire.pdf**

Lucas, C 2010, 'On developing a historical fire weather data-set for Australia', *Australian Meteorological and Oceanographic Journal*, vol. 60, pp. 1–14.

Rainfall

Arblaster, JM & Meehl, GA 2006, 'Contributions of external forcings to southern annular mode trends', *Journal of Climate*, vol. 19, no. 12, pp. 2896–2905.

Brown, JR, Moise, AF, Colman, R & Zhang, H 2016, 'Will a Warmer World Mean a Wetter or Drier Australian Monsoon?', *Journal of Climate*, vol. 29, no. 12, pp. 4577–4596.

Cai, W & Cowan, T 2006, 'SAM and regional rainfall in IPCC AR4 models: Can anthropogenic forcing account for southwest Western Australian winter rainfall reduction?', *Geophysical Research Letters*, vol. 33, no. 24, pp. 1–5.

Cai, W & Cowan, T 2008, 'Dynamics of late autumn rainfall reduction over south-eastern Australia', *Geophysical Research Letters*, vol. 35, no. 9, pp. 1–5.

CSIRO and Bureau of Meteorology, 2012, *Climate and water availability in south-eastern Australia: A synthesis of findings from Phase 2 of the South Eastern Australian Climate Initiative (SEACI)*, Australia, accessed from **http://www.seaci.org/publications/documents/SEACI-2Reports/SEACI_Phase2_SynthesisReport.pdf**

Dowdy, AJ, Grose, MR, Timbal, B, Moise, A, Ekstrom, M, Bhend, J & Wilson, L 2015, 'Rainfall in Australia's eastern seaboard: a review of confidence in projections based on observations and physical processes', *Australian Meteorological and Oceanographic Journal*, vol. 65, no. 1, pp. 107–126.

Drosdowsky, W 2005, 'The latitude of the subtropical ridge over eastern Australia: The L index revisited', *International Journal of Climatology*, vol. 25, no. 10, pp. 1291–1299.

Durack, PJ, Wijffels, SE & Matear, RJ 2012, 'Ocean Salinities Reveal Strong Global Water Cycle Intensification During 1950 to 2000', *Science*, vol. 336, no. 6080, pp. 455–458.

Frederiksen, CS, Frederiksen, JS, Janice, M & Osbrough, SL 2011, 'Australian winter circulation and rainfall changes and projections', *International Journal of Climate Change Strategies and Management*, vol. 3, no. 2, pp. 170–188.

Frederiksen, CS & Grainger, S 2015, 'The role of external forcing in prolonged trends in Australian rainfall', *Climate Dynamics*, vol. 45, no. 9-10, pp. 2455–2468.

Gallant, AJE, Hennessy, KJ & Risbey, J 2007, 'Trends in rainfall indices for six Australian regions: 1910-2005', *Australian Meteorological Magazine*, vol. 56, pp. 223–239

Grose MR, Risbey JS, Black MT & Karoly DJ 2015, 'Attribution of exceptional mean sea level pressure anomalies south of Australia in August 2014', *Bulletin of the American Meteorological Society*, vol. 96, no. 12, pp. S158-62.

Timbal, B, Wilson, L, Bathols, J & Kent, D 2015, 'The subtropical ridge in CMIP5 and implications for projections of rainfall in southeast Australia', *Australian Meteorological and Oceanographic Journal,* vol 65, pp. 5-101.

Hope, P, Grose, MR, Timbal, B, Dowdy, AJ, Bhend, J, Katzfey, JJ, Bedin, T, Wilson, L & Whetton, PH 2015, 'Seasonal and regional signature of the projected southern Australian rainfall reduction', *Australian Meteorological and Oceanographic Journal*, vol. 65, no. 1, pp. 54–71.

Hope, P, Keay, K, Pook, M, Catto, J, Simmonds, I, Mills, G, McIntosh, P, Risbey, J & Berry, G 2014, 'A comparison of automated methods of front recognition for climate studies: A case study in southwest Western Australia'. *Monthly Weather Review*, vol. 142, pp. 343–363.

Hope, P, Timbal, B & Fawcett, R 2010, 'Associations between rainfall variability in the southwest and southeast of Australia and their evolution through time', *International Journal of Climatology*, vol. 30, no. 9, pp. 1360–1371.

Hu, Y, Tao, L & Liu, J 2013, 'Poleward expansion of the Hadley circulation in CMIP5 simulations', *Advances in Atmospheric Sciences*, vol. 30, no. 3, pp. 790–795.

Jovanovic, B, Braganza, K, Collins, D & Jones, D 2012, 'Climate variations and change evident in high-quality climate data for Australia's Antarctic and remote island weather stations', *Australian Meteorological and Oceanographic Journal*, vol. 62, no. 4, pp. 247–261.

Jovanovic, B, Collins, D, Braganza, K, Jakob, D & Jones, DA 2011, 'A high-quality monthly total cloud amount dataset for Australia', *Climatic Change*, vol. 108, no. 3, pp. 485–517.

Kirono, DGC, Kent, DM, Hennessy, KJ & Mpelasoka, F 2011, 'Characteristics of Australian droughts under enhanced greenhouse conditions: Results from 14 global climate models', *Journal of Arid Environments*, vol. 75, no. 6, pp. 566–575.

Lim, EP, Hendon, HH, Arblaster, JM, Chung, C, Moise, AF, Hope, P, Young, G & Zhao, M 2016, 'Interaction of the recent 50-year SST trend and La Niña 2010: amplification of the Southern Annular Mode and Australian springtime rainfall', *Climate Dynamics*, vol. 1900, pp. 1–19.

Lucas, C 2010, *A high-quality historical humidity database for Australia* **http://www.cawcr.gov.au/technical-reports/CTR_024.pdf**

Lucas, C & H. Nguyen, 2015 'Regional characteristics of tropical expansion and the role of climate variability', *Journal of Geophysical Research*, vol. 120, pp. 6809-6824.

Murphy, BF & Timbal, B 2008, 'A review of recent climate variability and climate change in south-eastern Australia', *International Journal of Climatology*, vol. 28, no. 7, pp. 859–879.

Nicholls, N 2010, 'Local and remote causes of the southern Australian autumn-winter rainfall decline, 1958-2007', *Climate Dynamics*, vol. 34, no. 6, pp. 835–845.

Polvani, LM, Waugh, DW, Correa, GJP & Son, SW 2011, 'Stratospheric ozone depletion: the main driver of twentieth-century atmospheric circulation changes in the Southern Hemisphere', *Journal of Climate*, vol. 24, no. 3, pp. 795–812.

Pook, MJ, Risbey, JS, & McIntosh, PC 2014, 'A comparative synoptic climatology of cool-season rainfall in major grain-growing regions of southern Australia', *Theoretical and Applied Climatology*, vol. 117, no. 3–4, pp. 521–533.

Pook, MJ, Risbey, JS & McIntosh, PC 2012. 'The synoptic climatology of cool-season rainfall in the Central Wheatbelt of Western Australia', *Monthly Weather Review*, vol. 140, pp. 28–43.

Risbey, J, Pook, M, McIntosh, P, Ummenhofer, C & Meyers, G 2008. 'Characteristics and variability of synoptic features associated with cool season rainfall in southeastern Australia', *International Journal of Climatology*, vo. 29, no. 11, pp. 1595-1613.

Risbey, JS, Pook, MJ, Wheeler, MC & Hendon, HH 2009, 'On the remote drivers of rainfall variability in Australia', *Monthly Weather Review*, vol. 137, no. 10, pp. 3233–3253.

Smith, I 2004, 'An assessment of recent trends in Australian rainfall', *Australian Meteorological Magazine*, vol. 53, no. 3, pp. 163–173.

Thompson, DWJ, Solomon, S, Kushner, PJ, England, MH, Grise, KM & Karoly, DJ 2011, 'Signatures of the Antarctic ozone hole in Southern Hemisphere surface climate change', *Nature Geoscience*, vol. 4, no. 11, pp. 741–749.

Timbal, B, Arblaster, J, Braganza, K, Fernandez, E, Hendon, H, Murphy, B, Raupach, M, Rakich, C, Smith, I, Whan, K & Wheeler, M 2010, *Understanding the anthropogenic nature of the observed rainfall decline across South Eastern Australia*, CAWCR technical report No 26. accessed from **http://www.cawcr.gov.au/technical-reports/CTR_026.pdf**

Timbal, B, Arblaster, JM & Power, S 2006, 'Attribution of the late-twentieth-century rainfall decline in southwest Australia', *Journal of Climate*, vol. 19, no. 10, pp. 2046–2062.

Timbal, B & Drosdowsky, W 2013, 'The relationship between the decline of South-eastern Australian rainfall and the strengthening of the subtropical ridge', *International Journal of Climatology*, vol. 33, no. 4, pp. 1021–1034.

Timbal, B, Ekström, M, Fiddes, S, Grose, M, Kirono, D & Lim, E 2016. Climate change science and Victoria, Bureau Research Report, no. 14, pp. 92.

Timbal, B & Fawcett, R 2013, 'A historical perspective on South-eastern Australian rainfall since 1865 using the instrumental record', *Journal of Climate*, vol. 26, no. 4, pp. 1112–1129.

Ummenhofer, CC, England, MH, McIntosh, PC, Meyers, GA, Pook, MJ, Risbey, JS, Gupta, AS & Taschetto, AS 2009, 'What causes southeast Australia's worst droughts?', *Geophysical Research Letters*, vol. 36, no. 4, pp. 1–5.

Watterson, IG 2010, 'Relationships between south-eastern Australian rainfall and sea surface temperatures examined using a climate model', *Journal of Geophysical Research Atmospheres*, vol. 115, no. 10, pp. 1–14.

Heavy Rainfall

Christidis, N, Stott, PA, Karoly, DJ & Ciavarella, A 2013, 'An attribution study of the heavy rainfall over eastern Australia in March 2012', *Bulletin of the American Meteorological Society*, vol. 94, no. 9, pp. S58–S61.

Evans, JP & Boyer-Souchet, I 2012, 'Local sea surface temperatures add to extreme precipitation in northeast Australia during la Niña', *Geophysical Research Letters*, vol. 39, no. 10, pp. 12–14.

Gallant, AJE, Karoly, DJ & Gleason, KL 2014, 'Consistent trends in a modified climate extremes index in the United States, Europe, and Australia', *Journal of Climate*, vol. 27, no. 4, pp. 1379–1394.

Hendon, HH, Lim, E, Arblaster, JM & Anderson, DLT 2014, 'Causes and predictability of the record wet east Australian spring 2010', *Climate Dynamics*, vol. 42, no. 5-6, pp. 1155–1174.

King, AD, Lewis, SC, Perkins, SE, Alexander, L V., Donat, MG, Karoly, DJ & Black, MT 2013, 'Limited evidence of anthropogenic influence on the 2011-12 Extreme Rainfall over Southeast Australia', *Bulletin of the American Meteorological Society*, vol. 94, no. 9, pp. S55–S58.

Rafter, A & Abbs, D 2009, 'An analysis of future changes in extreme rainfall over Australian regions based on GCM simulations and Extreme Value Analysis', *CAWCR Research Letters*, no. 3, pp. 44–49, **http://www.cawcr.gov.au/researchletters/CAWCR_Research_Letters_3.pdf**

Wentz, FJ, Ricciardulli, L, Hilburn, K & Mears, C 2007, 'How Much More Rain Will Global Warming Bring?', *Science*, vol. 317, no. 5835, pp. 233–235.

Streamflow

Fiddes, S & Timbal, B 2016, 'Assessment and reconstruction of catchment streamflow trends and variability in response to rainfall across Victoria, Australia', *Climate Research*, vol. 67, pp. 43-60.

Timbal, B, Griffiths, M. & Tan, KS 2015, 'Rainfall and streamflows in Greater Melbourne catchment area: variability and recent anomalies', *Climate Research*, vol. 63, pp. 215–232.

Zhang XS, Amirthanathan GE, Bari MA, Laugesen RM, Shin D, Kent DM, MacDonald AM, Turner ME & Tuteja NK 2016, 'How streamflow has changed across Australia since the 1950s: evidence from the network of hydrologic reference stations', *Hydrology and Earth System Sciences*, vol. 20, no. 9, pp. 3947–3965.

Tropical Cyclones

Abbs, D 2012, *The Impact of Climate Change on the Climatology of Tropical Cyclones in the Australian Region*, CSIRO Climate Adaptation Flagship Working Paper no. 11, **https://research.csiro.au/climate/wp-content/uploads/sites/54/2016/03/11_WP11-CAF-climchange-tropcyclones.pdf**

Callaghan, J & Power, SB 2011, 'Variability and decline in the number of severe tropical cyclones making land-fall over eastern Australia since the late nineteenth century', *Climate Dynamics*, vol. 37, no. 3, pp. 647–662.

Dowdy, AJ 2014, 'Long-term changes in Australian tropical cyclone numbers', *Atmospheric Science Letters*, vol. 15, no. 4, pp. 292–298.

Knutson, TR, McBride, JL, Chan, J, Emanuel, K, Holland, G, Landsea, C, Held, I, Kossin, JP, Srivastava, AK & Sugi, M 2010, 'Tropical cyclones and climate change', *Nature Geoscience*, vol. 3, pp. 157–163.

Kuleshov, Y, Fawcett, R, Qi, L, Trewin, B, Jones, D, McBride, J & Ramsay, H 2010, 'Trends in tropical cyclones in the South Indian Ocean and the South Pacific Ocean', *Journal of Geophysical Research Atmospheres*, vol. 115, no. 1, pp. 1–9.

Oceans and cryosphere

Ocean temperature and heat content

Australian Bureau of Meteorology 2016, '*2016 marine heatwave on the Great Barrier Reef*'. Special statement: **http://www.bom.gov.au/environment/doc/marine-heatwave-2016.pdf**

Church, JA, White, NJ, Konikow, LF, Domingues, CM, Cogley, JG, Rignot, E, Gregory, JM, van den Broeke, MR, Monaghan, AJ & Velicogna, I 2011, 'Revisiting the Earth's sea-level and energy budgets from 1961 to 2008', *Geophysical Research Letters*, vol. 38, no. 18, p. L18601.

Church, JA, White, NJ, Konikow, LF, Domingues, CM, Cogley, JG, Rignot, E, Gregory, JM, van den Broeke, MR, Monaghan, AJ & Velicogna, I 2013, 'Correction to "Revisiting the Earth's sea-level and energy budgets from 1961 to 2008', *Geophysical Research Letters*, vol. 40, no. 15, pp. 4066–4066.

Domingues, CM, Church, JA, White, NJ, Gleckler, PJ, Wijffels, SE, Barker, PM & Dunn, JR 2008, 'Improved estimates of upper-ocean warming and multi-decadal sea-level rise', *Nature*, vol. 453, no. 7198, pp. 1090–1093.

Feng, M, McPhaden, MJ, Xie, S-P, & Hafner, J 2013, 'La Niña forces unprecedented Leeuwin Current warming in 2011', *Scientific reports*, Vol. 3, p. 1277.

GO-SHIP: The global ocean ship-based hydrographic investigation program, **http://www.go-ship.org**

Hobday AJ, Alexander LV, Perkins SE, Smale DA, Straub SC, Oliver EC, Benthuysen JA, Burrows MT, Donat MG, Feng M & Holbrook NJ 2016, 'A hierarchical approach to defining marine heatwaves'. *Progress in Oceanography*. Vol. 141, pp. 227–238.

Hobday A, Oliver E, McDonald J & Grose M. 2016. 'Was Tasmania's summer of fires and floods a glimpse of its climate future?', *The Conversation*, 19 April, **https://theconversation.com/was-tasmanias-summer-offires-and-floods-a-glimpse-of-its-climate-future-58055**

Huang, B, Banzon, VF, Freeman, E, Lawrimore, J, Liu, W, Peterson, TC, Smith, TM, Thorne, PW, Woodruff, SD & Zhang, H-MM 2015, 'Extended Reconstructed Sea Surface Temperature version 4 (ERSST.v4). Part I: Upgrades and intercomparisons', *Journal of Climate*, vol. 28, no. 3, pp. 911–930.

Johnson, CR, Banks, SC, Barrett, NS, Cazassus, F, Dunstan, PK, Edgar, GJ, Frusher, SD, Gardner, C, Haddon, M, Helidoniotis, F, Hill, KL, Holbrook, NJ, Hosie, GW, Last, PR, Ling, SD, Melbourne-Thomas, J, Miller, K, Pecl, GT, Richardson, AJ, Ridgway, KR, Rintoul, SR, Ritz, DA, Ross, DJ, Sanderson, JC, Shepherd, SA, Slotwinski, A, Swadling, KM, & Taw, N 2011, 'Climate change cascades: shifts in oceanography, species' ranges and subtidal marine community dynamics in eastern Tasmania', *Journal of Experimental Marine Biology and Ecology*, Vol. 400, No. 1, pp. 17–32.

Kennedy, JJ 2014, 'A review of uncertainty in in situ measurements and data sets of sea surface temperature', *Reviews of Geophysics* March, Vol. 52, No. 1, pp. 1–32.

Levitus, S, Antonov, JI, Boyer, TP, Baranova, OK, Garcia, HE, Locarnini, RA, Mishonov, A V., Reagan, JR, Seidov, D, Yarosh, ES & Zweng, MM 2012, 'World ocean heat content and thermosteric sea level change (0-2000 m), 1955-2010', *Geophysical Research Letters*, vol. 39, no. 10, p. L10603.

Liu, W, Huang, B, Thorne, PW, Banzon, VF, Zhang, H-MM, Freeman, E, Lawrimore, J, Peterson, TC, Smith, TM & Woodruff, SD 2015, 'Extended Reconstructed Sea Surface Temperature version 4 (ERSST.v4): Part II. Parametric and structural uncertainty estimations', *Journal of Climate*, vol. 28, no. 3, pp. 931–951.

Miles, E, Spillman, C, Jones, DA & Walland, DJ 2016, 'This summer's sea temperatures were the hottest on record for Australia: here's why', *The Conversation*, April 5, **https://theconversation.com/this-summers-sea-temperatures-were-the-hottest-on-record-for-australia-heres-why-56906**

Oliver, ECJ & Holbrook, NJ 2014, 'Extending our understanding of south Pacific gyre "spin up": modeling the East Australian Current in a future climate', *Journal of Geophysical Research: Oceans*, Vol. 119, pp. 2788–2805.

Pearce, AF & Feng, M 2013, 'The rise and fall of the "marine heat wave" off Western Australia during the summer of 2010/2011', *Journal of Marine Systems*, Vol. 111–112, pp. 139–156.

Purkey, SG & Johnson, GC 2010, 'Warming of Global Abyssal and Deep Southern Ocean Waters between the 1990s and 2000s: Contributions to Global Heat and Sea Level Rise Budgets*', *Journal of Climate*, vol. 23, no. 23, pp. 6336–6351.

Purkey, S.G. and Johnson, G.C., 2013. Antarctic bottom water warming and freshening: Contributions to sea level rise, ocean freshwater budgets, and global heat gain*. *Journal of Climate*, 26 (16), pp. 6105-6122.

Rhein, M, Rintoul, SR, Aoki, S, Campos, E, Chambers, D, Feely, RA, Gulev, S, Johnson, GC, Josey, SA, Kostianoy, A, Mauritzen, C, Roemmich, D & Wang, F 2013, '*Observations: Ocean*', in: Stocker, TF, Qin, D, Plattner, G-K, Tignor, M, Allen, SK, Boschung, J, Nauels, A, Xia, Y, Bex, V & Midgley, PM (Eds), Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 255–316.

Roemmich, D, Church, J, Gilson, J, Monselesan, D, Sutton, P & Wijffels, S 2015, 'Unabated planetary warming and its ocean structure since 2006', *Nature Climate Change*, vol. 5, no. 3, pp. 240–245.

Wernberg, T, Smale, DA, Tuya, F, Thomsen, MS, Langlois, TJ, de Bettignies, T, Bennett, S, & Rousseaux, CS 2013, 'An extreme climatic event alters marine ecosystem structure in a global biodiversity hotspot', *Nature Climate Change*, Vol. 3, No. 1, pp. 78–82.

Wijffels, S, Roemmich, D, Monselesan, D, Church, J & Gilson, J 2016, 'Ocean temperatures chronicle the ongoing warming of Earth', *Nature Climate Change*, vol. 6, no. 2, pp. 116–118.

Sea level

Agarwal, N, Jungclaus, JH, Köhl, A, Mechoso, CR & Stammer, D 2015, 'Additional contributions to CMIP5 regional sea level projections resulting from Greenland and Antarctic ice mass loss', *Environmental Research Letters*, vol. 10, no. 7, pp. 1–8.

Boening, C, Willis, JK, Landerer, FW, Nerem, RS & Fasullo, J 2012, 'The 2011 La Niña: So strong, the oceans fell', *Geophysical Research Letters*, vol. 39, no. 19, p. L19602.

Burgette, RJ, Watson, CS, Church, JA, White, NJ, Tregoning, P & Coleman, R 2013, 'Characterizing and minimizing the effects of noise in tide gauge time series: relative and geocentric sea level rise around Australia', *Geophysical Journal International*, vol. 194, no. 2, pp. 719–736.

Church, JA, Clark, PU, Cazenave, A, Gregory, JM, Jevrejeva, S, Levermann, A, Merrifield, MA, Milne, GA, Nerem, RS, Nunn, PD, Payne, AJ, Pfeffer, WT, Stammer, D & Unnikrishnan, AS 2013, '*Sea level change*', in Stocker, TF, Qin, D, Plattner, G-K, Tignor, M, Allen, SK, Boschung, J, Nauels, A, Xia, Y, Bex, V & Midgley, PM (Eds), Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, pp. 1137–1216.

Church, JA & White, NJ 2011, 'Sea-Level Rise from the Late 19th to the Early 21st Century', *Surveys in Geophysics*, vol. 32, no. 4-5, pp. 585–602.

Fasullo, JT, Boening, C, Landerer, FW & Nerem, RS 2013, 'Australia's unique influence on global sea level in 2010-2011', *Geophysical Research Letters*, vol. 40, no. 16, pp. 4368–4373.

Jevrejeva, S, Moore, JC, Grinsted, A & Woodworth, PL 2008, 'Recent global sea level acceleration started over 200 years ago?', *Geophysical Research Letters*, vol. 35, no. 8, p. L08715.

Masters, D, Nerem, RS, Choe, C, Leuliette, E, Beckley, B, White, N & Ablain, M 2012, 'Comparison of Global Mean Sea Level Time Series from TOPEX/Poseidon, Jason-1, and Jason-2', *Marine Geodesy*, vol. 35, no. sup1, pp. 20–41.

Ray, RD & Douglas, BC 2011, 'Experiments in reconstructing twentieth-century sea levels', *Progress in Oceanography*, vol. 91, no. 4, pp. 496–515.

Rignot, E, Velicogna, I, Van Den Broeke, MR, Monaghan, A & Lenaerts, J 2011, 'Acceleration of the contribution of the Greenland and Antarctic ice sheets to sea level rise', *Geophysical Research Letters*, vol. 38, no. 5, p. L05503.

Watson, CS, White, NJ, Church, JA, King, MA, Burgette, RJ & Legresy, B 2015, 'Unabated global mean sea-level rise over the satellite altimeter era', *Nature Climate Change*, vol. 5, no. 6, pp. 565–568.

White, NJ, Haigh, ID, Church, JA, Koen, T, Watson, CS, Pritchard, TR, Watson, PJ, Burgette, RJ, McInnes, KL, You, ZJ, Zhang, X & Tregoning, P 2014, 'Australian sea levels-trends, regional variability and influencing factors'. *Earth-Science Reviews*, vol. 136, pp. 155–174.

Ocean acidification

Kleypas, JA, Feely, RA, Fabry, VJ, Langdon, C, Sabine, CL & Robbins, LL, 2006, '*Impacts of ocean acidification on coral reefs and other marine calcifiers: A guide for future research*'. A report from a workshop held 18–20 April 2005, St. Petersburg, FL, sponsored by the National Science Foundation, the National Oceanic and Atmospheric Administration, and the U.S. Geological Survey, 88 pp.

Lenton A, Tilbrook B, Matear RJ, Sasse T & Nojiri Y 2016, 'Historical reconstruction of ocean acidification in the Australian region'. *Biogeosciences*, vol. 13, pp. 1753–1765.

Cryosphere

Bintanja, R, van Oldenborgh, GJ, Drijfhout, SS, Wouters, B & Katsman, CA 2013, 'Important role for ocean warming and increased ice-shelf melt in Antarctic sea-ice expansion', *Nature Geoscience*, vol. 6, no. 5, pp. 376–379.

Holland, PR & Kwok, R 2012, 'Wind-driven trends in Antarctic sea-ice drift', *Nature Geoscience*, vol. 5, no. 12, pp. 872–875.

Hope, P, Reid, P, Tobin, S, Tully, M, Klekociuk, A & Krummel, P 2015, 'Seasonal climate summary southern hemisphere (spring 2014): El Niño continues to try to break through, and Australia has its warmest spring on record (again!)', *Australian Meteorological and Oceanographic Journal*, vol. 65, no. 2, pp. 267–292.

Li, X, Holland, DM, Gerber, EP & Yoo, C 2014, 'Impacts of the north and tropical Atlantic Ocean on the Antarctic Peninsula and sea ice', *Nature*, vol. 505, no. 7484, pp. 538–542.

Liu, J & Curry, JA 2010, 'Accelerated warming of the Southern Ocean and its impacts on the hydrological cycle and sea ice', *Proceedings of the National Academy of Sciences*, vol. 107, no. 34, pp. 14987–14992.

Massonnet, F, Guemas, V, Fuckar, NS, & Doblas-Reyes, FJ 2015, 'The 2014 high record of antarctic sea ice extent', *Bulletin of the American Meteorological Society*, Vol. 96, No. 12, pp. S163–S167.

Paolo, FS, Fricker, HA & Padman, L 2015, 'Volume loss from Antarctic ice shelves is accelerating', *Science*, vol. 348, no. 6232, pp. 327–331.

Stammerjohn, SE, Martinson, DG, Smith, RC, Yuan, X & Rind, D 2008, 'Trends in Antarctic annual sea ice retreat and advance and their relation to El Niño–Southern Oscillation and Southern Annular Mode variability', *Journal of Geophysical Research: Oceans*, vol. 113, no. C03S90, pp. 1–20.

Stammerjohn, S, Massom, R, Rind, D & Martinson, D. 2012, 'Regions of rapid sea ice change: An inter-hemispheric seasonal comparison', *Geophysical Research Letters*, vol. 39, no. 6, p. L06501.

Turner, J, Comiso, JC, Marshall, GJ, Lachlan-Cope, TA, Bracegirdle, T, Maksym, T, Meredith, MP, Wang, Z & Orr, A 2009, 'Non-annular atmospheric circulation change induced by stratospheric ozone depletion and its role in the recent increase of Antarctic sea ice extent', *Geophysical Research Letters*, vol. 36, no. 8, pp. 1–5.

Vaughan, DG, Comiso, JC, Allison, I, Carrasco, J, Kaser, G, Kwok, R, Mote, P, Murray, T, Paul, F, Ren, J, Rignot, E, Solomina, O, Steffen, K & Zhang, T 2013, '*Observations: Cryosphere*', in: Stocker, TF, Qin, D, Plattner, G-K, Tignor, M, Allen, SK, Boschung, J, Nauels, A, Xia, Y, Bex, V & Midgley, PM (Eds), Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 317–382.

Greenhouse gases

Allison, CE & Francey, RJ 2007, 'Verifying Southern Hemisphere trends in atmospheric carbon dioxide stable isotopes', *Journal of Geophysical Research: Atmospheres*, vol. 112, no. D21, p. D21304.

Bousquet, P, Ringeval, B, Pison, I, Dlugokencky, EJ, Brunke, E-G, Carouge, C, Chevallier, F, Fortems-Cheiney, A, Frankenberg, C, Hauglustaine, DA, Krummel, PB, Langenfelds, RL, Ramonet, M, Schmidt, M, Steele, LP, Szopa, S, Yver, C, Viovy, N & Ciais, P 2011, 'Source attribution of the changes in atmospheric methane for 2006–2008', *Atmospheric Chemistry and Physics*, vol. 11, no. 8, pp. 3689–3700.

Chevallier, F, Ciais, P, Conway, TJ, Aalto, T, Anderson, BE, Bousquet, P, Brunke, EG, Ciattaglia, L, Esaki, Y, Fröhlich, M, Gomez, A, Gomez-Pelaez, AJ, Haszpra, L, Krummel, PB, Langenfelds, RL, Leuenberger, M, Machida, T, Maignan, F, Matsueda, H, Morguí, JA, Mukai, H, Nakazawa, T, Peylin, P, Ramonet, M, Rivier, L, Sawa, Y, Schmidt, M, Steele, LP & Va, D 2010, 'CO_2 surface fluxes at grid point scale estimated from a global 21 year reanalysis of atmospheric measurements', *Journal of Geophysical Research: Atmospheres*, vol. 115, no. D21, p. D21307.

Derek, N, Krummel, PB & Cleland, SJ (Eds) 2014, *'Baseline atmospheric program Australia 2009-2010'*, Australian Bureau of Meteorology and CSIRO Marine and Atmospheric Research, **http://www.bom.gov.au/inside/cgbaps/baseline.shtml**

Etheridge, DM, Steele, LP, Francey, RJ & Langenfelds, RL 1998, 'Atmospheric methane between 1000 A.D. and present: Evidence of anthropogenic emissions and climatic variability', *Journal of Geophysical Research: Atmospheres*, vol. 103, no. D13, pp. 15979–15993.

Etheridge, DM, Steele, LP, Langenfelds, RL, Francey, RJ, Barnola, JM & Morgan, VI 1996, 'Natural and anthropogenic changes in atmospheric CO_2 over the last 1000 years from air in Antarctic ice and firn', *Journal of Geophysical Research: Atmospheres*, vol. 101, no. D2, pp. 4115–4128.

Flückiger, J, Monnin, E, Stauffer, B, Schwander, J, Stocker, TF, Chappellaz, J, Raynaud, D & Barnola, J-M 2002, 'High-resolution Holocene N_2O ice core record and its relationship with CH_4 and CO_2', *Global Biogeochemical Cycles*, vol. 16, no. 1, pp. 10–1–10–8.

Francey, RJ, Trudinger, CM, Van Der Schoot, M, Krummel, PB, Steele, LP & Langenfelds, RL 2010, 'Differences between trends in atmospheric CO_2 and the reported trends in anthropogenic CO_2 emissions', *Tellus, Series B: Chemical and Physical Meteorology*, vol. 62, no. 5, pp. 316–328.

Francey, RJ, Trudinger, CM, van der Schoot, M, Law, RM, Krummel, PB, Langenfelds, RL, Steele, PL, Allison, CE, Stavert, AR, Andres, RJ & Rödenbeck, C 2013, 'Atmospheric verification of anthropogenic CO_2 emission trends', *Nature Climate Change*, vol. 3, no. 5, pp. 520–524.

Higgins, JA, Kurbatov, A V., Spaulding, NE, Brook, E, Introne, DS, Chimiak, LM, Yan, Y, Mayewski, PA & Bender, ML 2015, 'Atmospheric composition 1 million years ago from blue ice in the Allan Hills, Antarctica', *Proceedings of the National Academy of Sciences*, vol. 112, no. 22, pp. 6887–6891.

Hönisch, B, Hemming, NG, Archer, D, Siddall, M & McManus, JF 2009, 'Atmospheric carbon dioxide concentration across the mid-Pleistocene transition', *Science*, vol. 324, no. 5934, pp. 1551–1554.

Khatiwala, S, Tanhua, T, Mikaloff Fletcher, S, Gerber, M, Doney, SC, Graven, HD, Gruber, N, McKinley, GA, Murata, A, Ríos, AF & Sabine, CL 2013, 'Global ocean storage of anthropogenic carbon', *Biogeosciences*, vol. 10, no. 4, pp. 2169–2191.

Kirschke, S, Bousquet, P, Ciais, P, Saunois, M, Canadell, JG, Dlugokencky, EJ, Bergamaschi, P, Bergmann, D, Blake, DR, Bruhwiler, L, Cameron-Smith, P, Castaldi, S, Chevallier, F, Feng, L, Fraser, A, Heimann, M, Hodson, EL, Houweli, JE & Zeng, G 2013, 'Three decades of global methane sources and sinks', *Nature Geoscience*, vol. 6, no. 10, pp. 813–823.

Krummel, PB, Fraser, PJ, Steele, LP, Derek, N, Rickard, C, Ward, J, Somerville, NT, Cleland, SJ, Dunse, BL, Langenfelds, RL, Baly, S, & Leist, MA 2014, 'The AGAGE *in situ* program for non-CO_2 greenhouse gases at Cape Grim, 2009–2010', in *Baseline Atmospheric Program (Australia) 2009–2010*, Australian Bureau of Meteorology and CSIRO Marine and Atmospheric Research, Melbourne, Australia, pp. 56–70.

Langenfelds, RL, Fraser, PJ, Francey, RJ, Steele, LP, Porter, LW & Allison, CE 1996, 'The Cape Grim air archive: The first seventeen years, 1978-1995', in *Baseline Atmospheric Program (Australia) 1994-1995,* Bureau of Meteorology and CSIRO Division of Atmospheric Research, Melbourne, Australia, pp. 53–70.

Langenfelds, RL, Steele, LP, Gregory, RL, Krummel, PB, Spencer, DA & Howden, RT 2014, Atmospheric methane, carbon dioxide, hydrogen, carbon monoxide, and nitrous oxide from Cape Grim flask air samples analysed by gas chromatography, in *Baseline Atmospheric Program (Australia) 2009-2010*, Australian Bureau of Meteorology and CSIRO Marine and Atmospheric Research, Melbourne, Australia, pp. 45–49.

Levin, I, Naegler, T, Kromer, B, Diehl, M, Francey, RJ, Gomez-Pelaez, AJ, Steele, LP, Wagenbach, D, Weller, R & Worthy, DE 2010, 'Observations and modelling of the global distribution and long-term trend of atmospheric $^{14}CO_2$', *Tellus, Series B: Chemical and Physical Meteorology*, vol. 62, no. 1, pp. 26–46.

le Quéré, C, Moriarty, R, Andrew, R, Canadell, J, Sitch, S, Korsbakken, J, Friedlingstein, P, Peters, G, Andres, R, Boden, T, Houghton, R, House, J, Keeling, R, Tans, P, Arneth, A, Bakker, D, Barbero, L, Bopp, L, Chang, J, Chevallier, F, Chini, L, Ciais, P, Fader, M, Feely, R, Gkritzalis, T, Harris, I, Hauck, J, Ilyina, T, Jain, A, Kato, E, Kitidis, V, Klein Goldewijk, K, Koven, C, Landschützer, P, Lauvset, S, Lefèvre, N, Lenton, A, Lima, I, N Metzl, F, Millero, Munro, D, Murata, A, Nabel, J, Nakaoka, S, Nojiri, Y, O'Brien, K, Olsen, A, Ono, T, Pérez, F, Pfeil, B, Pierrot, D, Poulter, B, Rehder, G, Rödenbeck, C, Saito, S, Schuster, U, Schwinger, J, Séférian, R, Steinhoff, T, Stocker, B, Sutton, A, Takahashi, T, Tilbrook, B, Laan-Luijkx, I van der, Werf, G van der, Heuven, S van, Vandemark, D, Viovy, N, Wiltshire, A, Zaehle, S & Zeng, N 2015, 'Global Carbon Budget 2015', *Earth System Science Data*, vol. 7, no. 2, pp. 349–396.

Loulergue, L, Schilt, A, Spahni, R, Masson-Delmotte, V, Blunier, T, Lemieux, B, Barnola, J-M, Raynaud, D, Stocker, TF & Chappellaz, J 2008, 'Orbital and millennial-scale features of atmospheric CH_4 over the past 800,000 years', *Nature*, vol. 453, no. 7193, pp. 383–386.

Lüthi, D, Le Floch, M, Bereiter, B, Blunier, T, Barnola, J-M, Siegenthaler, U, Raynaud, D, Jouzel, J, Fischer, H, Kawamura, K & Stocker, TF 2008, 'High-resolution carbon dioxide concentration record 650,000-800,000 years before present.', *Nature*, vol. 453, no. 7193, pp. 379–382.

MacFarling Meure, C, Etheridge, D, Trudinger, C, Steele, P, Langenfelds, R, Van Ommen, T, Smith, A & Elkins, J 2006, 'Law Dome CO_2, CH_4 and N_2O ice core records extended to 2000 years BP', *Geophysical Research Letters*, vol. 33, no. 14, pp. 2000–2003.

Machida, T, Nakazawa, T, Fujii, Y, Aoki, S & Watanabe, O 1995, 'Increase in the atmospheric nitrous oxide concentration during the last 250 years', *Geophysical Research Letters*, vol. 22, no. 21, pp. 2921–2924.

Park, S, Croteau, P, Boering, KA, Etheridge, DM, Ferretti, D, Fraser, PJ, Kim, K-R, Krummel, PB, Langenfelds, RL, van Ommen, TD, Steele, LP & Trudinger, CM 2012, 'Trends and seasonal cycles in the isotopic composition of nitrous oxide since 1940', *Nature Geoscience*, vol. 5, no. 4, pp. 261–265.

Patra, PK, Houweling, S, Krol, M, Bousquet, P, Belikov, D, Bergmann, D, Bian, H, Cameron-Smith, P, Chipperfield, MP, Corbin, K, Fortems-Cheiney, A, Fraser, A, Gloor, E, Hess, P, Ito, A, Kawa, SR, Law, RM, Loh, Z, Maksyutov, S, Meng, L, Palmer, PI, Prinn, RG, Rigby, M, Saito, R & Wilson, C 2011, 'TransCom model simulations of CH_4 and related species: Linking transport, surface flux and chemical loss with CH_4 variability in the troposphere and lower stratosphere', *Atmospheric Chemistry and Physics*, vol. 11, no. 24, pp. 12813–12837.

Rigby, M, Prinn, RG, Fraser, PJ, Simmonds, PG, Langenfelds, RL, Huang, J, Cunnold, DM, Steele, LP, Krummel, PB, Weiss, RF, O'Doherty, S, Salameh, PK, Wang, HJ, Harth, CM, Muhle, J & Porter, LW 2008, 'Renewed growth of atmospheric methane', *Geophysical Research Letters*, vol. 35, no. 22, pp. 2–7.

Rigby, M, Prinn, RG, O'Doherty, S, Miller, BR, Ivy, DJ, Muhle, J, Harth, CM, Salameh, PK, Arnold, T, Weiss, RF, Krummel, PB, Steele, LP, Fraser, PJ, Young, D, & Simmonds, PG 2014, 'Recent and future trends in synthetic greenhouse gas radiative forcing', *Geophysical Research Letters*, vol. 41, no. 7, pp. 2623–2630.

Rubino, M, Etheridge, DM, Trudinger, CM, Allison, CE, Battle, MO, Langenfelds, RL, Steele, LP, Curran, M, Bender, M, White, JWC, Jenk, TM, Blunier, T & Francey, RJ 2013, 'A revised 1000 year atmospheric δ^{13} C-CO_2 record from Law Dome and South Pole, Antarctica', *Journal of Geophysical Research: Atmospheres*, vol. 118, no. 15, pp. 8482–8499.

Steele, P, Krummel, P, van der Schoot, M, Spencer, D, Baly, S, Langenfelds, R, Howden, R, Ward, J, Somerville, N & Cleland, S 2014, 'Baseline carbon dioxide monitoring', in *Baseline Atmospheric Program (Australia) 2009-2010*, Australian Bureau of Meteorology and CSIRO Marine and Atmospheric Research, Melbourne, Australia, pp. 39–41.

Sturrock, GA, Etheridge, DM, Trudinger, CM, Fraser, PJ & Smith, AM 2002, 'Atmospheric histories of halocarbons from analysis of Antarctic firn air: Major Montreal Protocol species', *Journal of Geophysical Research: Atmospheres*, vol. 107, no. 24, pp. 1–14.

Thompson, RL, Chevallier, F, Crotwell, AM, Dutton, G, Langenfelds, RL, Prinn, RG, Weiss, RF, Tohjima, Y, Nakazawa, T, Krummel, PB, Steele, LP, Fraser, P, O'Doherty, S, Ishijima, K & Aoki, S 2014, 'Nitrous oxide emissions 1999 to 2009 from a global atmospheric inversion', *Atmospheric Chemistry and Physics*, vol. 14, no. 4, pp. 1801–1817.

Thompson, RL, Dlugokencky, E, Chevallier, F, Ciais, P, Dutton, G, Elkins, JW, Langenfelds, RL, Prinn, RG, Weiss, RF, Tohjima, Y, O'Doherty, S, Krummel, PB, Fraser, P & Steele, LP 2013, 'Interannual variability in tropospheric nitrous oxide', *Geophysical Research Letters*, vol. 40, no. 16, pp. 4426–4431.

Tian, H, Lu, C, Ciais, P, Michalak, AM, Canadell, JG, Saikawa, E, Huntzinger, DN, Gurney, KR, Sitch, S, Zhang, B, Yang, J, Bousquet, P, Bruhwiler, L, Chen, G, Dlugokencky, E, Friedlingstein, P, Melillo, J, Pan, S, Poulter, B, Prinn, R, Saunois, M, Schwalm, CR & Wofsy, SC 2016, 'The terrestrial biosphere as a net source of greenhouse gases to the atmosphere', *Nature*, vol. 531, no. 7593, pp. 225–228.

Trudinger, CM, Etheridge, DM, Rayner, PJ, Enting, IG, Sturrock, GA & Langenfelds, RL 2002, 'Reconstructing atmospheric histories from measurements of air composition in firn', *Journal of Geophysical Research: Atmospheres*, vol. 107, no. 24, pp. 1–13.

van Vuuren, DP, Edmonds, J, Kainuma, M, Riahi, K, Thomson, A, Hibbard, K, Hurtt, GC, Kram, T, Krey, V, Lamarque, J-F, Masui, T, Meinshausen, M, Nakicenovic, N, Smith, SJ & Rose, SK 2011, 'The representative concentration pathways: An overview', *Climatic Change*, vol. 109, no. 1, pp. 5–31.

Future climate

Collins, M, Knutti, R, Arblaster, J, Dufresne, J-L, Fichefet, T, Friedlingstein, P, Gao, X, Gutowski, WJ, Johns, T, Krinner, G, Shongwe, M, Tebaldi, C, Weaver, AJ & Wehner, M 2013, '*Long-term Climate Change: Projections, Commitments and Irreversibility*', in: Stocker, TF, Qin, D, Plattner, G-K, Tignor, M, Allen, SK, Boschung, J, Nauels, A, Xia, Y, Bex, V & Midgley, PM (Eds), Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1029–1136.

CSIRO & Australian Bureau of Meteorology 2015, 'Climate Change in Australia', *Climate Change in Australia website, reports and tools*, accessed from **http://www.climatechangeinaustralia.gov.au/en/**

CSIRO & Bureau of Meteorology 2015, *Projections: Atmosphere and the land. Climate Change in Australia Information for Australia's Natural Resource Management Regions: Technical Report,* Whetton, P, Ekstrom, M, Gerbing, C, Grose, M, Bhend, J, Webb, L & Risbey, J (Eds), CSIRO. **http://www.climatechangeinaustralia.gov.au/en/publications-library/technical-report/**

Regional cluster reports, as referenced below, available from: **http://www.climatechangeinaustralia.gov.au/en/publications-library/cluster-reports/**

Dowdy, A et al. 2015, East Coast Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, Ekström, M. et al., (Eds), CSIRO and Bureau of Meteorology, Australia.

Ekström, M et al. 2015, Central Slopes Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, Ekström, M. et al., (Eds), CSIRO and Bureau of Meteorology, Australia.

Grose, M et al. 2015, Southern Slopes Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, Ekström, M. et al., (Eds), CSIRO and Bureau of Meteorology, Australia.

Hope, P et al. 2015, Southern and South Western Flatlands Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, Ekström, M. et al., (Eds), CSIRO and Bureau of Meteorology, Australia.

McInnes, K et al. 2015, Wet Tropics Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, Ekström, M. et al., (Eds), CSIRO and Bureau of Meteorology, Australia.

Moise, A et al. 2015, Monsoonal North Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, Ekström, M. et al., (Eds), CSIRO and Bureau of Meteorology, Australia.

Timbal, B et al. 2015, Murray Basin Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, Ekström, M. et al., (Eds), CSIRO and Bureau of Meteorology, Australia.

Watterson, I. et al. 2015, Rangelands Cluster Report, Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, Ekström, M. et al., (Eds), CSIRO and Bureau of Meteorology, Australia.