Climate Systems

National Environmental Science Program

Finding and selecting the right climate change information for your needs

April 2026

Key messages

- This guide will help you find the best source of climate information to suit your needs, whether you're just exploring information, doing a climate risk assessment, or developing strategic policy.
- Focusing your attention on a small set of climate resources most useful for your purpose can save a lot of time, effort and potential confusion.

Many different sources of climate data and information exist. In most cases, these resources have been designed for specific purposes or to suit specific audiences. They often present information in different ways. Looking for climate information can often leave people feeling overwhelmed by the number of different sources and confused by the different options for certain types of information.

While each information source has value, focusing your attention on a small set of the most useful resources for your purpose can save a lot of time, effort and potential confusion.

This guide will help you to:

- understand the variety of climate information sources using a simple catalogue of resources,
- identify those that are most relevant for your particular purpose, and
- provide a simple way to filter the available information sources and select the best one for your intended use.

Part 1. Finding the climate information you need

Need to explore national climate information?

The Australian Climate Service (ACS) has been established to provide improved data, intelligence and expert advice on climate risks and impacts to support and inform climate decision-making in Australia. The National Climate Risk Assessment (NCRA), released in 2025, provides a comprehensive investigation and discussion of Australia's future climate risk over a number of documents.

The ACS data explorer provides visualisations of climate risk information underpinning NCRA through an interactive national map. Its intended audience is climate adaptation practitioners, and the ACS recommends its use with other sources of climate information.

The ACS Data Explorer includes:

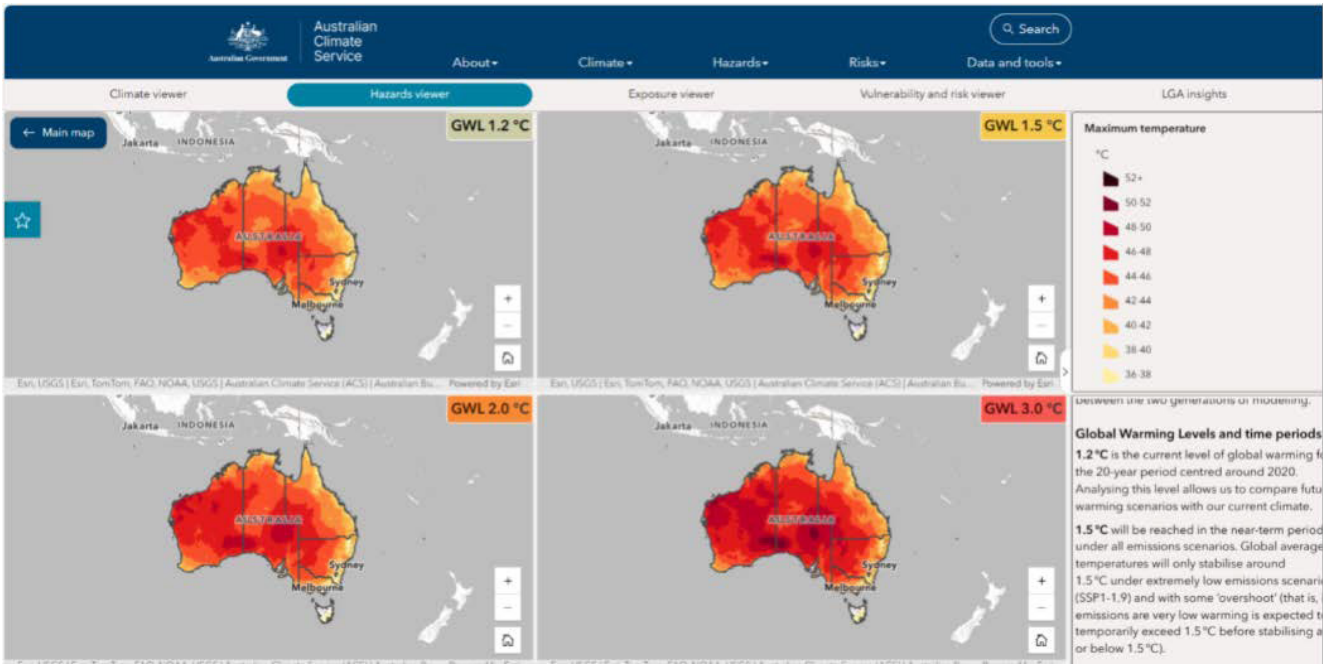
- Climate and Hazards maps: Visualises climate and hazard data at a national level
- An Exposure map: Visualises exposure data at a national level
- A Vulnerability and risk map: Visualises vulnerability and risk data at a national level
- Local Government Area insights: Explores summary information by LGA.

The ACS has produced a number of climate and hazard projection datasets (CMIP6 and CMIP5) for a selection of climate and ocean variables and hazards at global warming levels +1.2°C, +1.5°C, +2.0°C and +3.0°C and the ocean sea level-rise increment in metres for different global warming levels and time frames. In addition, a suite of exposure and vulnerability datasets relevant to climate risk such as the Australian Climate Social Vulnerability Index (ACSVI) 2021 (beta) and Industry of Employment Diversity Index (IEDI) (beta) have been developed. These and other datasets are progressively being made available for download through the ACS Data Catalogue.

The ACS produced CMIP6 datasets for temperature, rainfall, relative humidity, solar radiation and wind-speed at 5km resolution and daily timestep, for 2050 (2035-2064) and 2085 (2070-2099) for four greenhouse gas emissions pathways (SSP1-2.6, SSP2-4.5, SSP3-7.0 & SSP5-8.5) and 20-year periods corresponding to global warming level (GWL) 1.5 °C, 2.0 °C, 3.0 °C and 4.0 °C. These data sets are also available on the Climate Change in Australia (CCiA) website.

The original CCiA resources were developed by CSIRO and the Bureau of Meteorology in 2015 and have been selectively updated. While the tools listed below are based on CMIP5 projection datasets, they are applicable across a broad range of sectors and applications. CCiA includes several tools that allow access to information of differing levels of complexity or to suit different purposes. These tools include:

- The Regional Climate Change Explorer provides summary text on future climates at a regional level for a subset of climate variables.
- The climate Analogues Explorer matches the proposed future climate of a town or city of interest with the current climate experienced in another locality based on annual average rainfall and maximum temperature. This helps people visualise a possible future based on their own knowledge or experience of a different location.
- The Summary Data Explorer provides an interface to explore the projected changes in eight climate variables, as bar charts or a downloadable table of the underlying data, in CSV format
- The Extremes Data Explorer provides access to projections data for six different measures of extremes in temperature and rainfall. Outputs are bar charts and tables of the underlying data, in CSV format.
- The Thresholds Calculator allows you to explore projected changes in maximum and minimum temperature above and below defined thresholds.
- The Map Explorer provides a way to visualise projected changes in climate variables for different regions, time periods, emissions scenarios and for sets of individual climate models.
- The Climate Futures tool is a multi-purpose resource to assist understanding and application of climate change projections for impact assessment and adaptation planning. This tool includes projections from global and regional climate models as well as statistically downscaled data. The tool provides access to projected changes in up to 16 climate variables, 14 future time periods (5-year increments to 2090) and 4 emissions scenarios (RCP2.6, RCP4.5, RCP6.0 and RCP8.5).
- As well as access to gridded daily data derived from CMIP6, the Download NRM Datasets page provides access to CMIP5 application-ready projections data on a 5km grid and for selected locations for Australia's natural resource management regions.



The Australian Climate Service's Data Explorer showing the highest daily maximum temperature reached in a year at a Global Warming Level of 1.2 °C, 1.5 °C, 2.0 °C and 3 °C.

Need national summaries of the best available science?

In addition to the climate projection data and information available from the ACS and through CCiA, other resources provide useful summary information via reports and websites. These include:

- State of the Climate is produced every two years by CSIRO and the Bureau of Meteorology. It provides an overview of the latest knowledge on how the climate is changing and how it will continue to change in the future. The report draws on a range of national and international sources, national projections data and information and past observational data from the Australian Bureau of Meteorology.
- The National Environmental Science Program Climate Systems Hub is an applied science partnership of Australia's leading climate change research and decision-making agencies with a focus on providing research outputs that directly inform decisions, policies and climate adaptation responses.
- The ARC Centre of Excellence for 21st Century Weather is researching how Australia's weather is being reshaped by climate change. The research program is informed by industry and government partners and is designed to enable better decision-making.
- The ARC Centre of Excellence for Climate Extremes (CLEX) was an international research consortium of 4 Australian universities and partner organisations, supported by the Australian Research Council (ARC). Although completed, this legacy site provides a wealth of information delivered by the program. CLEX supported a comprehensive climate research program and produced reports and briefing notes on extreme events to support decision-making by governments and industry.

Need historical summaries of climate?

The Australian Bureau of Meteorology provides access to historical climate data in a variety of formats, including timeseries charts and data for states and regions.

Need gridded historical data updated daily?

SILO (Scientific Information for Land Owners) is a database of Australian climate data from 1889 to yesterday. SILO is a service provided by the Queensland Government hosting data from the Bureau of Meteorology and other suppliers. It provides daily meteorological datasets for a range of climate variables in ready-to-use formats suitable for biophysical modelling, research and climate applications.

Need detailed information for states and territories?

A number of states and territories provide their own climate data resources, often designed with a particular set of users in mind and/or built on their own climate science programs. While there can be some variations across these resources (for example, in the range of variables presented, spatial resolution, emissions scenarios, time horizons and the available data formats), these tools are valuable resources. This is particularly the case where your area of interest is fully contained within one state or territory and the selection of climate variables or hazard information available from a state resource may be more relevant or precise. States and territory-based information includes:

Queensland

The Queensland Future Climate Dashboard provides an easy-to-use, map-based interface for climate projection data for Queensland from both the fifth (CMIP5) and sixth (CMIP6) phases of the global climate models. The Dashboard provides access to data in different formats to suit different purposes, including simple data summaries, charts, and spatial data in shapefile format to overlay with other datasets in a Geographic Information System (GIS). Regionalised data are available for a broad range of climate variables (including extreme events), two emissions scenarios (RCP4.5 and RCP8.5) for CMIP5 projections and three emissions scenarios (SSP1–2.6, SSP2–4.5, SSP3–7.0) for CMIP6 projections, different seasons, and four-time horizons (2030, 2050, 2070 and 2090). The Dashboard presents the dynamically downscaled, high-resolution (10km grid) climate projections generated through the Queensland Future Climate Science Program (Queensland Government).

- The Regional Explorer provides a quick and easy way to access summary information for a specific region as either tables or time-series charts.
- The Heatwave case study summarises the expected effects of climate change on the frequency and intensity of heatwaves, and potential implications for health, infrastructure, services and industries. It provides information via maps and time-series charts.
- The Water Security case study explores the potential effects of climate change on Queensland's water supply and water security, and how these effects can be managed. It provides information via maps and time-series charts.
- The Tropical Cyclone Hazard Dashboard presents information on severe wind hazards associated with tropical cyclones out to 2090, expressed as both Average Recurrence Intervals (ARI) and Annual Exceedance Probabilities (AEP). This presents the data component of the Severe Wind Hazard Assessment for Queensland (SWHA-Q), delivered in partnership with Queensland Fire and Emergency Services (QFES) and Geoscience Australia.
- The high-resolution projection data pages provide access to gridded datasets for both CMIP5 and CMIP6 projections. The data are provided in netCDF format and is most appropriate for users with programming and modelling skills.

New South Wales and ACT

AdaptNSW provides access to climate projections data via the interactive climate change projections map. Projections information is available using a region view (based on the ten major planning regions of NSW and the ACT), or using a higher resolution 4km grid view. Multiple climate variables and indices averaged over 20 year periods from 2020 to 2099, for a low (SSP1-2.6) and high (SSP3-7.0) emissions scenario are available, and information is available via the map, tables and charts. More detailed summaries for each region are available through the regional climate change snapshots, which include a third 'middle of the road' scenario (SSP2-4.5).

The projections data available from AdaptNSW was generated through the NSW and Australian Regional Climate Modelling (NARCliM) initiative. The NARCliM initiative is led by the NSW Government with support from the ACT, South Australian, Victorian, and Western Australian governments; the University of New South Wales, Murdoch University; and National Computational Infrastructure Australia (NCI). The NSW Government has mandated the use of NARCliM climate data in all government planning and proposals.

The NSW Climate Data Portal supports users with knowledge of and experience working with climate data. Through the Portal users can access, download, and apply CMIP6 NARCliM climate data (NARCliM2.0) for over 50 variables and three scenarios (SSP1.2.6, SSP2-4.5, SSP3-7.0), for daily, monthly or annual periods. Data is available in NetCDF, GeoTiff and CSV formats, and all downloads are free of charge. Examples of users of the Portal include consultants and experts in climate impact research, risk and vulnerability assessment, modelling for renewable energy, sustainable development, climate resilience programs, and community adaptation programs.

The Future Climate and Adaptation Hub, accessed through the NSW Department of Climate Change, Energy, the Environment and Water's SEED platform (Sharing and Enabling Environmental Data in NSW), allows users to explore data and tools to support climate change adaptation and risk management. Data collections include coastal hazards, severe fire weather, hillslope erosion and hot days.

Victoria

Victoria's Climate Science Report is a statutory requirement under the Victorian Climate Action Act 2017 to provide a summary of the best available climate change science and its implications for the state. The most recent 2024 report and its supporting climate projections, regional summaries, fact sheets and other resources can be used by decision-makers across businesses, the community and government, to improve research, risk assessments and planning for climate resilience. The report accompanies the Victorian Climate Science Report 2019, Victorian Climate Projections 2019 and sits alongside research from the Victorian Water and Climate Initiative, and leading academic institutions.

Victoria's Future Climate Tool provides access to climate projections and climate-related hazard indicators for both CMIP6 and CMIP5 projections, each with two emission scenarios. The interactive tool allows users to customise and view future climate information including temperature and rainfall maps, charts and datasets at a regional and local level, to understand climate impacts, and inform risk assessments, research and planning. Climate data, including high resolution projections, can be exported for use in spatial tools.

Tasmania

The Climate Futures for Tasmania project provides climate projections at a local scale and a series of technical reports on specific hazards or sector-specific impacts. Climate projections information for Tasmania can be viewed on LISTmap, the Land Information System Tasmania online mapping service. New fine-scale climate projections for Tasmania are expected to be available soon.

South Australia

The Guide to climate projections for risk assessment and planning in South Australia | 2022 and the South Australian Climate Projections viewer, provide reliable information on the likely future changes in South Australia's climate to help local councils, landscape and health regions, industry, and climate adaptation leader's plan for the future.

The guide and viewer provide summary tables of likely changes to important climate variables under two greenhouse gas scenarios (RCP4.5 and RCP8.5) for four future time periods: 2020-2039, 2040-2059, 2060-2079 and 2080-2099. The information is based on dynamically-downscaled CMIP5 projections from the NARCliM initiative (NARCliM1.5). South Australia's projections guide and viewer will be updated to the CMIP6 NARCliM2.0 projections in 2026.

Western Australia

The Western Australian Climate Projections Summary supports high-level or 'first pass' climate risk assessments and adaptation planning. The information is drawn from the projections and tools available on Climate Change in Australia (see above) for three emissions scenarios (RCP2.6, RCP4.5 and RCP8.5) and for the most commonly requested climate variables, including temperature, number of days over 40°C, rainfall, frost, rainfall intensity, water availability, cyclones, wind speed and fire risk.

The Climate Science Initiative (CSI) has released temperature and rainfall climate projections at a 20km resolution for the whole of Western Australia for expert users to support more detailed impact and risk assessments. High-resolution 4km regional projections are available from the National Computational Infrastructure. The CSI will deliver additional Western Australia-specific 4km downscaled projections, tools and services, including a climate projections viewer, throughout 2026 and 2027.

The Guide to future climate projections for water management in Western Australia (Department of Water and Environmental Regulation 2024) facilitates a contemporary, risk-based climate assessment. It helps water planners, scientists and decision-makers assess climate risk and opportunities for Western Australia's water resources using the latest climate science. The guide's practical framework for investigating future climates accommodates any new set of climate projections, including those released by the CSI. It currently recommends using the Bureau of Meteorology's National Hydrological Projections, from the Australian Water Outlook.

Northern Territory

'Climate Change in the Northern Territory – State of the science and climate change impacts' is a summary of climate change; what it is and how it is affecting the Northern Territory. The report is intended to inform Territorians on how their climate is changing and how to both reduce greenhouse gas emissions and to adapt to its impacts.

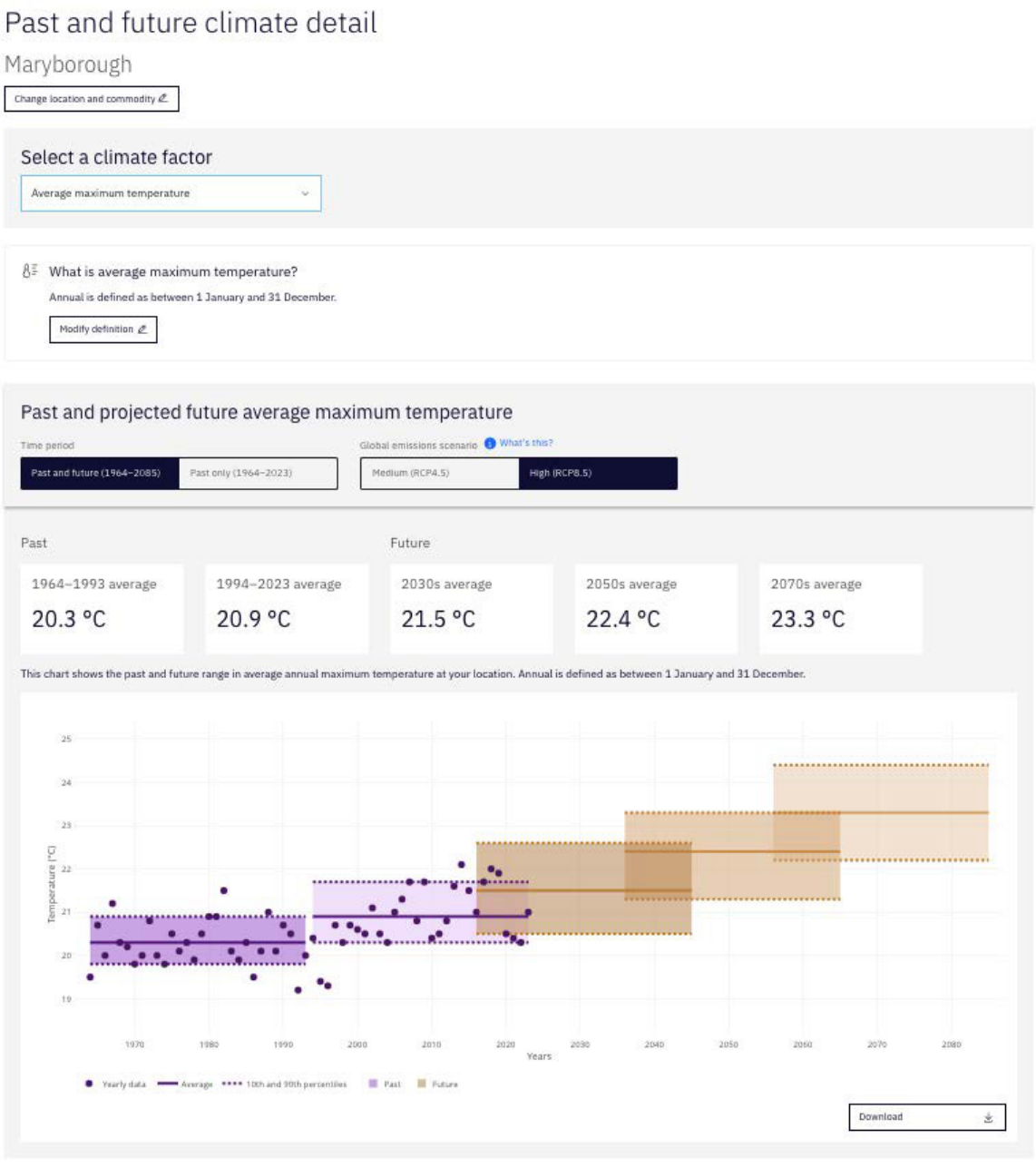
This report is an important resource to inform policy and assist the Government, industry, and the community to make decisions that build a climate-smart future.

Sector-specific resources and tools

In addition to the general resources above, there are resources designed to meet the needs of particular sectors such as energy, agriculture and water. While they focus on a specific sector, some of the information provided may be of use in other sectors or for a broader range of uses.

A selection of these are listed below.

- Electricity Sector Climate Information (ESCI) – provides climate and extreme weather information for the electricity sector.
- My Climate View – provides historical, seasonal and future climate information for the agriculture sector, including tailored metrics for different commodities and production locations.
- Climate Measurement Standards Initiative (CMSI) – provides resources to support the measurement and disclosure of climate-related risks in Australia's financial sector.
- Australian Water Outlook (AWO) – provides historical data on water availability, forecast products and hydrological impact projections using the Bureau's Australian Water Landscape Water Balance model (AWRA-L) to inform water resource management.
- Further information: Climate portals infographic - NESP 2 climate



My Climate View provides summary data and visualisations that combine historical data and projections for selected locations and agriculture-relevant climate variables.

Sea level rise

CoastAdapt provides sea level projections and inundation maps for Australia's local government areas. Note inundation maps are not available where digital elevation information was not available at the time of development. Projections are provided for two future emissions scenarios (RCP4.5 and RCP8.5) for 2050 and 2100. CoastAdapt also provides educational information on climate-driven coastal hazards and important considerations for risk assessments and adaptation planning.

Coastal Risk Australia provides more coverage and flexibility in inundation map displays. In addition to viewing sea level projections for different scenarios, you can manually set the level (in 10cm increments up to 10m) to display on the map. This is useful for considering low-likelihood but higher impact sea-level rise (e.g. based on the higher range or longer-term information in the latest IPCC report), and decision trigger points.

Canute 3 (CSIRO) provides estimates of the likelihood of extreme sea levels during this century, taking into account climate-related sea level rise as well as the effects of tides, storm surges and wave setup.

CoastAdapt provides information on climate-driven sea level rise, coastal hazards and important considerations for risk assessments and adaptation planning for coastal regions.

International resources

The Sixth Assessment Report (AR6) from the Intergovernmental Panel on Climate Change (IPCC) provides the most comprehensive overview of international climate science and interprets the results to support risk assessments and decision making. Estimates of likelihood and confidence are provided in the conclusions. The assessment reports are released in sections addressing specific topics.

- the physical science
- impacts, adaptation and vulnerability
- mitigation of climate change
- a synthesis report.

The IPCC also produces a series of reports addressing particular topics, such as climate change and land and the impacts of global warming above 1.5°C.

While these reports are comprehensive and rigorous, the IPCC also provides more accessible summaries for policy makers (such as this one for the AR6 Synthesis report) and a Summary for All on the science of climate change.

Part 2. Common uses for climate data and information

Climate data and information can be used in a variety of ways that require different levels of detail, formats and ease of use. Some common uses are described below and a suitability matrix (table 1) provides a simple guide to identify the most appropriate sources of information for a given purpose.

General understanding – Many people start exploring climate change information out of curiosity or self-education, or to improve their awareness of possible future hazards and impacts. Others are seeking simple but trustworthy information that can be used in documents like educational reports, communication materials, presentations, briefs and regional profiles. Simple summary tables and charts can often meet these needs.

Physical climate risk assessments – Climate risk assessments vary in the level of detail required and are often performed in sequence, getting more focused and detailed at each step. A common way to describe these stages is:

- **1st pass risk assessment** - An initial or high-level exploration or scan to identify the most relevant climate hazards and risks, to prioritise further work or scope for more detailed steps or cycles.
- **2nd pass risk assessment** - A formal climate risk assessment for a particular entity or activity to develop a strategic climate risk management plan.
- **3rd pass risk assessment** - A detailed climate risk assessment that can be used for specific projects, including operational planning and major investment decisions.

Detailed hazard analysis – The quantification of climate hazards to enable estimates of exposure and vulnerability can require more detailed information on extreme events under climate change, e.g. projected changes in the frequency, duration and intensity of events relating to extreme heat, rainfall, wind and fire weather. Hazard-specific resources can often provide this kind of information in a variety of formats.

Research and modelling – Researchers and modellers are likely to seek high-resolution climate projection data at fine time scales and for specific models or application including hydrological modelling, bioclimatic modelling such as species distribution modelling and engineering applications such as analyses to support minimum design specifications or standards for heat or wind.

Strategic policy and planning – Large organisations, including all levels of government, non-government organisations and the private sector, seek information on the potential changes to climate hazards and risks over strategic timeframes to inform the development of or amendments to policies, regulations, governance structures, decision-making frameworks, operations and procedures that adequately consider the effects of climate change.

Reporting and compliance – Public and private organisations need information to demonstrate the assessment and management of climate risks and opportunities, driven by emerging standards for reporting on environmental, social and governance (ESG) performance and financial disclosures of climate risk such as those provided by the International Sustainability Standards Board (ISSB) and the Australian Accounting Standards Board.

Climate risk assessment methodologies

A climate risk assessment methodology or framework provides a structured process for estimating the level of risk that arises from a combination of a climate hazard, exposure, vulnerability and consequence.

Importantly, these methodologies provide a way to navigate uncertainty, consider multiple sources of information, identify required data and information (climate and non-climate), and to make appropriate decisions with often imperfect information.

Different methodologies are available, with many focusing on the needs of specific sectors. Most methodologies follow much the same process but may vary in the terminology used or recommended information sources.

New climate risk methodologies and frameworks are in development, reflecting the evolution of approaches to climate risk management for different sectors and activities.

Our guide *Understanding data inputs for a climate risk assessment* in this series provides more information on a common approach to climate risk assessments and highlights some of the important considerations for selecting appropriate climate data to assess future hazards, as well as non-climate data required to inform estimates of exposure and vulnerability to those hazards.

Part 3. Which resource is most suitable to my needs?

The suitability matrix in Table 1 below provides an easy way to identify national and state climate information sources to suit your specific needs. The list of sources includes the most relevant climate information sources described in Part 1 above, focusing on climate data 'portals' and reports rather than research programs or resource libraries. The list of applications reflects the section above on common uses of climate information. The colours in the matrix indicate how well a source matches each use or application – green for a good match, yellow/gold for possible match, and grey for a poor match. Many of these information sources are designed to meet a broad range of user needs, while also providing flexibility in how information is presented and in what level of detail depending on user preferences. This is reflected in the matrix with some sources matching a large number of uses. More details for each platform are available in our navigation guide here.

Table 1: *A suitability matrix matching the information sources against their ideal applications.* ***Dark green*** *indicates a close match between the source and intended use, and that these would be the recommended climate information sources to use in each case.* ***Yellow/Gold*** *indicates that some features of the source may be suitable for that use, but that other options may provide a better match or be easier to use.* ***Grey*** *indicates that the source is not a good match for the application and you will be better served by alternatives.*

	SOURCES	APPLICATIONS							
		General understanding	1st pass (scan cycle) risk assessment	2nd pass (strategy cycle) risk assessment	3rd pass (project cycle) risk assessment	Strategic policy and planning	Reporting and compliance	Detailed hazard analysis	Research and modelling
NATIONAL	State of the Climate report								
NATIONAL	Australian Climate Service's Data Explorer								
NATIONAL	Climate Change in Australia - Regional Climate Change Explorer and associated tools								
NATIONAL	Climate Change in Australia – Download NRM Datasets (NetCDF grids*)								
QUEENSLAND	Queensland Future Climate Dashboard								
QUEENSLAND	Regional Explorer								

SOURCES		APPLICATIONS							
		General understanding	1st pass (scan cycle) risk assessment	2nd pass (strategy cycle) risk assessment	3rd pass (project cycle) risk assessment	Strategic policy and planning	Reporting and compliance	Detailed hazard analysis	Research and modelling
QUEENSLAND	Heatwave Case Study								
	Water security case study								
	Tropical Cyclone Dashboard								
	High-resolution projection data (NetCDF grids*)								
NSW & ACT	AdaptNSW								
	NSW Climate Data Portal								
	Future Climate and Adaptation Hub								
VICTORIA	Victoria's Future Climate Tool								
	High-resolution projections (NetCDF grids*)								
	Victoria's Climate Science Report, regional summaries and supporting documents								
TAS	Climate Futures for Tasmania								
SA	Guide to climate projections for risk assessment and planning in South Australia								
NT	Climate change in the Northern Territory: State of the science and climate change impacts								
WA	Western Australian Climate Projections Summary								
	A guide to future climate projections for water management in Western Australia								
	Western Australian Climate Science Initiative download climate projections								

SOURCES		APPLICATIONS							
		General understanding	1st pass (scan cycle) risk assessment	2nd pass (strategy cycle) risk assessment	3rd pass (project cycle) risk assessment	Strategic policy and planning	Reporting and compliance	Detailed hazard analysis	Research and modelling
SECTOR-SPECIFIC	Electricity Sector Climate Information (energy sector)								
	My Climate View (agriculture sector)								
	Climate Measurement Standards Initiative (financial sector)								
	Australian Water Outlook (water sector)								
SEA-LEVEL RISE	CoastAdapt								
	Coastal Risk Australia								
	Canute3								

* The NetCDF format is used for multidimensional scientific data and is commonly employed in climatology, meteorology and Geographic Information Systems (GIS). While NetCDF is a standard format used in climate modelling, a higher level of technical knowledge is usually required to access and apply these datasets in other applications.

Cover image: Zoe White (OzFish Unlimited) explains salt marsh restoration project to visitors. Photo courtesy of Ailie Gallant.

For more information:
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Guides in this series include:

- Everything you need to know about the latest in climate modelling
- Finding and selecting the right climate change information for your needs
- Understanding data inputs for a climate risk assessment
- Navigating climate information

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