Title	NARCliM1.0 climate projections
Alternative title(s)	Regional climate projections

Abstract

What is NARCliM?

The New South Wales and Australian Regional Climate Modelling (NARCliM) project develops high-resolution regional climate projections that cover NSW and South-eastern Australia at a higher resolution and the Australasian continent and beyond at another resolution (named the NARCliM and CORDEX domains, respectively). Computer modelled climate projections are the best information we have available on our future climate. NARCliM has been designed to help government, industry and community in NSW and Australia plan for our future with robust regional and local scale data. The NARCliM project uses currently available global climate models (GCM) and greenhouse gas (GHG) emissions scenarios from the latest Coupled Model Intercomparison Project (CMIP) used in the IPCC reports and applies regional dynamical downscaling using the latest Weather Research and Forecasting model (WRF). NARCliM generates critical climate indices for a broad range of applications and climate change adaptation and risk analysis.

NARCliM1.0

The NARCliM project began as a multi-agency partnership led by the NSW Government, partnered with the ACT Government, and with contributions from the Climate Change Research Centre (CCRC) at the University of New South Wales. NARCliM1.0 was released in 2014. It contains simulations from four CMIP3 GCMs and three regional climate models (RCM) using WRF3.3 for one future GHG scenario (SRES A2). Time periods included are 1990 to 2009, 2020 to 2039 and 2060 to 2079, with a grid resolution of 10km for South-eastern Australia (NARCliM domain) nested within a 50km grid for Australasia (CORDEX domain). NARCliM1.0 data has been used for a range of NSW climate adaptation and impact studies and climate change visualisations.

NARCliM1.0 features: * Historical period: 1990 to 2009 * Future simulation periods: 2020 to 2039 and 2060 to 2079

Some common variables projected by NARCliM1.0 include: * Temperature * Precipitation * Wind speed * Surface evaporation * Soil moisture * Bias corrected and post processed data * Three National Centres for Environmental Predictions (NCEP) reanalysis forced simulations were run from 1950 to 2009.

Model output

For access to NARCliM climate projections data, please visit the NSW Climate Data Portal or the National Computational Infrastructure at ANU. The Climate Data Portal provides users access to NARCliM's most commonly used "core variables" at daily and monthly frequencies. Additional variables useful for specialist analysis are available upon request. For more information, visit the AdaptNSW website, or contact us through the NARCliM Mailbox, narclim@environment.nsw.gov.au.

Related links

Discover how climate change will affect your region at AdaptNSW

Resource locator

Data quality statement	Name: Data quality statement Protocol: WWW:DOWNLOAD-1.0-http--download Description: Data quality statement for NARCliM1.0 data. Function: download
NARCliM1.0 climate variables	Name: NARCliM1.0 climate variables Protocol: WWW:DOWNLOAD-1.0-http--download Description: List of variables generated for NARCliM1.0, alongside of NARCliM1.5. For more information on data availability, please visit the Climate Data Portal

	Function: download
NARCliM1.0 reanalysis climate variables	Name: NARCliM1.0 reanalysis climate variables Protocol: WWW:DOWNLOAD-1.0-http--download Description: This link will redirect you to the NSW Climate Data Portal, where you can browse and download reanalysed NARCliM1.0 climate variables. Function: download
Technical Note 1 - Choosing GCMs	Name: Technical Note 1 - Choosing GCMs Protocol: WWW:DOWNLOAD-1.0-http--download Description: Method for choosing global climate models for NARCliM1.0 Function: download
Technical Note 2 - Choosing the RCMs to perform the downscaling	Name: Technical Note 2 - Choosing the RCMs to perform the downscaling Protocol: WWW:DOWNLOAD-1.0-http--download Description: Method for choosing regional climate models for NARCliM1.0 Function: download
Technical Note 3 - Guidance on the use of bias corrected data	Name: Technical Note 3 - Guidance on the use of bias corrected data Protocol: WWW:DOWNLOAD-1.0-http--download Description: Guidance on the use of bias corrected data developed for NARCliM1.0 Function: download
Technical Note 4 - NARCliM1.0 Climatological Atlas	Name: Technical Note 4 - NARCliM1.0 Climatological Atlas Protocol: WWW:DOWNLOAD-1.0-http--download Description: Climatological atlas for NARCliM1.0 Function: download
NARCliM Terms and Condition of use	Name: NARCliM Terms and Condition of use Protocol: WWW:DOWNLOAD-1.0-http--download Description: Please read: covers the requirement of how to acknowledge and cite NARCliM in publications, data disclaimer, license and privacy. Function: download

Unique resource identifier

Code	6ab66b13-c98d-4ab8-b47d-b79971bff73a

Presentation form	Model digital
Edition	NARCliM1.0
Dataset language	English

Metadata standard

Name	ISO 19115
Edition	2016
Dataset URI	https://datasets.seed.nsw.gov.au/dataset/6ab66b13-c98d-4ab8-b47d-b79971bff73a
Purpose	Meeting strategic requirements for regional climate data
Status	Under development
Spatial representation type	grid
Spatial reference system	
Code identifying the spatial reference system	4283
Spatial resolution	10 km
Additional information source	**NARCliM output** The NARCliM models generate data for more than 100 variables. The most commonly used variables are provided on the Climate Data Portal in multiple formats. These include: • 2-metre temperature (hourly) • Daily maximum 2-metre temperature • Daily minimum 2-metre temperature • Precipitation • Surface pressure • 2-metre specific humidity (hourly) • 10-metre wind speed (hourly) • Surface evaporation • Soil moisture • Radiation (upward and downward longwave, upward and downward short wave) • Forest fire danger index (FFDI) • Areal potential evapotranspiration (APET) *For daily mean variables:* • Mean is average within daily values time: point values 1hour • Max is maximum within daily values time: point values 1 hour • Min is minimum within daily values time: point values 1 hour. • Meantstep is average within daily values time: point values 300 second • Maxtstep is maximum within daily values time: point values 300 second • Mintstep is minimum within daily values time: point values 300 second *For monthly mean variables:* • Mean is average within monthly values time: point values 1hour • Max is maximum within monthly values time: point values 1 hour • Maxmean is mean of daily maximum within daily values: point value 1 hour

- Min is minimum within monthly values time: point values 1 hour
- Minmean is mean of daily minimum within daily values: point value 1 hour
- Meantstep is average within monthly values time: point values 300 second
- Maxtstep is maximum within monthly values time: point values 300 second
- Mintstep is minimum within monthly values time: point values 300 second

Data licensing

Data disclaimer

For all enquires, feedback and complaints relating to NARCliM data, please contact: narclim@environment.nsw.gov.au

Topic category

Keyword set

keyword value	CLIMATE-AND-WEATHER CLIMATE-AND-WEATHER-Climate-change
Originating controlled vocabulary	
Title	ANZLIC Search Words
Reference date	2008-05-16

Geographic location

West bounding longitude	133.7271
East bounding longitude	168.1256
North bounding latitude	-39.7919
South bounding latitude	-22.471
NSW Place Name	South-eastern Australia

Vertical extent information

Minimum value	-100
Maximum value	2228
Coordinate reference system	
Authority code	urn:ogc:def:cs:EPSG::
Code identifying the coordinate reference system	5711

Temporal extent

Begin position	1990-01-01
End position	N/A

Dataset reference date

Resource maintenance

Maintenance and update frequency	As needed
Contact info	
Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
Responsible party role	pointOfContact

Lineage

NARCliM is an ensemble of twelve global-regional climate model combinations. Four Coupled Model Inter-comparison Project phase 3 (CMIP3) global climate models (GCMs) were dynamically downscaled to finer spatial and temporal scales using three regional climate models (RCMs). Three twenty-year periods were simulated: (i) recent past (1990-2009), (ii) near future (2020-2039), and (iii) far future (2060-2079). Three 1950-2009 reanalysis-forced simulations were also developed for quantifying the RCMs' capability to simulate observed regional climate for Southeast Australia. Further, finer dynamical downscaling to 2 km over Sydney and statistical downscaling to 250 m and 1 km resolution, were developed.

General information

Outputs from GCMs are used as the initial condition in the regional climate model. GCMs were selected based on their overall performance in representing large scale climate phenomena (e.g. El Nino patterns) and climate variability in widely used metrics (e.g. rainfall and temperature), based on an extensive literature review. The overall poor-performing GCMs were excluded. The remaining GCMs were ranked for independence. Finally, the independence ranking was combined with choosing a spread in temperature and rainfall projections for southeastern Australia.

The RCMs differ by their parameterisations of planetary boundary layer, land surface and cumulus physics, micro physics, and short and longwave radiation physics. The RCMs were selected from combinations of physics schemes, ranked on their distinct ability to capture temperature, precipitation, mean sea level pressure and winds, as well as their statistical independence.

The model output from the NARCliM twelve-member (NARCliM1.0) three-dimensional (longitude, latitude, height) ensemble was further processed into two-dimensional Coordinated Regional Climate Downscaling Experiment (CORDEX)-compliant files at various temporal resolutions from sub-daily to annual timescales. The postprocessed data was then interpolated onto a regular latitude-longitude grid from the native rotated pole grid that WRF uses. Temperature and precipitation outputs were bias-corrected which acts as an additional dataset available when assessing thresholds and non-linearities in the system. NARCliM data is in NetCDF format, however the Climate Data Portal provides data in a text-readable format.

The NARCliM models were simulated on the National Computational Infrastructure supercomputing facility. The CORDEX 50 km and NARCliM 10 km domains are run together in a one-way nesting set-up.

Limitations on public access

Scope	dataset

DQ Completeness Commission

Effective date	2014-12-01
Explanation	Excess datum in the dataset are projections of southern Queensland, eastern South Australia and all of Victoria. **NARCliM Domain** (including the excess data) • Grid Type: rotated pole • Grid north pole: (147.63N, 60.31E) • Grid corner (regular coordinates): (133.7271, -39.7919) (168.1256, -22.4710)

DQ Completeness Omission

Effective date	2014-12-01
Explanation	All data has been provided except for the variable 'snow amount' at monthly, daily and hourly timesteps. This variable can be derived at these temporal frequencies based on the raw model output developed for the project.

DQ Absolute External Positional Accuracy

Effective date	2014-12-01
Explanation	Resolution is 10 km for the NARCliM domain and 50 km for the CORDEX domain.

Responsible party

Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
Responsible party role	pointOfContact

Metadata point of contact

Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
Responsible party role	pointOfContact

Metadata date

2024-10-18T00:41:41.650213

Metadata language