Downscaled CMIP3 and CMIP5 Climate and Hydrology Projections

This site is best viewed with Chrome (recommended) or Firefox.
Some features are unavailable when using Internet Explorer.
Requires JavaScript to be enabled.

Welcome | **About** | **Tutorials** | **Projections: Subset Request** | **Projections: Complete Archives** | **Feedback** | **Links**

Click on the sub-tabs below for information on how this archive leverages information from the WCRP WCRP CMIP3 and CMIP5 efforts. The sub-tabs below provide information on archive development drivers and motivation, scope of archive contents related to CMIP3 and CMIP5, projection attributes (e.g., variables, spatial-temporal coverage and resolution), and (for climate) comparison of CMIP5 and CMIP3 climate projection information. [Note May 2013 The contents of the previous “About” webpage will eventually be migrated to standalone documentation reports. This migration has been applied to content describing downscaled climate projection development. The migration will be completed when the website is updated to include BCSD CMIP5 hydrology projections.]

Climate **Hydrology**

Documentation

“Downscaled CMIP3 and CMIP5 Climate Projections: Release of Downscaled CMIP5 Climate Projections, Comparison with preceding Information, and Summary of User Needs", May 2013 (Report) available at https://gdo-dcp.ucllnl.org/downscaled_cmip_projections/techmemo/downscaled_climate.pdf; Appendix C figures available at https://gdo-dcp.ucllnl.org/downscaled_cmip_projections/techmemo/downscaled_climate_AppendixC_Figures.zip. Errata discovered since May 2013 available at https://gdo-dcp.ucllnl.org/downscaled_cmip_projections/techmemo/Errata.ClimateDownscalingDocumentation.140709.pdf. The Report summarizes the motivation and context for this collaborative effort to develop downscaled climate projections using two statistical techniques. The Report discusses data development methods, provides cursory comparison of CMIP5 and CMIP3 downscaled information, and summarizes user needs in understanding these differences concluding with a brief description of ongoing research activities addressing these differences. An addendum to this report, "Release of Downscaled CMIP5 Climate Projections (LOCA) and Comparison with Preceding Information", September 2015, available at https://gdo-dcp.ucllnl.org/downscaled_cmip_projections/techmemo/Downscaled_Climate_Projections_Addendum_Sept2016.pdf introduces new CMIP5 LOCA projections.

Release Notes (May 7, 2013)

Moving forward, it is expected that the Report will serve as a living document describing the Collaborators’ information resources and DCHP website content pertaining to downscaled climate projections. At the time of this website update, several notes apply to the release, interpretation, and use of the downscaled CMIP5 climate information:

- The CMIP5 projections represent a new opportunity to improve our understanding of climate science, which is evolving at a rapid pace. As new information such as CMIP5 is developed, the DCHP webWweb site collaborators are taking active roles in evaluating and incorporating it, as appropriate, into ongoing activities.
- While CMIP5 projections may inform future analyses, many completed and ongoing studies remain informed by CMIP3 projections that were selected as best information available at the time of study. Even though CMIP5 is newer, it has not been determined to be a better or more reliable source of climate projections compared to existing CMIP3 climate projections. CMIP5 projections should be considered an addition to (not a replacement of) the existing CMIP3

projections unless the climate science community can offer an explanation as to why CMIP5 should be favored over CMIP3.

- Because the CMIP5 model solutions have been available to the wider community only very recently, understanding how and why CMIP5 results differ from those in CMIP3 is at the early stage. It is thought now that any differences broadly relate to updates and other differences in the climate models used for CMIP5 and to the new set of climate forcing emissions scenarios. However, understanding those differences and their effects on regional specific is still underway.

- Section 3 provides a cursory summary of differences between downscaled CMIP5 and CMIP3 climate projections over the conterminous U.S. Most of the differences arise from differences in the CMIP5 global climate model projections of regional scale temperature and precipitation. However, some of these differences are due to the downscaling technique, meaning that the differences in downscaled information are similar to, but not precisely the same as, differences in global CMIP5 and CMIP3 climate information over the U.S. prior to downscaling.

- Collaborators are releasing the CMIP5 content additions at the DCHP website with the goal of accelerating community understanding of the CMIP5 versus CMIP3 differences depicted here and promoting use of an ever more complete representation of possible future climates. Releasing the new information to the large user community will build shared awareness of CMIP5 versus CMIP3 similarities and differences, as well as enhance the encouragement of the large community of users already familiar with CMIP3 to evaluate, explore, and diagnose the projections.

Attributes

Each BCSD climate projection has the following attributes:

- Variables:
  - precipitation, mean daily rate during each month, mm/day
  - surface air temperature, monthly mean, °C
  - missing value flag: 1E+20
- Time:
  - coverage: 1950-2099
  - resolution: monthly
- Space:
  - coverage: North American Land-Data Assimilation System domain (i.e. contiguous U.S. plus portions of southern Canada and northern Mexico, spanning 25.125° N to 52.875° N and - 124.625° E to -67.000° E)
  - resolution: 1/8° latitude-longitude (~ 12km by 12 km)

Each BCCA climate projection has the following attributes:

- Variables:
  - precipitation, mm
  - minimum surface air temperature, °C
  - maximum surface air temperature, °C
  - missing value flag: 1E+20
- Time:
  - CMIP3 coverage: 1961-2000, 2046-2065, 2081-2100
  - CMIP5 coverage: 1950-2099
  - resolution: daily
- Space:
  - coverage: same as BCSD climate projections
  - resolution: same as BCSD climate projections

Each LOCA climate projection has the following attributes:

- Variables:
  - precipitation, kg m-2 s-1 (converted to mm/day in 'Subset Request' interface)
  - minimum surface air temperature, °K (converted to °C in 'Subset Request' interface)
  - maximum surface air temperature, °K (converted to °C in 'Subset Request' interface)
  - missing value flag: 1E+30
- Time:
  - coverage: 1950-2099
  - resolution: daily
- Space:
  - coverage: same as BCSD climate projections

- resolution: 1/16° latitude-longitude (~ 6 km by 6 km)

UCRL-WEB-236256 Last modified October, 2016

Privacy and Legal Notice Comments/Questions