Downscaling method	Literature describing method	Datasets that use this method	Dataset descriptor paper(s)	Data access	Resolution (1/8 ~= 12-km 1/24 ~= 4-km)	Scenarios downscaled	Variables downscaled	Dataset domain & period	Training or calibration dataset	Other Notes
STATISTICAL										
Bias Correction and Spatial Disaggregation (BCSD)	Wood et al. (2002) Wood et al. (2004)	21st Century Hydrologic Projections for Alaska and Hawaii	Mizukami et al. (2022)	Public - NCAR Climate Data Gateway	Daily, 1-km (Hawai'i) and 12-km (Alaska)	CMIP5 - historical, RCP4.5, RCP8.5	pr, tmax, tmin	Alaska and Hawai'i, 1950-2099	Daymet, University of Hawai'i dataset	
		Downscaled CMIP3 and CMIP5 Climate and Hydrology Projections (Bureau of Reclamation project) - BCSD simulations	Brekke et al. (2013)	Public - GDO	Monthly, 1/8°	CMIP5 - historical, RCP2.6, RCP4.5, RCP6.0, RCP8.5	pr, t_mean, tasmin, tasmax	CONUS, 1950-2099	Maurer et al 2002	
		NASA Earth Exchange Global Daily Downscaled Projections (NEX-GDDP)	Thrasher et al., 2012 Thrasher et al. (2022)	Public - AWS S3 & NCCS THREDDS	Daily, 0.25°	CMIP5 - historical, rcp45, rcp85 CMIP6 - historical, ssp245, ssp370, ssp585	pr, tasmin, tasmax	Global, 1950-2099	Global Meteorological Forcing Dataset for Land Surface Modeling (GMFD)	
		NASA Earth Exchange (NEX) Downscaled Climate Projections (NEX-DCP30)	NEX-DCP30 Tech Note	Public - AWS S3 (NCCS THREDDS link does not work)	Monthly, 30 arc-seconds (0.0083°)	CMIP5 - historical, RCP2.6, RCP4.5, RCP6.0, RCP8.5	pr, tasmin, tasmax	CONUS, 1950-2099	PRISM	
Quantile Delta Mapping	Cannon et al. (2015)	Climate Impacts Lab (CIL) Global Downscaled Projections for Climate Impacts Research	Gergel et al. (2024)	Public - Planetary Computer	Daily, 0.25°	CMIP6 - historical, SSP126, SSP245, SSp370, SSP585	pr, tasmin, tasmax	Global, 1950-2100	ERA5	"This project makes use of statistical bias correction and downscaling algorithms... specifically designed to accurately represent changes in the extremes. ...we selected Quantile Delta Mapping (QDM), following the method introduced by Cannon et al. (2015), which preserves quantile-specific trends from the GCM while fitting the full distribution for a given day-of-year to... ERA5. We then introduce a similar method... to increase spatial resolution while preserving extreme behavior, Quantile-Preserving Localized-Analog Downscaling (QPLAD). Together, these methods provide a robust means to handle both the central and tail behavior seen in climate model output... and providing the spatial granularity needed to study surface impacts."
Constructed analog (CA) techniques	Hidalgo et al. (2008) Maurer et al. (2010) Abatzoglou & Brown (2012) Gutmann et al. (2014)	Downscaled CMIP3 and CMIP5 Climate and Hydrology Projections (Bureau of Reclamation project) - Bias Correction Constructed Analogs (BCCA) simulations	Brekke et al. (2013)	Public - GDO	Daily, 1/8°	CMIP5 - historical, RCP2.6, RCP4.5, RCP6.0, RCP8.5	pr, tasmin, tasmax	CONUS, 1950-2099	Maurer et al 2002	
		Double Bias Correction Constructed Analogs (DBCCA) (Oak Ridge National Lab)	Rastogi et al. (2022)	Public - ORNL	Daily, 1/24°	6 CMIP6 members - historical, SSP585	pr, tasmin, tasmax	CONUS, 1980-2060	Livneh & Daymet (2 versions of DBCCA)	
		Multivariate Adaptive Constructed Analogs (MACA)	Abatzoglou & Brown (2011)	Public - Climatology Lab	Daily, at 4-km (gridMet-trained) and 6-km (Livneh-trained)	CMIP5 - historical, RCP4.5, and RCP8.5	lots (pr, tasmin, tasmax, hurs, ...)	CONUS, 1950-2100	6-km Livneh & 4-km gridMet (2 versions of MACA)	CMIP6 version of MACA in progress - available sometime soon?
		Carbon Plan MACA	Chegwidden et al. (2022)	Public - GitHub	Daily, 0.25°	CMIP6 (MRI-ESM2, NorESM) - historical, SSP245, SSP585	pr, tasmin, tasmax	Global, 1950-2099	ERA5	
		CanDCS-M6	Sobie et al. (2023)	Public	Daily, 1/12°	CMIP6 - historical, SSP126, SSP245, SSP585	pr, tasmin, tasmax	Canada, 1950-2100	3 calibration datasets: AHCCDv3 Adjusted Precipitation Dataset for Canada PNWNAmet	
		Bias Correction Constructed Analogues with Quantile mapping reordering (BCCAQ)	Gebrechorkos et al 2023	Public - CEDA Archive	Daily, 0.25°	18 CMIP6 GCMS - historical, SSP245, SSp370, SSP585	pr, ta, tmin,tmax, hus, wind, pressure, ps, hurs, sfcWind	Global, 1981-2100	GloH2O (MSWX & MSWEP)	
Locally constructed analogs (LoCA)	Pierce et al. (2014)	Locally Constructed Analogs (LOCA) versions 1 (CMIP5) and 2 (CMIP6)	LOCA: Pierce et al. (2014) LOCA2: Pierce et al. (2023)	Public - CMIP5 CMIP6	Daily, 1/16°	CMIP6 - historical , ssp245, ssp370, and ssp585	precip, tasmin, tasmax	CONUS, 1950-2100	Livneh (LOCA) Livneh-unsplit (LOCA2)	
The Ensemble Generalized Analog Regression Downscaling (En-GARD)	Gutmann et al. (2022)	En-GARD	Gutmann et al. (2022)	Not public, but available upon request	Daily, 1/8°	CMIP6 - historical, SSP370	precip, t_mean	CONUS, 1950-2100	GMET	
		GARD-LENS	Hartke et al. (2024)	Public - NCAR RDA	Daily, 1/8° to 1-km	3 CMIP6 LENS - historical, SSP370	precip, t_mean, t_range	CONUS (1/8°), Alaska (4-km), & Hawai'i (1-km), 1950-2100	GMET	
		Carbon Plan single variate and multivariate GARD	Chegwidden et al. (2022)	Public - GitHub	Daily, 0.25°	CMIP6 - 2 GCMs - historical, SSP245, SSP370, SSP585	pcp, tasmin, tasmax	Global, 1950-2099	ERA5	
Seasonal Analysis of Residual Trends Empirical Statistical Downscaling Model (STAR-ESDM)	Hayhoe et al. (2021)	Seasonal Trend and Analysis of Residuals Empirical-Statistical Downscaling Method (STAR-ESDM)	No dataset desciptor for CMIP6 STAR-ESDM simulations	Not yet publicly available	Daily, 1/24°	25 CMIP6 GCMs - historical, SSP245, SSP585	pcp, tasmin, tasmax	CONUS, 1950-2100	NClimGrid-Daily	
Multivariate Bias Correction	Cannon et al. (2018)	Canadian Large Ensembles Adjusted Datasets (CanLEAD v1)	Cannon et al. (2021)	Public - Canada Open Goverment Portal	Daily, 0.5°	CanESM2 (CMIP5) - historical, RCP8.5	pr, tasmin, tasmax, hurs, ps, sfcWind, rsds, rlds	North America, 1950-2100	S14 global meteorological forcing dataset (S14FD) EartH2Observe, WFDEI and ERA-Interim data Merged and Bias-corrected for ISIMIP (EWEMBI) Canadian Regional Climate Model Large Ensemble	The Canadian Large Ensembles Adjusted Dataset version 1 (CanLEADv1) contains 50-member ensembles of bias-adjusted near-surface global and regional climate model variables on a 0.5° grid over North America for historical and future scenarios (1950–2100). Canadian Earth System Model Large Ensembles (CanESM2 LE) and Canadian Regional Climate Model Large Ensemble (CanRCM4 LE) datasets are bias-corrected using a multivariate quantile-mapping algorithm for statistical consistency with two observationally constrained historical meteorological forcing datasets
Probabilistic	No paper, but Dave Lorenz's website describes the methodology	Coupled Model Intercomparison Project Phase 5 (CMIP5) University of Wisconsin-Madison Probabilistic Downscaling Dataset (UW-PD)	No paper, but Dave Lorenz's website describes the methodology	Public - AWS	Daily, 0.1°	24 CMIP5 GCMs - historical, RCP2.6, RCP4.5, RCP6.0, RCP8.5	pr, tasmin, tasmax	US and southern Canada east of the Rocky Mountains, 1950-2100	NCEP Reanalysis	This downscaling method predicts the Probability Density Function (PDF) for each day and grid point given the large-scale from the global climate model. (This takes into account that there's no exact relationship between the large-scale atmospheric state and the weather at a point. Instead, the large-scale determines the relative likelihood of certain events at a point.) To generate a time series of data given the PDFs, we draw random numbers from the PDFs.
DYNAMICAL										
Intermediate Complexity Atmospheric Research model (ICAR)	Gutmann et al. (2016)	Intermediate Complexity Atmospheric Research model (ICAR) dataset	Gutmann et al. (2016)	Not public, but available upon request	3-Hourly, 6, 12 km	CMIP5 - Historical, RCP4.5, RCP8.5 CMIP6 - Historical, SSP245, 370, 585 (in progress) primarily Western US	pcp, tasmin, tasmax (daily) t2m,hus2m, u/v10m, rsds, rlds, psfc, rain/snow	Western CONUS, 1950-2100	--	
Canadian Regional Climate Model (CanRCM4)		Canadian Regional Climate Model Large Ensemble	Scinocca et al. (2016)	Public - Canada Open Government Portal	Hourly, 50 km (0.44°)	CMIP5 - CanESM2 large ensemble	clt, hurs, pr, ps, rlds, rsds, tas, uas, vas	North America, 1950-2100	--	The CanRCM4 large ensemble is a 50-member ensemble from 1950-2100 with all historical forcings for the North American Domain. Each ensemble member is driven by a member of the CanESM2 large ensemble. The model, forcings, variable names, and file formats all follow those used in the Coordinated Regional Downscaling Experiment (CORDEX). Simulations were run to 2005 using CMIP5 historical forcings and then to 2100 using RCP 8.5 forcings following CMIP5 protocols.
CORDEX (Mixed Regional Climate Models)		North America Coordinated Regional Downscaling Experiment (NA-CORDEX)	Bukovsky & Mearns et al. (2020)	Public - NCAR Climate Data Gateway	Various - 0.22° & 0.44°	CMIP5 - RCP4.5, and RCP8.5	pcp, tasmin, tasmax (daily) t2m,hus2m, u/v10m, rsds, rlds, psfc, rain/snow and more	CONUS, 1950-2100	--	
Weather Forecasting and Research (WRF) model	Skamarock et al. (2008) Skamarock et al. (2019)	CONUS404	Rasmussen et al. (2023)	Some public files - NCAR RDA	Hourly, 4 km	Historical Future PGW being run	pcp, tasmin, tasmax (daily) t2m,hus2m, u/v10m, rsds, rlds, psfc, rain/snow and more	CONUS, 1980-2020 (still being run for future PGW simulations)	ERA5 (for historical simulations)	
		Western United States Dynamically Downscaled Dataset (WUS-D3)	Rahimi et al. (2024)	Public - AWS	Hourly, 9-km	CMIP6 - Historical, SSP370	pcp, tasmin, tasmax (daily) t2m,hus2m, u/v10m, rsds, rlds, psfc, rain/snow and more	Western CONUS, 1980-2100	--	
		IM3/HyperFACETS Thermodynamic Global Warming (TGW) Simulation Datasets	Jones et al. (2023)	Public - Globus via MSD Live	Hourly, 1/8°	CMIP6 - historical, SSP245, SSP585	Lots - precip, surface temps, surface runoff, etc.	1980-2099		Regional climate models can be used to examine how past weather events might unfold under different climate conditions by simulating analogue versions of those events with modified thermodynamic conditions (i.e., warming signals). Here, we apply this approach... Warming signals follow two emission scenarios (SSP585 and SSP245) and are derived from two groups of global climate models based on whether they exhibit relatively high or low climate sensitivity. The resulting dataset... contains 25 hourly and over 200 3-hourly variables at 12 km resolution.
		Argnne Dynamic Downscaled Achieve V2 (ADDA_V2)	Akinsonola et al. (2024)	Some data public - ClimRR portal Only accumulated statistics available, not raw dataset	Hourly, 4-km	Historical	temperature, precip, wind speeds, degree days, fire weather index	CONUS, AK, and Puerto Rico, 2001-2020	ERA5 (for historical simulations)	Hourly weather data for energy modeling coming soon?
		EPA Dynamically Downscaled Ensemble (EDDE), Version 1	No dataset descriptor, but is described in a few publications linked to AWS data page	A subset of data is public via AWS	Hourly, 36-km	2 CMIP5 GCMs (CESM & GFDL-CM3) - historical, RCP4.5, RCP6.0, RCP8.5	Lots - precip, surface temps, surface runoff, etc.	CONUS, 1975-2100		
Regional Climate Model Version 4 (RegCM4)	Giorgi et al. (2012)	RegCM (Oak Ridge National Lab)	Rastogi et al. (2022)	Public - ORNL	Daily, 1/24°	CMIP6 - historical, ssp585	pr, tasmin, tasmax	CONUS, 1980-2060	Livneh & Daymet (2 separate versions of RegCM runs)	
MACHINE LEARNING										
Convolutional Neural Net (CNN)	Baño-Medina et al. (2020)	DeepSD (Carbon Plan)	Chegwidden et al. (2022)	Public - GitHub	Daily, 0.25°	CMIP6 (CanESM5, MRI-ESM2) - historical, ssp245, ssp370, ssp585	pcp, tasmin, tasmax	Global, 1950-2099	ERA5	Dataset does not have sufficient zero precipitation occurrences; instead a threshold value, e.g., 0.015 for the grid cell over Seattle, WA, appears to hold the place of zero precipitation. This threshold value varies across CONUS, but can be observed occurring for long stretches of time when one would expect to see 0.0 in a typical precipitation dataset.
DISCLAIMER	This catalog has been a group effort to describe gridded downscaled datasets available over the Contiguous United States and North America, and we cannot ensure that all information is correct.									
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