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Monthly Climate Data for Selected USGS HCDN Sites, 1951-1990, R1

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Summary:

Time series of monthly minimum and maximum temperature, precipitation, and potential evapotranspiration were derived for 1,469 watersheds in the conterminous United States for which stream flow measurements were also available from the national streamflow database, termed the Hydro-Climatic Data Network (HCDN), developed by Slack et al. (1993a,b). Monthly climate estimates were derived for the years 1951-1990.

The climate characteristic estimates of temperature and precipitation were estimated using the PRISM (Daly et al. 1994, 1997) climate analysis system as described in Vogel, et al. 1999.

Estimates of monthly potential evaporation were obtained using a method introduced by Hargreaves and Samani (1982) which is based on monthly time series of average minimum and maximum temperature data along with extraterrestrial solar radiation. Extraterrestrial solar radiation was estimated for each basin by computing the solar radiation over 0.1 degree grids using the method introduced by Duffie and Beckman (1980) and then summing those estimates for each river basin. This process is described in Sankarasubramanian, et al. (2001).

The data files are organized in directories by parameter, Tmax, Tmin, Pre, or PET, with each of the four directories containing 18 subdirectories representing the 18 Water Resources Council regions for the conterminous United States. Each region subdirectory contains data files for the monthly time series of respective hydroclimate attributes (Tmax, Tmin, Precipitation, and PET) for the individual basins in that region for the years 1951-1990. All files are in space delimited ASCII format.

Revision Notes: This data set has been revised to update the number of watersheds included in the data set and to updated the units for the potential evapotranspiration variable. Please see the Data Set Revisions section of this document for detailed information.

Data Citation:

Cite this data set as follows:

Vogel, R.M., and A. Sankarasubramanian. 2015. Monthly Climate Data for Selected USGS HCDN Sites, 1951-1990, R1. ORNL DAAC Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/810>.

This data set was originally published as:

Vogel, R. M., and A.Sankarasubramanian. 2005. Monthly Climate Data for Selected USGS HCDN Sites, 1951-1990. Data set. Available on-line [<http://www.daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. <http://dx.doi.org/10.3334/ORNLDAAC/810>.

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1. Data Set Overview:

Project: Hydroclimatology

Time series of monthly minimum and maximum temperature, precipitation, and potential evapotranspiration were derived for 1,469 watersheds in the conterminous United States for which stream flow measurements were also available from the national streamflow database, termed the Hydro-Climatic Data

Network (HCDN), developed by Slack et al. (1993a,b). Monthly climate estimates were derived for the years 1951-1990.

The climate characteristic estimates of temperature and precipitation were estimated using the PRISM (Daly et al. 1994, 1997) climate analysis system as described in Vogel, et al. 1999.

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The data files are organized in directories by parameter, Tmax, Tmin, Pre, or PET, and with each of the four directories containing 18 subdirectories representing the 18 Water Resources Council regions for the conterminous United States. Each region subdirectory contains data files for the monthly time series of respective hydroclimate attributes (Tmax, Tmin, Precipitation, or PET) for the individual basins in that region for the years 1951-1990.

2. Data Characteristics:

Data Format:

The data files are organized in directories by parameter, Tmax, Tmin, Pre, or PET, and contain 18 subdirectories representing the 18 Water Resources Council regions (Region-- , -- represents the region number). See description below.

Each region subdirectory contains data files for the monthly time series of respective hydroclimate attributes (Tmax, Tmin, Precipitation, and PET) for the individual sites in that region for the years 1951-1990. File names are identified by the unique number id of the HCDN station located within each watershed. All files are in space delimited ASCII format.

Parameter	Description and Units
Pre	Precipitation in mm/month
PET	Potential evapotranspiration in mm/month
Tmax	Average maximum monthly temperature in tenths of degree Celsius (e.g., -40.6250 *0.1 = -4.06250 degree Celsius)
Tmin	Average minimum monthly temperature in tenths of degree Celsius (e.g., see Tmax)

Example data records: Maximum Temperature for Region 10, HCDN Station 6019500. File name: 6019500.tmax

Columns: Station Year Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

6019500	1951	-40.6250	13.8750	16.0625	100.7500	157.4375	159.8750	255.8125	218.8125	184.7500	84.8125	20.7500	-44.1875
6019500	1952	-34.0625	-10.5625	7.1875	116.8125	155.1250	203.9375	241.0000	247.1875	226.5000	165.3750	5.0000	-11.3750
...													
6019500	1989	-21.8750	-58.4375	46.6875	109.6250	145.1250	203.6250	272.8125	223.6250	198.4375	103.5000	46.5000	-0.8750
6019500	1990	-2.3125	2.1250	55.3125	122.8125	135.7500	196.4375	254.8125	247.0000	239.4375	111.3750	47.1250	-64.6875

Companion Files

Watershed Characteristics

In the file, HCDN_watershed_characteristics.zip, a companion file of detailed HCDN watershed characteristics (HCDN_watershed_characteristics.csv) and a documentation file (hcdn_watershed_char_desc.pdf) are provided.

A companion file of detailed HCDN watershed characteristics ([HCDN_watershed_characteristics.csv](#)) and a documentation file ([hcdn_watershed_char_desc.pdf](#)) are provided.

Selected HCDN Sites

In the file **selected_HCDN_stations.zip**, the companion file [Selected_HCDN_stations.zip_20050601.csv](#) provides station information for 1,376 HCDN sites corresponding to this data set. This information is subset from the master HCDN station data file available online from USGS. Format and content descriptions are contained in the documentation file hcdn_stations_fmt_desc.pdf.

3. Data Application and Derivation:

These data could be used in climate models.

4. Quality Assessment:

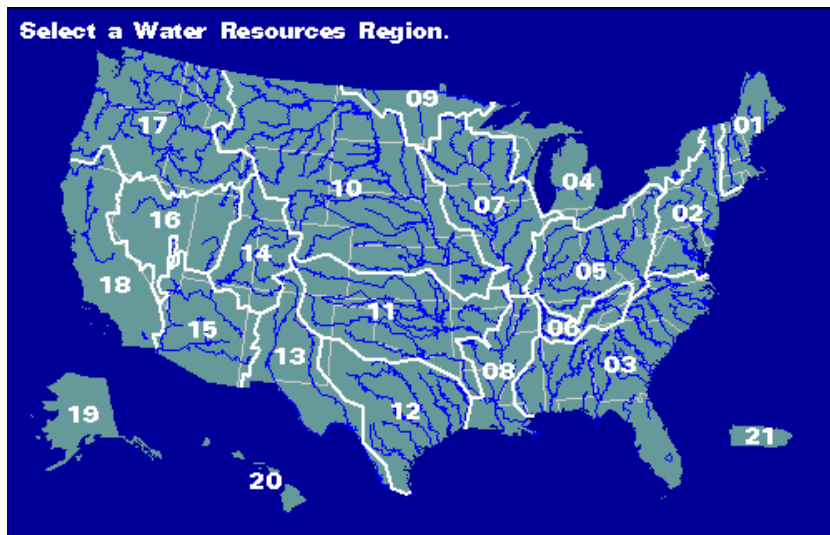
Not available.

5. Data Acquisition Materials and Methods:

A subset of the HCDN streamflow sites from watersheds with at least 10 years of record length were used in this study. Overall, the HCDN data set consists of records of average daily streamflow at 1,553 sites located throughout the United States. The data meet certain measurement accuracy criterion outlined by Slack et al. (1993). The HCDN contains river flows from 1874 to 1988, with an average record length of 44 years. The streamflow data included in the HCDN are relatively free from anthropogenic influences and the accuracy ratings of these records are at least rated good per USGS standards.

Water Resources Council Regions

The monthly climate data are organized by United States Water Resources Council Regions. The United States Geologic Survey (USGS) has divided and subdivided the US into successively smaller hydrologic units. The first and broadest level of classification divides the U.S. into 21 Water-Resources Council Regions. For a more comprehensive explanation of these divisions, refer to "Hydrologic units, hydrologic unit codes, and hydrologic unit names" (<http://pubs.usgs.gov/of/1992/ofr92-129/files/hucs.html>).



The gray lines are state lines, the blue lines are major rivers, and the white lines are water-resources region boundary lines. **This data set only has data for the 18 regions of the conterminous United States.**

- Region 01: New England
- Region 02: Mid-Atlantic
- Region 03: South Atlantic-Gulf
- Region 04: Great Lakes
- Region 05: Ohio
- Region 06: Tennessee
- Region 07: Upper Mississippi
- Region 08: Lower Mississippi
- Region 09: Souris-Red-Rainy
- Region 10: Missouri
- Region 11: Arkansas-White-Red
- Region 12: Texas-Gulf
- Region 13: Rio Grande
- Region 14: Upper Colorado
- Region 15: Lower Colorado
- Region 16: Great Basin
- Region 17: Pacific Northwest
- Region 18: California
- Region 19: Alaska
- Region 20: Hawaii
- Region 21: Caribbean

6. Data Access:

This data is available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

Data Archive Center:

Contact for Data Center Access Information:

E-mail: uso@daac.ornl.gov

Telephone: +1 (865) 241-3952

7. References:

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8. Data Set Revisions:

Revision Summary:

The number of watersheds included in this data set has been updated to 1,469. In the original documentation, the number of watersheds was listed as 1,337.

The units for the variable PET, Potential evapotranspiration, have been updated to mm/month. In the original data set, the units for PET were in mm/day.



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