Twelve-digit hydrologic unit total flow and snowmelt from the National Hydrologic Model Infrastructure with the Precipitation-Runoff Modeling System, 1980-2016

Metadata:

- Identification Information
- Data Quality Information
- Entity and Attribute Information
- Distribution Information
- Metadata Reference Information

Identification Information:

Citation:

Citation Information:

Originator: LaFontaine, J.H.
Originator: Blodgett, D.L.
Publication Date: 11/08/2022
Title:
Twelve-digit hydrologic unit total flow and snowmelt from the National Hydrologic Model Infrastructure with the Precipitation-Runoff Modeling System, 1980-2016
Geospatial Data Presentation Form: tabular digital data
Online Linkage: https://doi.org/10.5066/P902KHSM

Description:

Abstract:

This dataset is part of the National Water Census ongoing development of best estimates of daily historical water budgets for over 100,000 hydrologic units across the United States. In this release, estimates of total flow and snowmelt for each hydrologic unit are added to the already released estimates of actual evapotranspiration, snowpack water-equivalent storage, soil moisture, recharge, streamflow, and precipitation. All these estimates are made available per twelve-digit hydrologic unit code watershed as contained in the NHDPlus v2.1 dataset and associated Watershed Boundary Dataset (WBD) snapshot. As this project progresses, it is expected that a complete closed water budget generated from the same water budget model will succeed this data release. Users are advised to ignore the first two years of the simulations to account for model initialization.

For background on source data and generation of these water budget variables, see nhru_hru_outflow.csv and nhru_snowmelt.csv from:

Hay, L.E. and LaFontaine, J.H., 2020, Application of the National Hydrologic Model Infrastructure with the Precipitation-Runoff Modeling System (NHM-PRMS), 1980-2016, Daymet Version 3 calibration: U.S. Geological Survey data release, https://doi.org/10.5066/P9PGZE0S

The water budget variables were converted to a HUC12 basis using area-weighted spatial interpolation. The HUC12 version is the one included with WBD snapshot associated withe NHDPlus v2.1. All code used for conversions are published by Blodgett (2020) referenced below.

Summary of files included:
1) hu12_ids.csv.zip - twelve digit hydrologic unit (HUC12) code identifiers used in all files.
2) timesteps.csv.zip - timesteps used in all files.
3) nhm_total_flow_timeseries.csv.zip - One HUC12 per row, one date per column, version of total flow data.
4) nhm_snowmelt_timeseries.csv.zip - One HUC12 per row, one date per column, version of snowmelt data.

This data release compliments the following related data releases:

Actual evapotranspiration and snowpack water equivalent storage:
Blodgett, D.L., 2020, Twelve-digit hydrologic unit actual evapotranspiration and snowpack water equivalent storage from the National Hydrologic Model Infrastructure with the Precipitation-Runoff Modeling System 1980-2016: U.S. Geological Survey data release, https://doi.org/10.5066/P9IH7CB8.

Soil moisture and recharge:
Blodgett, D.L., 2019, Twelve digit hydrologic unit soil moisture and recharge from the National Hydrologic Model Infrastructure with the Precipitation-Runoff Modeling System: U.S. Geological Survey data release, https://doi.org/10.5066/P9ZZAWK4.

Streamflow:
Russell, A.M., Over, T.M., and Farmer, W.H., 2018, Statistical daily streamflow estimates at HUC12 outlets in the conterminous United States, Water Years 1981-2017: U.S. Geological Survey data release, https://doi.org/10.5066/P9DPSY6G.

Precipitation:
https://www.sciencebase.gov/catalog/item/52a7bed0e4b0de1a6d2dd0fd
Thornton, P.E., Thornton, M.M., Mayer, B.W., Wei, Y., Devarakonda, R., Vose, R.S., and Cook, R.B., 2017, Daymet—Daily surface weather data on a 1-km grid for North America, Version 3: ORNL DAAC website, accessed March 8, 2017, at https://doi.org/10.3334/ORNLDAAC/1328.

Purpose:

This data release is made available for scientists and decision makers seeking baseline water-budget information for a variety of applications. It addresses the U.S. Geological Survey Water Mission Area's congressional performance measures and addresses requirements that are part of the Secure Water Act.

Time Period of Content:

Time Period Information:

Range of Dates/Times:

Beginning Date: 10/01/1980
Ending Date: 12/31/2016

Currentness Reference:

ground condition

Status:

Progress:

Planned

Maintenance and Update Frequency: As needed

Spatial Domain:

Description of Geographic Extent:

Bounding Coordinates:

West Bounding Coordinate: -126.2109
East Bounding Coordinate: -65.3906
North Bounding Coordinate: 49.9512
South Bounding Coordinate: 23.2413

Keywords:

Theme:

Theme Keyword Thesaurus: ISO 19115 Topic Category
Theme Keyword: inlandWaters

Theme:

Theme Keyword Thesaurus: USGS Thesaurus
Theme Keyword: Hydrology
Theme Keyword: Hydrologic processes

Theme:

Theme Keyword Thesaurus: USGS Metadata Identifier
Theme Keyword: USGS:612b9b68d34e40dd9c0804ff

Place:

Place Keyword Thesaurus: Common geographic areas
Place Keyword: United States

Access Constraints: None. Please see 'Distribution Info' for details.
Use Constraints:
None. Users are advised to read the data set's metadata thoroughly to understand appropriate use and data limitations. Users are advised to ignore the first two years of the simulations to account for model initialization.
Point of Contact:

Contact Information:

Contact Person Primary:

Contact Person: Jacob H LaFontaine
Contact Organization: U.S. Geological Survey, Southeast Region

Contact Position: Research Hydrologist
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Postal Code: 30093

Country: US
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Contact Facsimile Telephone: 678-924-6710
Contact Electronic Mail Address: jlafonta@usgs.gov

Native Data Set Environment:

These data were produced with MacOS and should be portable to any operating system.

Cross Reference:

Citation Information:

Originator: R.S. Regan
Originator: K.E. Juracek
Originator: L.E. Hay
Originator: S.L. Markstrom
Originator: R.J. Viger
Originator: J.M. Driscoll
Originator: J.H. LaFontaine
Originator: P.A. Norton
Publication Date: 01/2019
Title:
The U. S. Geological Survey National Hydrologic Model infrastructure: Rationale, description, and application of a watershed-scale model for the conterminous United States
Geospatial Data Presentation Form: publication
Series Information:

Series Name: Environmental Modelling & Software
Issue Identification: vol. 111

Publication Information:

Publication Place: n/a
Publisher: Elsevier BV

Other Citation Details:
ppg. 192-203
Online Linkage: http://dx.doi.org/10.1016/j.envsoft.2018.09.023

Cross Reference:

Citation Information:

Originator: Roland, J. Viger
Publication Date: 04/28/2014
Title:
GIS Features of the Geospatial Fabric for National Hydrologic Modeling
Geospatial Data Presentation Form: vector digital data
Online Linkage: http://dx.doi.org/doi:10.5066/F7542KMD

Cross Reference:

Citation Information:

Originator: Lauren E Hay
Originator: Jacob H LaFontaine

Publication Date: 2020
Title:
Application of the National Hydrologic Model Infrastructure with the Precipitation-Runoff Modeling System (NHM-PRMS),1980-2016, Daymet Version 3 calibration
Geospatial Data Presentation Form: dataset
Publication Information:

Publication Place: https://www.sciencebase.gov
Publisher: U.S. Geological Survey

Online Linkage: https://doi.org/10.5066/p9pgze0s

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Data Quality Information:

Attribute Accuracy:

Attribute Accuracy Report:

The files and model configuration were subject to USGS peer review but have not undergone a formal accuracy assessment.

Logical Consistency Report:

Data were spot checked visually and were logically consistent with input.

Completeness Report:
Data set is considered complete for the information presented, as described in the abstract. Users are advised to read the rest of the metadata record and referenced materials carefully for additional details.
Positional Accuracy:

Horizontal Positional Accuracy:

Horizontal Positional Accuracy Report:
No formal positional accuracy tests were conducted

Vertical Positional Accuracy:

Vertical Positional Accuracy Report:
No formal positional accuracy tests were conducted

Lineage:

Source Information:

Source Citation:

Citation Information:

Originator: Lauren E Hay
Originator: Jacob H LaFontaine
Publication Date: 2020
Title:

Application of the National Hydrologic Model Infrastructure with the Precipitation-Runoff Modeling System (NHM-PRMS),1980-2016, Daymet Version 3 calibration
Geospatial Data Presentation Form: dataset
Publication Information:

Publication Place: ScienceBase
Publisher: U.S. Geological Survey

Online Linkage: https://doi.org/10.5066/p9pgze0s
Type of Source Media: Digital
Source Time Period of Content:

Time Period Information:

Range of Dates/Times:

Beginning Date: 10/01/1980
Ending Date: 12/31/2016

Source Currentness Reference:
ground condition

Source Citation Abbreviation:
NHM-PRMS Data
Source Contribution:
Actual evapotranspiration and snowpack water equivalent data
Source Information:

Source Citation:

Citation Information:

Originator: Roland, J. Viger
Publication Date: 04/28/2014
Title:
GIS Features of the Geospatial Fabric for National Hydrologic Modeling
Geospatial Data Presentation Form: vector digital data
Online Linkage: http://dx.doi.org/doi:10.5066/F7542KMD

Type of Source Media: Digital
Source Time Period of Content:

Time Period Information:

Single Date/Time:

Calendar Date: 04/28/2014

Source Currentness Reference:
ground condition

Source Citation Abbreviation:
Geospatial Fabric
Source Contribution:
Hydrologic Response Unit Polygons

Source Information:

Source Citation:

Citation Information:

Originator: Lucinda McKay
Publication Date: 02/15/2015
Title:
NHDPlus National Data
Geospatial Data Presentation Form: vector digital data
Online Linkage: https://www.epa.gov/waterdata/nhdplus-national-data

Type of Source Media: Digital
Source Time Period of Content:

Time Period Information:

Single Date/Time:

Calendar Date: 02/15/2015

Source Currentness Reference:
ground condition

Source Citation Abbreviation:
WBD HU12
Source Contribution:
Hydrologic-Unit Boundaries

Process Step:

Process Description:

1) Calculate area intersection weights between model hydrologic response units (HRUs) and summary twelve-digit hydrologic units (HUC12s).
2) Apply area intersection weights to transfer time series from HRU basis to HUC12 basis.
3) Convert results to csv timeseries format.

Source Used Citation Abbreviation:
Geospatial Fabric
Source Used Citation Abbreviation:
WBD HU12
Source Used Citation Abbreviation:
NHM-PRMS Data
Process Date: 09/01/2021

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Entity and Attribute Information:

Detailed Description:

Entity Type:

Entity Type Label: Zip file containing huc12_ids.csv
Entity Type Definition:
List of HUC12 units included in the data files.
Entity Type Definition Source:
U.S. Geological Survey

Detailed Description:

Entity Type:

Entity Type Label: Zip file containing timesteps.csv
Entity Type Definition:
List of daily time steps included in the data files.
Entity Type Definition Source:
U.S. Geological Survey

Detailed Description:

Entity Type:

Entity Type Label: Zip file containing nhm_snowmelt_timeseries.csv
Entity Type Definition:
Daily time step estimates of snowmelt, in inches, for each hydrologic response unit from the NHM-PRMS application. File has one HUC12 per row and one date per column.
Entity Type Definition Source:
U.S. Geological Survey

Detailed Description:

Entity Type:

Entity Type Label: Zip file containing nhm_total_flow_timeseries.csv
Entity Type Definition:
Daily time step estimates of total flow, in cubic feet per second, for each hydrologic response unit from the NHM-PRMS application. File has one HUC12 per row and one date per column.
Entity Type Definition Source:
U.S. Geological Survey

Overview Description:

Entity and Attribute Overview:

Data in this data release are all in units of cubic feet per second (per time step) for total flow (PRMS variable hru_outflow) and inches (per time step) for snowmelt (PRMS variable snowmelt). The ascii-text data files are written with hydrologic units as rows and dates as columns. Index files containing the hydrologic unit codes (HUC12) and timeseries values present in the data files are provided. The version of the HUC12 units are associated with the version of WBD associated with NHDPlus v2.1.

Summary of files included:
1) hu12_ids.csv - twelve digit hydrologic unit (HUC12) code identifiers used in all files
2) timesteps.csv - timesteps used in all files.
3) nhm_total_flow_timeseries.csv - One HUC12 per row version of total flow data
4) nhm_snowmelt_timeseries.csv - One HUC12 per row version of snowmelt data

Entity and Attribute Detail Citation:

LaFontaine, J.H., and Blodgett, D.L. 2022, Twelve-digit hydrologic unit total flow and snowmelt from the National Hydrologic Model Infrastructure with the Precipitation-Runoff Modeling System, 1980-2016: U.S. Geological Survey data release, https://doi.org/10.5066/P902KHSM.

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Distribution Information:

Distributor:

Contact Information:

Contact Organization Primary:

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Contact Person: GS ScienceBase

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Distribution Liability:

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Standard Order Process:

Digital Form:

Digital Transfer Information:

Format Name: Digital Data

Digital Transfer Option:

Online Option:

Computer Contact Information:

Network Address:

Network Resource Name:https://doi.org/10.5066/P902KHSM

Fees: None

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Metadata Reference Information:

Metadata Date: 11/08/2022
Metadata Contact:

Contact Information:

Contact Person Primary:

Contact Person: Jacob H LaFontaine
Contact Organization: U.S. Geological Survey, Southeast Region

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Metadata Standard Name: FGDC Content Standard for Digital Geospatial Metadata
Metadata Standard Version: FGDC-STD-001-1998

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