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The National Water Census (NWC) is a USGS research program on national water availability and use that develops new water accounting tools and assesses water availability at the regional and national scales. A component of the NWC is a collection of computing infrastructure referred to as the data platform. The platform and a web portal built using its services enables integration and delivery of water budget information alongside other data, such as water-use data and ecological assessment criteria. This poster describes how the NWC implements the USGS Science Data Lifecycle¹ from data management planning to data preservation publication and sharing.

Data Management and Planning:

- The NWC requires that funded projects follow the USGS Science Data Lifecycle¹.
- NWC funded projects must create data management plans as part of project planning.
- Data management plans document handling of project inputs and outputs, important software and models, and the intention for archiving outcomes.
- The approach was designed based on National Climate Change and Wildlife Science Center² and USGS Data Management Best Practices¹.

Users

Scientists and Modelers Planners and Legislators Engineers and Managers

User Interfaces

Scripts and Workflows Third Party Portals NWC Portal

Processing Services

Streamflow Statistics Formatting and Attribution Subsetting and summarization

Data Access

Hydrologic Data Geospatial Data Metadata

Authoritative Archives

USGS Data Archives NWC Platform Data Archive Metadata Catalogs

Data Archiving and Sharing:

NWC-related data is archived and made available using the architecture described in the diagram above. Existing systems are used where possible. All components used are exposed as open data, code, and services.

U.S. Department of the Interior
U.S. Geological Survey



- 1: <http://www.usgs.gov/datamanagement/index.php>
- 2: <http://nccwsc.usgs.gov/content/data-policies-and-guidance>
- 3: <http://cida.usgs.gov/nwc/>
- 4: <http://daymet.ornl.gov/>
- 5: <http://dx.doi.org/10.1111/jawr.12057>
- 6: http://www.horizon-systems.com/nhdplus/NHDPlusV2_home.php

- 7: <http://waterdata.usgs.gov/nwis/wu>
- 8: <https://github.com/USGS-R/EflowStats>
- 9: <http://waterservices.usgs.gov/>
- 10: <http://cida.usgs.gov/nwc/thredds/>
- 11: <https://www.sciencebase.gov/catalog/?community=National+Water+Census>

Community: National Water Census

Type some text to search... Search Advanced Search

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- water use
- water availability
- withdrawal
- watersheds
- All tags...

Browse by Location:

About National Water Census

The National Water Census is a USGS research program on national water availability and use that develops new water accounting tools and assesses water availability at the regional and national scales. Through the Water Census, USGS is integrating diverse research on water availability and use and enhancing the understanding of connection between water quality and water availability. Research is designed to build decision support capacity for water management agencies and other natural resource managers. It is one of six major science directions identified by the USGS in its 2007 Science Plan and is called for in the SECURE Water Act and implemented through the Department of the Interior WaterSMART initiative. That National Water Census is using ScienceBase to catalog metadata and data-holdings for project work that is ongoing and planned.

Active National Water Census Projects.

All Projects

Evapotranspiration Project

This project applies ET remote sensing at two scales, 1) across the full landscape at 1000 m MODIS resolution (as a component of the water budget to support water availability studies, and 2) on agricultural lands at 30 m Landsat resolution (for estimating crop water use).

National Water Census Data Portal

A major component of the Water Census is the National Water Census Data Platform, which enables integration and delivery of water budget information alongside other data of interest to managers, such as water use data or ecological assessment criteria. Eventually, end users of water budget data (i.e. management agencies and decision-makers) will be able to access an integrated system of online databases in a form that will enable them to construct local and regional water budgets.

Estimating withdrawal and consumption of water at thermoelectric power plants using heat- and water-budget models

This project has developed models based on heat budgets to estimate water use for electrical generation, and produced estimated thermoelectric withdrawal and consumption at the level of individual plants for 2010. Refinement of these methods is ongoing.

Apalachicola-Chattahoochee-Flint Rivers Geographic Focus Area Study

The Apalachicola-Chattahoochee-Flint (ACF) Basin in Alabama, Florida, and Georgia has ongoing conflict over water use and availability. To address this issue, the USGS is conducting a three-year study to estimate water use, model surface and groundwater flow, and develop ecological flow relations.

Estimating Flows at Ungauged Stations

While streamgages can provide accurate and timely measurements of streamflow, streamflow needs are too wide ranging and disparate to allow installation of streamgages at every location where information is required. This project seeks to develop estimates of streamflow at ungauged locations by making use of nearby gauged records and state of the art modeling techniques.

Colorado River Geographic Focus Area Study

Working to better quantify selected components of the water budget in the Colorado River Basin to assist in the assessment of water availability for the region.

Delaware River Geographic Focus Area Study

The study will: 1) improve the integration of state water-use and water supply data; 2) develop a basin-wide surface-water hydrologic model capable of evaluating the impacts of land-use change, climate change, and changes in water demand; and 3) develop a scientific approach to defining relations between streamflow processes and the responses of aquatic organisms in tributary streams.

ScienceBase Community

The NWC uses a ScienceBase Community¹¹ to track and display metadata containing project summaries, USGS publications and reports from journals, and data products. As the NWC progresses, this community will be a comprehensive catalog for NWC products.

Water Budget:

The portal³ provides access to historical estimates of precipitation from the Daymet dataset⁴ and evapotranspiration from the Simplified Surface Energy Balance model⁵ attributed to 12-digit hydrologic unit code watersheds⁶. County estimates of water use from the Aggregate Water Use Data System⁷ are also provided.

Available Water Budget Components

Discover and access precipitation and evapotranspiration data for watersheds and counties.

Percentage of HUC in Hillsborough County 100%
Percentage of Hillsborough County in HUC 4%

Water Use for Hillsborough County

Download Water Use

US Customary Metric

Total County Water Use Area Normalized County Water Use

Water use estimates derived from the Aggregate Water Use Data System also available from NWIS Web [↗](#).

Precipitation and Evapotranspiration for the Selected HUC

Hydrologic Unit Code
03120020802

HUC Name
Lees Creek-Ochlocknee River

Download Evapotranspiration Download Precipitation

US Customary Metric

Area Weighted Mean Precipitation
Area Weighted Mean Actual Evapotranspiration

Precipitation and Evapotranspiration data derived from the Daymet [↗](#) and SSEBop [↗](#) datasets, respectively.

Drag the handles at then end of the date axis to zoom in. Drag the window you are zoomed on to pan the date window through time. To access custom subsets of these and other data, visit the Geo Data Portal [↗](#).

Siczewicz, Peter. U.S. Historical Counties (Generalized .001 deg). Dataset. Emily Kelley, digital comp. Atlas of Historical County Boundaries, ed. by John H. Long. Chicago: The Newberry Library, 2011. Available online from <http://publications.newberry.org/ahcbp>

Streamflow Statistics:

Ecologically relevant streamflow statistics are calculated for modeled or observed streamflow using an open source R package⁸. Publicly available web services from the National Water Information System⁹ and the NWC¹⁰ are used by the portal's processing service and can be accessed by R users offline for more specific applications.

Streamflow Statistics Calculator

Software to calculate these statistics is also available as an open-source R package on GitHub: <https://github.com/USGS-R/EflowStats>.

Modeled streamflow data was created using methods described here. [↗](#)

Select Streamflow Statistics Parameters

Select a subset of the time series for which you would like to calculate various statistics.

Note that streamflow estimate applies to the watershed selected and all watersheds upstream of it.

Hydrologic Unit Code
03120020802

HUC Name
Lees Creek-Ochlocknee River

Drainage Area (km²)
1960.98178087000

Download Modeled Streamflow

Modeled Streamflow for the Lees Creek-Ochlocknee River Watershed.

Download These Statistics

Name	Value	Description
site_no	03120020802	
min_date	1980-10-01	
max_date	2010-09-30	
lam1Obs	724.24	Mean of the daily streamflow for the period of record.
tau2Obs	0.65	Coefficient of L-variation (Hosking and Wallis, 1994, eqn. 2.61) of the daily streamflow for the period of record.
tau3Obs	0.56	L-skewness (Hosking and Wallis, 1994, eqn. 2.60 with r equal to 3) of the daily streamflow for the period of record.
tau4Obs	0.34	L-kurtosis (Hosking and Wallis, 1994, eqn. 2.60 with r equal to 4) of the daily streamflow for the period of record.
ar1Obs	-0.05	Autoregressive lag-one correlation coefficient of the daily streamflow for the period of record. First, the streamflow time series is deseasonalized by subtracting the long-term monthly mean streamflow from each of the days in the respective month and then standardized to have a zero mean and unit variance.

