

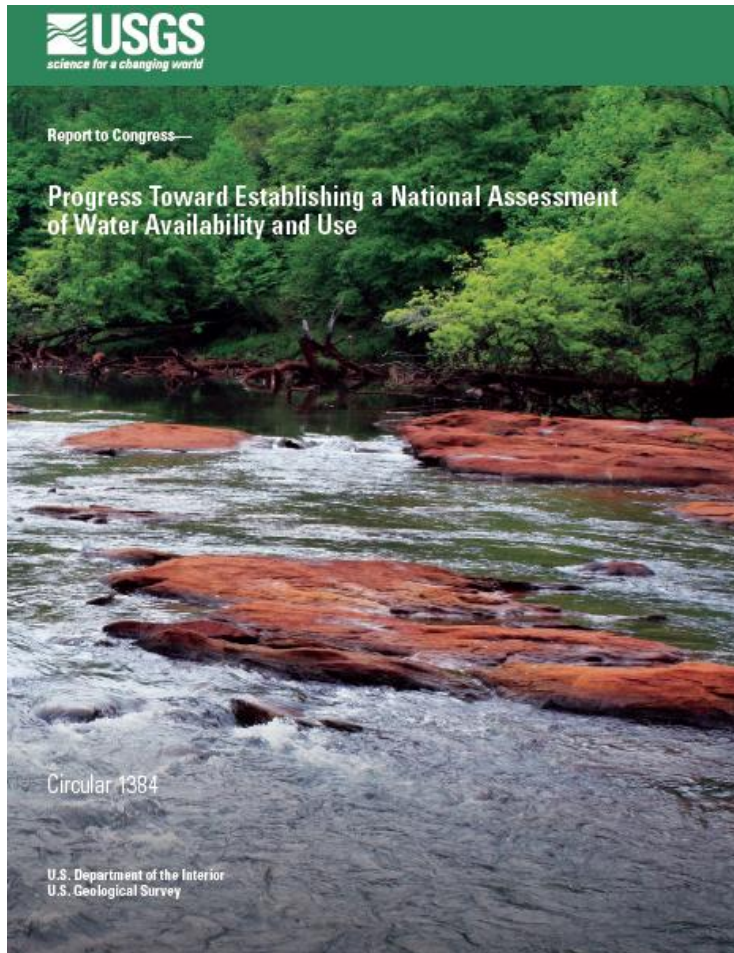
# Water Availability

## Overview of the Current Landscape

By Donna Myers, Chief  
U.S. Geological Survey  
Office of Water Quality



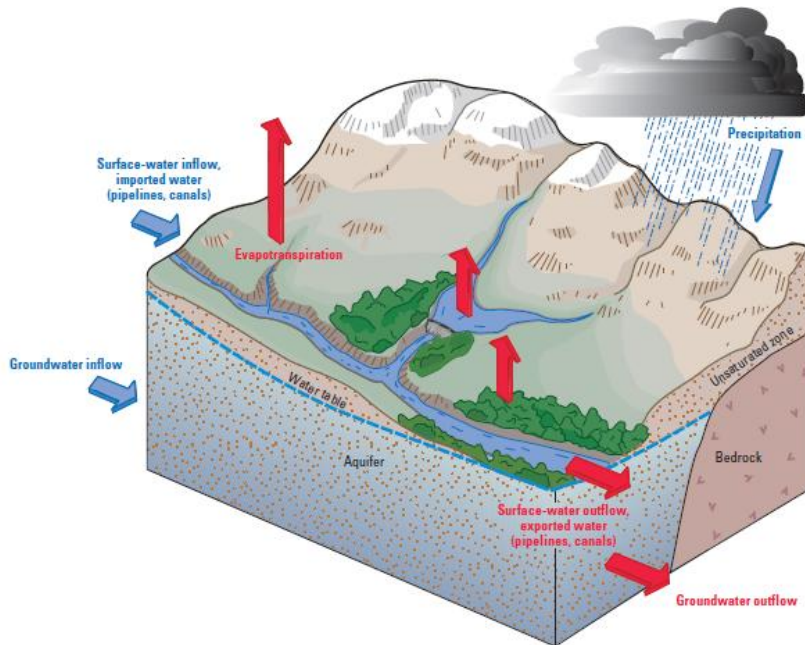
# Water availability and use has not been comprehensively assessed since 1978



- The USGS Water Census fulfills the need for a new assessment
- Undeveloped resources
- Trends and change
- Surface water storage and groundwater reserves
- Water use
- Water conflicts

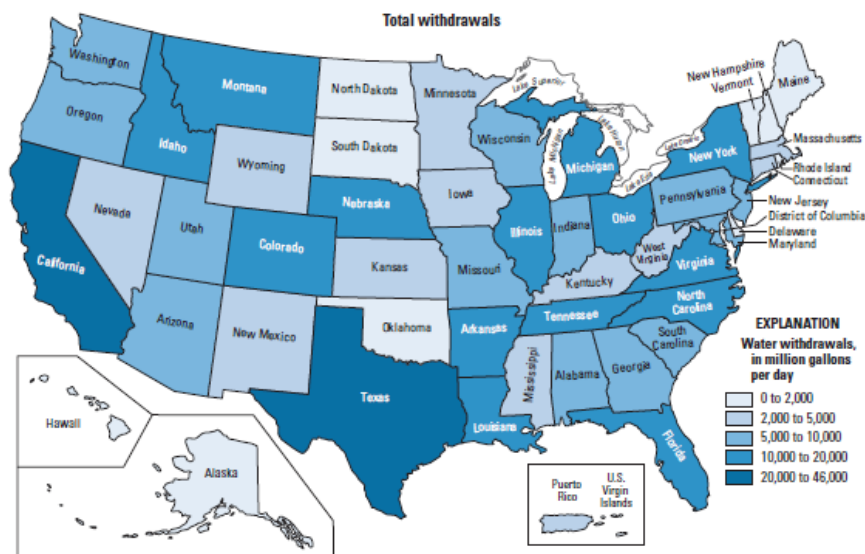
# Water budgets are a unifying theme

- Water budgets account for the inputs to, outputs from, and changes in the amount of water in the various components of the water cycle. They are the hydrologic equivalent of the deposits to, withdrawals from, and changes in the balance in a checking account and provide the hydrologic foundation for analysis of water availability.



# Water Use Reports at 5-Year Intervals

## Total Water Use, 2005

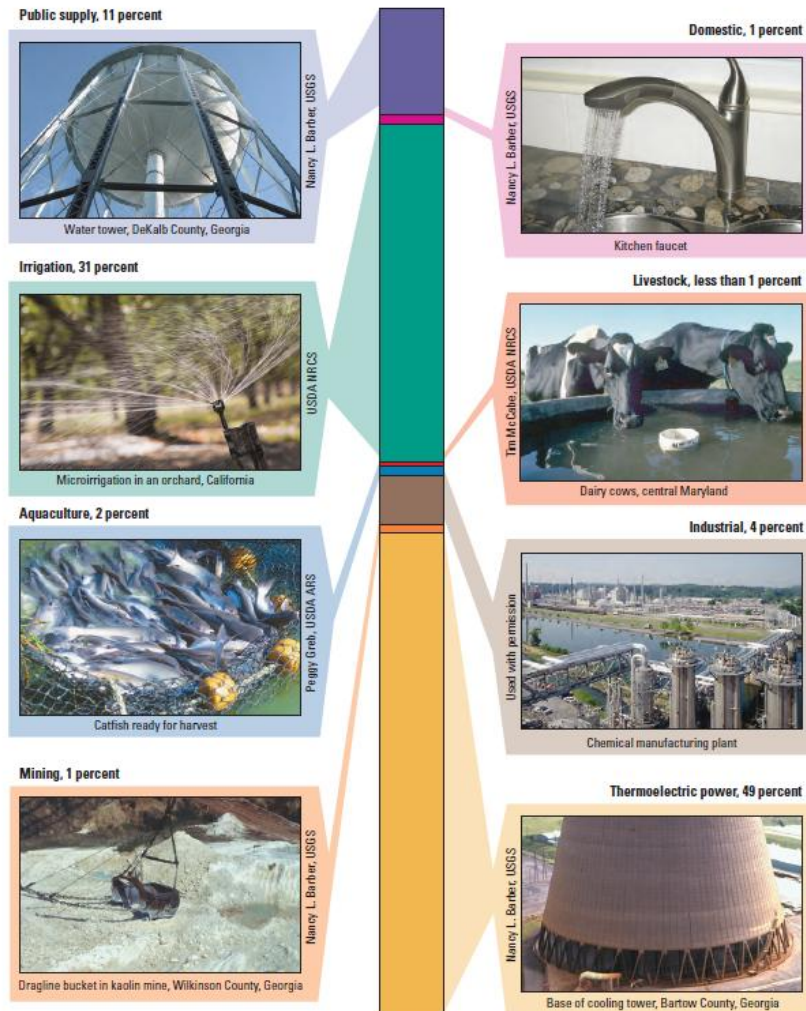


## Water Use Program Goals

- Analyze the source, use, and disposition of water resources at local, state, and national levels
- Reply to water-use information requests from the public
- Document trends in water use in the United States
- Cooperate with state and local agencies on projects of special interest
- Develop water-use data bases
- Publish local, state, and national water-use data reports

<http://water.usgs.gov/watuse/>

# Thermoelectric Use is the Largest Share of the Total Water Use

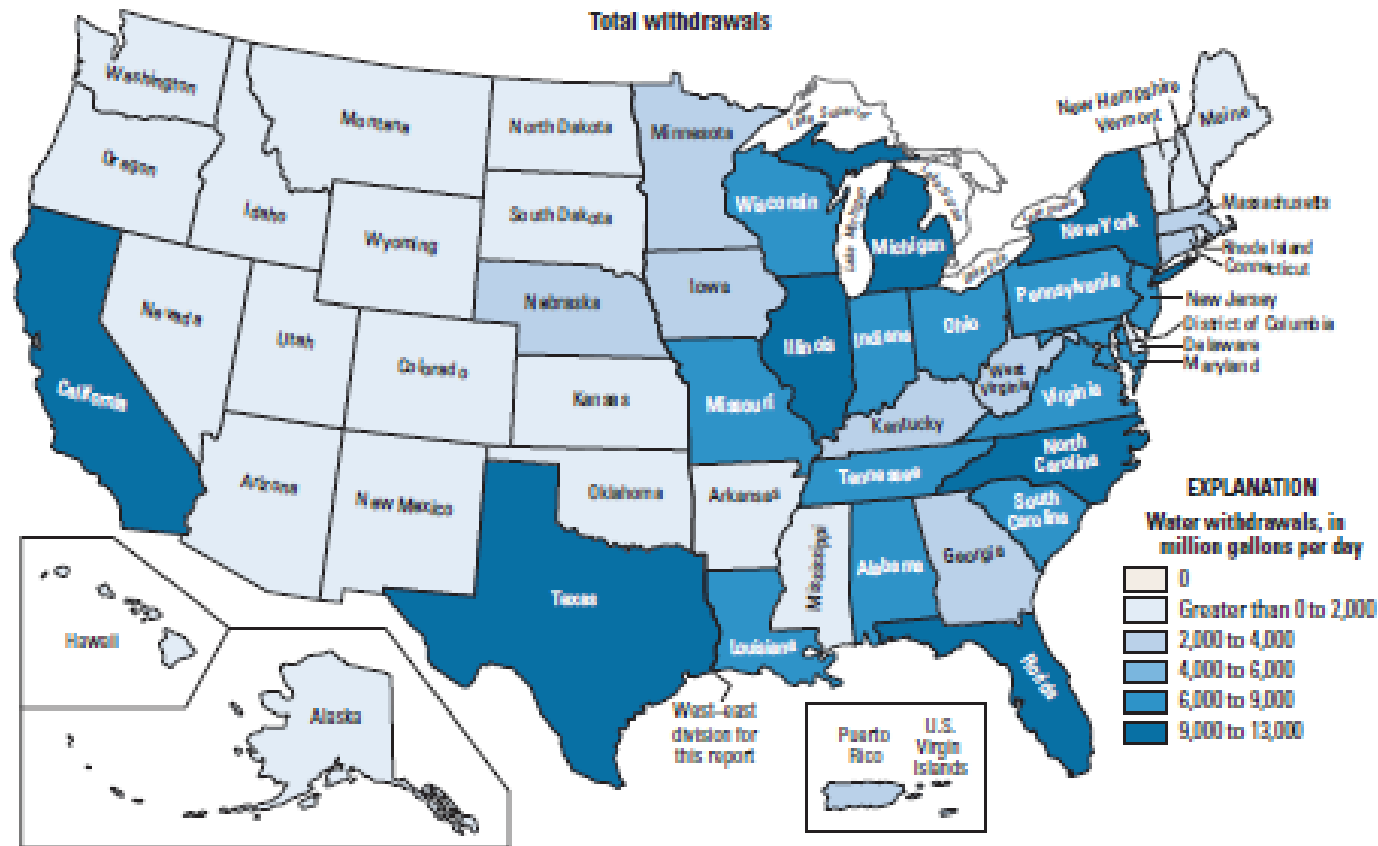


## Percent of Total Water Use

- Thermoelectric (49%)
- Irrigation (31%)
- Public supply (11 %)
- Industrial, aquaculture, mining, self-supplied domestic, livestock less than 10% of total water use.

# Thermoelectric-power withdrawals accounted for 49 percent of total water use in 2005

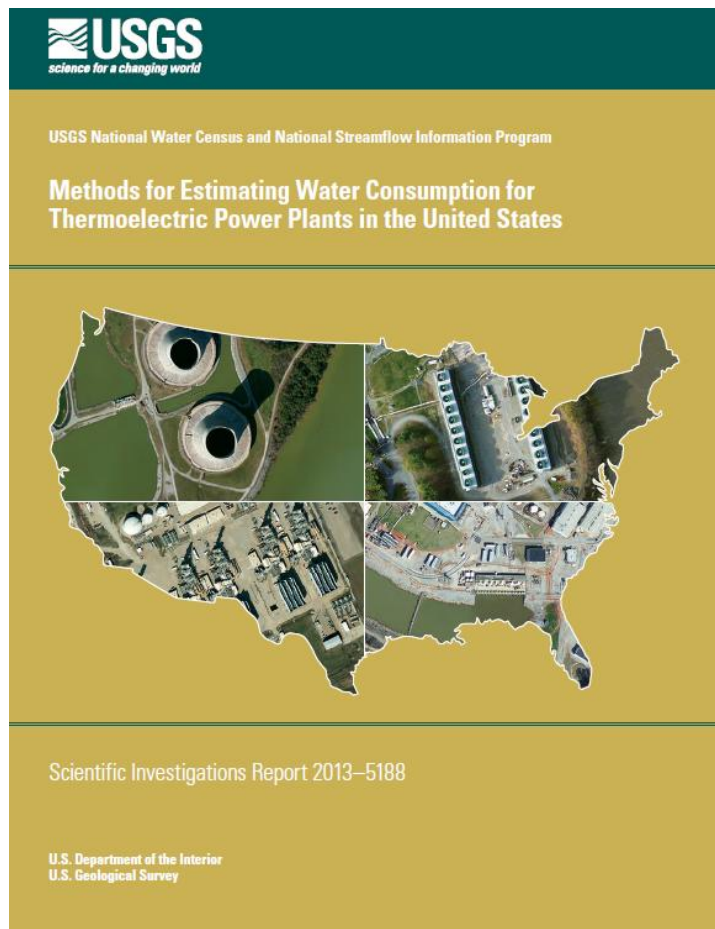
(225,000 acre-ft per year and 3,190,000 gigawatt-hours)





# Thermoelectric water consumption

## Methods for computing thermoelectric water consumption

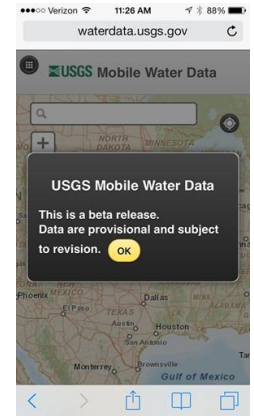


## Water consumed is water not returned to the local system

- Water is essential for cooling systems
- Water consumption is poorly understood
- Cooling systems are sensitive to ambient water temperatures and so are sensitive to droughts and heat waves

# Water Resources Internet Tools

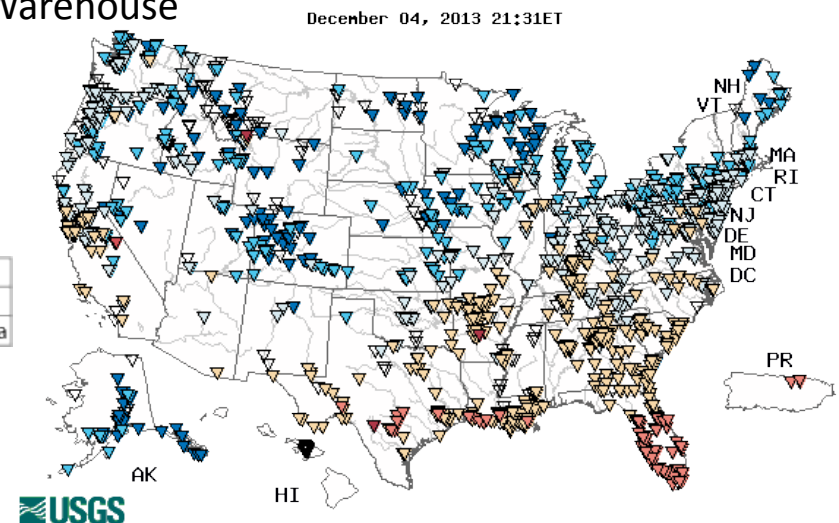
- WaterWatch - <http://waterwatch.usgs.gov/>
- WaterQualityWatch - <http://waterwatch.usgs.gov/wqwatch>
- Groundwater Watch - <http://groundwaterwatch.usgs.gov/>
- WaterNow - <http://water.usgs.gov/waternow/>
- WaterAlert - <http://water.usgs.gov/wateralert/>
- USGS Flood Inundation Mapper - <http://wim.usgs.gov/FIMI/>
- National Water Information System (NWIS) - <http://waterdata.usgs.gov/nwis>
- StreamStats - <http://streamstats.usgs.gov/>
- National Water Quality Assessment (NAWQA) Data Warehouse - <http://water.usgs.gov/nawqa/data.html>



## Water Temperature

Explanation							
<1	1-4.9	5-9.9	10-19.9	20-29.9	30-35	>35	No Data

<http://pubs.usgs.gov/fs/2013/3072/>

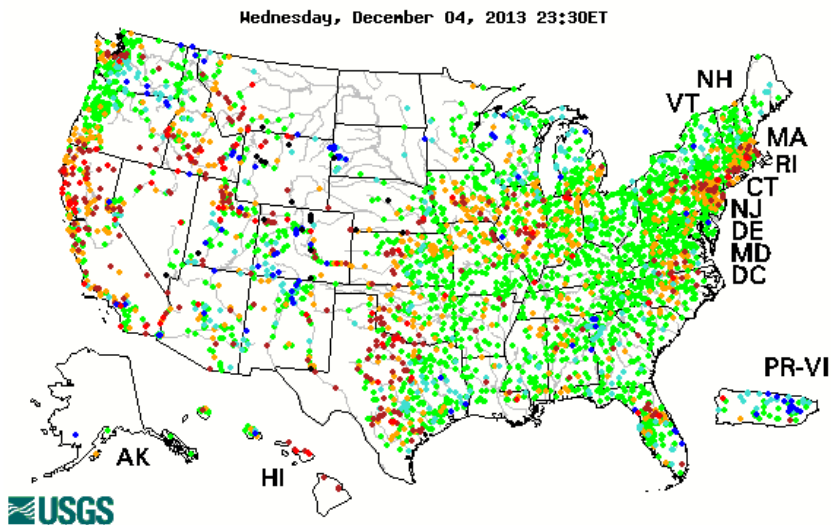




# Streamflow

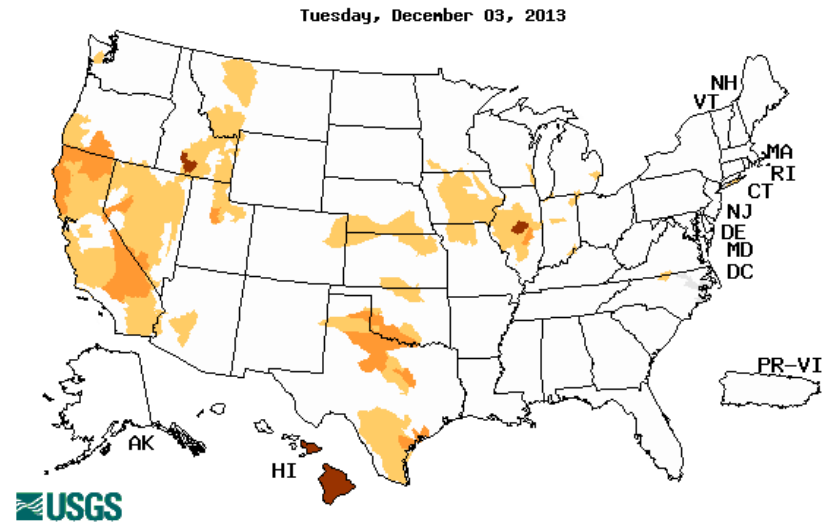
<http://waterwatch.usgs.gov/>

## Current Conditions



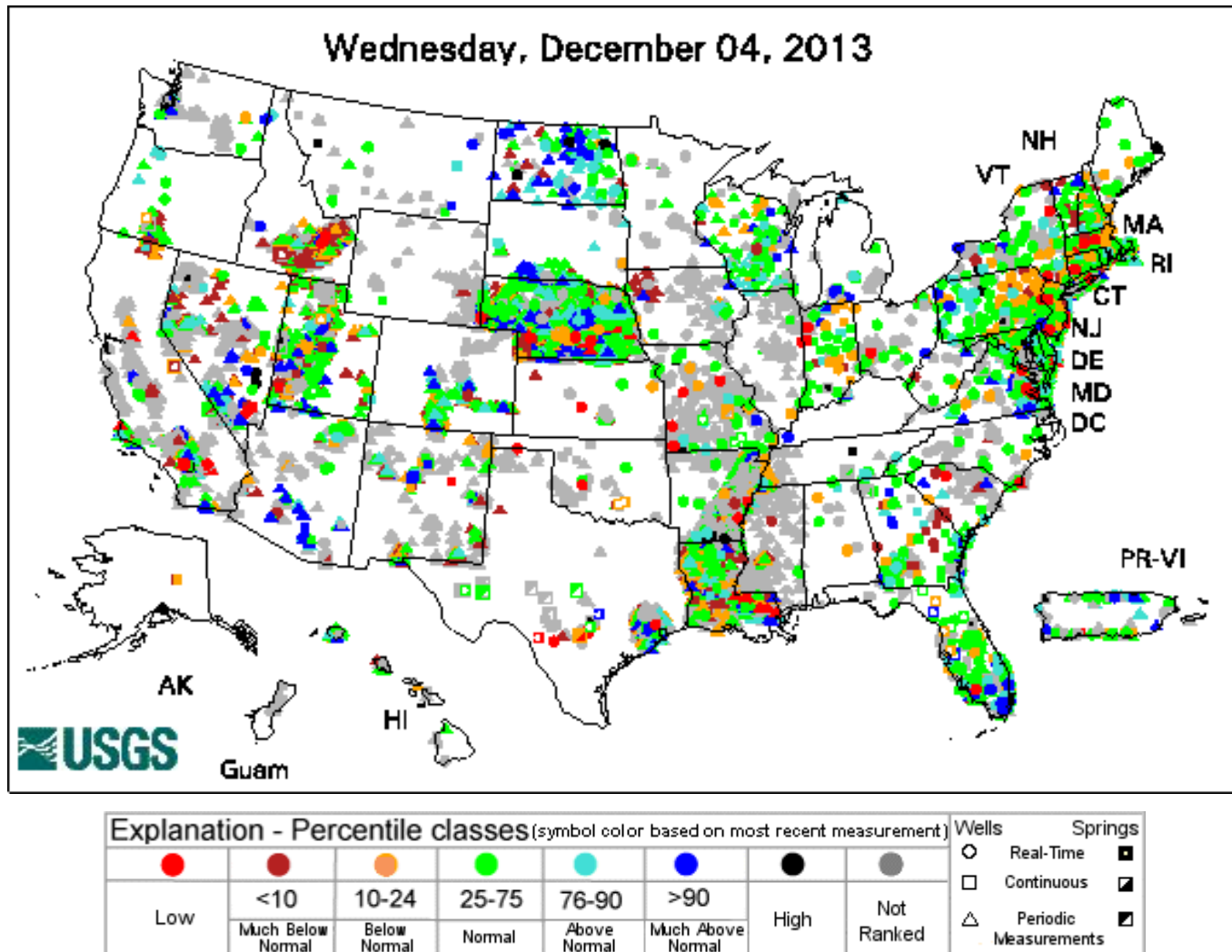
## Drought Conditions –

7 day average streamflow adjusted for season



# Groundwater Levels

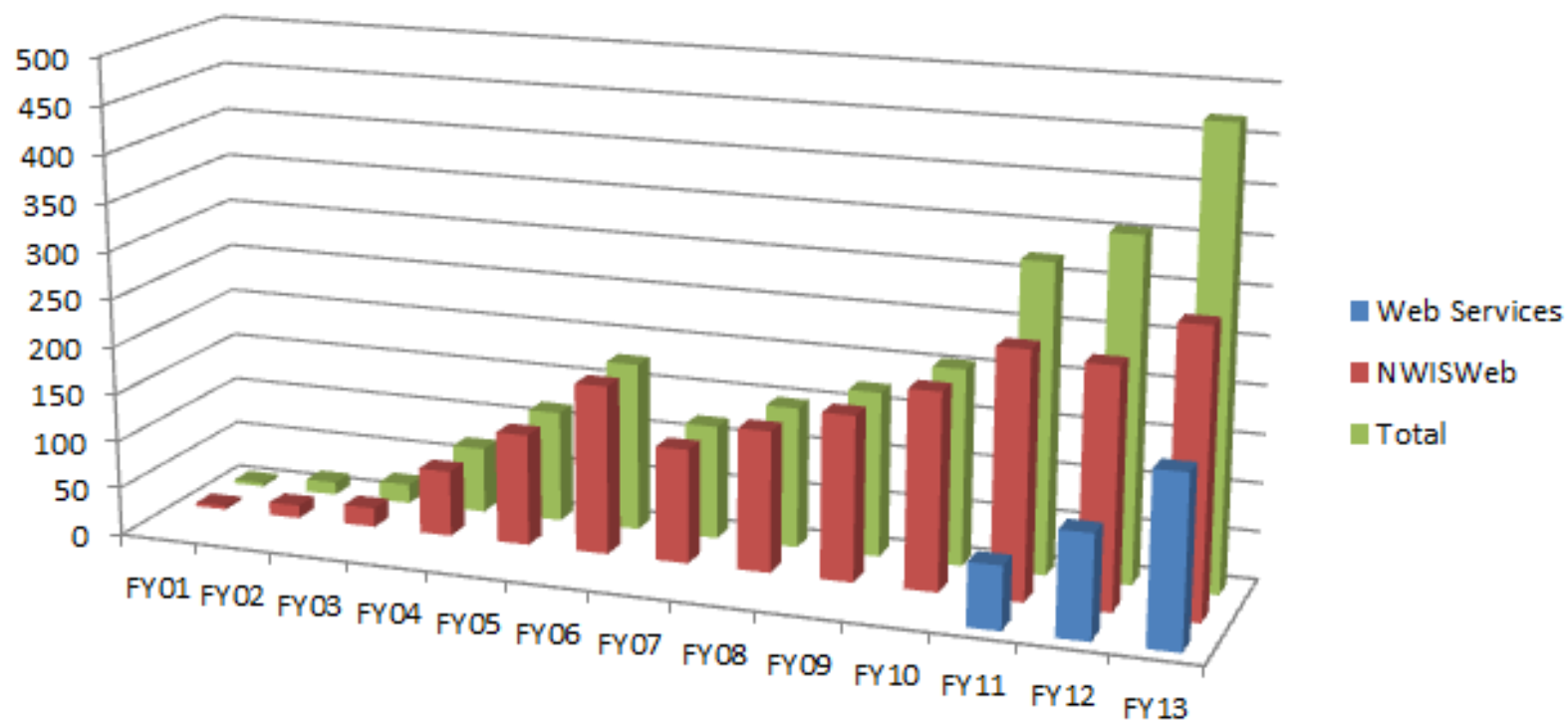
<http://groundwaterwatch.usgs.gov/default.asp>



Active Well Count Real-Time: 1,419 Daily: 1,107 Periodic: 18,050

# NWIS Web usage

Fiscal Year Page Requests (M)





# NATIONAL WATER QUALITY MONITORING COUNCIL



## Water Quality Portal

[www.waterqualitydata.us](http://www.waterqualitydata.us)



*Search over **150 million water-quality data records** from States, Tribal Partners, USEPA, and USGS*



# National Groundwater Monitoring Network

## Objectives:

Create an **automated public** web map portal for:

- Groundwater levels
- Groundwater quality data
- Lithology
- Well construction

## Principals:

**Distributed** → Data stays with owner

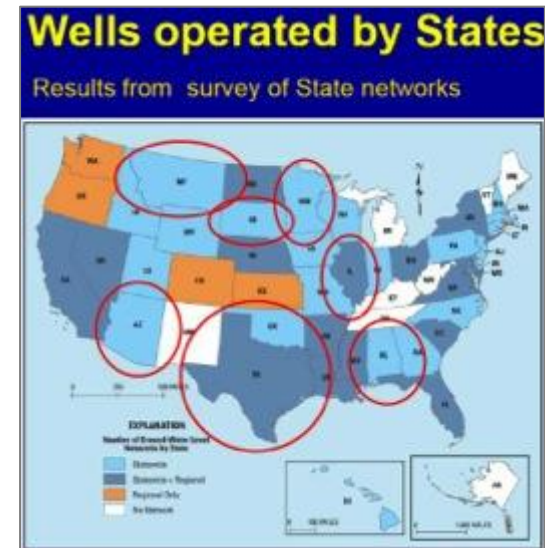
**Seamless** → Acts as one virtual database

**Multi-access** → Multiple portals, tools

**Standards Based** → OGC's WFS & SOS, EPA's WQX, WaterML, etc...



**ACWI**  
Advisory Committee  
on Water Information



Credit: Jessca Lucido





## Hydrography

Home

News

Get Data

Stewardship

User Resources

Tools

Applications

Contact Us

Watershed Boundary Dataset

## Hydrography

### National Hydrography Dataset

### Watershed Boundary Dataset



**Watch the NHD Video**

**Watch the NHD Seminar Series**

NHD is often used by scientists using Geographic Information Systems (GIS). GIS technologies take advantage of a rich set of attributes imbedded in the NHD to generate specialized information. These analyses are possible because the NHD contains a flow network that allows for tracing water downstream or upstream. It also uses an addressing system based on reach codes and linear referencing to link specific information about the water such as water discharge rates, water quality, and fish population. Using basic NHD features like flow network, linked information, and other characteristics, it is possible to study cause and effect relationships, such as how a source of poor water quality upstream might affect a fish population downstream.

Some of the files on this page are presented in Portable Document Format (PDF); the latest version of Adobe Acrobat Reader or similar software is required to view it. [Download the latest version of Acrobat Reader, free of charge.](#)

The National Hydrography Dataset (NHD) is the surface water component of *The National Map*. The NHD is a digital vector dataset used by geographic information systems (GIS). It contains features such as lakes, ponds, streams, rivers, canals, dams and streamgages. These data are designed to be used in general mapping and in the analysis of surface-water systems.

In mapping, the NHD is used with other data themes such as elevation, boundaries, and transportation to produce general reference maps. The

Search NHD

### National Hydrography Dataset

@USGSTNM

#### Tweets

**NHD** ☒ **@USGSNHD** 27 Nov

Happy Thanksgiving to our Hydro community! Take a moment to enjoy this photo of Rouge River, OR taken by Linda Kelly [pic.twitter.com/2Y5vulrps3](http://pic.twitter.com/2Y5vulrps3)

**NHD** ☒ **@USGSNHD** 26 Nov

The NHD dynamic overlay service may be intermittent between 10 and 10:30 MT today. You will still be able to download. Thanks!

**NHD** ☒ **@USGSNHD** 20 Nov

USGS article on mapping [usgs.gov/blogs/features...](http://usgs.gov/blogs/features...)

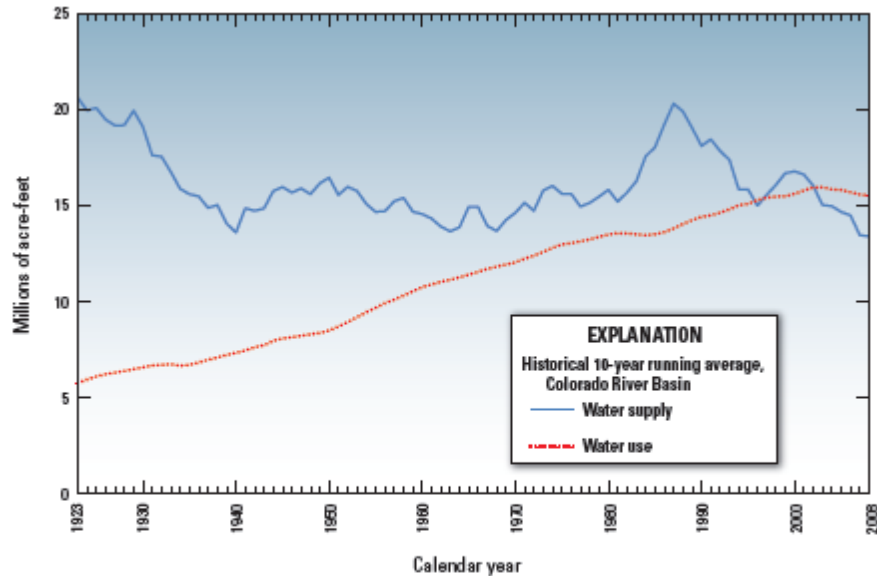
**NHD** ☒ **@USGSNHD** 20 Nov

HAPPY GIS DAY!!

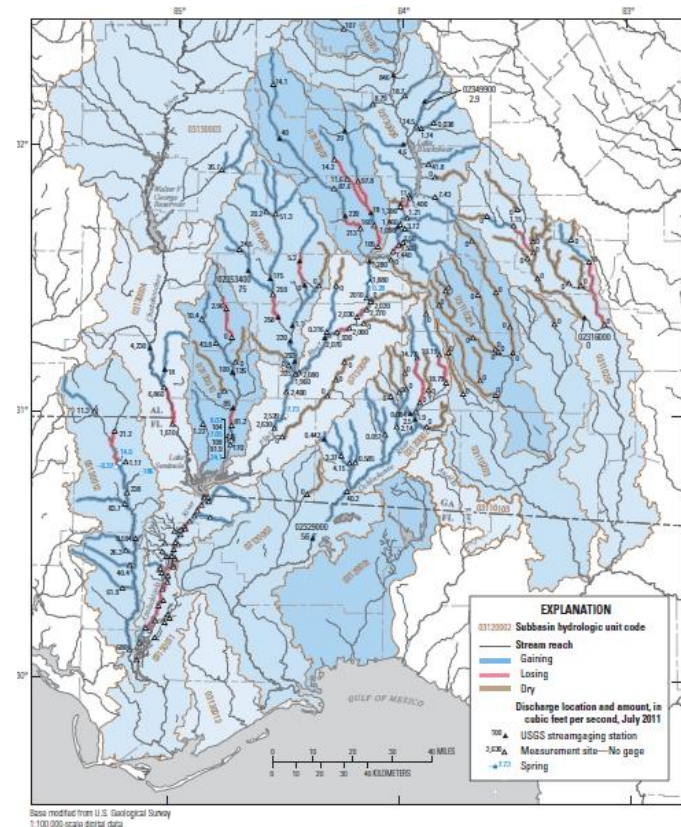


# Provide a uniform baseline of information on water quantity, quality, and use

Water use is exceeding water supply in the Colorado River Basin

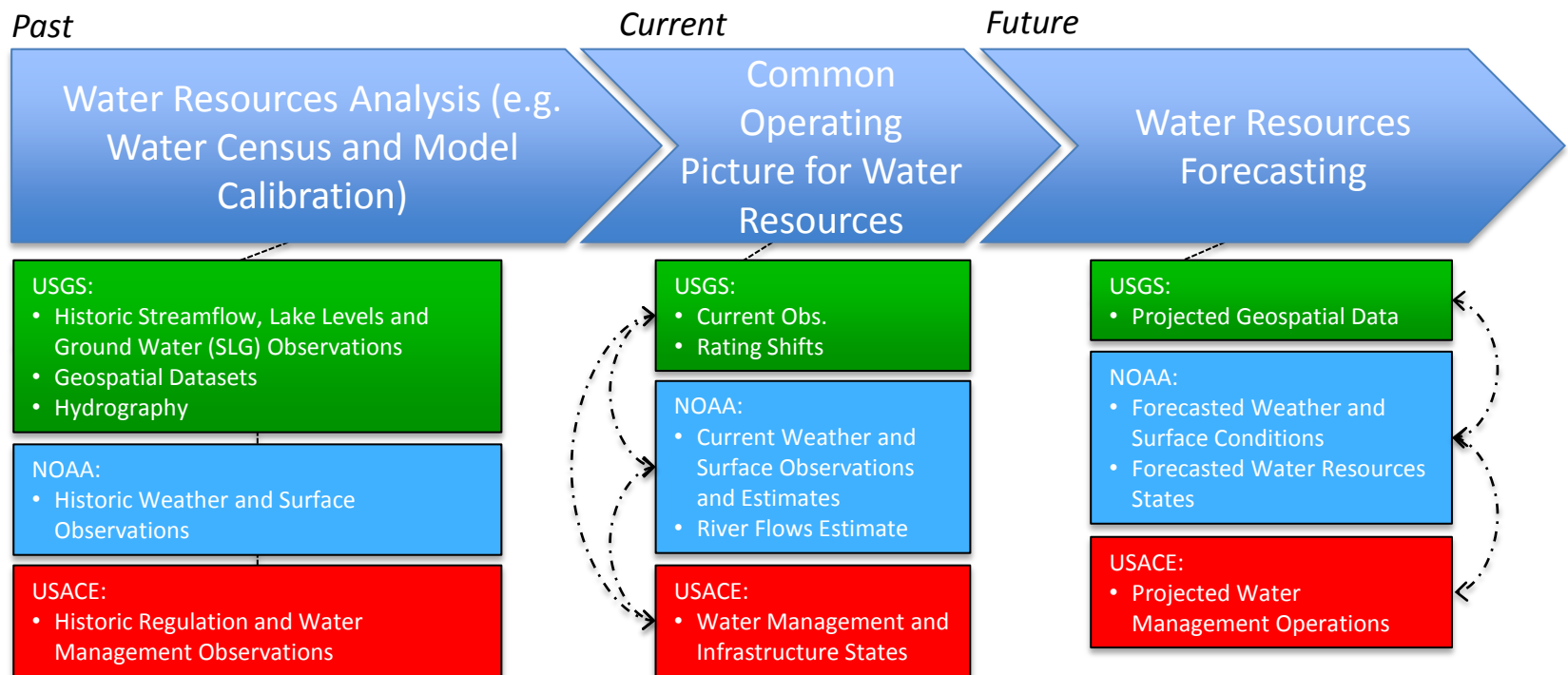


Water use can stress water availability in the ACF Basin



# USGS-NWS-USACE example

Three-existing workflows, identify the **essential data sets** that require synchronization, achieve system-interoperability and advanced data-handling practices.



# Questions