A National Water Census
Water Census: Accounts for the changing amount, quality, and use of water resources across the Nation.
Primary Water Census questions:

Does the Nation have an adequate availability of freshwater to meet both human and ecological needs?

Will this water be present to meet both existing and future needs?
USGS objective for the Water Census is to place the technical information and tools into the hands of stakeholders, allowing them to evaluate water availability for the questions that they are facing.
A Water Census of the United States: Quantifying, Forecasting, and Securing Freshwater for America’s Future

• **Status** of freshwater resources and how they are changing,

• **Water use** for human, environmental, and wildlife needs,

• How freshwater availability is related to **natural storage and movement of water** as well as engineered infrastructure,

• **Water sources not commonly thought to be a resource.**

• **Forecasts** of likely outcomes of water availability, quality, and aquatic ecosystem health due to changes in land use and cover, natural and engineered infrastructure, water use, and climate.
Section 9507: Water Data Enhancement by United States Geological Survey

*Full National Streamflow Information Program.*
*Creates a National Groundwater Resources Monitoring Program and a Brackish Groundwater Assessment.*

Section 9508: Water Availability Assessments

*Creates a national program to study water quality and quantity.*
*Requires first report in 2012 and every 5 years thereafter.*
*Grants are available to assist state agencies in developing and integrating state water use data.*
Section 9508 of SECURE Water calls for a National Water Availability and Use Assessment Program

1. Assessment of the status of the water resources of the United States;
2. Quantity of water that is available for beneficial uses;
3. Quality of the water resources of the United States;
4. Long-term trends in water availability;
5. For each long-term trend - a more accurate assessment of the change in the availability of water
6. Develop the basis for an improved ability to forecast the availability.
Report to Congress - Every 5 years thereafter:

1. The **current availability** of water resources in the United States,

2. **Significant trends** affecting water **availability**, including documented or projected impacts as a result of global climate change,

3. The **withdrawal and use** of surface water and groundwater by various sectors,

4. **Significant trends** relating to each **water use** sector, including significant changes in water use due to the development of new energy supplies,

5. **Significant water use conflicts or shortages** that have occurred or are occurring,

6. Each **factor** that has **caused**, or is causing, a conflict or shortage.
Water Use Grants to States
USGS Implementation Team

Water Use  
Water Quality  
Geology  
Surface Water  
Ecological Flow  
Biology  
Climate Change  
Information Technology  
Groundwater  
Geography  
Pilot Studies  

Program Integration  
Water Use  
Ecological Flows  
Availability Indicators  
Products, Info Mgmt, Decision Support
• Implementation Team produces short “concept papers”

• Team works through ACWI / SWRR to refine the concepts to meet stakeholders goals

• Team develops a draft implementation plan from the work with the ACWI / SWRR committee

• USGS finalizes and publishes a plan for the National Water Census
We need your help on an ad hoc committee

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<tr>
<th>Organization</th>
<th>Acronym</th>
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<tr>
<td>Association of Fish and Wildlife Agencies</td>
<td>AFWA</td>
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<td>Association of Metropolitan Water Agencies</td>
<td>AMWA</td>
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<td>Association of State Drinking Water Administrators</td>
<td>ASDWA</td>
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<td>American Water Works Association</td>
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<td>National Ground Water Association</td>
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<td>The Nature Conservancy</td>
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<td>Bureau of Reclamation</td>
<td>BOR</td>
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<td>US Dept. of Energy - Energy Information Administration</td>
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Charge to the ad hoc committee

The ad hoc committee will work with the Implementation Team to improve the concepts, efforts, and products proposed for inclusion in the Water Census so that they best meet stakeholders needs.

The output from the committee will be brief report to the Associate Director for Water, USGS, on the concensus reached for the Water Census.

The timeframe for this effort is January – June, 2010.
Integration of programs around the Theme of Water Availability
Account for water with a “budget”

Water budget components of a bounded hydrologic unit.
- GW\textsubscript{in} and GW\textsubscript{out}, groundwater inflows and outflows
- ET, evapotranspiration
- SW\textsubscript{in} and SW\textsubscript{out}, surface-water inflows and outflows
- P, precipitation
- Hin and Hout, human inflows (return flows) and outflows (withdrawals)
- dS/dt, change in storage in both shallow and deep groundwater systems

Double arrows indicate exchange.
A Nationwide System to deliver water accounting information addressing:

- Precipitation
- Evapotranspiration
- Storage in Reservoirs, Lakes, Snow and Ice
- Surface Water
- Groundwater
  - Recharge rates
  - Water level in aquifers
- Ecological Needs
- Water Withdrawals
- Return Flows
- Consumptive Uses
- Run-of-the-River Uses
Generating and delivering information for water accounting

Envision a seamless coverage of information for a water accounting component
And if you could get that info for all accounting components:

- Precipitation
- Runoff
- Baseflow
- ET
- Recharge
- Surface Storage
Information Delivery

A web application for delivering water availability information at scales that are relevant to the user

Select the area of interest.
Generate information on water accounting components
Work with the online tool to construct your water budget
Access trend information
Enhancing the Nation’s Water Use Information

Use New Methods to Estimate Water Use
- Stratified Random Sampling
- Regression Models

Develop models of water use based on land use

Ability to track water from point of withdrawal thru to return of flow.
Flows Needs for Wildlife and Habitat

- Classify the streams across the nation for their hydro-ecological type
- Systematically examine the ecological affects of hydrologic alteration
- Develop flow alteration – ecological response relationships by “h-e” type
Assess Groundwater’s role in Water Availability

Use the strength of and enhance the resources within this program to provide the information on:

- Recharge
- GW yields
- Changes in storage.
- Saltwater Intrusion
- Trends in GW Indices
- Artificial Recharge
- Brackish and Saline Resources
- GW/SW Interactions
Assess Water Quality’s role in Water Availability

Use the strength of the NAWQA Program and tools like SPARROW to:

- Demonstrate the degree of water quality impairment that limits water availability
- Define the main compounds of importance.
- Relate to water use and return
- Trends
Finally, a series of studies focused on selected watersheds where there is significant competition over water resources. Here, the USGS will work collaboratively with stakeholders to comprehensively assess the technical aspects of water availability.
Focused Water Availability Assessments

- Water Quality
- Groundwater Resources
- Water Use
- Eco Flows
- Global Change
- SW Trends, Precipitation, etc
- State, Local, Regional Stakeholder Involvement

Defined Technical Questions to be Answered
The objective is to place the information and tools into stakeholders' hands to answer the questions they are facing.
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