

Water Observing Systems Program (WOSP) - *Update and Priorities*

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FY22 Omnibus Bill

GWSIP Budget Highlights

Total Program Funding – \$110.7M (+\$10M over FY21)

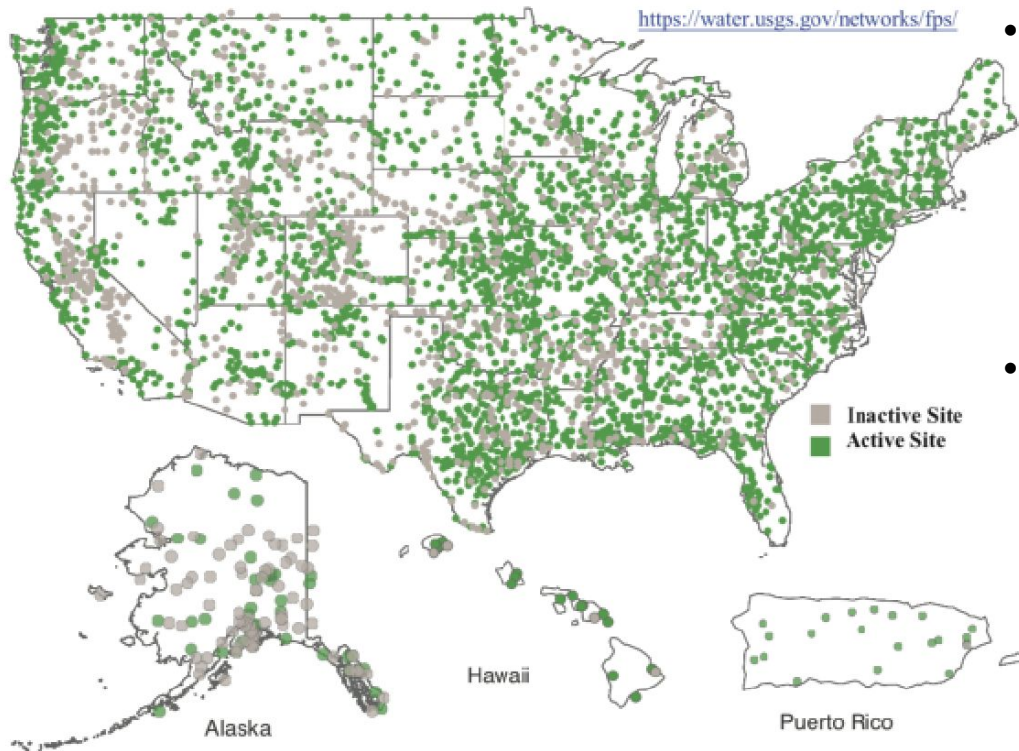
- Cooperative Matching Funds – \$30.7M (+\$0)
- Federal Priority Streamgages – \$25.2M (+\$0.5M)
- National Groundwater Monitoring Network – \$4.0M (+\$0)
- NextGen Water Observing System (NGWOS) – \$29.0M (+\$4.5M)
- US-Canada Transboundary Streamgages – \$3.1M (+\$0)
- Ohio River Supergages - \$0.5M (+\$0M)
- Klamath River Basin Monitoring - \$1.0M (+1.0M)
- Hydrological Science Talent Pipeline - \$2.0M (+2.0M)
- Monitoring Research and Development (i.e. remote sensing) – \$2.1M (+\$0)

FY22 Omnibus Bill NWQP Budget Highlights

Total Program Funding – \$96.7M (+\$3.2M over FY21)

- Cooperative Matching Funds – \$16.9M (+\$0)
- Harmful Algae Bloom Research – \$6.49M (+1.0M in Directed CMF)
- Urban Water Federal Partnership – \$1.5M (+\$0)
- PFAS Methods Development and Monitoring – \$1.6M (+\$0.5M)
- National GW Quality Monitoring Networks – \$3.1M (+\$0)
- National SW Quality Monitoring Network - \$9.85M (+0)

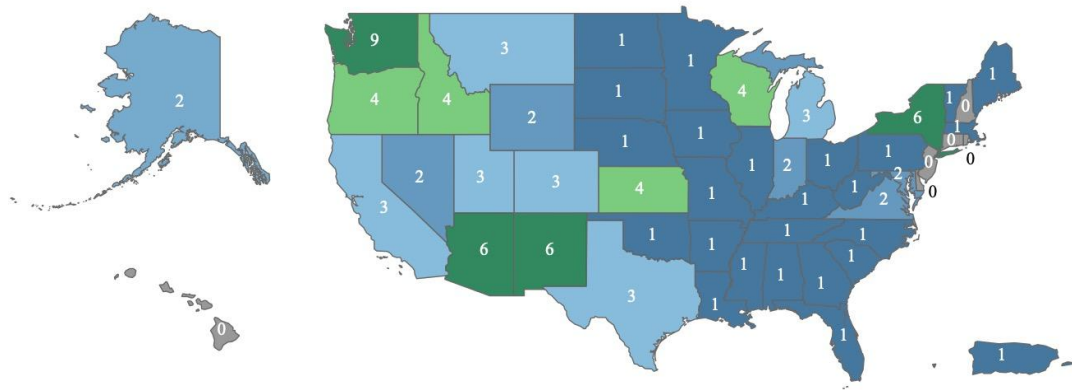
Federal Priority Streamgauge Network



- Federal Priority Streamgages (FPS) are monitoring stations that track the amount of water in streams and rivers across the Nation and that meet one or more strategic, long-term Federal information needs.
- In 2022, USGS will be engaging all Federal partners to re-evaluate their priorities for a National streamgauge network and develop revised criteria for the FPS eligible sites.

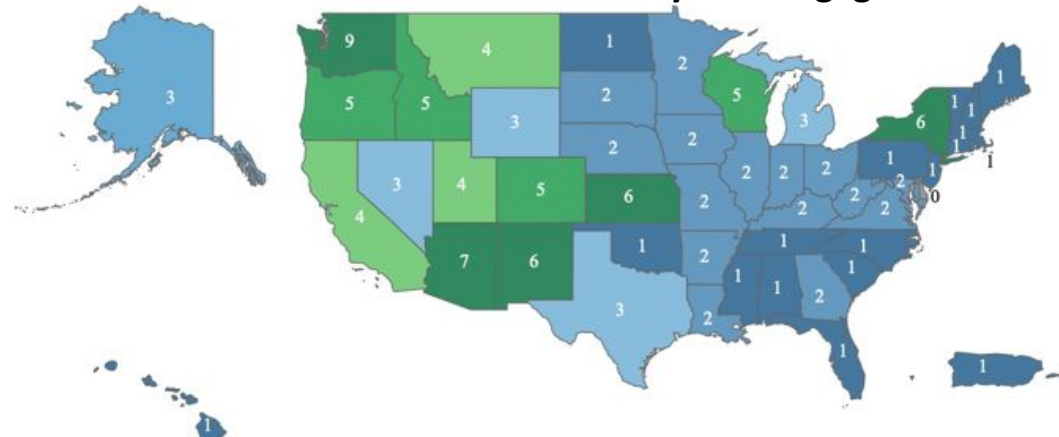
Threatened Federal Priority Streamgages

Number of Threatened Federal Priority Streamgages FY2022



Impacts of flat funding on threatened gages vary across USGS Water Science Centers because of varying levels of alternative funding sources.

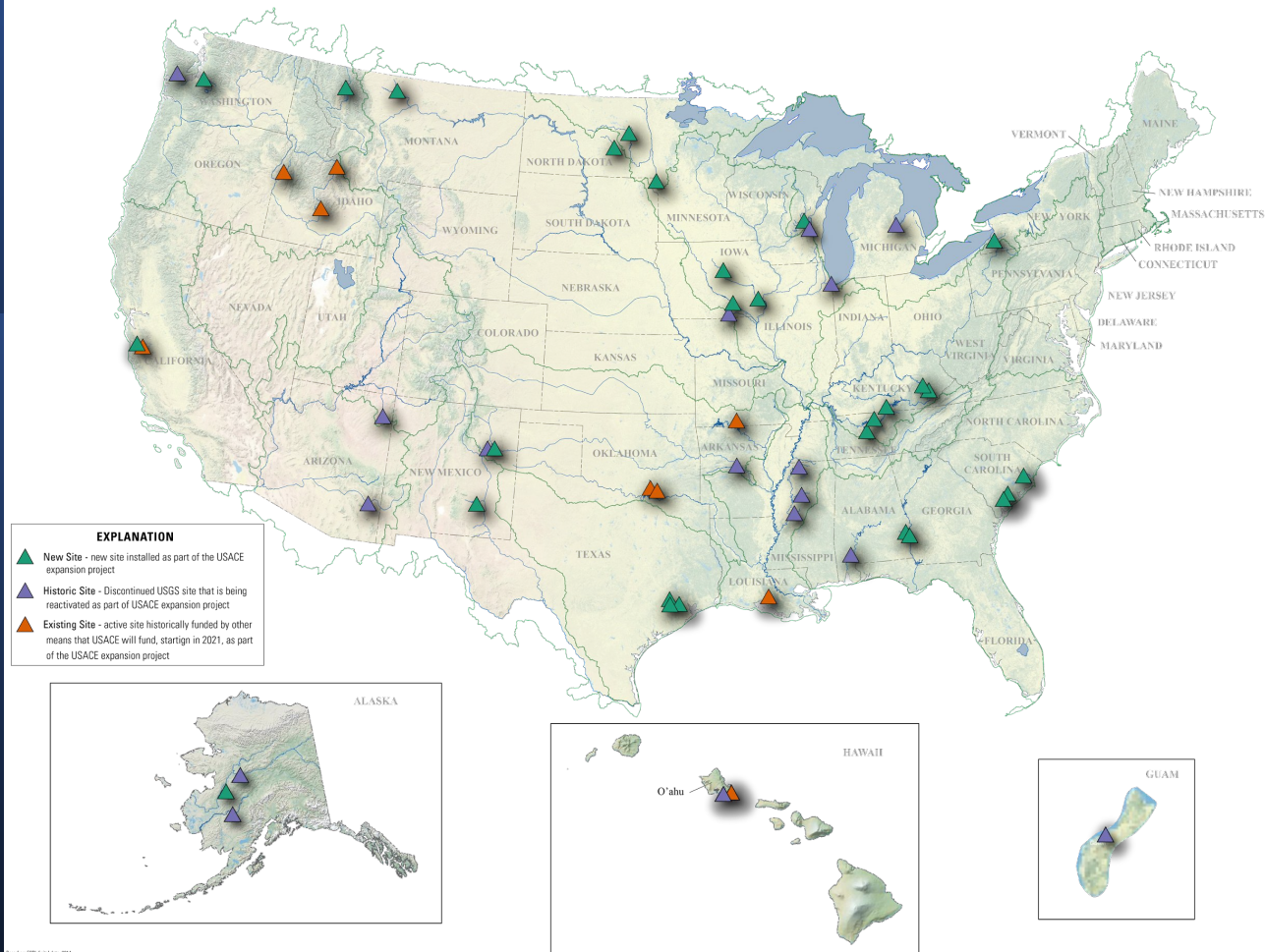
Number of Threatened Federal Priority Streamgages FY2023



Cumulative threatened FPS sites:

- 2022: 46
- 2023: 92
- 2024: 137
- 2025: 182

2021 USACE Streamgauge Expansion



Base from USGS Digital data, 2014
Topographic data from National Geographic Society and NOAA, 2014

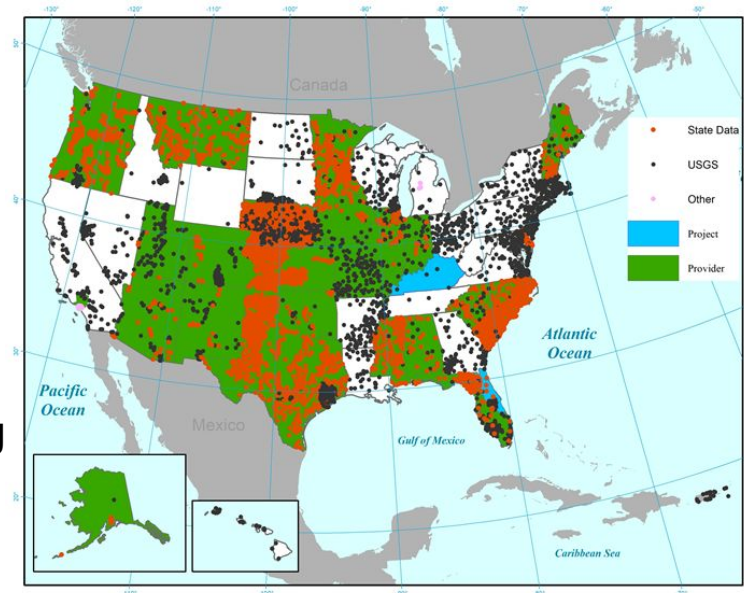
National Groundwater Monitoring Network

- Climate Response Network

- USGS increased the federally-funded Climate Response Network, which portrays the response of groundwater systems to short- and long-term climate variations Nationwide, by 10 wells and 1 spring.
 - States where new sites added in 2021: AZ, IL, ID (2 sites), LA, MI, NC, NM (2 wells), TX (2 wells)

- National GW Monitoring Network

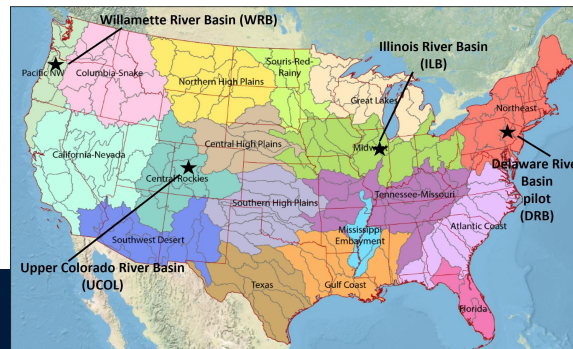
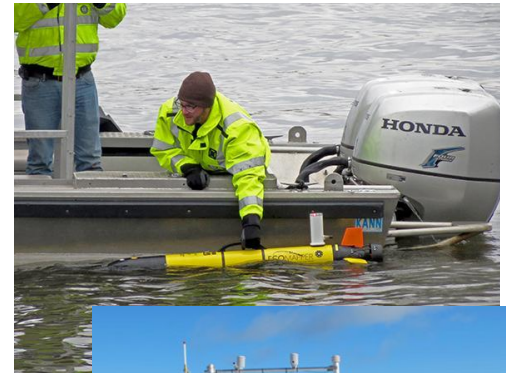
- \$1.8M in grant funding available annually
- State Geological Surveys in 25 states are involved
- 45 total data providers, over 20,000 sites
- 2022 Funding Opportunity
 - Closed in January
 - 18 of 22 proposals selected for funding
 - New in 2021: Equipment purchases to support continuous level monitoring are eligible for funding
- NGWMN Data Portal



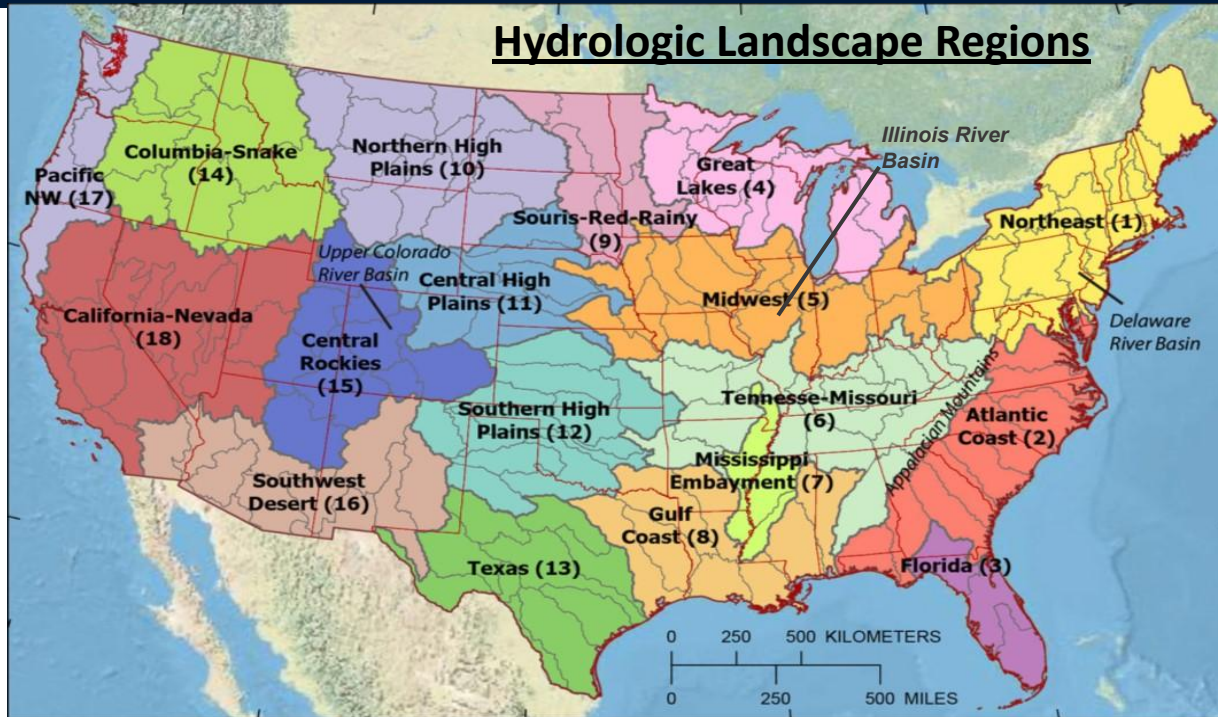
Next Generation Water Observing System (NGWOS)

Core Goals of the Next Generation Water Observing System:

- 1) Modernization of the NWIS data telemetry, storage and delivery system to improve integrated data delivery to resource managers and the public
- 2) Provide high-resolution, real-time data on water quantity, quality, and use in select Integrated Water Science Basins to support National modern water prediction and assessments.
- 3) Provide an innovation incubator for water observing methods and instrumentation development. Transition to our National network operations



Selecting the Next (5th) Integrated Water Science Basin



- Evaluate quantitative rankings of HUC04 basins in each targeted Hydrologic Region(s)
- Solicit/review input on basin nominations/priorities from Regional Directors
- Engage national and regional stakeholders in each potential Region to understand science priorities, monitoring needs, and upcoming initiatives
- Recommend potential basins to WMA Leadership for final selection
- Select IWSB #5 – **October 2022**

Highlights of WOSP Priorities

- Deliver “Fit-for-Purpose” Data
 - Concept collecting and serving data from stations and(or) citizen science that have various levels of uncertainty and QA/QC
 - Quantifying observational data uncertainty
 - Revise/develop new policy
- Modernizing National Hydrologic Monitoring Networks
 - Initiating a plan for expansion to include all components of water budget.

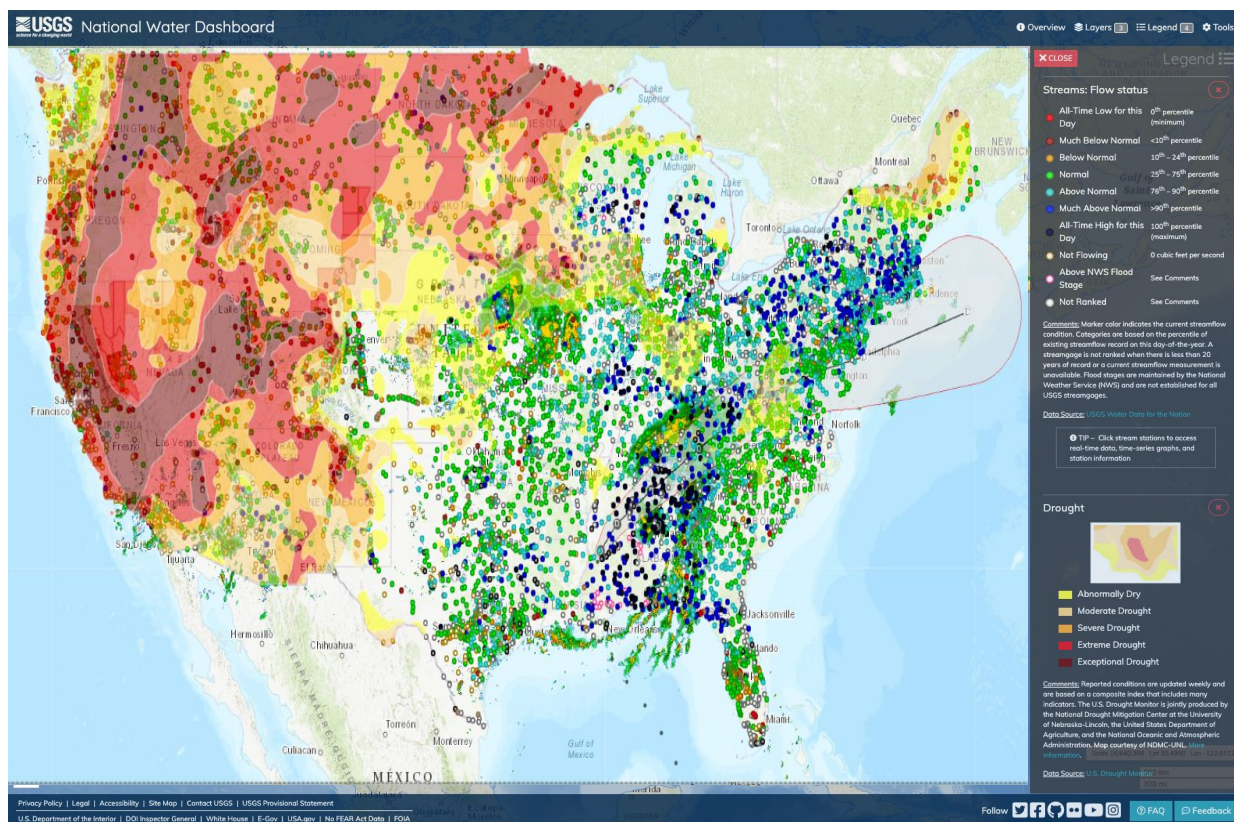
Highlights of WOSP Priorities

NWIS Modernization:

- Continue quest to transition off all legacy NWIS systems by 2024
- Delivery
 - Enhanced, more user-friendly, simple/"eye-catching" ways of delivering data (including social media)
 - New landing page for Water Data/Science including new search and download functionality
 - WaterAlert replacement
 - Unified replacement for the "Watches"
- Imagery and video storage and delivery

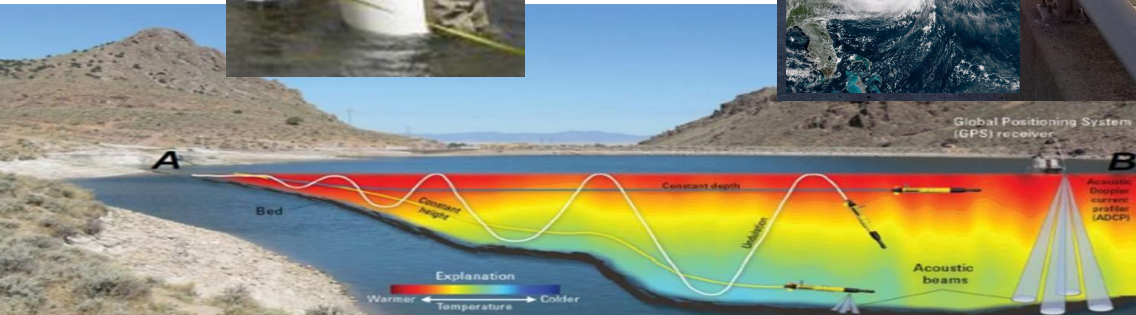
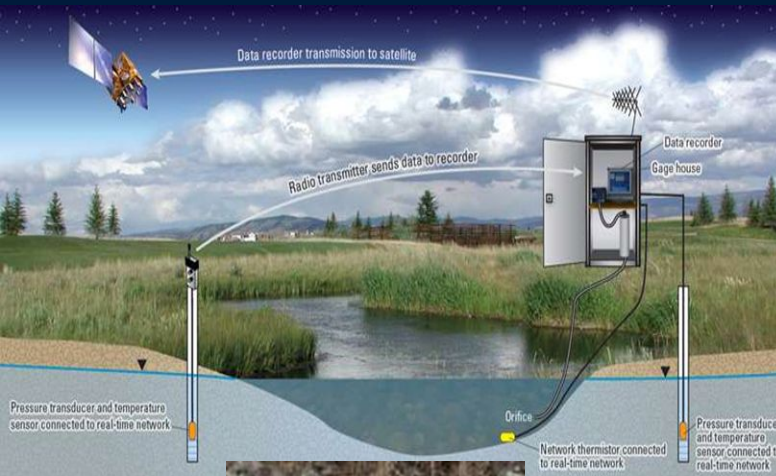
Enhance National Water Dashboard

- Provides “one-stop” perspective of hydrologic conditions
 - National to local
- Merges USGS water data with weather-related partner agency data
 - 7 categories of USGS water observations
 - 8 categories of weather information from NWS and NIDIS
 - Maps of Rivers, Watersheds, and Aquifers
 - 16 Basemap Options
- Mobile-friendly
- Data refreshed every minute
- ***Spanish language version coming in early 2023***



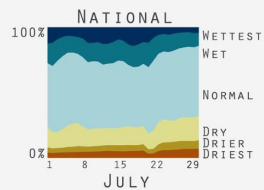
<https://dashboard.waterdata.usgs.gov/>

Questions/Discussion

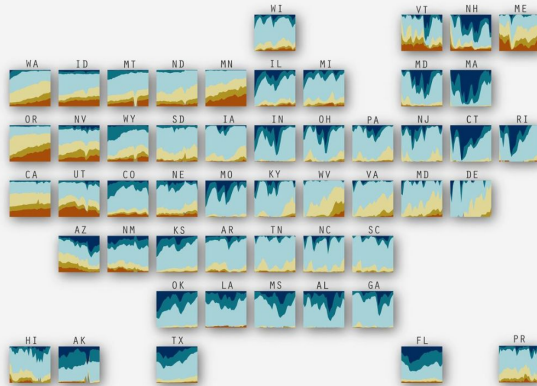


Data Visualizations

JULY 2021 STREAMFLOW



FLOW AT USGS STREAMGAGES
RELATIVE TO THE HISTORIC DAILY
RECORD FOR EACH GAGE.



From Snow to Flow

What changing snowmelt means for Water in the Western U.S.

<https://labs.waterdata.usgs.gov/visualizations/snow-to-flow/index.html#/>



U.S. River Conditions

July 1, 2021 - September 30, 2021

How Wildfires Threaten U.S. Water Supplies

Conservation across the United States and the globe rely on clean water flowing from natural watersheds. But fires threaten water supplies by the effects of ashfall.

To better understand and manage the threats to water supplies from wildfires, the U.S. Geological Survey is working to measure and predict how fires affect water supplies and quality.

<https://labs.waterdata.usgs.gov/visualizations/fire-hydro/index.html#/>

Also affected by wildfires in the Western U.S.
1981-2021
Last update: Dec 1, 2021



The Nation's Water Observation Backbone

USGS operates the Nation's largest water observing system, funded by USGS and over 1,600 partners. USGS received 1.2 billion+ data requests through NWIS-web in 2021.

National Streamgage Network

- 11,300+ real-time streamgages, including 3,470 Federal Priority Streamgages

National Groundwater Monitoring Network

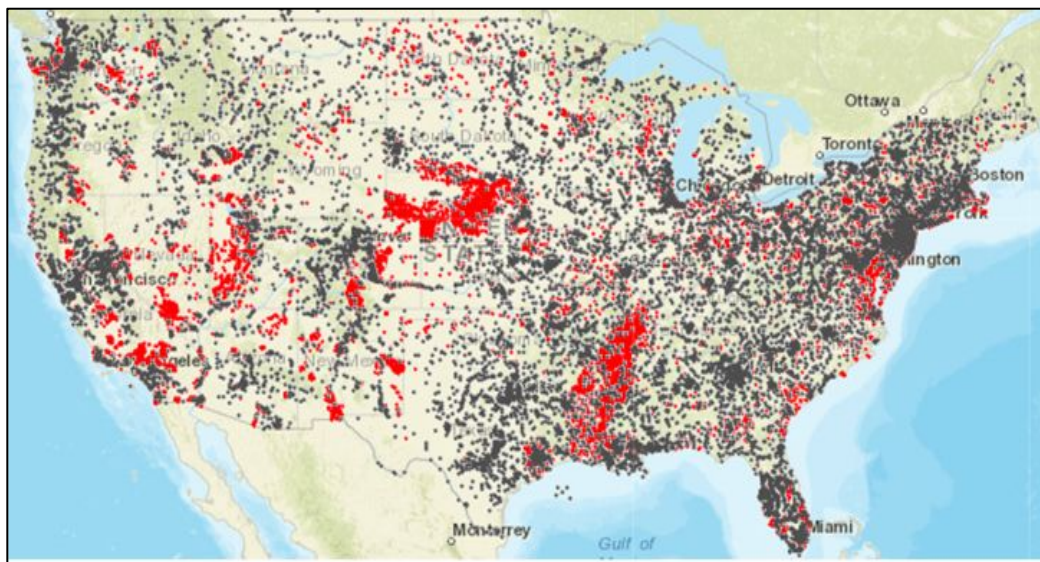
- Collaborative groundwater monitoring network of 18,000+ wells from Federal, State, and local agency data providers
- Climate Response Network includes 680+ wells nationwide that monitor the effects of droughts & other climate variability on groundwater levels.

National Water-Quality Network

- Discrete water-quality monitoring at 110 surface-water sites to assess status and trends of National water-quality conditions

Groundwater-Quality Networks

- Discrete water-quality monitoring in 80+ groundwater networks for status/trends of National groundwater-quality conditions



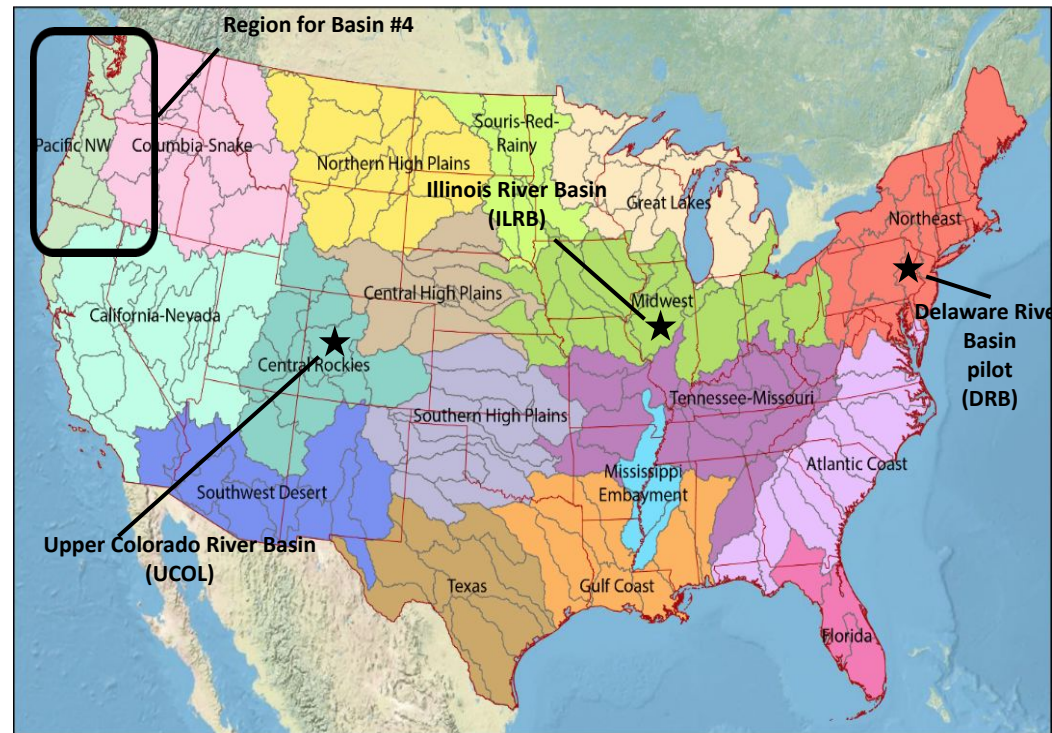
Additional Observing Networks

- 2,100+ continuous, real-time water-quality monitoring stations
- 1,000+ real-time precipitation stations
- 1,000+ short-term, rapid-deployment coastal storm-surge and flood stations

Integrated Water Science Basins

10 Intensive Reference Basins to Drive the Future of Integrated Water Science:

- Regional focus areas for intensive observation, assessments, modeling, and prediction
- 10 river basins (10,000-20,000 mi²) representative of larger water-resource regions
- Goal: Establish 10 basins in 10 years
- Develop a deep, integrated understanding that can be extended to the broader region
- Basin selection process includes quantitative metrics and extensive stakeholder engagement



USGS Water Mission Area

Water Observing Systems Portfolio

Major Portfolio Elements

- Collection, management, and dissemination of high quality and reliable integrated hydrologic information in real time and over the long term
- **Next Generation Water Observing System** (NGWOS) to provide the data necessary to evaluate and improve model prediction and innovate water observing methods and instrumentation
- Unified **National Streamgauge Network** of more than 11,400 real-time streamgages, including 3,470 Federal Priority Streamgages that support strategic Federal responsibilities
- Nationwide **Climate Response Network** of nearly 690 groundwater monitoring sites to understand the effects of drought and other climate variability
- Conduct **long-term, nationally consistent monitoring of water-quality** at 110 surface-water sites and 80+ groundwater monitoring networks for status/trends of National water-quality.
- **National Water Information System** (NWIS), providing current National hydrologic conditions (1.2 billion data requests last year through NWIS). Modernization efforts