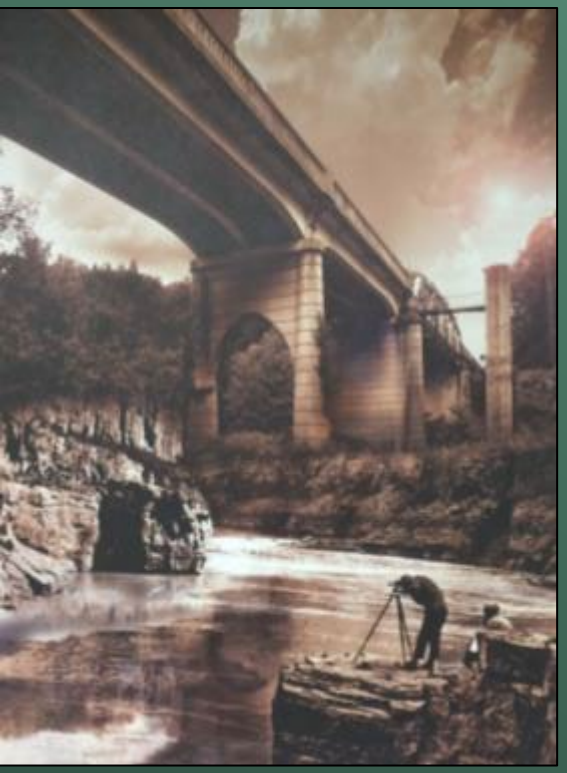

U.S. Geological Survey
Streamflow Monitoring
Toby D. Feaster, P.E.
September 27, 2022
USGS
02/28/2013
USGS
science for a changing world

Bureaus & Offices in the U.S. Department of the Interior



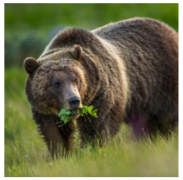
- Bureau of Indian Affairs
- Bureau of Indian Education
- Bureau of Land Management
- Bureau of Ocean Energy Management
- Bureau of Reclamation
- Bureau of Safety and Environmental Enforcement
- Bureau of Trust Funds Administration
- National Park Service
- Office of Surface Mining Reclamation and Enforcement
- U.S. Fish and Wildlife Service
- U.S. Geological Survey

USGS

USGS Mission Areas

Core Science Systems

CSS leads USGS's mission as the civilian mapping agency for the Nation. We conduct detailed surveys and develop high quality, highly accurate topographic, geologic, hydrographic, and biogeographic maps and data. Our maps allow precise planning for critical mineral assessments; energy development; infrastructure projects; urban planning; flood prediction; emergency response; and haz



Ecosystems

The USGS Ecosystems Mission Area provides science to help America achieve sustainable management and conservation of biological resources in wild and urban spaces, and places in between.

Energy and Minerals

The Energy and Mineral Resources Mission Area conducts research and assessments that focus on the location, quantity, and quality of mineral and energy resources, including the economic and environmental effects of resource extraction and use.

Natural Hazards

Every year in the United States, natural hazards threaten lives and livelihoods and result in billions of dollars in damage. We work with many partners to monitor, assess, and conduct targeted research on a wide range of natural hazards so that policymakers and the public have the understanding they need to enhance preparedness, response, and resilience.

Water Resources

Water information is fundamental to national and local economic well-being, protection of life and property, and effective management of the Nation's water resources.

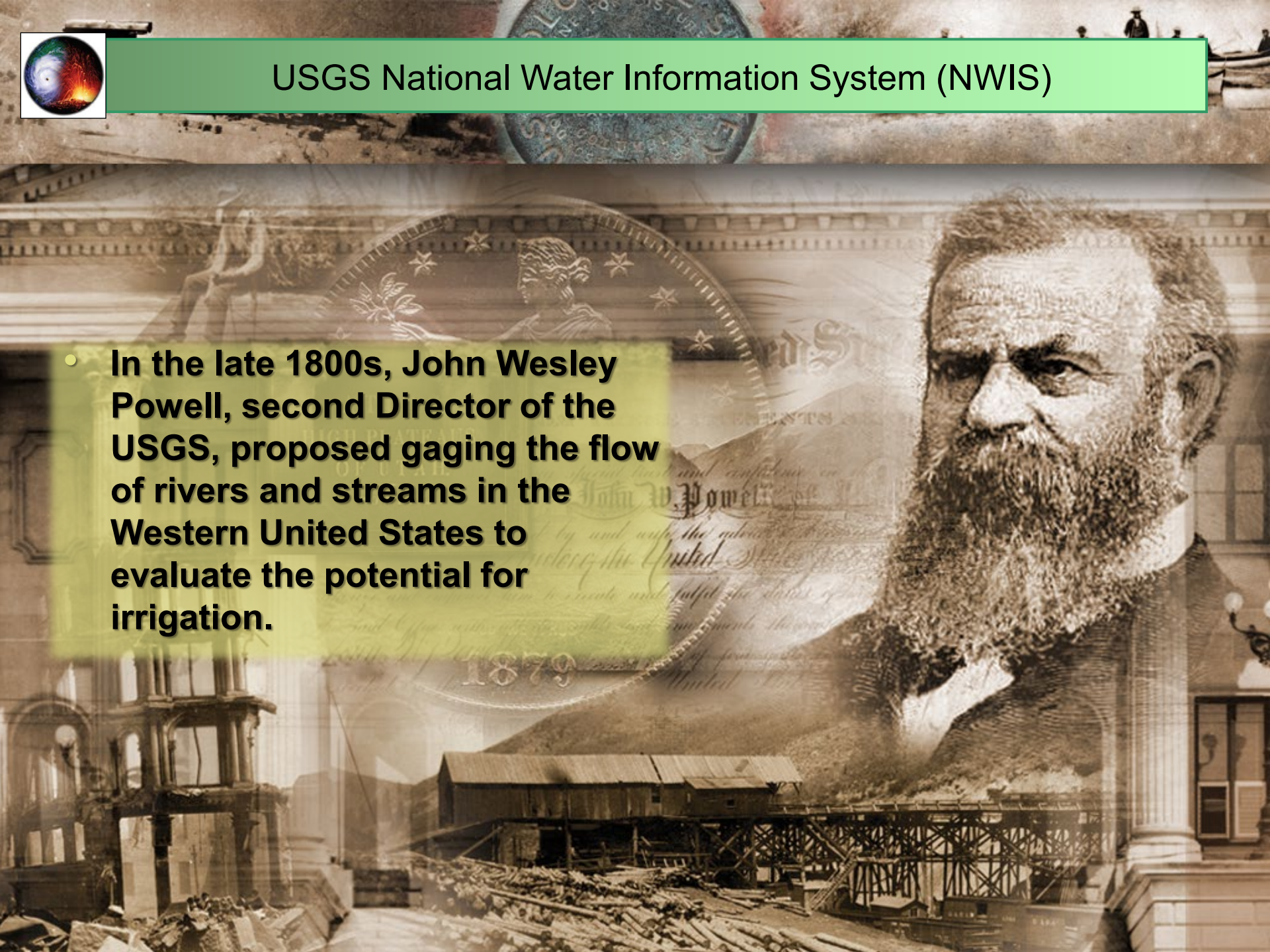
USGS

Water Mission Area

The USGS works with numerous partners to monitor, assess, and conduct targeted research on a wide range of water resources issues and conditions, including streamflow, groundwater, water quality, and water use and availability.

USGS

USGS National Water Information System (NWIS)



- **In the late 1800s, John Wesley Powell, second Director of the USGS, proposed gaging the flow of rivers and streams in the Western United States to evaluate the potential for irrigation.**

The First USGS Streamgage on the Rio Grande at Embudo, NM

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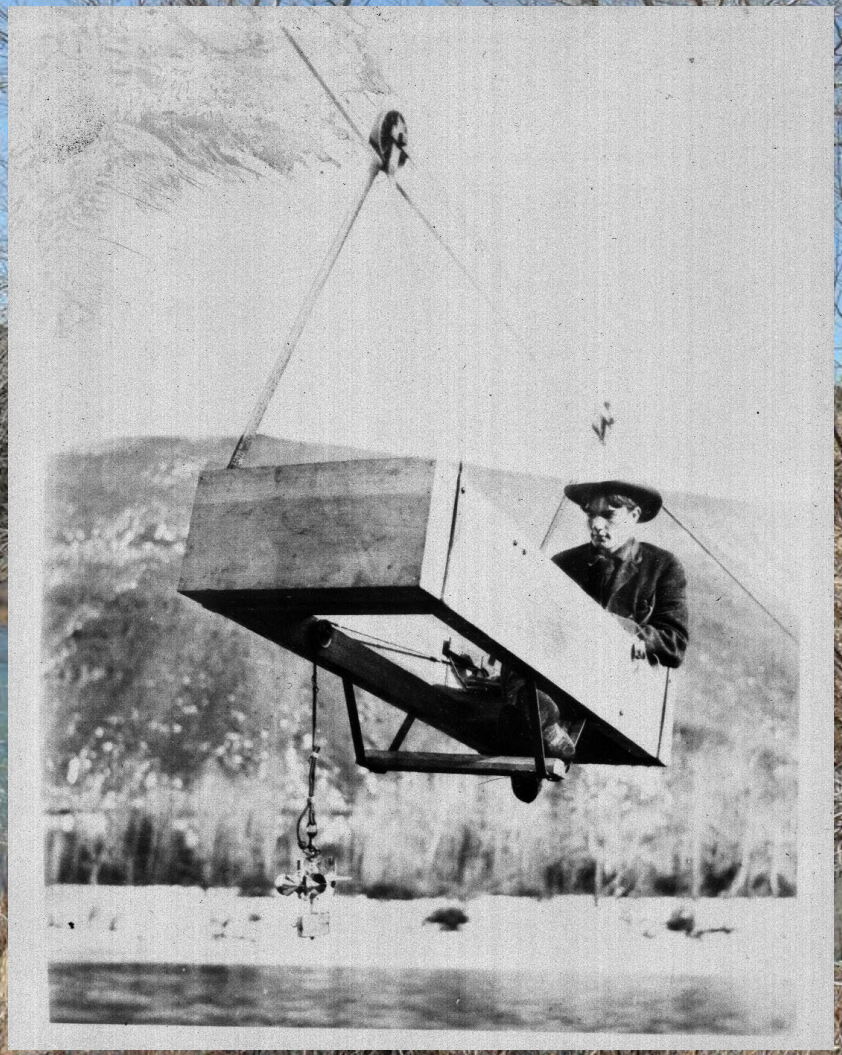
The First USGS Streamgage on the Rio Grande at Embudo, NM



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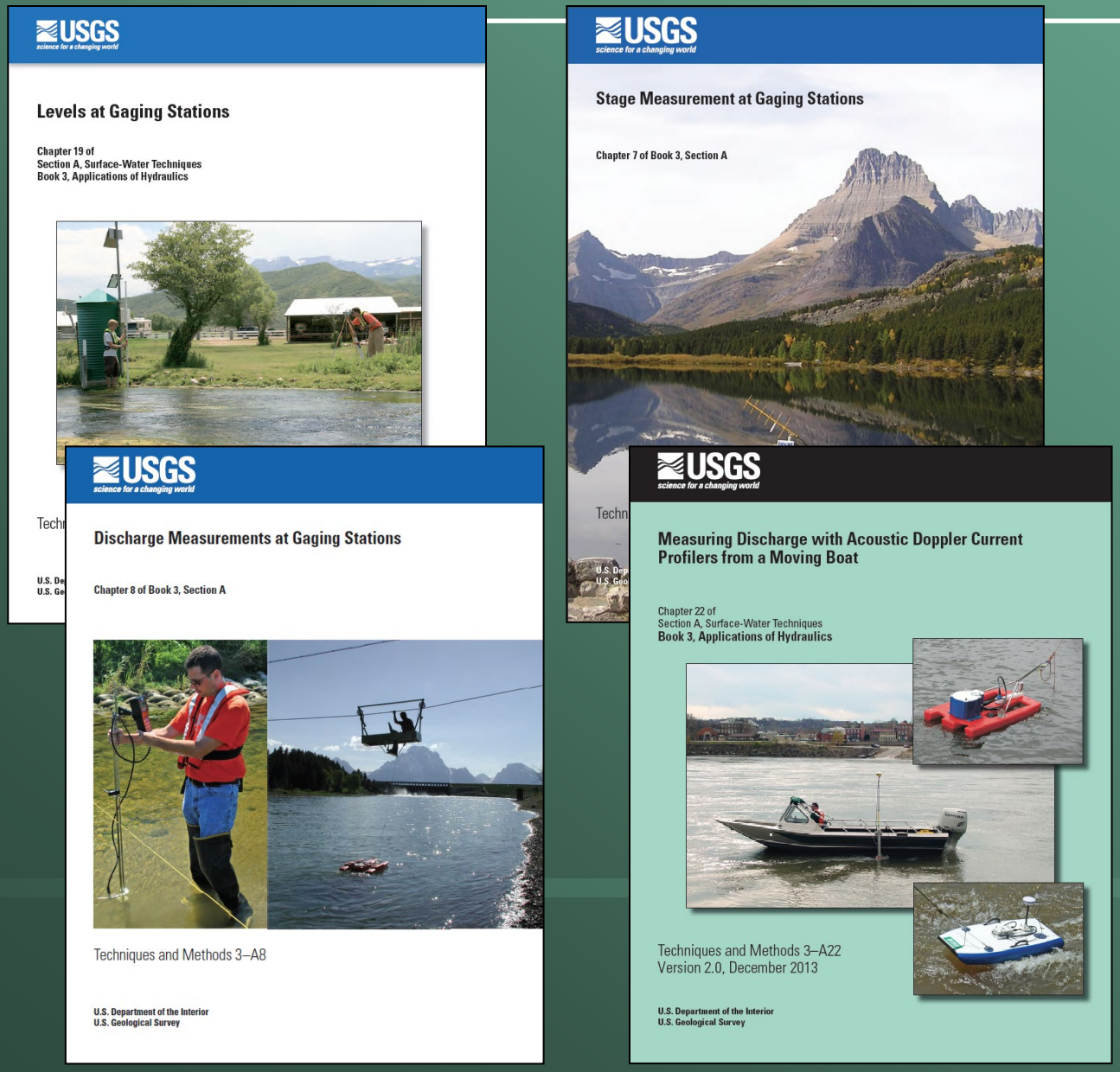
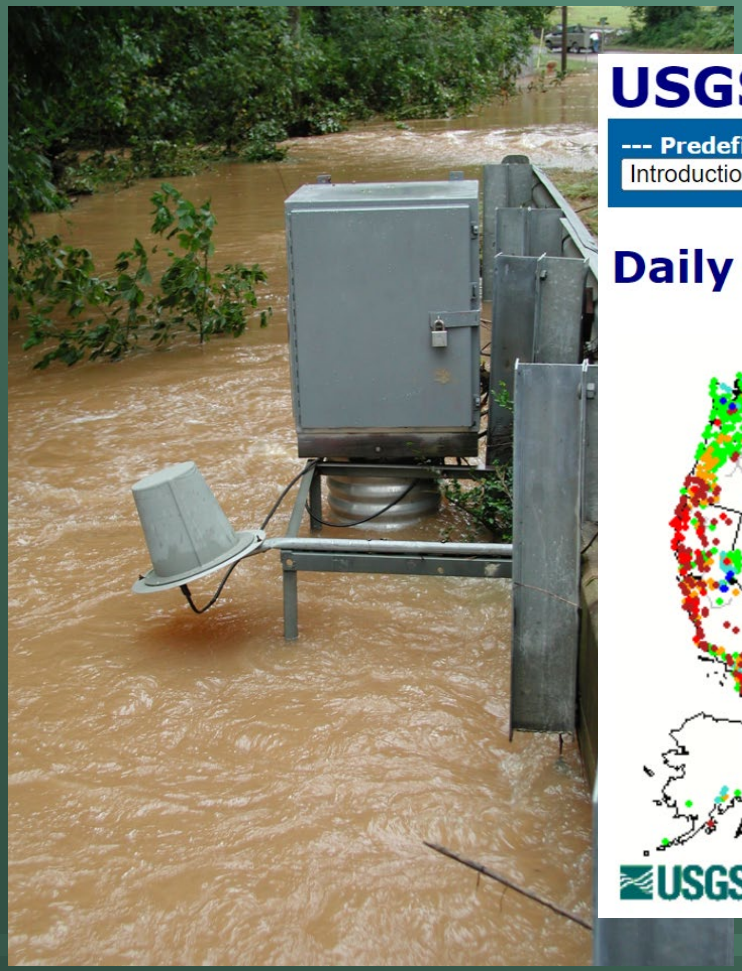
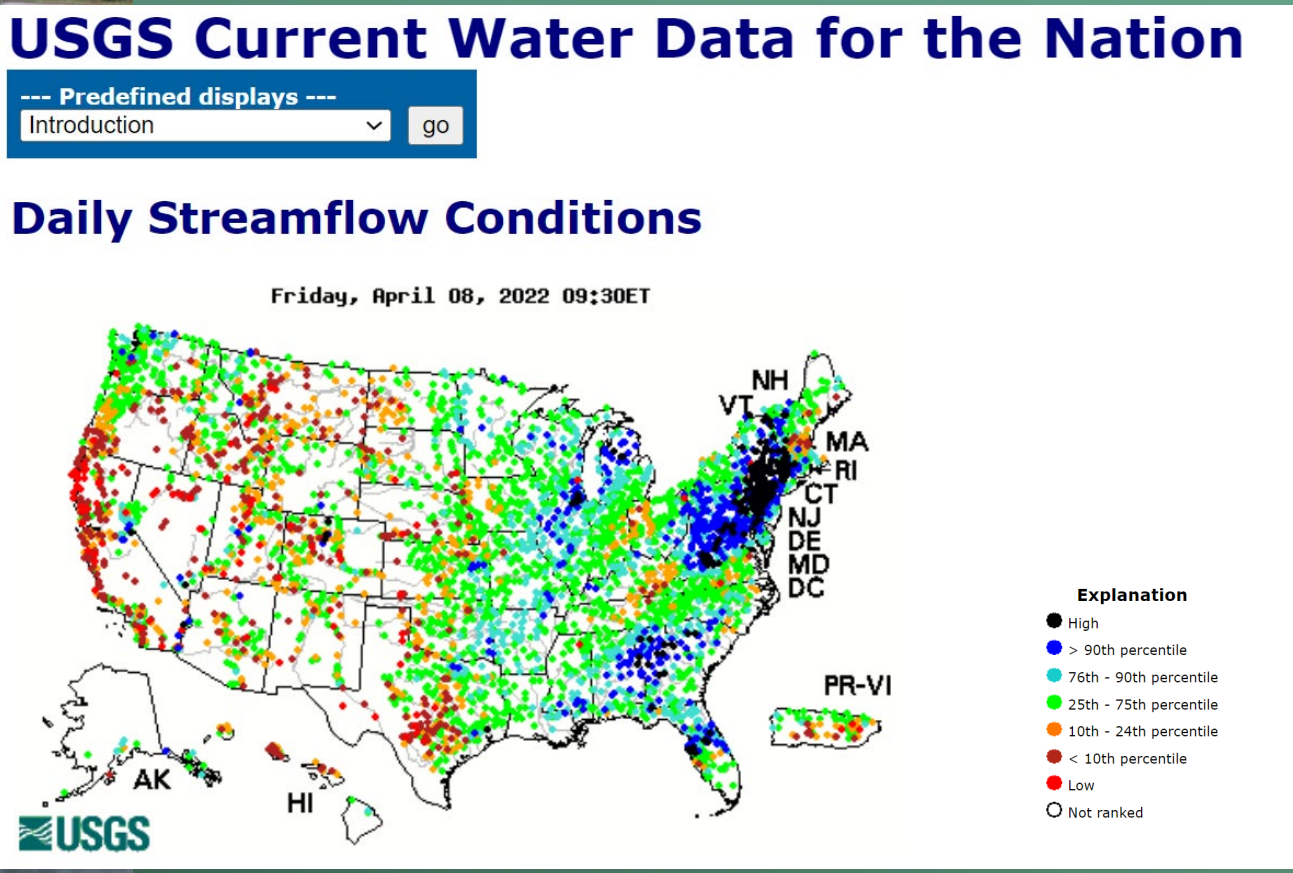
USGS National Water Information System (NWIS)



- The USGS continues to improve streamflow monitoring techniques and uses consistent methods throughout the United States.
- The data are quality controlled, electronically stored, and publicly available.

USGS National Water Information System (NWIS)



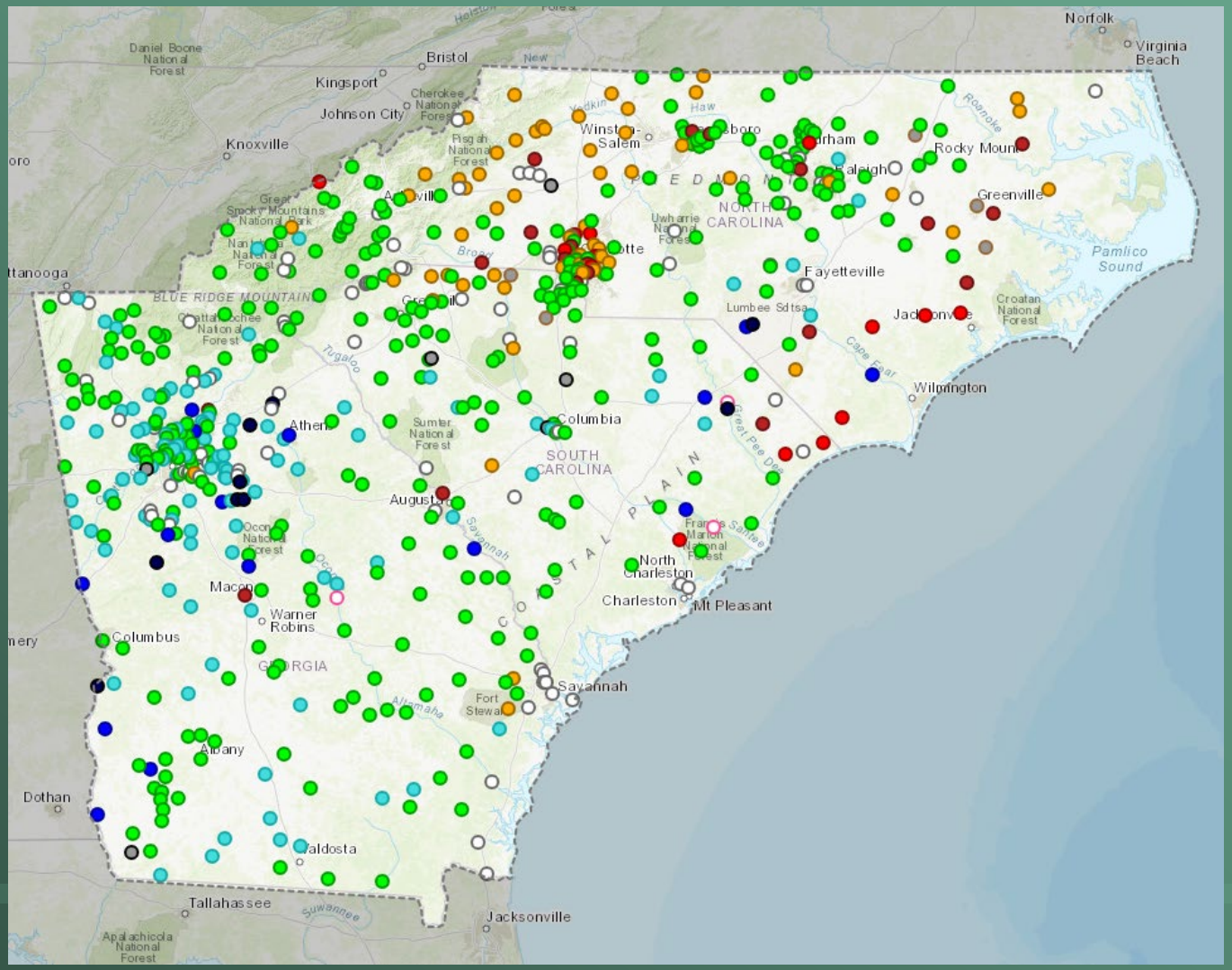


USGS

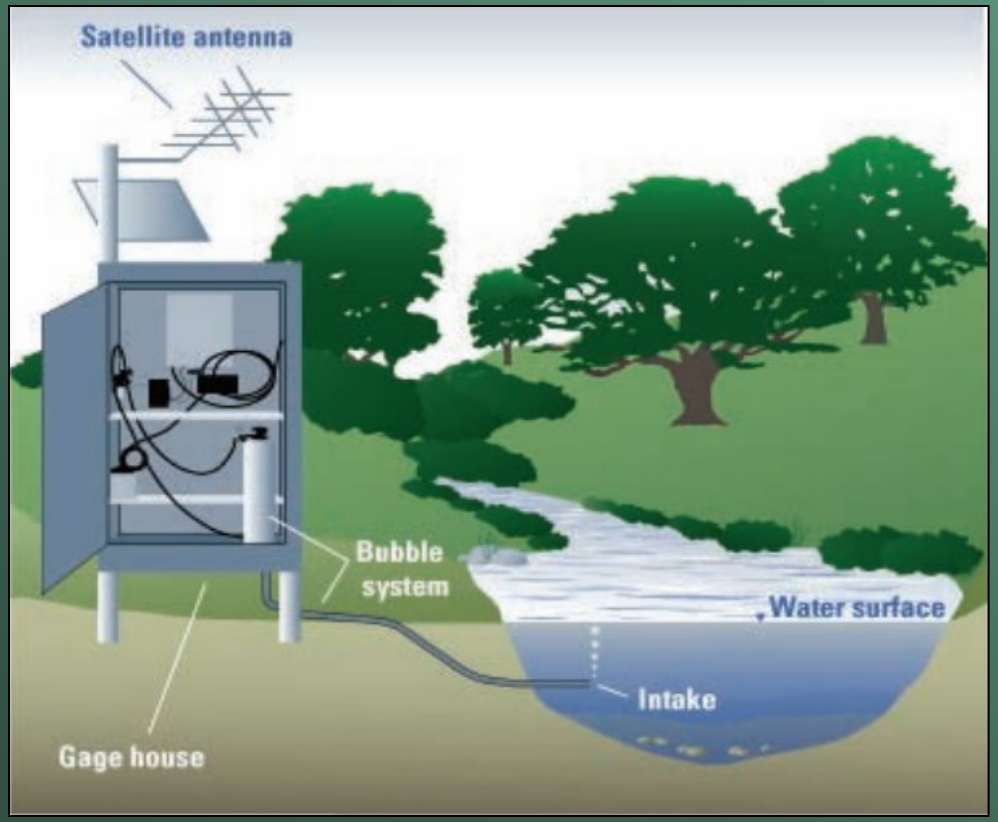
http://waterdata.usgs.gov/usa/nwis/rt

USGS South Atlantic Water Science Center (SAWSC)

USGS SAWSC operates approximately 900 real-time streamflow gaging stations using satellite telemetry

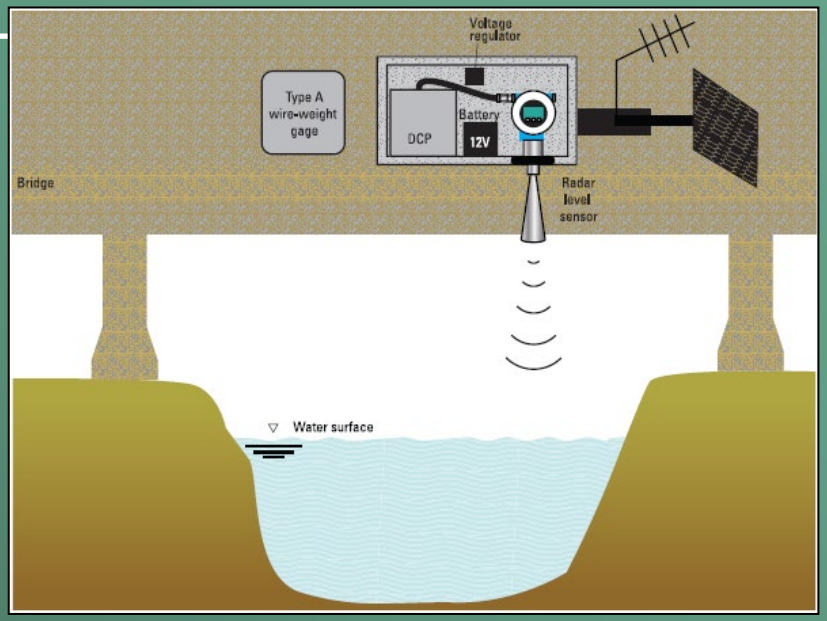


Site Specific Installations: Bubbler/Pressure Sensor



USGS

Site Specific Installations: Non-Contact/Radar

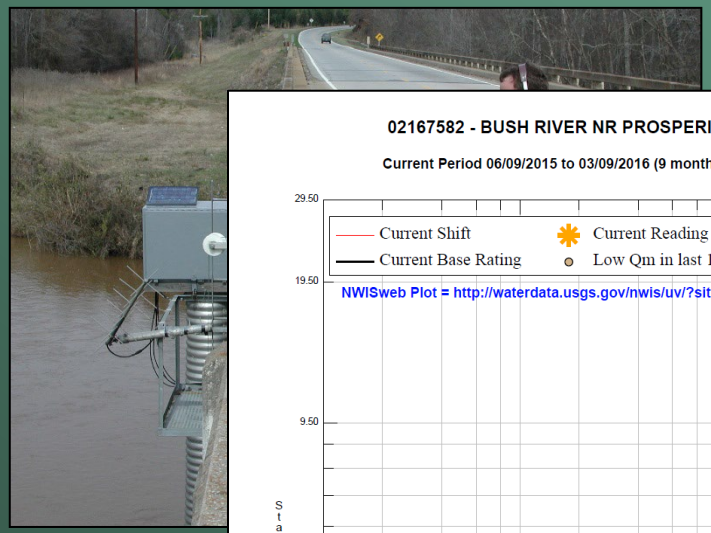


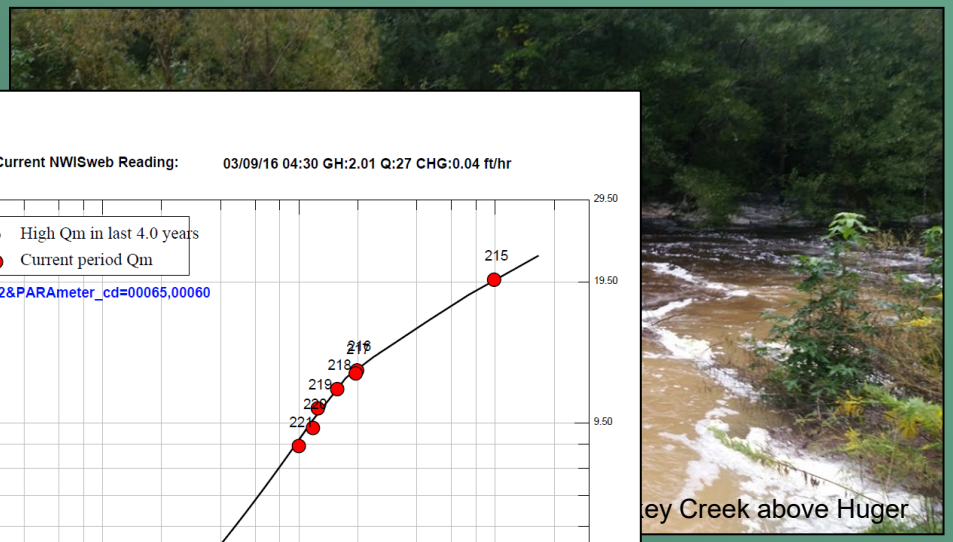
USGS

Site Specific Installations: Index Velocity

USGS

Operation and Maintenance





ey Creek above Huger

02169000 Saluda River near Columbia

Site Specific Installations

02153525 Broad River below Cherokee Falls

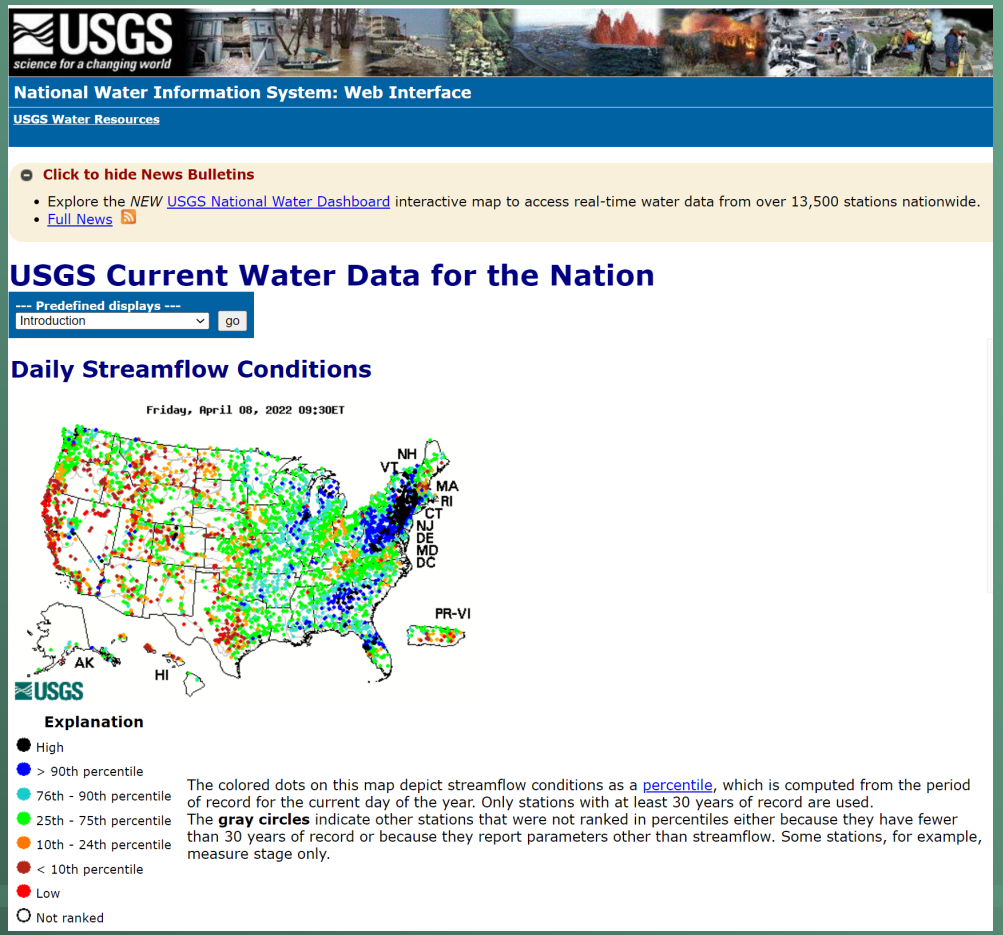
02164000 Reedy River near Greenville

02169500 Congaree River at Columbia

USGS

USGS NWISweb

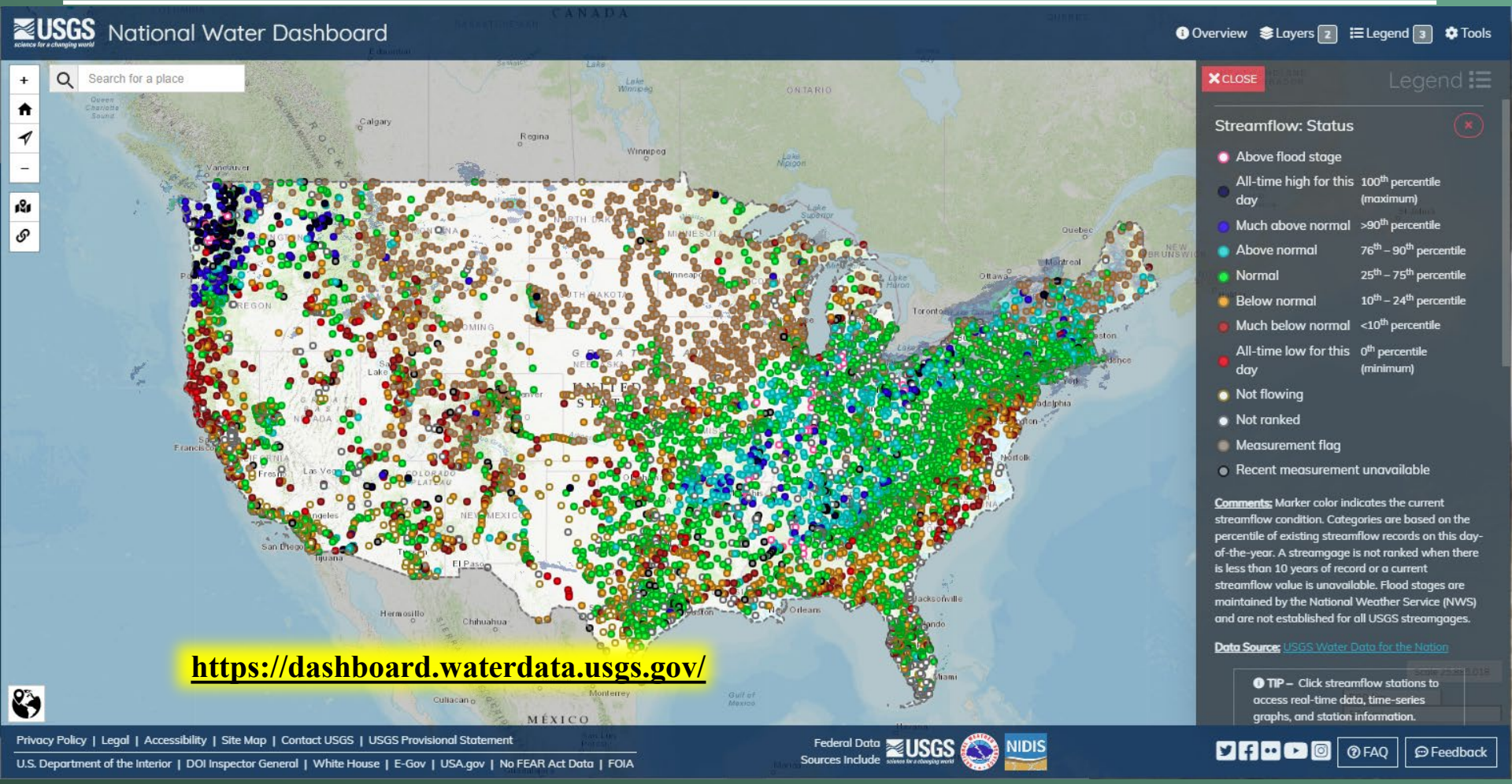
- Access to data from ~1.9 million sites
- Real-time and historical data
- Surface water, groundwater, water quality, water use



USGS

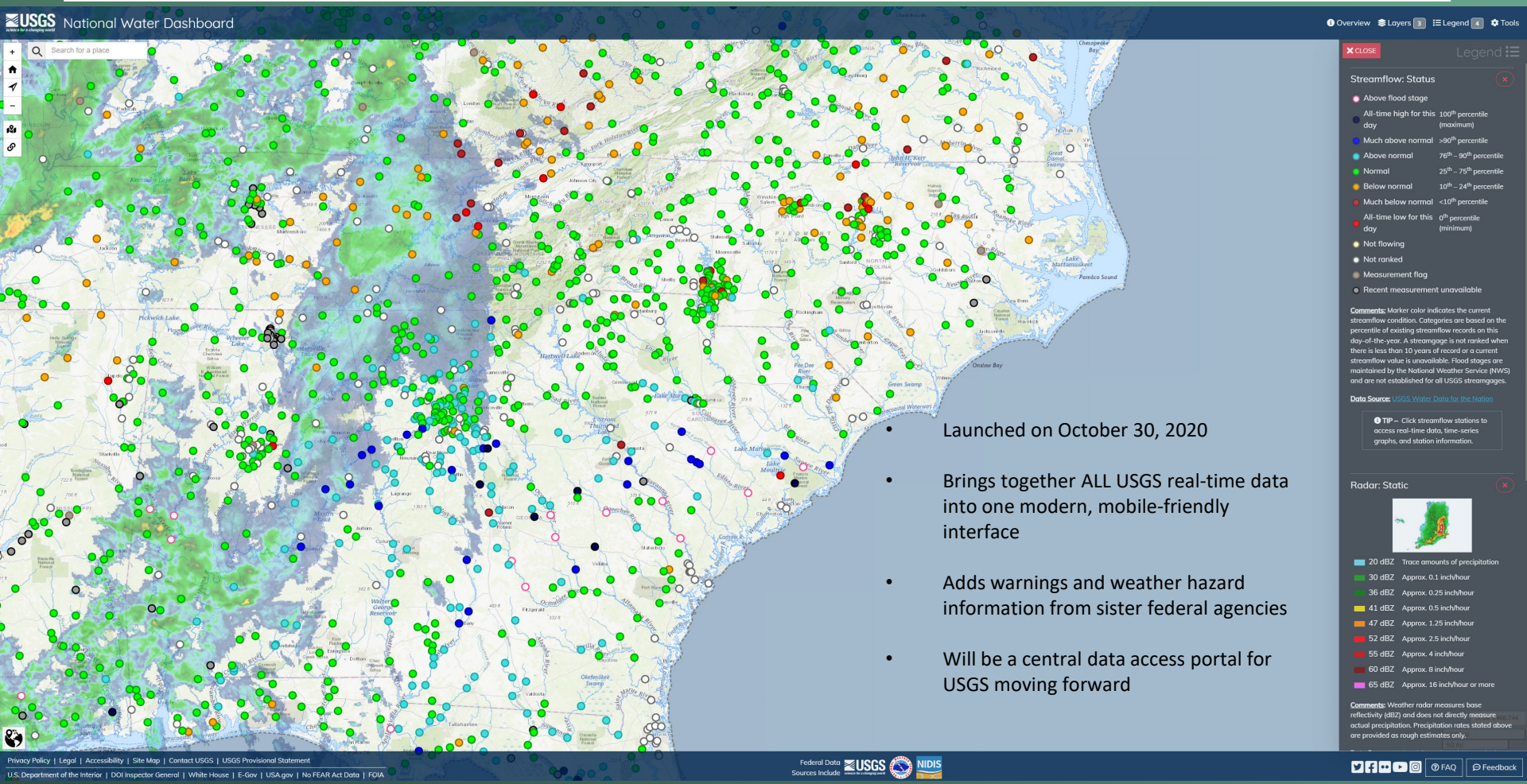
http://waterdata.usgs.gov/nwis/rt

USGS National Water Dashboard



USGS

USGS National Water Dashboard



- Launched on October 30, 2020
- Brings together ALL USGS real-time data into one modern, mobile-friendly interface
- Adds warnings and weather hazard information from sister federal agencies
- Will be a central data access portal for USGS moving forward

USGS

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

USGS WaterWatch

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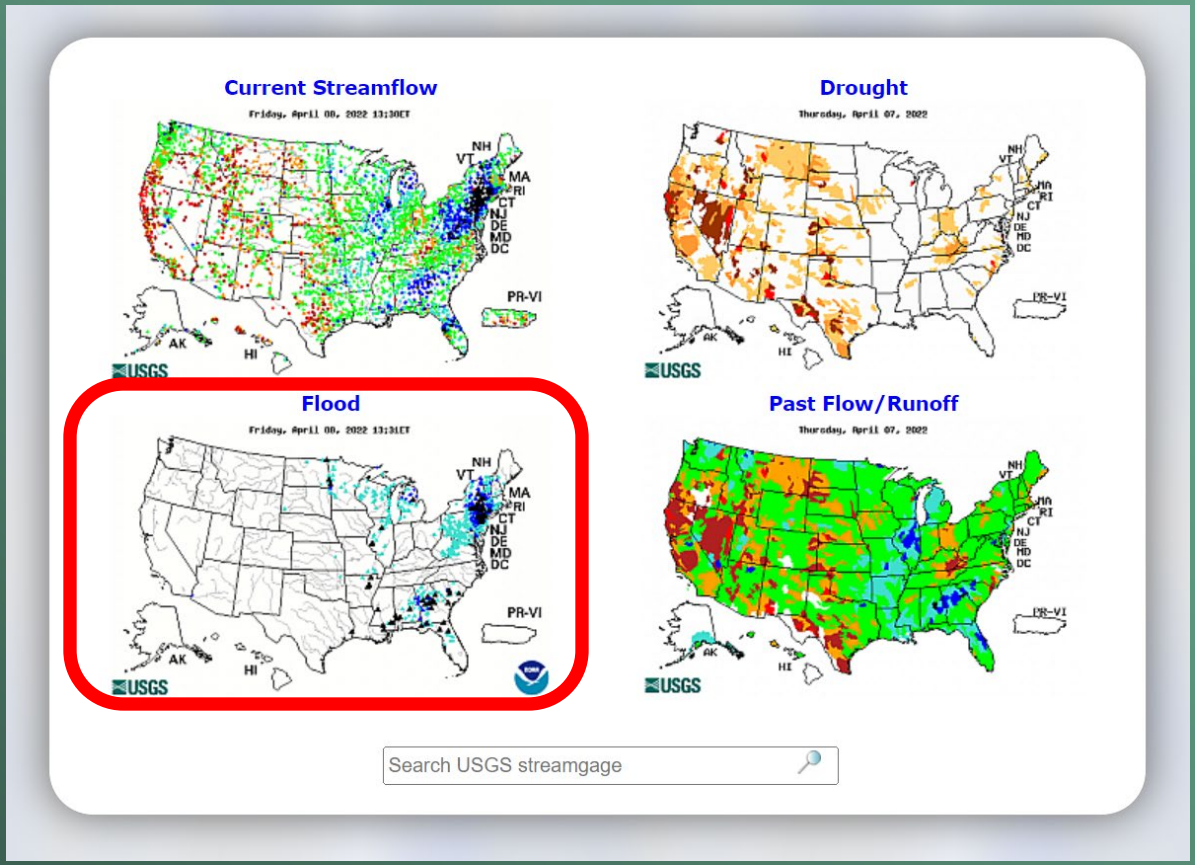
WaterWatch

- Home
- *Special Features*
- Current Streamflow
- Flood
- Drought
- Past Flow/Runoff
- Animation
- Toolkit
- Toolkit (internal)
- Annual Summaries
- Data Services
- Additional Information
- About WaterWatch



USGS

https://waterwatch.usgs.gov/

USGS WaterWatch

Flood

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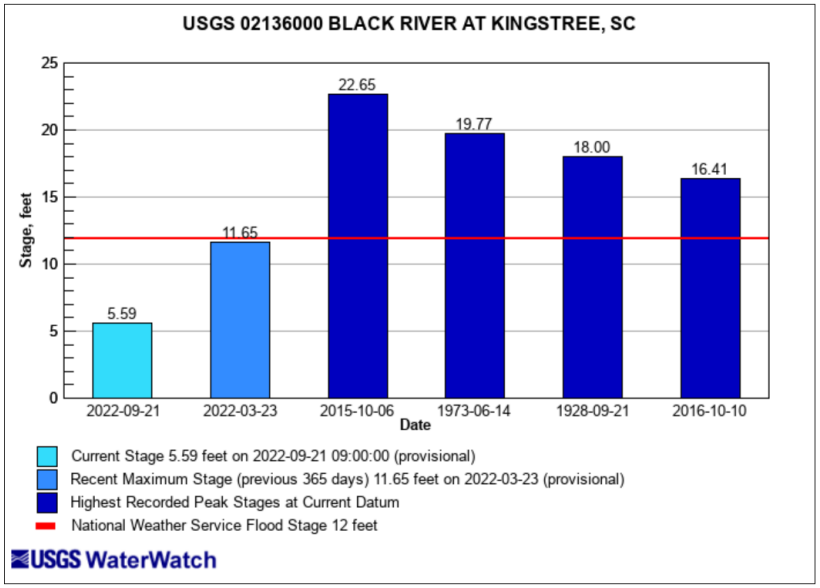
Flood Tracking Chart Builder

Site Number: 02136000 | Type: Gage Height | Size: Big (700x500) | Peak | Title | GO



Additional Information

- USGS real-time streamflow data
- USGS peak streamflow

USGS

https://waterwatch.usgs.gov/

USGS WaterWatch

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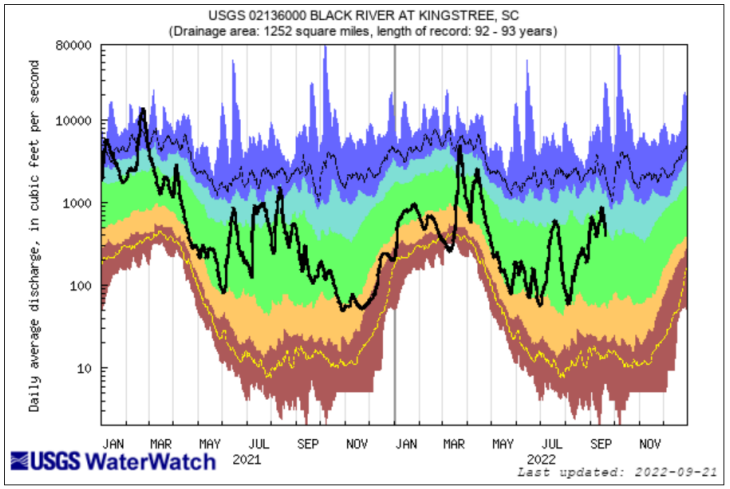
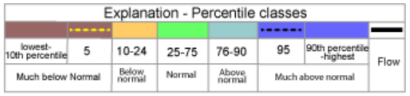
USGS Streamflow Duration Hydrograph Builder

Site number 02136000 | Year: 2022 | No. of years: 2 | Year type: Calendar Year | GO
Flow: Daily | cfs | Graph type: Regular | Output: Hydrograph | Overlay

For some streams, flow statistics may have been computed from mixed regulated and unregulated flows; this can affect depictions of flow conditions.





Additional Information

- USGS daily streamflow data

USGS

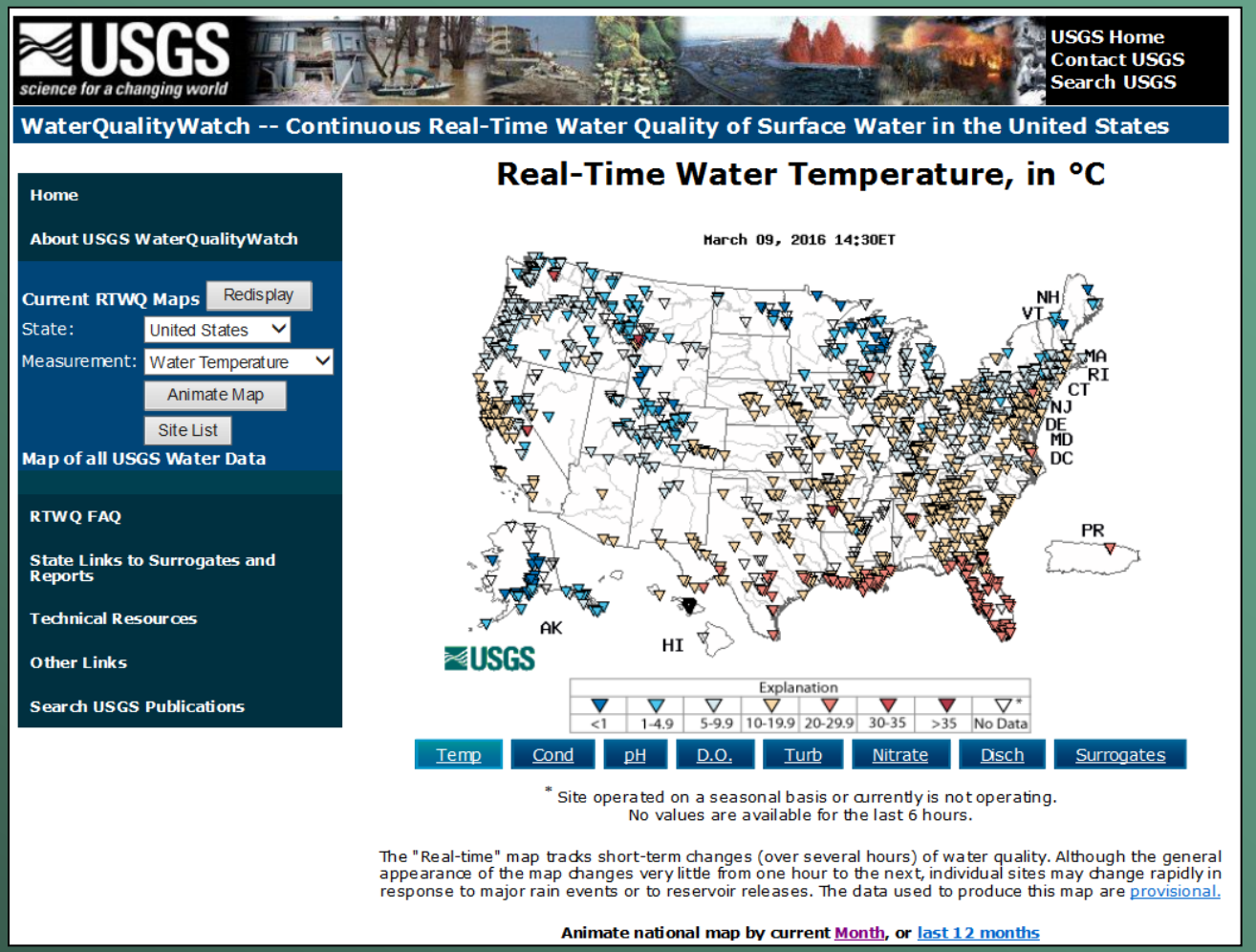
https://waterwatch.usgs.gov/

USGS WaterQualityWatch

Water-quality data, including:

- Temperature
- Specific Conductance
- pH
- Dissolved Oxygen
- Turbidity
- Nitrate

…from more than 2,000 sites.

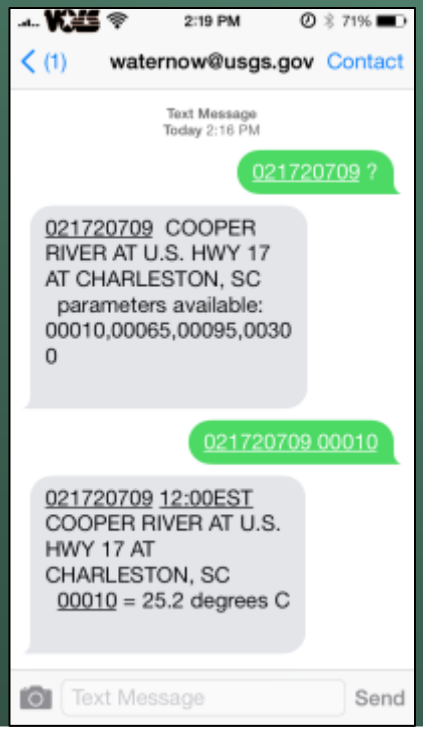


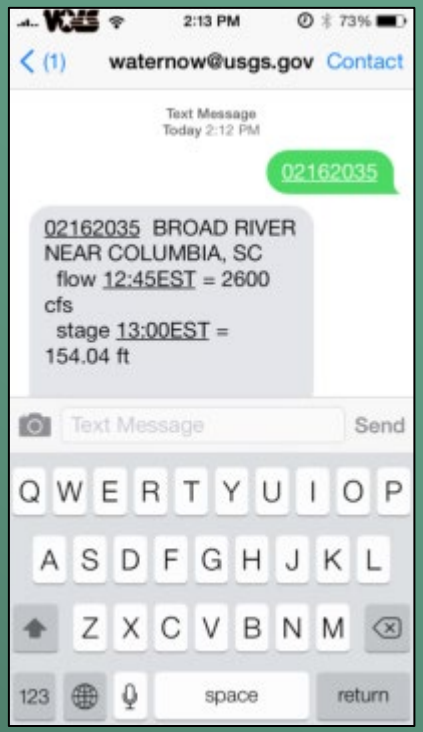
https://www.usgs.gov/tools/waterqualitywatch

USGS WaterNow

http://water.usgs.gov/waternow/

Current conditions for water data directly to your cell phone or email





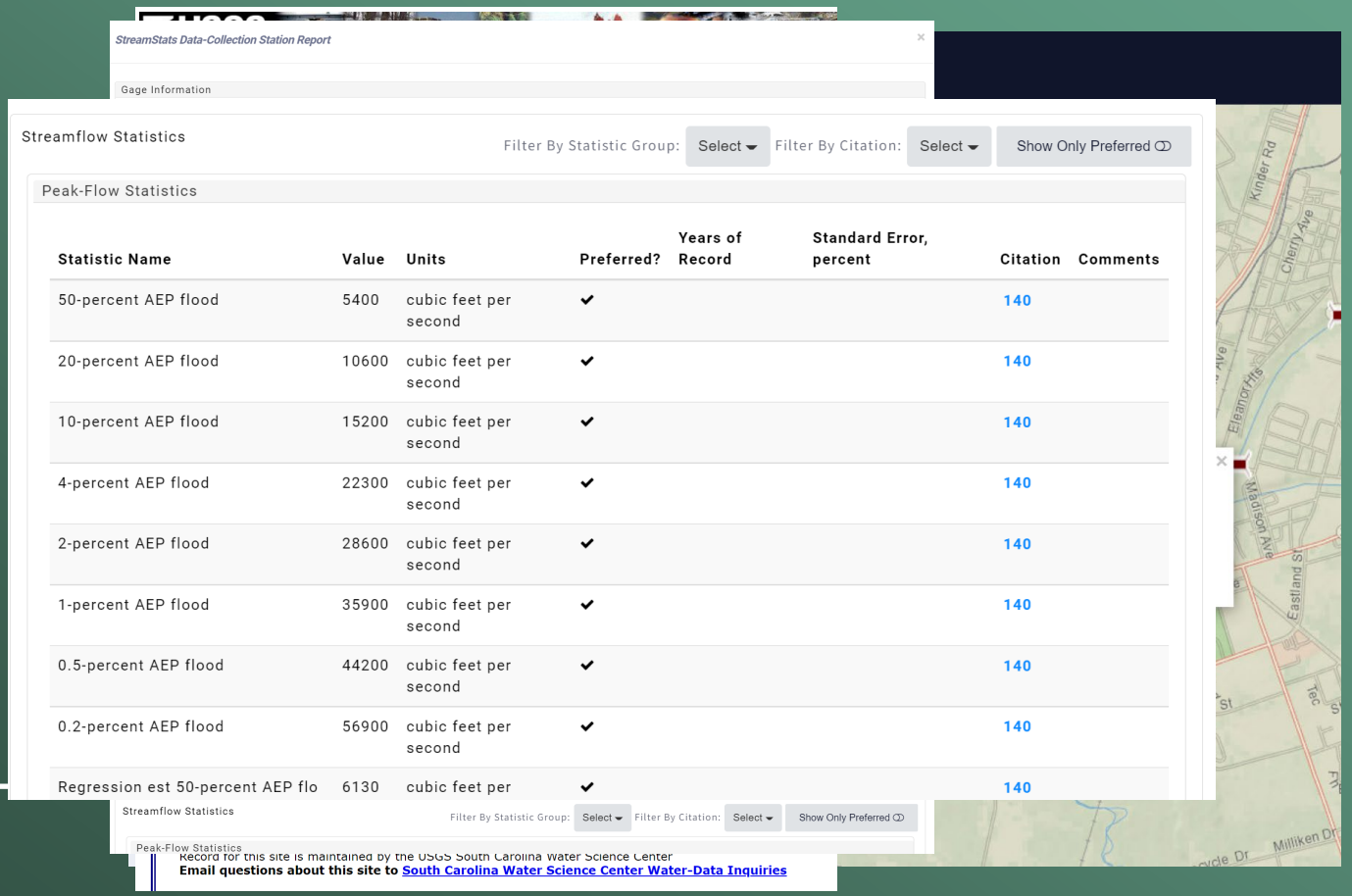
USGS

Send email or text message containing USGS station number and quickly receive a reply with its most recent observations

USGS StreamStats

StreamStats is a GIS-based web application

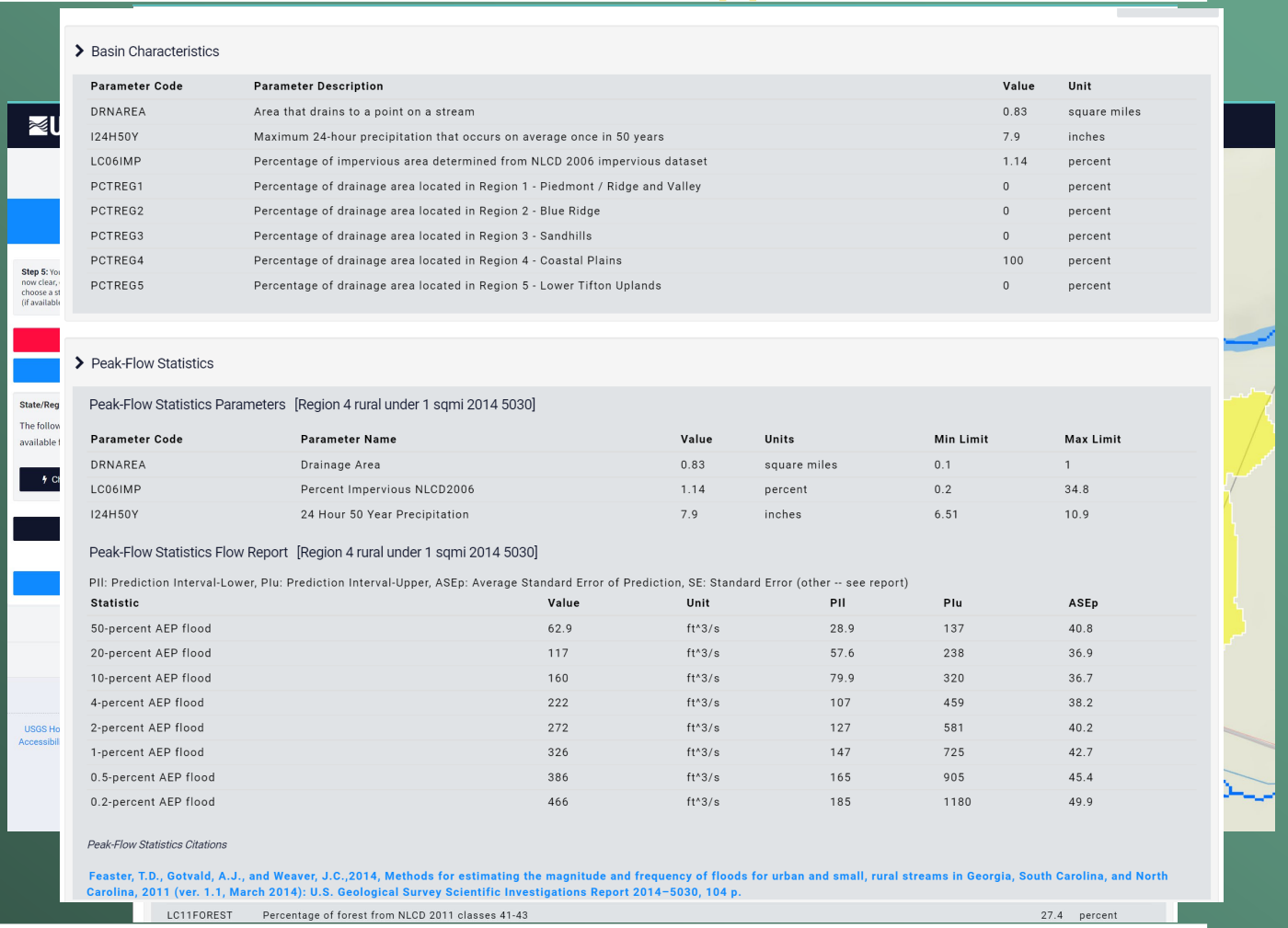
- Provide streamflow data and other information for data-collection stations.



USGS StreamStats

StreamStats is a GIS-based web application

- Provide streamflow statistics and basin characteristics for user-selected points on ungaged streams.



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.83	square miles
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	7.9	inches
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	1.14	percent
PCTREG1	Percentage of drainage area located in Region 1 - Piedmont / Ridge and Valley	0	percent
PCTREG2	Percentage of drainage area located in Region 2 - Blue Ridge	0	percent
PCTREG3	Percentage of drainage area located in Region 3 - Sandhills	0	percent
PCTREG4	Percentage of drainage area located in Region 4 - Coastal Plains	100	percent
PCTREG5	Percentage of drainage area located in Region 5 - Lower Tifton Uplands	0	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Region 4 rural under 1 sqmi 2014 5030]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.83	square miles	0.1	1
LC06IMP	Percent Impervious NLCD2006	1.14	percent	0.2	34.8
I24H50Y	24 Hour 50 Year Precipitation	7.9	inches	6.51	10.9

Peak-Flow Statistics Flow Report [Region 4 rural under 1 sqmi 2014 5030]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	ASEp
50-percent AEP flood	62.9	ft^3/s	28.9	137	40.8
20-percent AEP flood	117	ft^3/s	57.6	238	36.9
10-percent AEP flood	160	ft^3/s	79.9	320	36.7
4-percent AEP flood	222	ft^3/s	107	459	38.2
2-percent AEP flood	272	ft^3/s	127	581	40.2
1-percent AEP flood	326	ft^3/s	147	725	42.7
0.5-percent AEP flood	386	ft^3/s	165	905	45.4
0.2-percent AEP flood	466	ft^3/s	185	1180	49.9

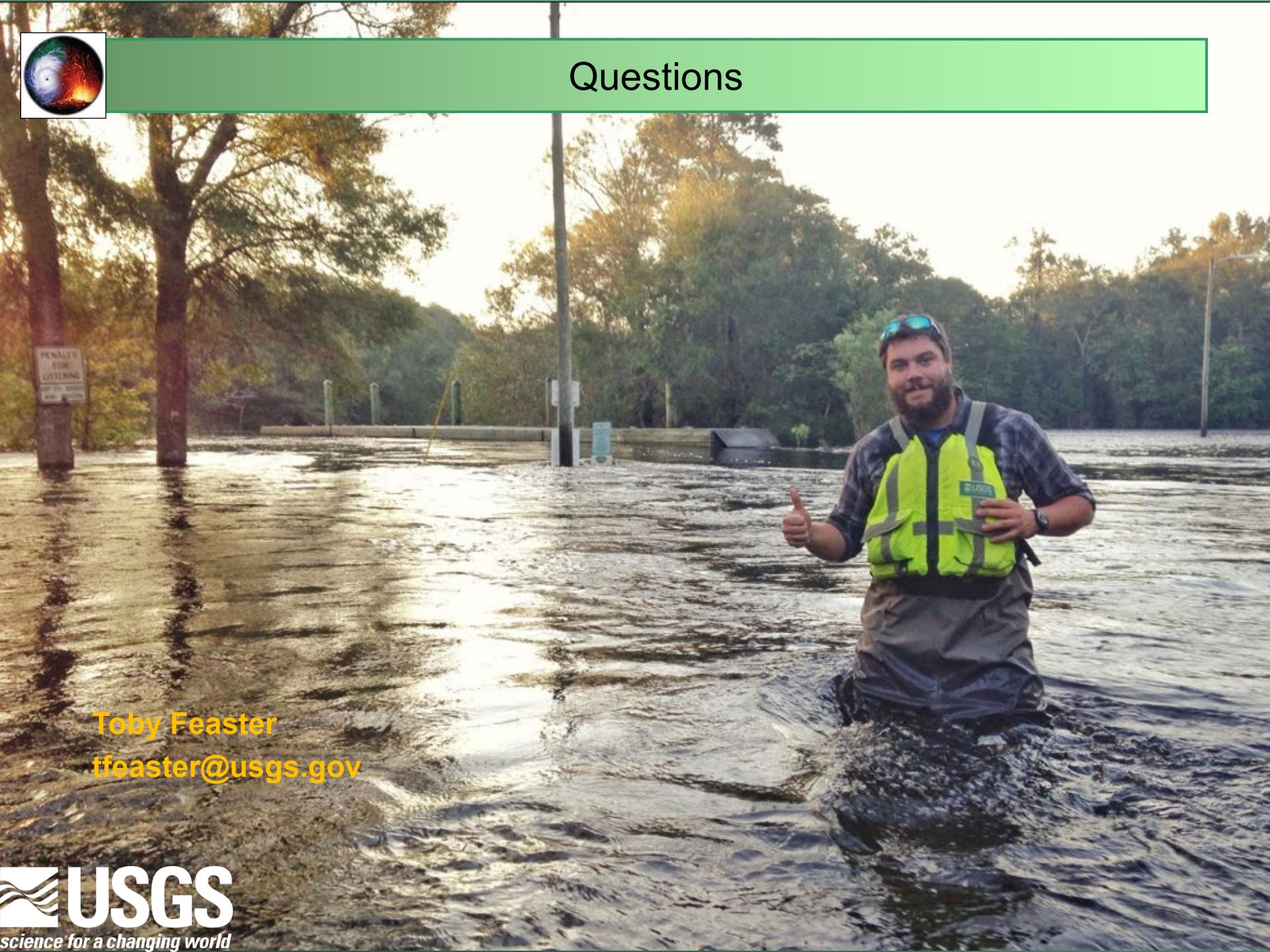
Peak-Flow Statistics Citations

Feaster, T.D., Gotvald, A.J., and Weaver, J.C.,2014, Methods for estimating the magnitude and frequency of floods for urban and small, rural streams in Georgia, South Carolina, and North Carolina, 2011 (ver. 1.1, March 2014): U.S. Geological Survey Scientific Investigations Report 2014–5030, 104 p.

LC11FOREST Percentage of forest from NLCD 2011 classes 41-43 27.4 percent

USGS

Questions



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