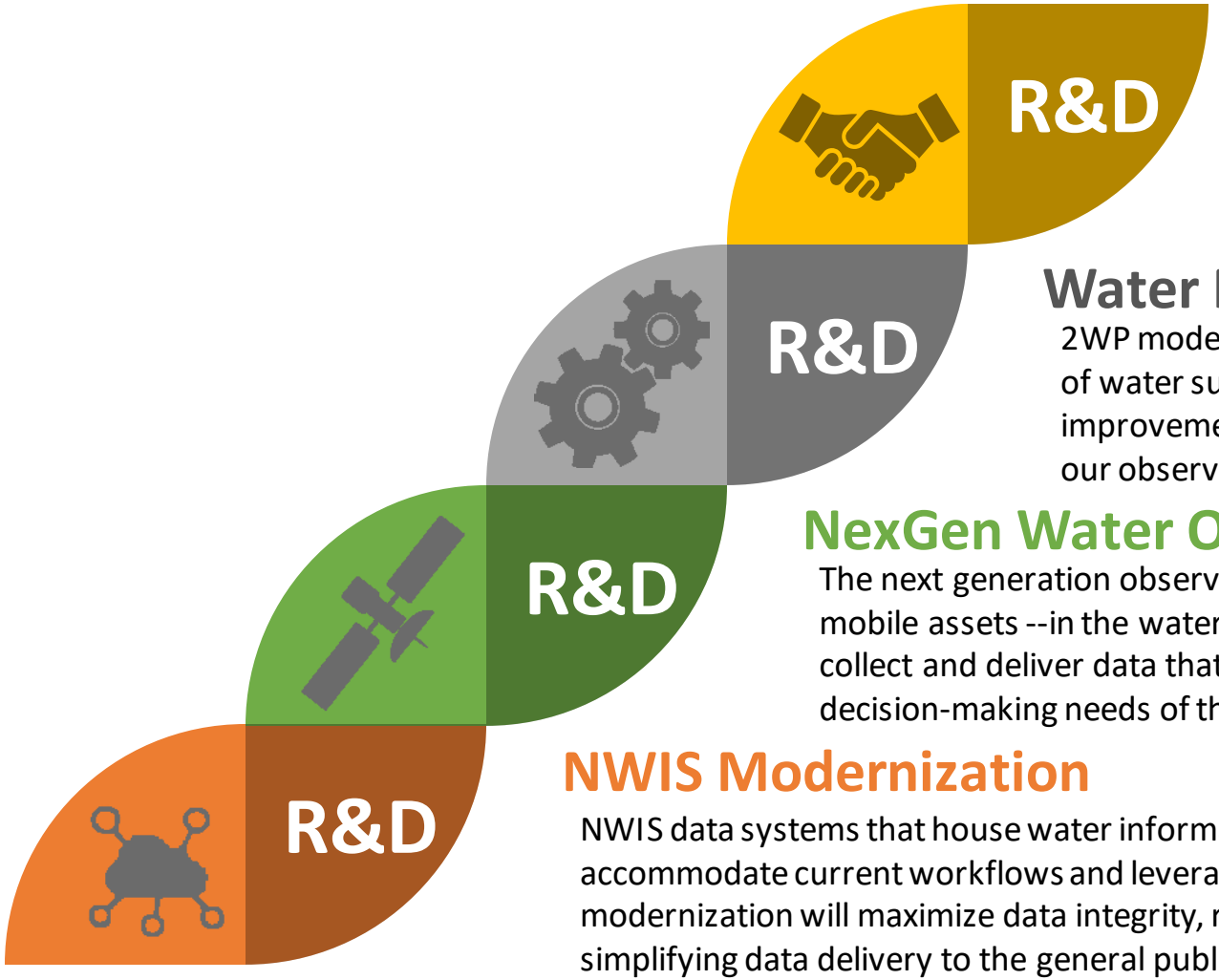
Water Availability and Use Science Program - updates

Mindi Dalton
ICWP Annual Meeting
October 9, 2019

USGS Water Mission Area Priorities



Integrated Water Availability Assessments

IWAAs evaluate water availability in terms of the spatial and temporal distribution of water quantity and quality in both surface and groundwater, as related to human and ecosystem needs and as affected by human and natural influences.

Water Prediction Work Program

2WP model predictions will support daily to decadal forecast-based management of water supplies and infrastructure at a regional and National extent through improvement of existing tools and development of new capacity supported by our observational data and data collected by other monitoring organizations.

NexGen Water Observing System

The next generation observing systems (NGWOS) is an integrated set of fixed and mobile assets --in the water, on the ground and in the air-- that will measure, collect and deliver data that can help address water resource challenges and decision-making needs of the future.

NWIS Modernization

NWIS data systems that house water information will be modernized to accommodate current workflows and leverage latest technology. NWIS modernization will maximize data integrity, reliability, and accessibility while simplifying data delivery to the general public.

SECURE Water Act

National Academies Research Recommendations (2018)

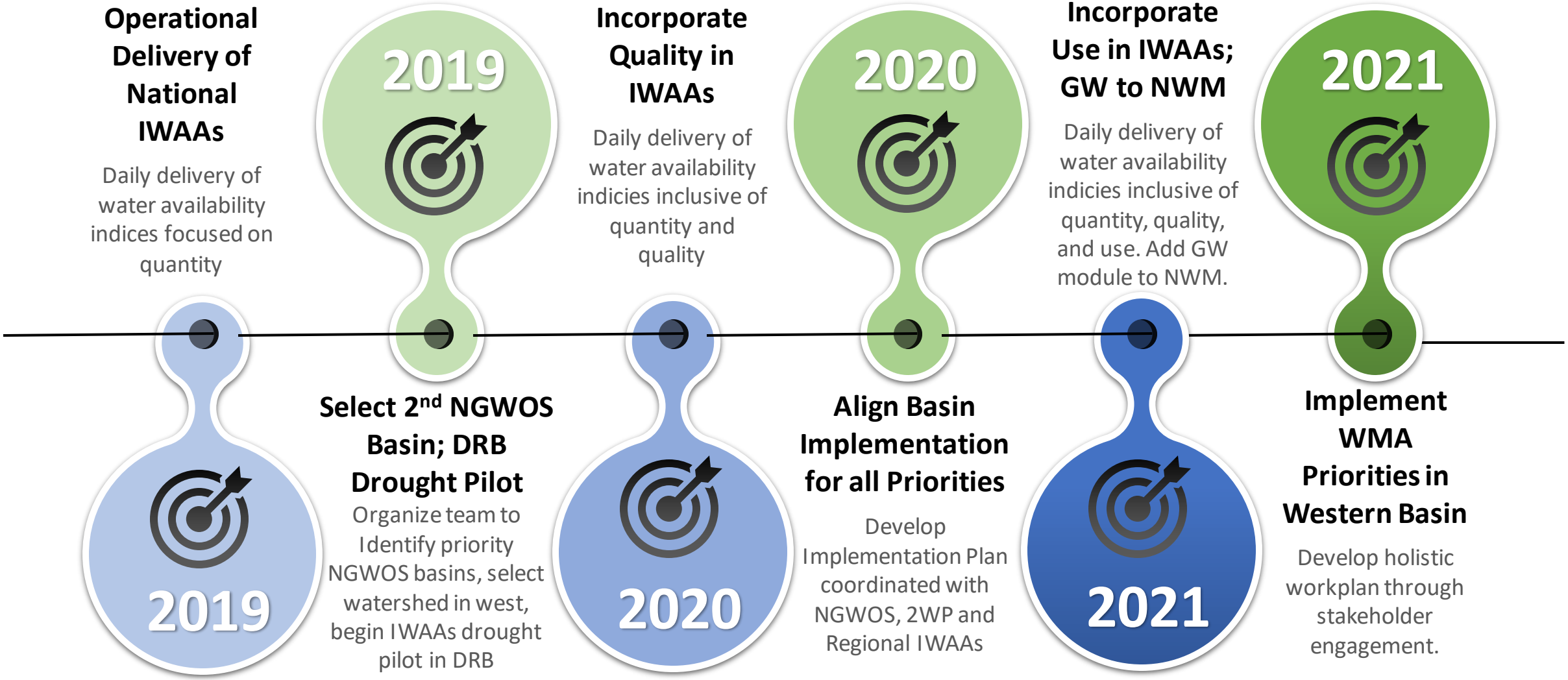
5 priority questions that would benefit USGS Strategic Science:

1. What is the quality and quantity of atmospheric, surface, and subsurface water, and how do these vary spatially and temporally?
2. How do human activities affect water quantity and quality?
3. How can water accounting be done more effectively and comprehensively to provide data on water availability and use?
4. How does changing climate affect water quality, quantity, and reliability, as well as water-related hazards and extreme events?
5. How can long-term water-related risk management be improved?

Presidential Memo on Western Water

Sec. 3. Improve Forecasts of Water Availability. To facilitate greater use of forecast-based management and use of authorities and capabilities provided by the Weather Research and Forecasting Innovation Act of 2017 (Public Law 115-25) and other applicable laws, the **Secretary of the Interior and the Secretary of Commerce shall convene water experts and resource managers to develop an action plan to improve the information and modeling capabilities related to water availability and water infrastructure projects.** The action plan shall be completed by January 2019 and submitted to the Chair of the Council on Environmental Quality.

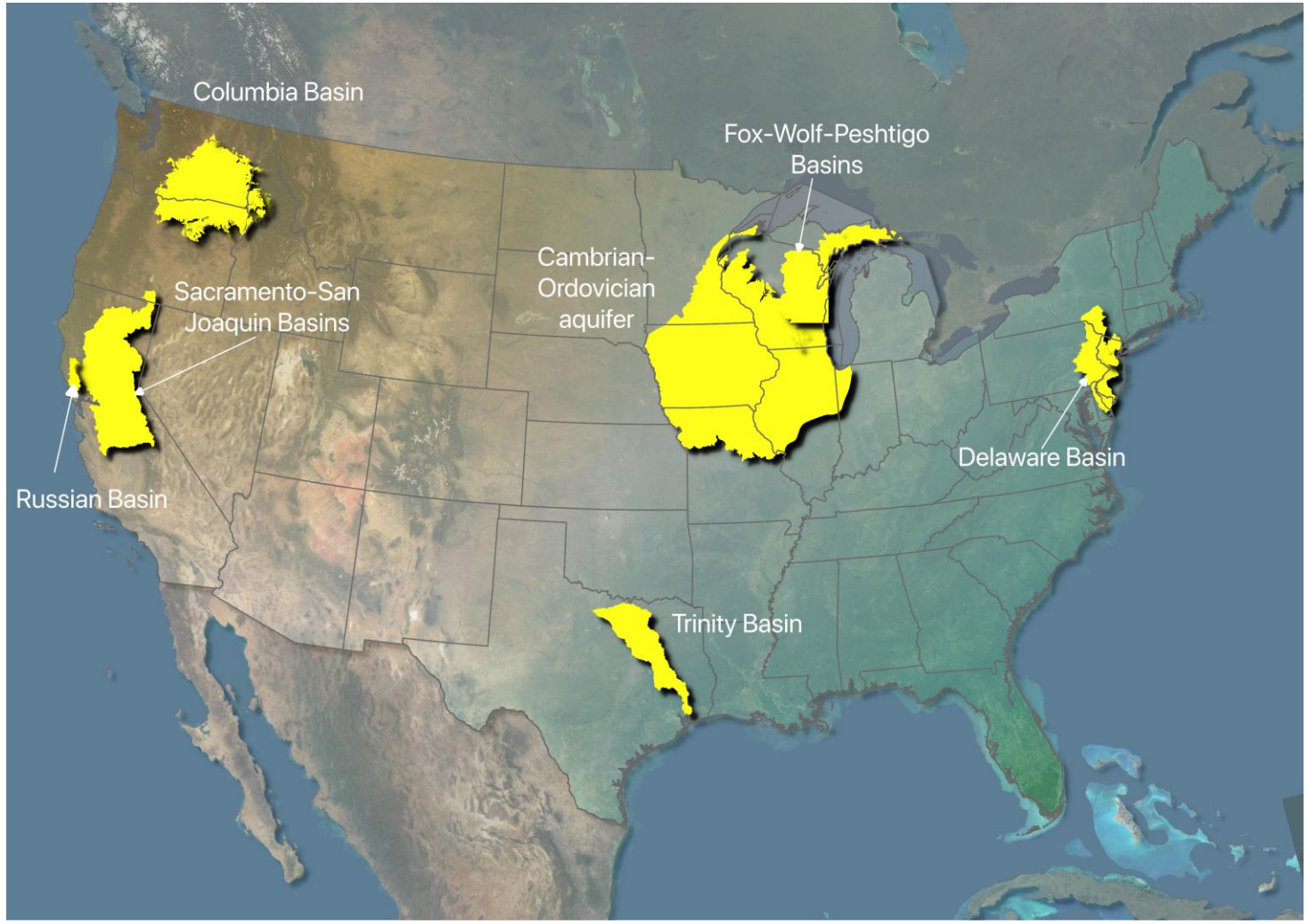
Presidential Memo Action Plan Deliverables



IWAAs

IWAAs Pilots

- 10 pilot projects selected to begin in FY19
- Topics include:
  - Delaware River Basin pilot - Drought
  - Data and Information Delivery
  - IWAAs pilot in Trinity River Basin
  - Informing process for incorporation of QW into models
  - Improving process for incorporation of groundwater into models



Delaware River Basin IWAAs

DRB Drought Pilot

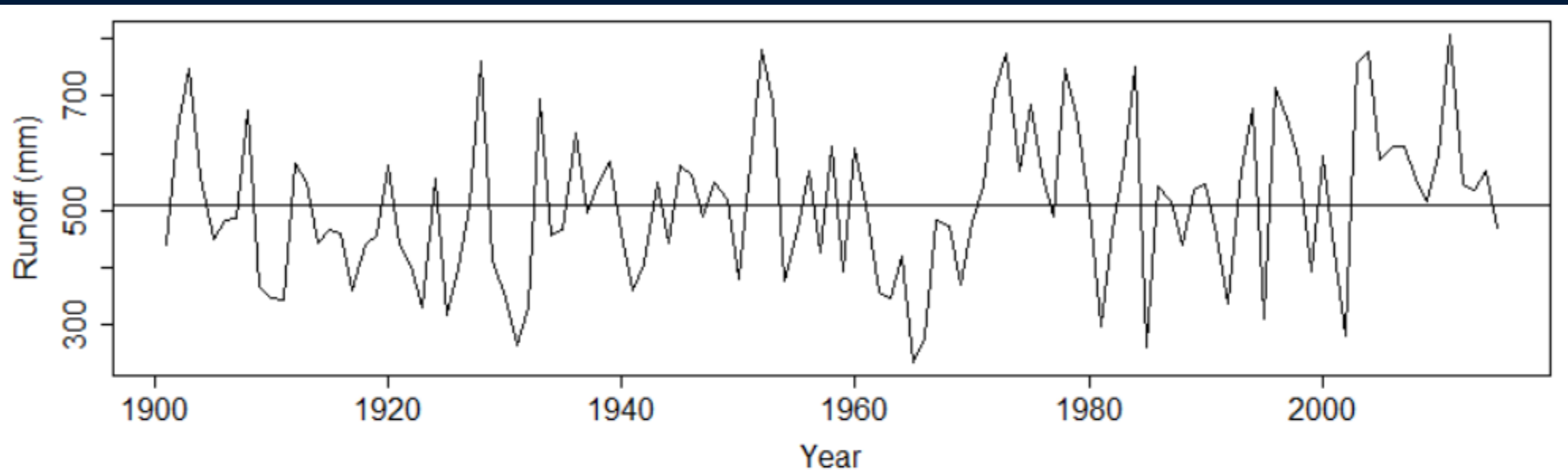
Multiple Centers within the Delaware River Basin are developing an integrated workplan for an IWAAs focused on drought.

Deliverables for this pilot include:

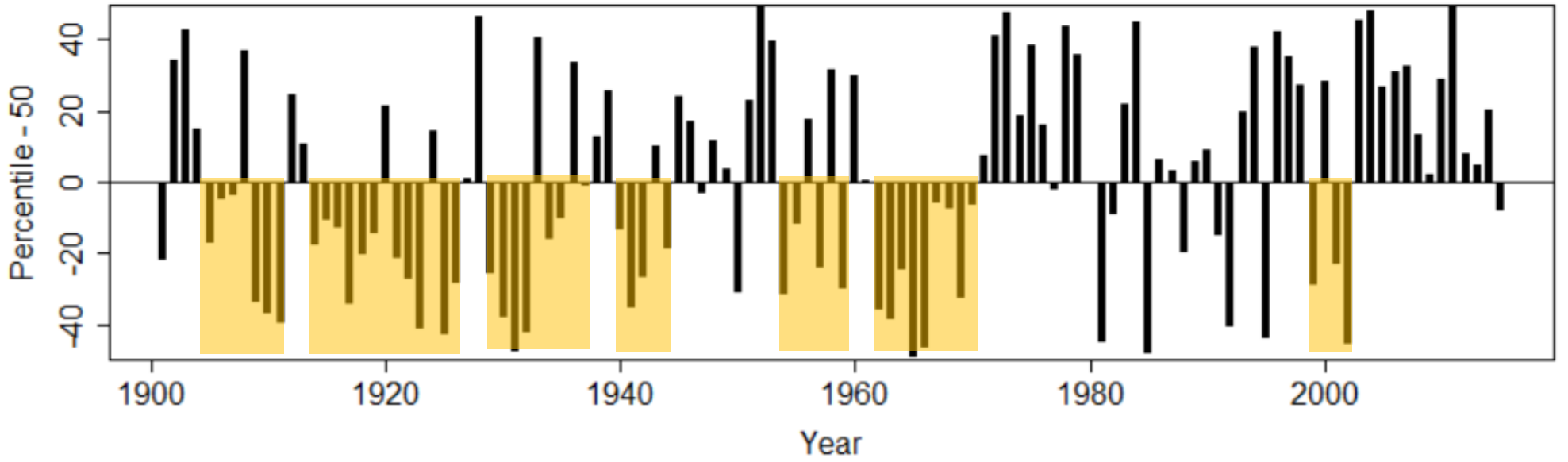
- Development of model to predict daily water use for public supply
- Improved predictions of streamflow during drought periods
- Improved water-quality modeling processes (nutrients)
- Evaluation of the utility of National scale models to inform local water management
- ***Understanding drought drivers***

Drought in the DRB

a. Mean DRB water-year runoff

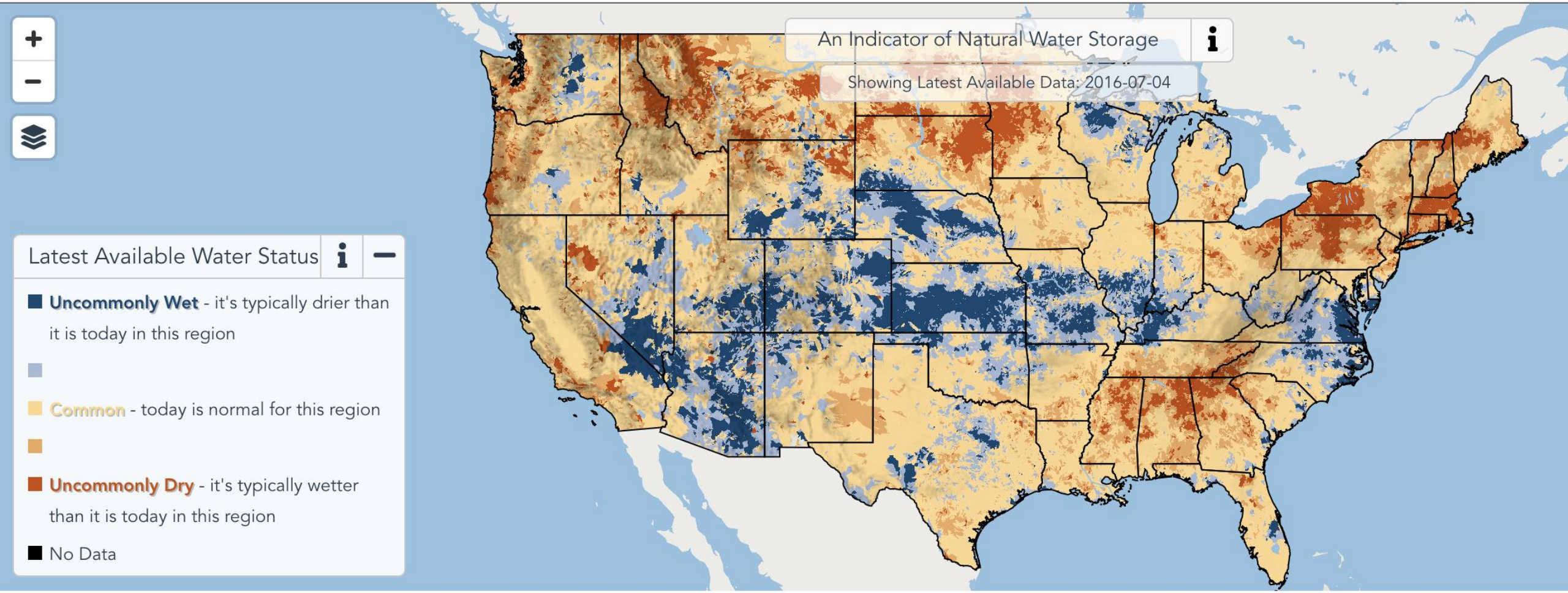


b. Percentiles of mean DRB water-year runoff and drought periods (drought periods are highlighted in yellow)



USGS

National Integrated Water Availability Assessments DEV

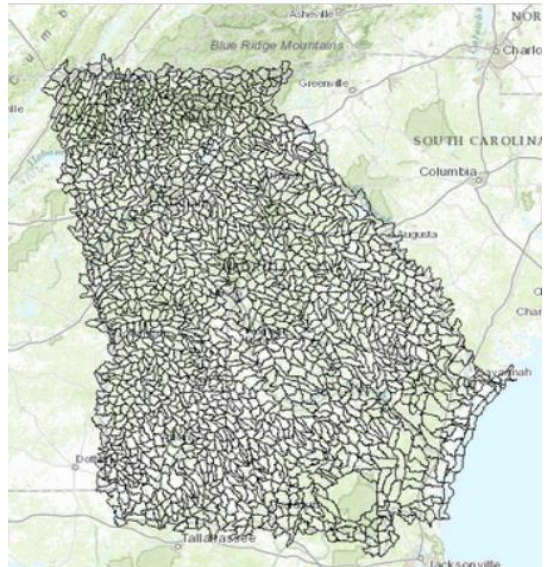


Water Use Reporting

Water Use Estimation

Water Budget Estimation and Evaluation Project (WBEEP)

- Developed model strategies for daily HUC-12 estimates of thermoelectric, public supply, and irrigation withdrawal
- Inclusive of consumptive use



Example of HUC-12 basins, Georgia

New Projects:

- Evaluating uncertainty in historical USGS water use data

Needs:

- Data
- Policy for water use data management
- Development of data services with State Water Resource agencies
- Continuous delivery of water use data

WUDR Overview

The USGS Water-Use Data and Research Program (WUDR) is authorized under the SECURE Water Act Section 9508

SECURE goals for WUDR

- Improve the availability, quality, compatibility, and delivery of water use data that is collected and/or estimated by States to support National water use assessments
- Integrate State water resource agency water-use or water-availability datasets into USGS databases

Support for USGS Strategic Goals and Priorities

- In addition, data and delivery improvements at the state level support USGS model development and daily delivery of water use Nationally

WUDR Competitive Awards Process

FY2016

- 18 proposals were awarded funding (~1.4M)

FY2017

- 15 proposals were awarded funding (~$1.32M)

FY2018

- 7 proposals were awarded funding (~$590k)

FY2019

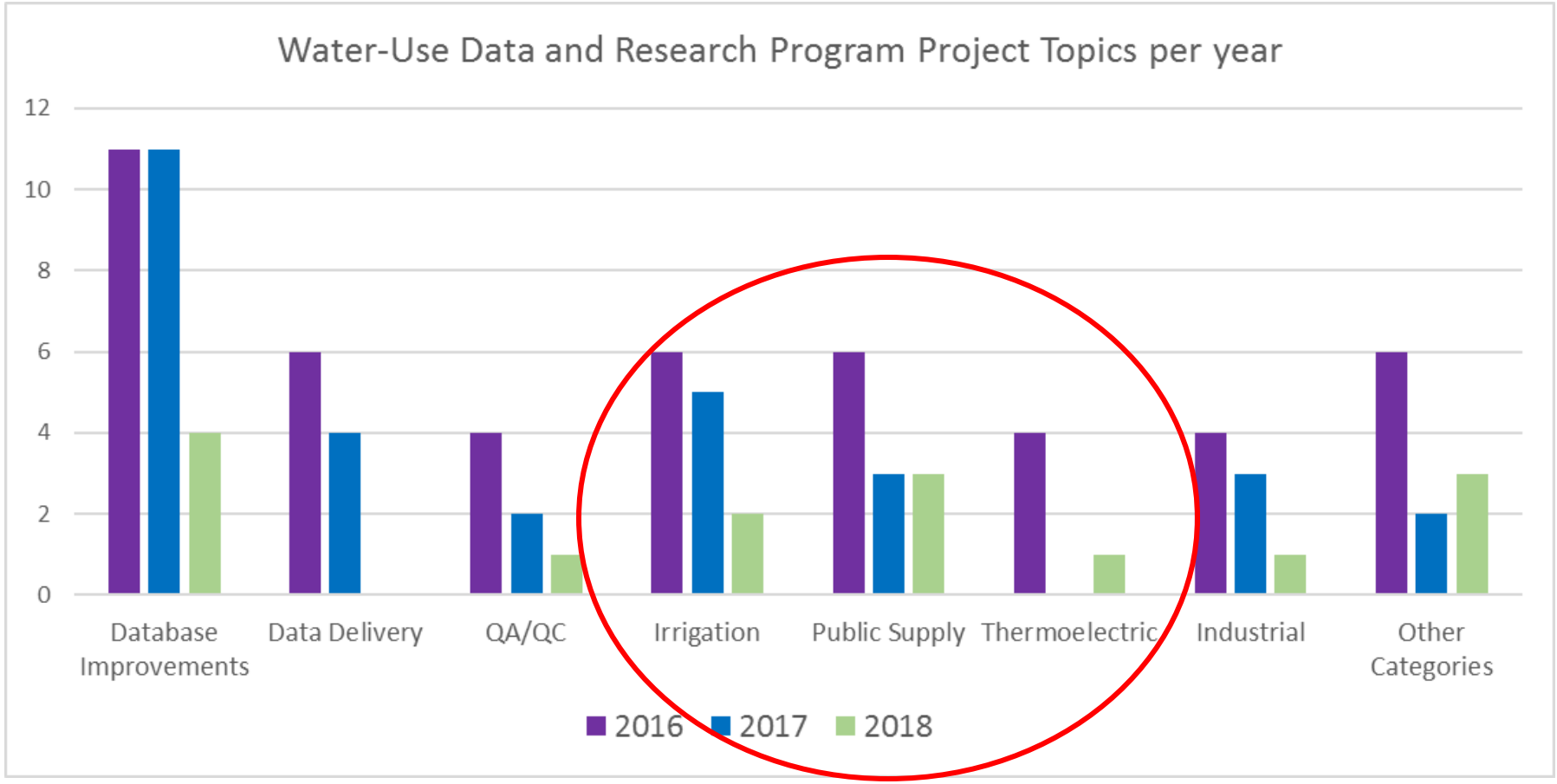
- 7 proposals were awarded for funding (~$59k)

FY19 WUDR Awards

- **Database Improvements**
  - Alabama eWater Application Upgrade – Phase 1
  - Consolidating the Display and Transferability of Water Use Measurement Data at IDWR
  - Proposal to improve the availability, quality and transfer of water use data estimated and collected statewide by the Vermont Department of Environmental Conservation.
  - Enhancements to the Water Use Estimation, Data Reporting and Analysis, and Data Availability Processes for the Nevada Division of Water Resources
  - Water Use Data Exchange across Multiple Agencies (Pennsylvania Department of Environmental Protection, Susquehanna River Basin Commission, and Delaware River Basin Commission) in Pennsylvania
- **Methods Development**
  - Real-time Flow Meter Readings to Improve Water Use Estimates for the Mississippi Delta
  - Agricultural Water Use Reporting Assessments to Support New Jersey Department of Environmental Protection's New Jersey Water Tracking Data Model (NJWaTr) Water Use Database

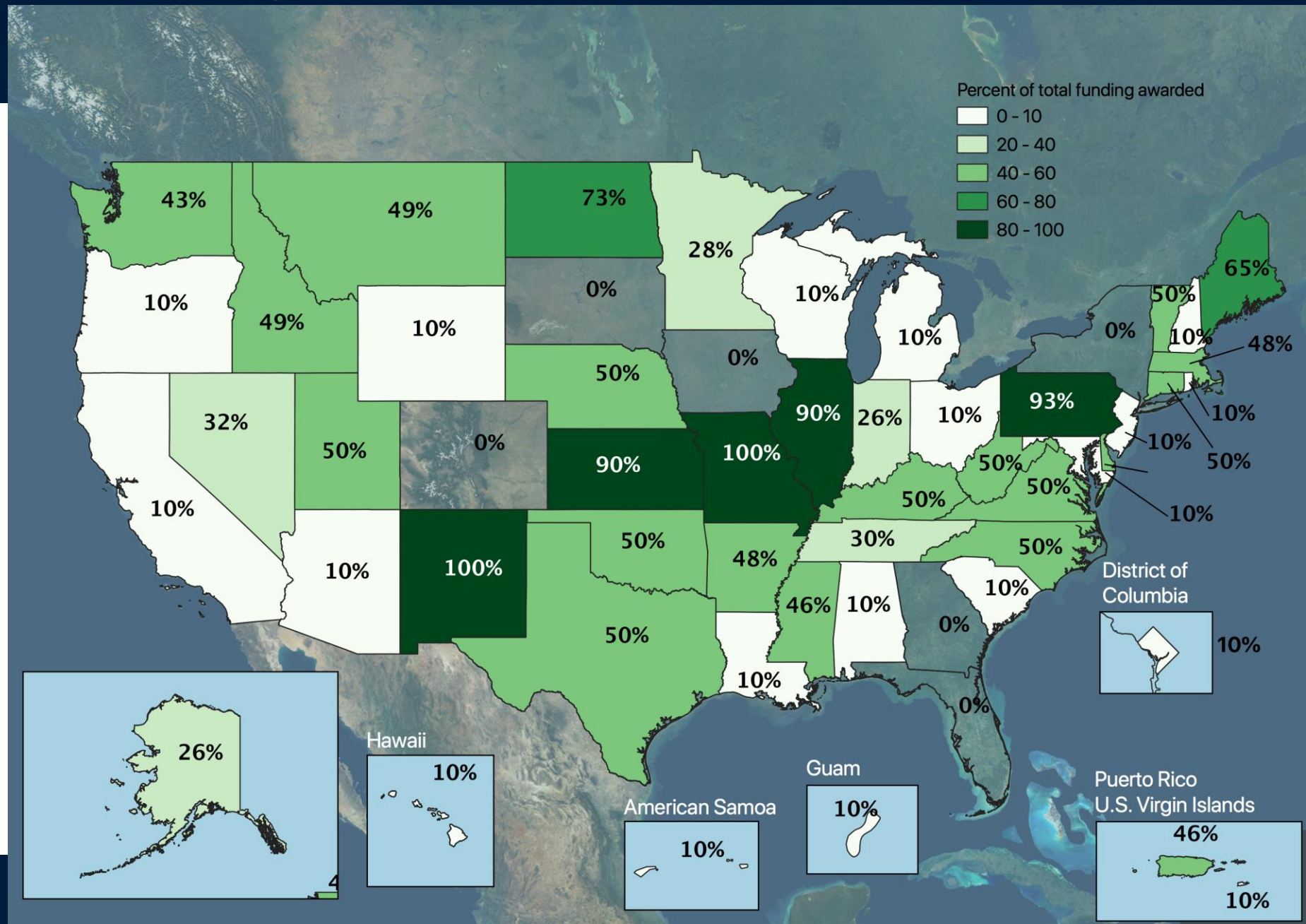
WUDR Project Summary

- 40 projects over 3 years
- Over half focus on database improvements
- States with multiple-year awards (ID, IL, KS ME, MO, MT, NM, ND, PA)
- Multiple projects support USGS water use model development



Percent of total funding awarded from Fiscal Years 2015-2018

- States can receive a cumulative maximum funding of $250,000
- States who have received 100% of funds are no longer eligible to participate
- Percentages reflect funding as of May 1, 2019



USGS

Collaboratively Improve Water Use Reporting

Improve Water Use Data Delivery Nationally

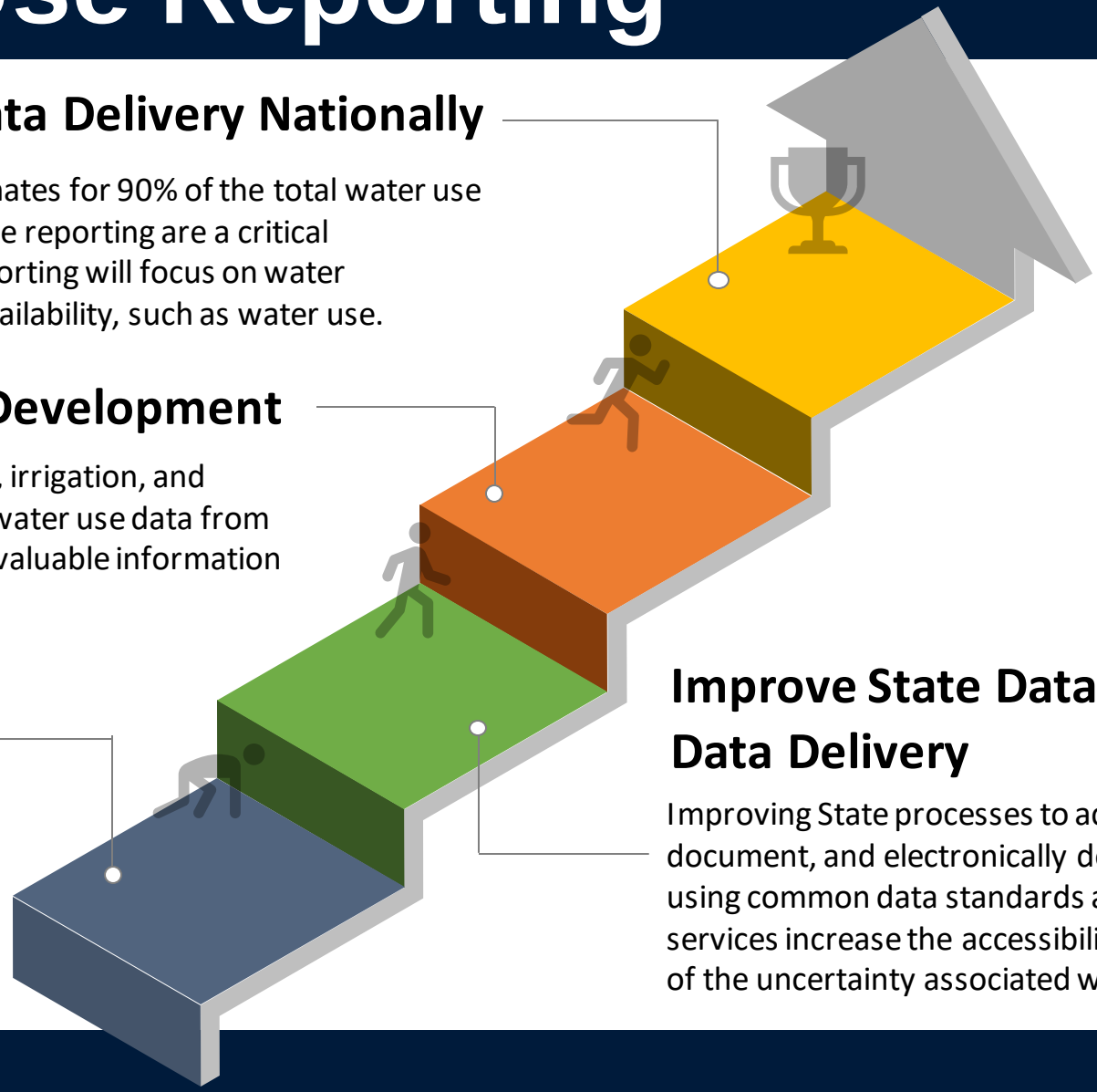
By 2022, USGS will report daily water use estimates for 90% of the total water use in the Nation. Improvements to State water use reporting are a critical component of this strategic goal. Five-year reporting will focus on water availability and trends in factors that impact availability, such as water use.

USGS Water Use Model Development

USGS is developing daily water use models for public supply, irrigation, and thermoelectric uses. These models need current, accurate water use data from State agencies. The models will provide resource managers valuable information needed to make management decisions.

Improve State Water Use Reporting

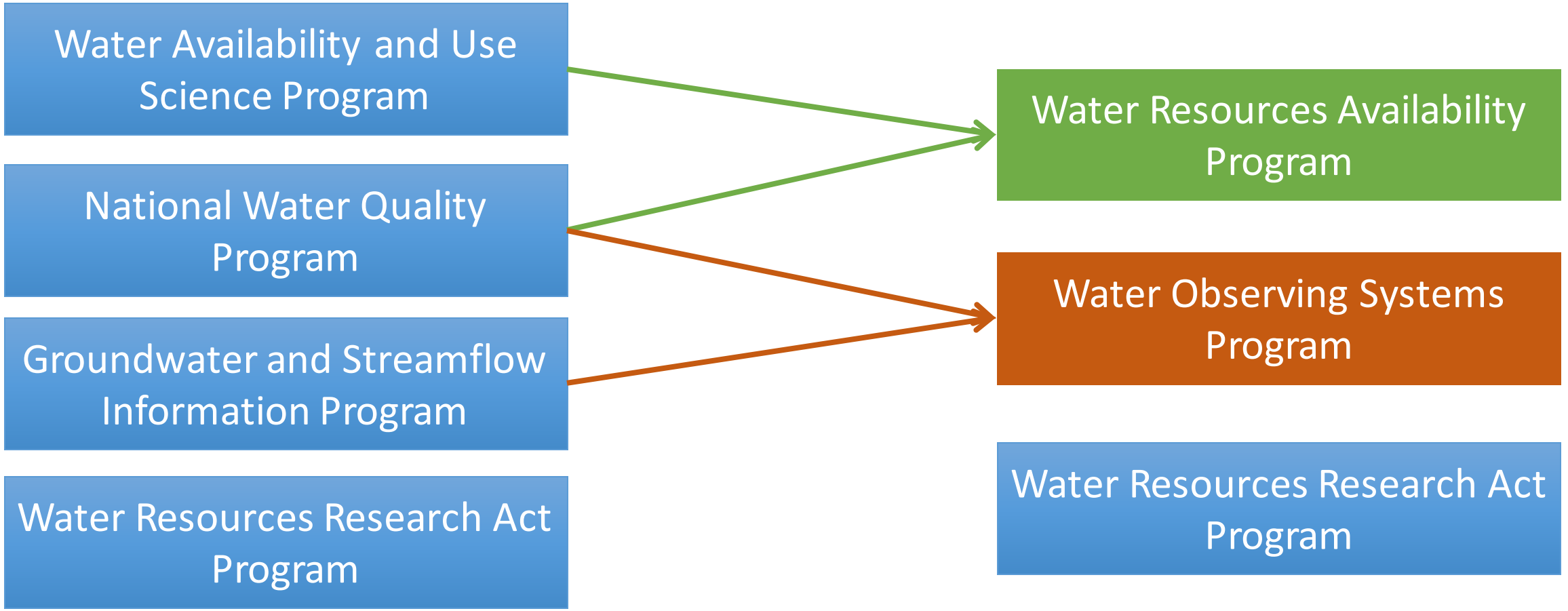
State agencies are looking for ways to improve water use data and tools to more accurately report and understand water use needs for multiple sectors. This information is critical to effective water resources availability management.



Improve State Databases and Data Delivery

Improving State processes to acquire, maintain, document, and electronically deliver water use data using common data standards and innovative web services increase the accessibility, and understanding of the uncertainty associated with reported data.

WMA FY 20 Proposed Budget Restructure



2020 Congressional Marks

Mission Area/Subactivity/Programs	2019	2020				
	Enacted	President's Budget	Changes	House Mark	Changes	Senate Mark
Water Resources						
Water Resources Availability Program						
Cooperative Matching Funds	*[23,216]*	*[20,397]*	*[1,500]*	*[24,716]*	*[0]*	*[23,216]*
Mississippi River Alluvial Plain Aquifer Assessment	[4,000]	[1,203]	-2,797	[1,203]	2,000	[6,000]
Transboundary Water Quality Assessment Strategy	[0]	[0]	0	[0]	1,500	[1,500]
Groundwater Hydrologic Studies in Fully Appropriated Western Basins	[0]	[0]	0	[0]	1,500	[1,500]
General Reduction (TBD)	[0]	[0]	0	[0]	-1,000	[-1,000]
Harmful Algal Blooms (includes CMF)	[3,471]	[2,652]	1,500	[4,971]	0	[3,471]
Total Water Resources Availability Program	**98,763**	**74,658**	**-949**	**97,814**	**4,000**	**102,763**

Questions

USGS
science for a changing world

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