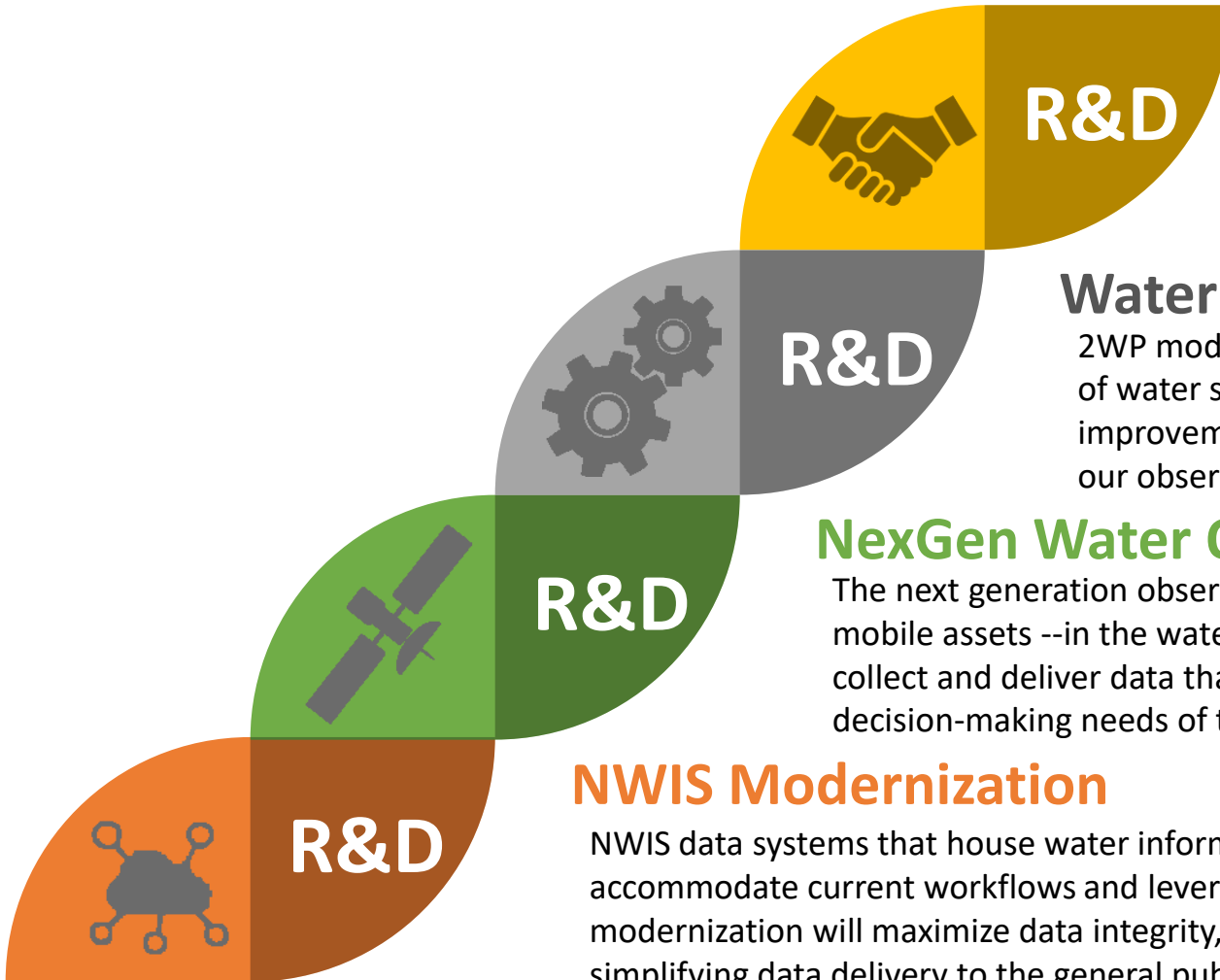


Integrated Water Availability Assessments



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.

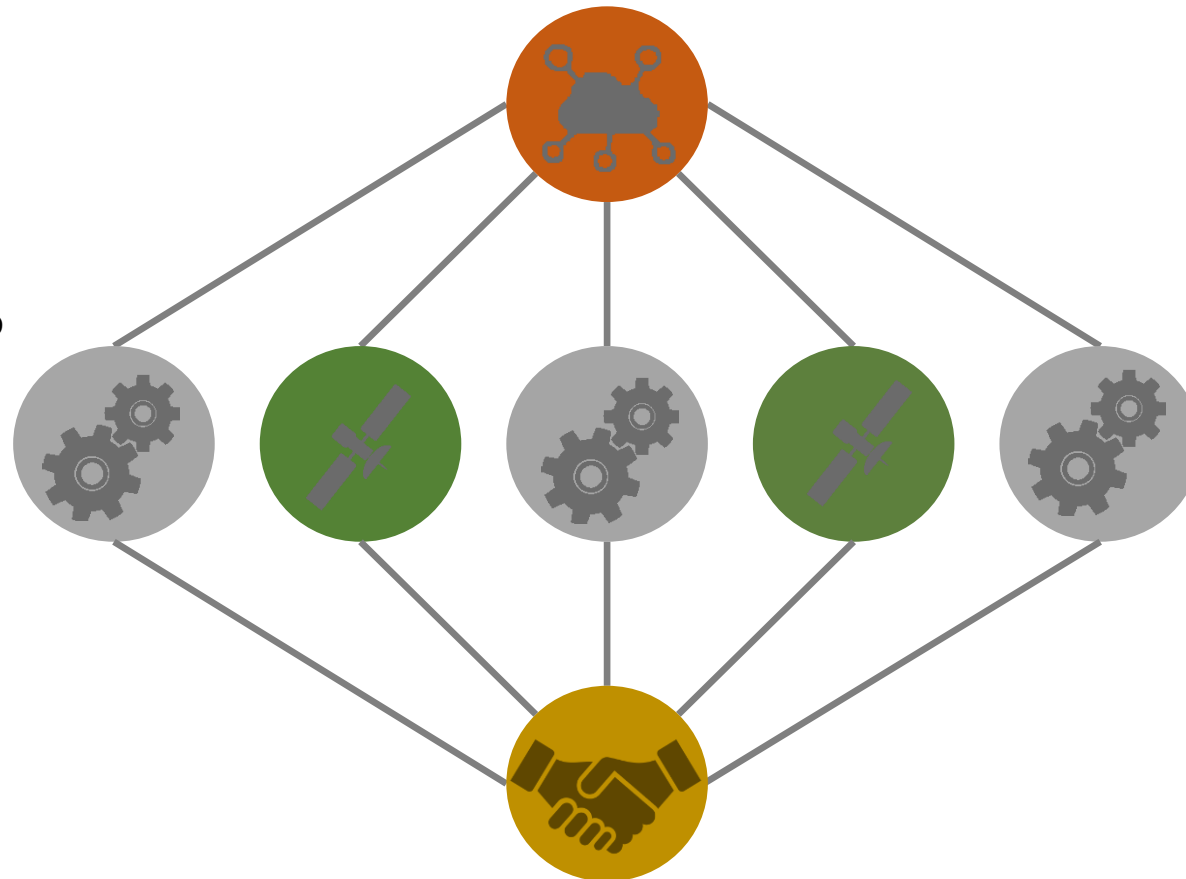
Collaborative Priorities

NWIS Modernization

NWIS Modernization is the backbone for all other WMA Priorities. NWIS modernization will maximize data integrity, reliability, accessibility while simplifying data delivery to the general public.

NGWOS

NGWOS will provide high temporal and spatial resolution water data that support modern water prediction and decision support systems to address complex water challenges



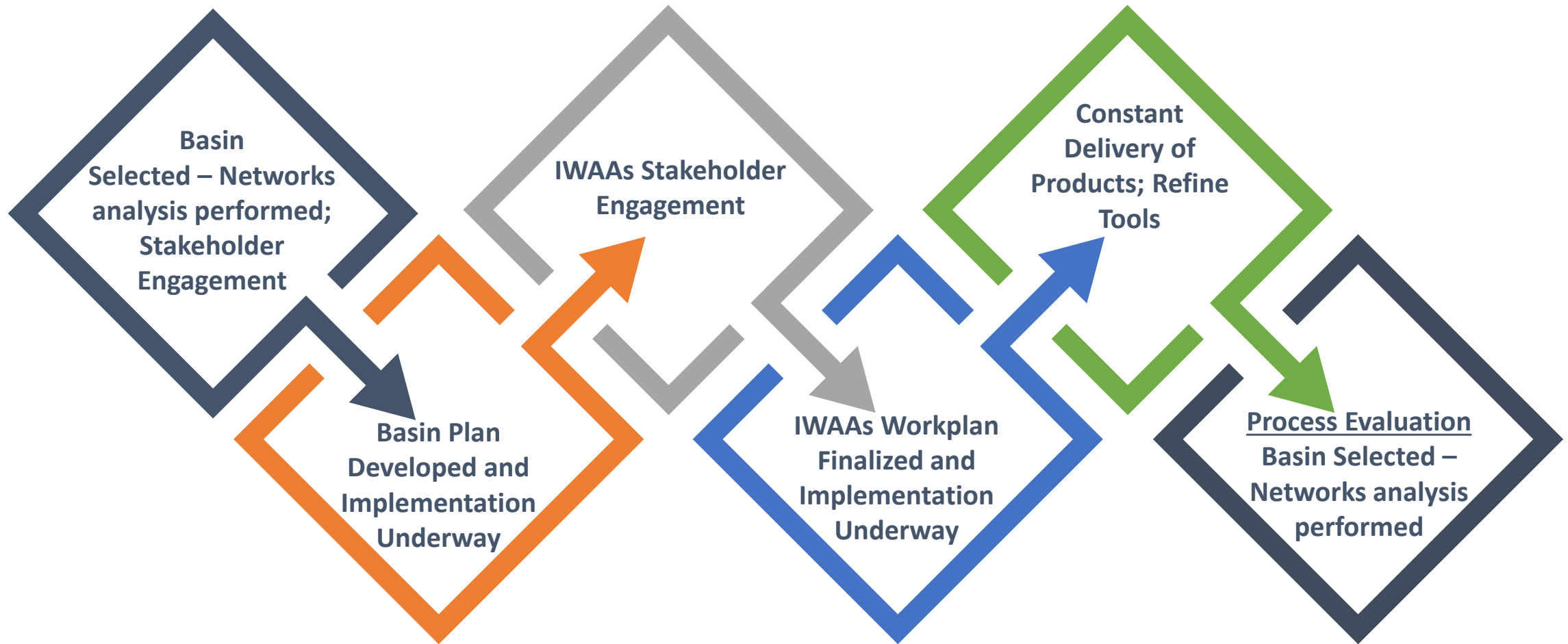
Water Prediction

2WP supports NGWOS through pre-basin gap analysis. 2WP is the framework that IWAAs will use for both National and Regional Assessments.

IWAAs

IWAAs will use the data, information, and tools collected and developed through NGWOS and 2WP to provide an assessment of current and future water availability at both National and Regional extents.

Sequencing Basin Activities

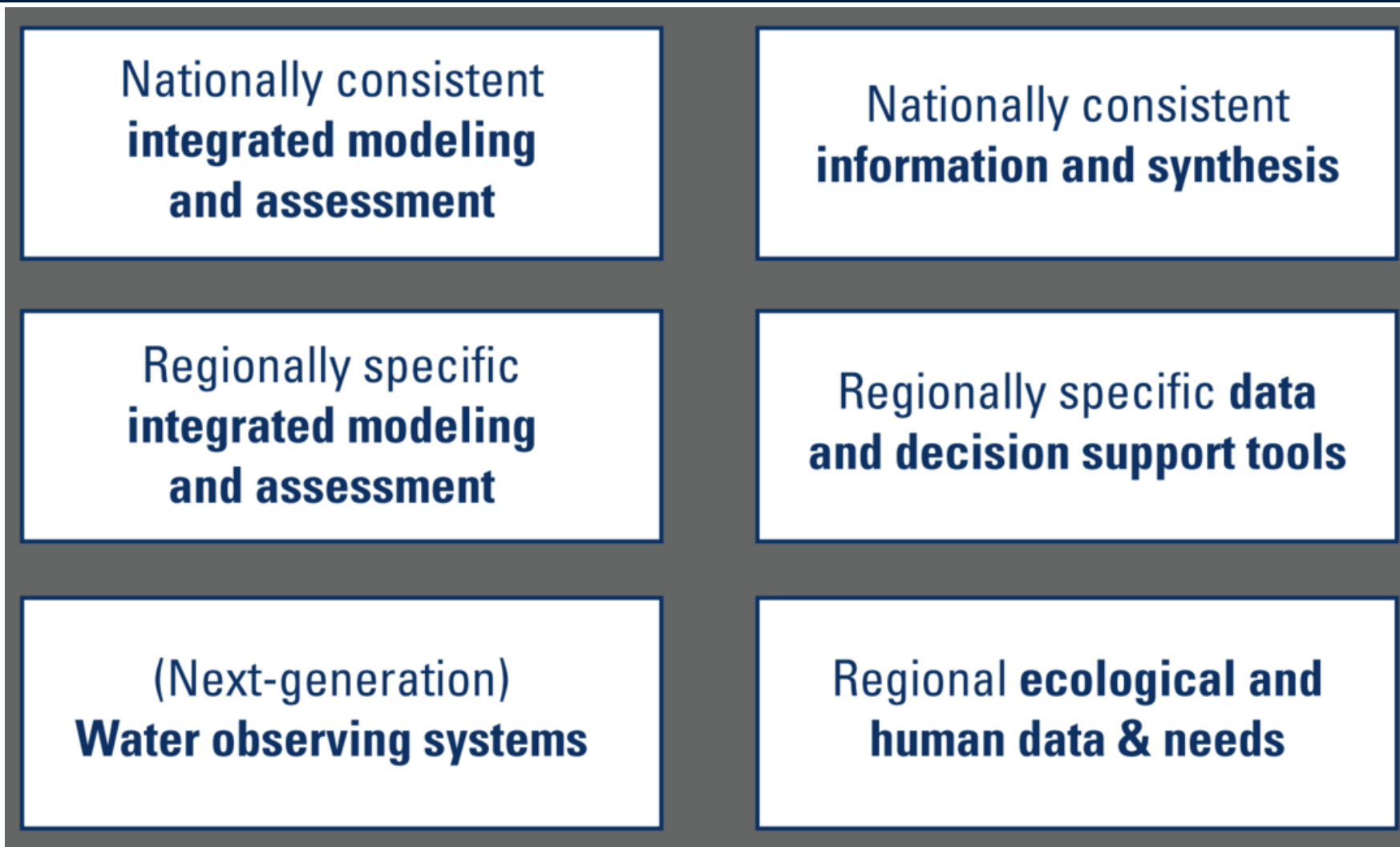


Integrated Water Availability Assessments

SECURE Water Act



IWAAs Framework



Integrated Water Availability Assessments (IWAA)

Address requirements outlined in SECURE Water Act

- Status and Trends of Water Resources - Quantity and Quality
- Develop National Scale Indicators of Availability
- Develop and Apply Predictive Tools

When fully implemented, IWAAAs will:

- Evaluate current water supply and demand, quality, and use;
- Evaluate long-term trends in water availability, inclusive of water quantity and quality;
- Provide seasonal to decadal forecasts of availability; and
- Inform water resource decisions through development of socioeconomic tools.

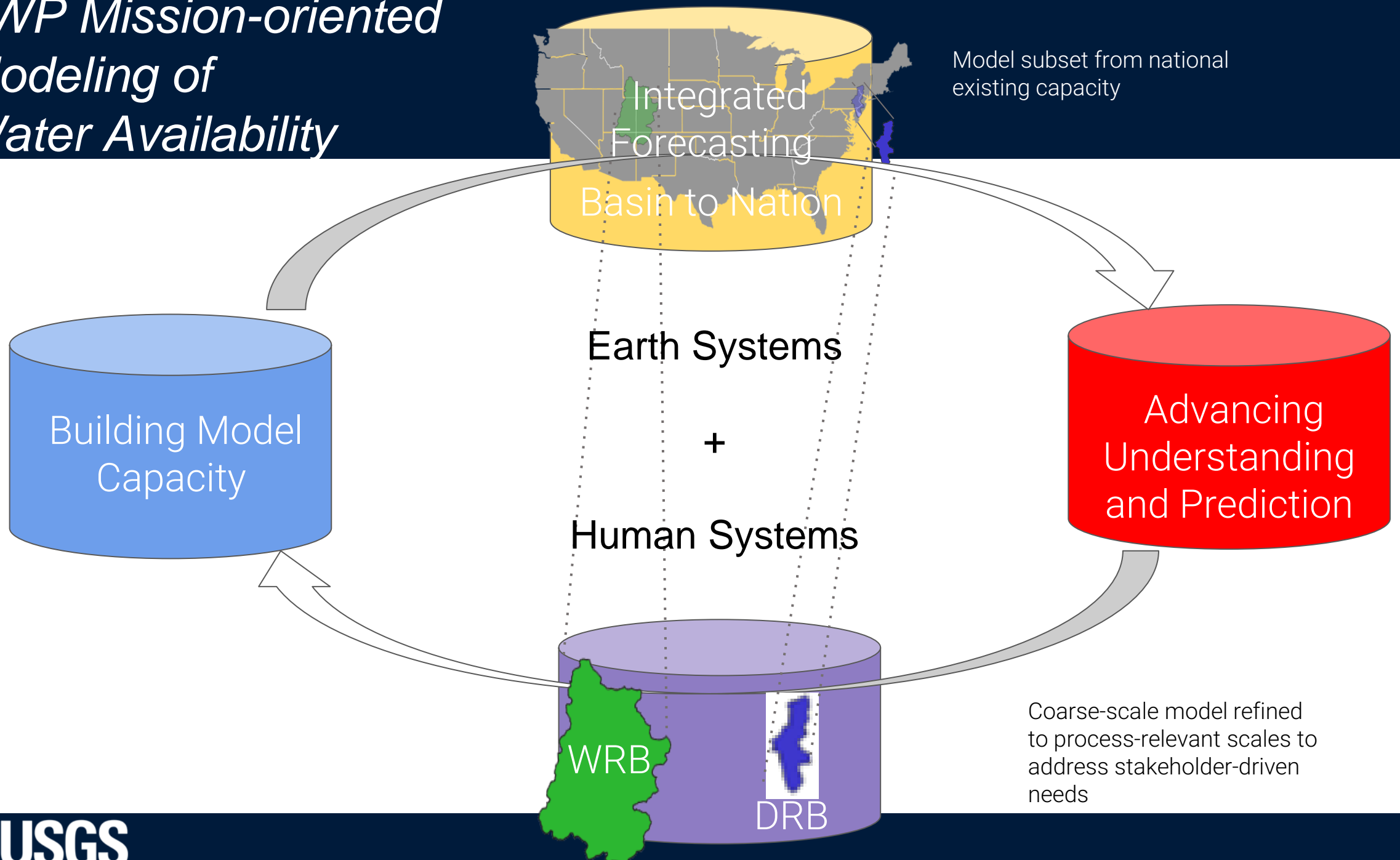
Water Prediction

IWAAs will use 2WP as the framework for delivering assessments

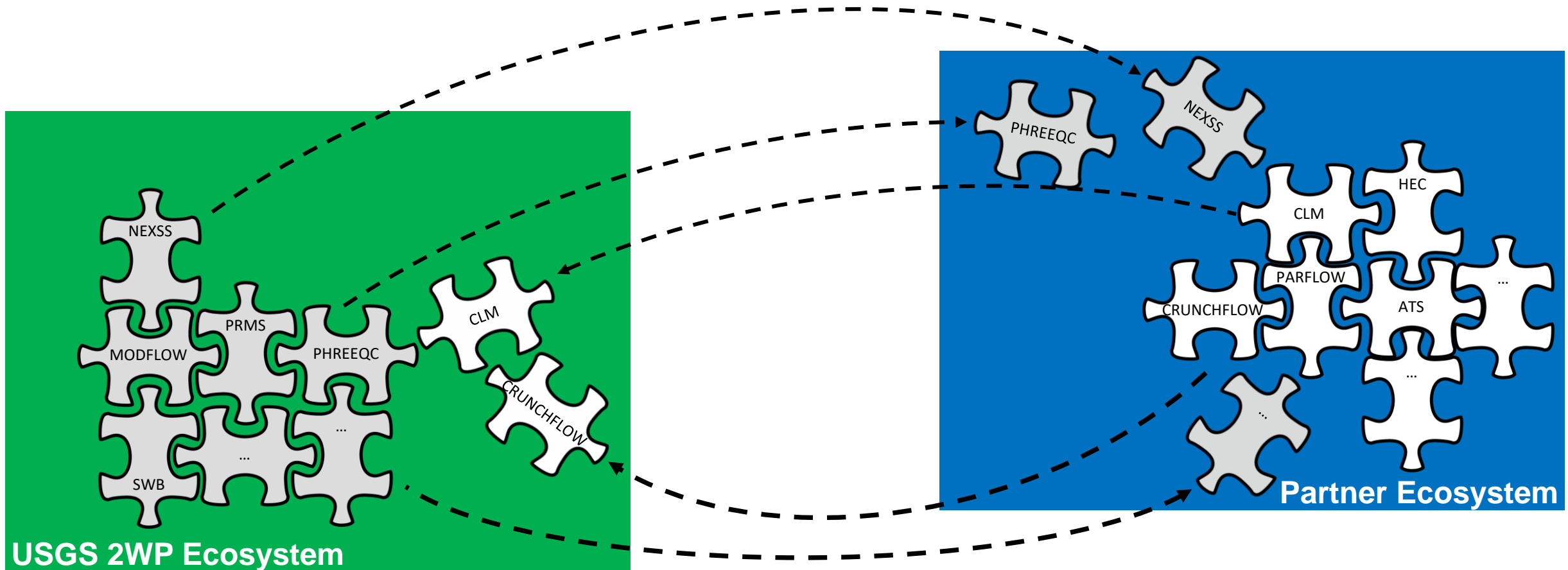
2WP is a Integrated Hydro-terrestrial Modeling Framework (IHTMF) and will be a National asset supporting the Nation's earth and biological system prediction capability of system *structure, function and evolution* over a range of temporal and spatial scales, including:

- Surface and subsurface hydrological processes
- Stream temperature
- Surficial and relevant landscape processes
- Transport, storage, and biogeochemical alteration of constituents
- Ecological processes

2WP Mission-oriented Modeling of Water Availability



Intentional Interoperability



Incorporating Water Use Science

- **Respond to widely recognized need for improved water use data and information**
 - Temporal
 - Spatial
- **Develop daily withdrawal models to account for 90% of use**
 - Thermoelectric
 - Irrigation
 - Public Supply

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

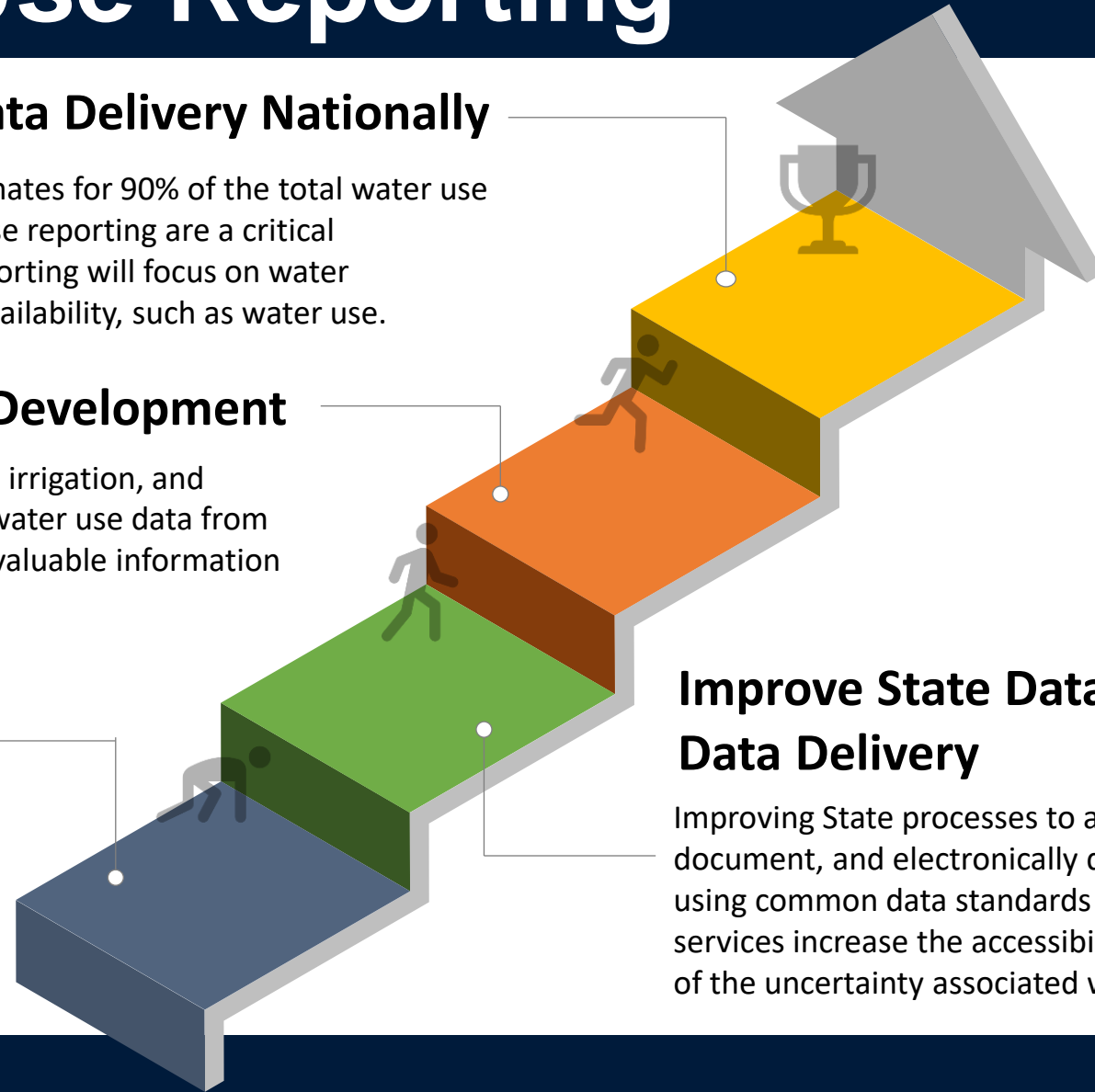
USGS is developing daily water use models for public supply, irrigation, and thermoelectric uses. These models need current, accurate water use data from State agencies. The models will provide resource managers valuable information needed to make management decisions.

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.



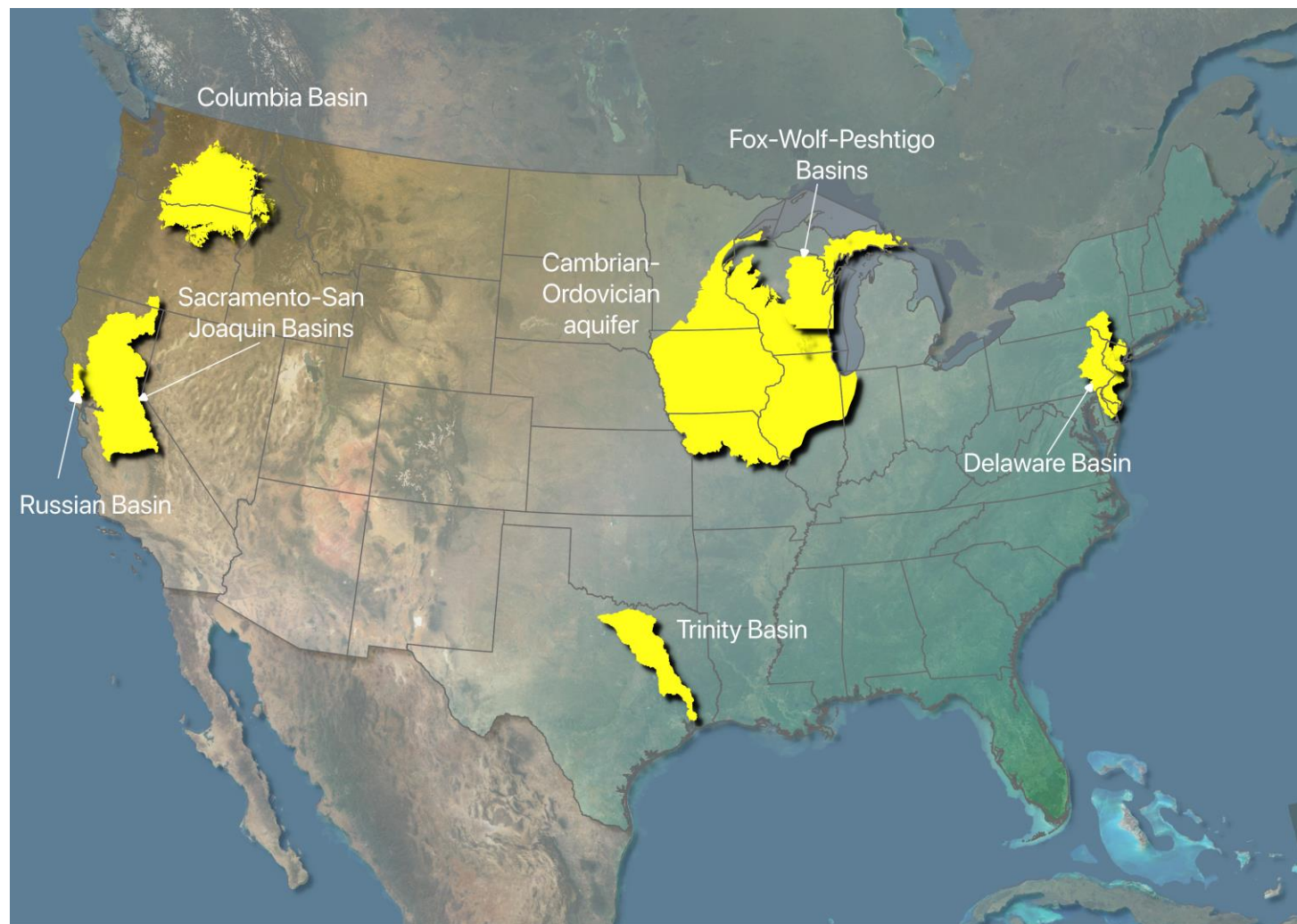
Incorporating Water Quality

Water-quality constituents, in order of number of 303d listings (reported surface water impairment)	Consumptive water uses from "Estimated use of water in the United States in 2015" (USGS circular 1441)								Instream water uses for ecosystem services		
	Aquaculture	Self Supply (GW)	Public Supply	Irrigation	Livestock	Mining	Industrial	Thermoelectric Power	Recreation	Fishing	Ecological Health
Pathogens/microorganisms											
Sediment											
Phosphorus											
Mercury											
Salinity (TDS, Major Ions)											
Temperature											
Dissolved oxygen											
Hydrophobic organics (PAHs, PFOs, etc.)											
Metals (Mn, Pb, radionuclides, etc.)											
Nitrogen											
Total organic carbon and disinfection byproducts											
Pesticides											
Contaminants of emerging concern											
Harmful algal blooms											
Flow alteration: magnitude/variability/timing											

2WP priority tiers from the constituents prospectus	Potential importance as a factor influencing water availability
Tier 1	Possible strong effect
Tier 2	Possible modest effect
Tier 3	Little or no effect expected

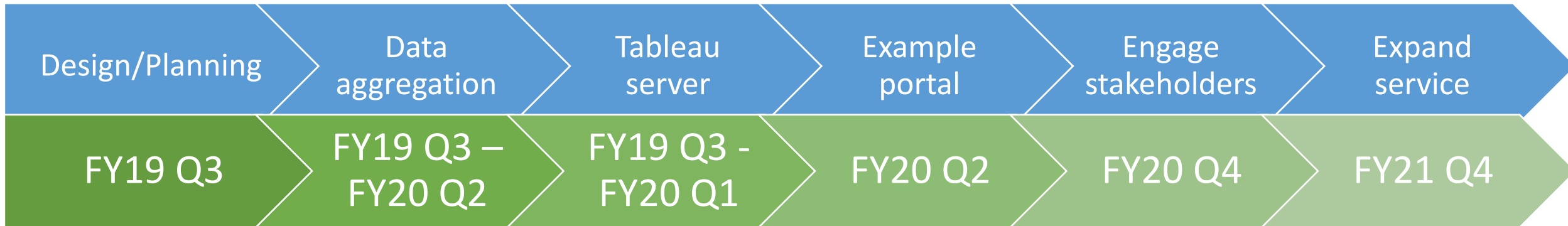
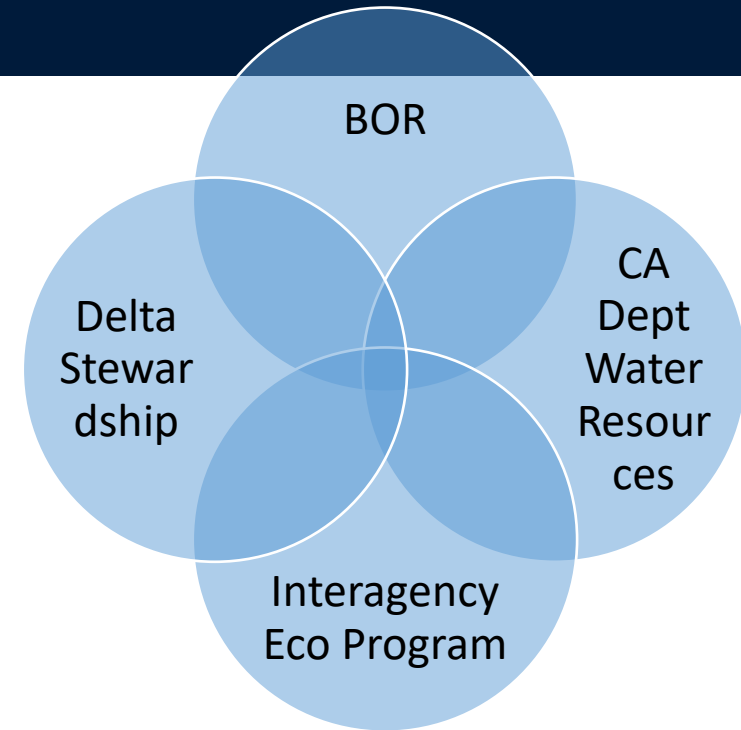
IWAAs Pilots

- 10 pilot projects selected to begin in FY19
- Topics include:
 - DRB Drought
 - Visualization
 - IWAAs pilot in Trinity River Basin
 - Informing process for incorporation of QW into models
 - Development of GSFLOW processes



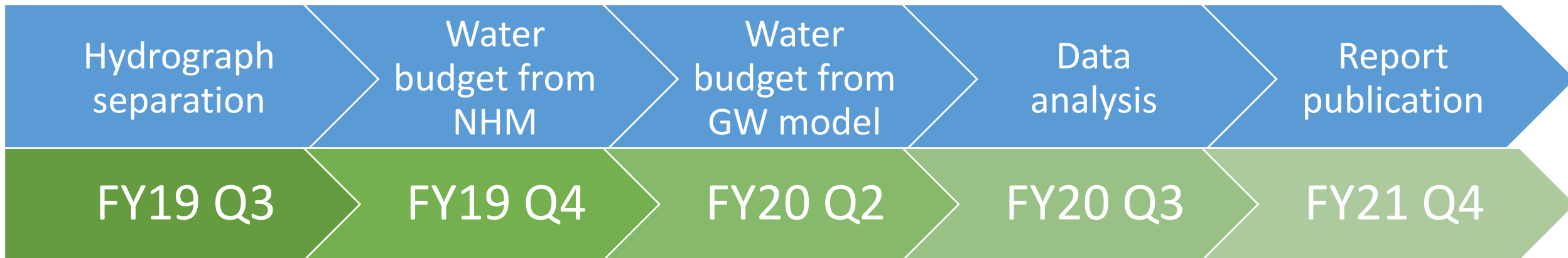
Data Playground

- Provide direct access to data visualization ‘dashboards’ custom designed to aggregate data sets associated with specific community needs and issues.
- As part of the dashboards, provide the capability for users to explore the data by, e.g., selecting or combining data type, data source, time period, frequency, geographic scope, or type of analysis.



Columbia Plateau

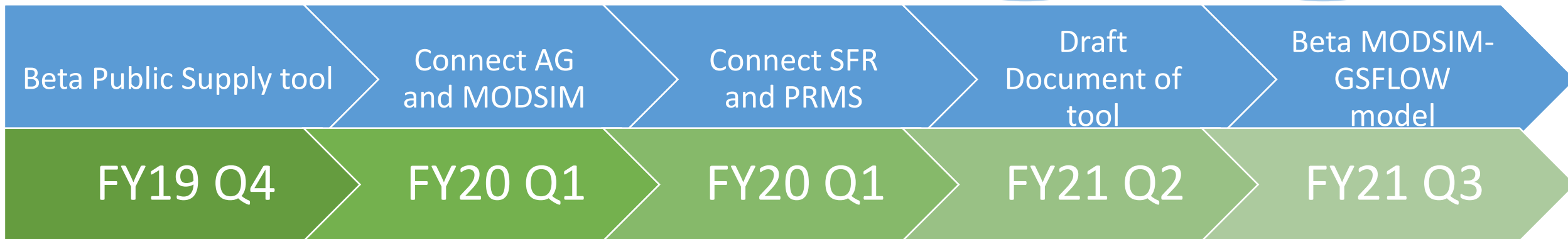
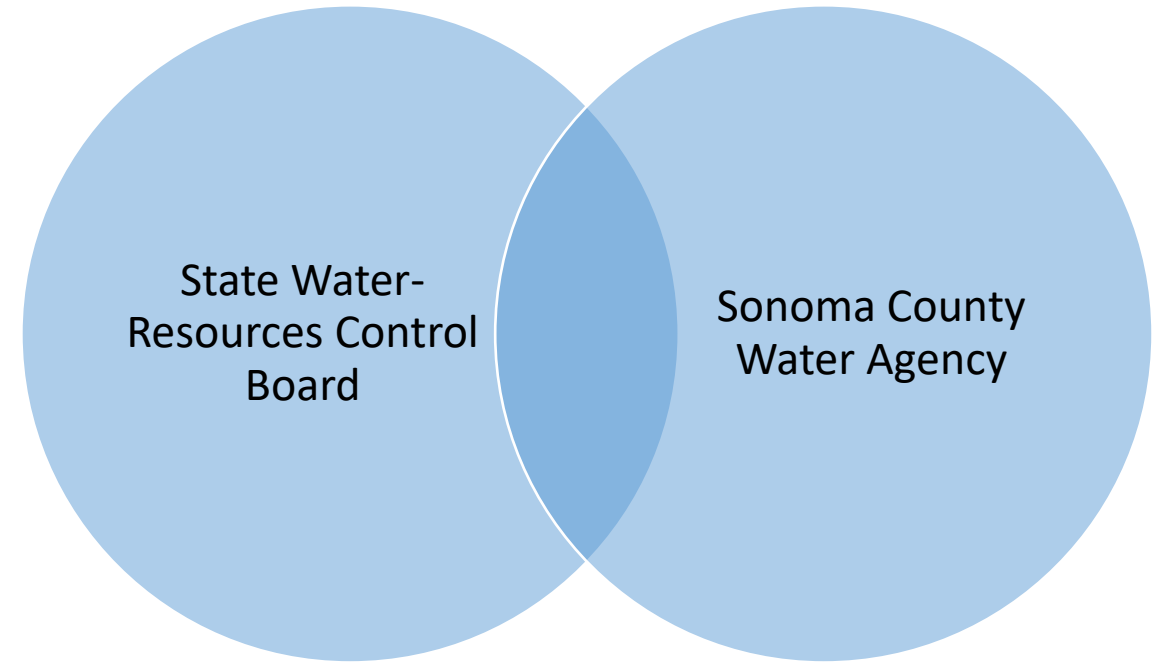
The objectives are to assess a regional GW model inform and improve the NHM's capability in simulating and predicting baseflow and to evaluate approaches for future research and development of the NHM.



Russian River

Project objectives include:

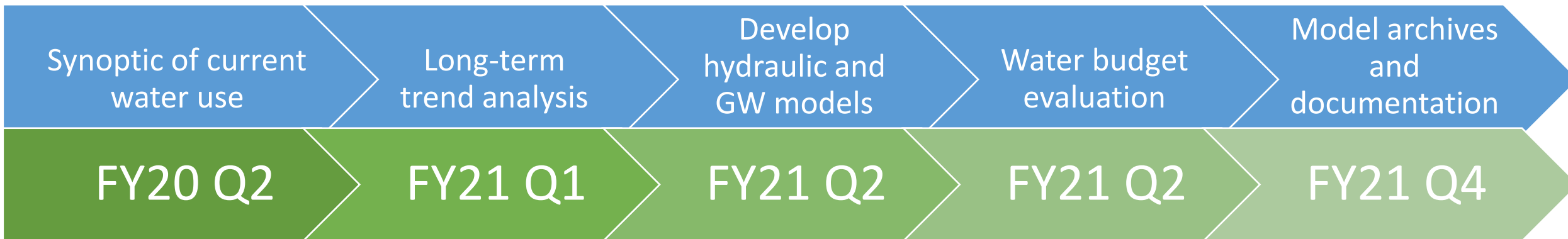
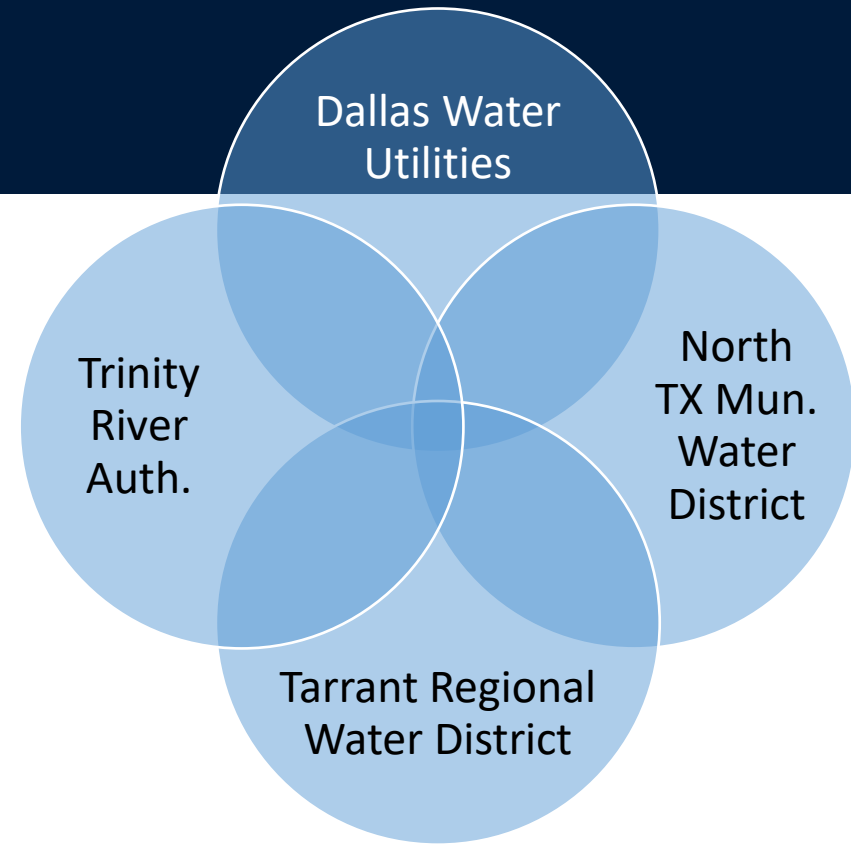
- enhancement of the GSFLOW code to represent irrigation supply ponds, and water use for frost-protection and heat protection of crops
- development and application of innovative methods for estimating municipal and industrial water use



Trinity River Pilot

Project objectives include:

- improved understanding of the hydrologic processes is needed to help resource managers manage the basin
- balancing environmental requirements with the various human water supply needs is essential for successful future planning



Presidential Memorandum on Western Water Availability

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.

Initial IWAA Deliverables

Operational Delivery

Daily delivery of water availability indices focused on quantity

2019



Incorporate Quality

Daily delivery of water availability indices inclusive of quantity and quality

2020



Incorporate Use

Daily delivery of water availability indices inclusive of quantity, quality, and use.

2021



DRB Drought Pilot

Begin drought pilot in DRB focused on drought of record under current supply and demand conditions

2019



Align Basin Selection with NGWOS

Develop Implementation Plan coordinated with NGWOS for Regional IWAAs

2020



2021



Implement Full IWAAs in Western Basin

Develop a workplan through stakeholder engagement.

Questions

