

The Western State Water Council Water Data Exchange (WaDE) Program 2.0 Demo

WestFAST Webinar
August 25, 2020

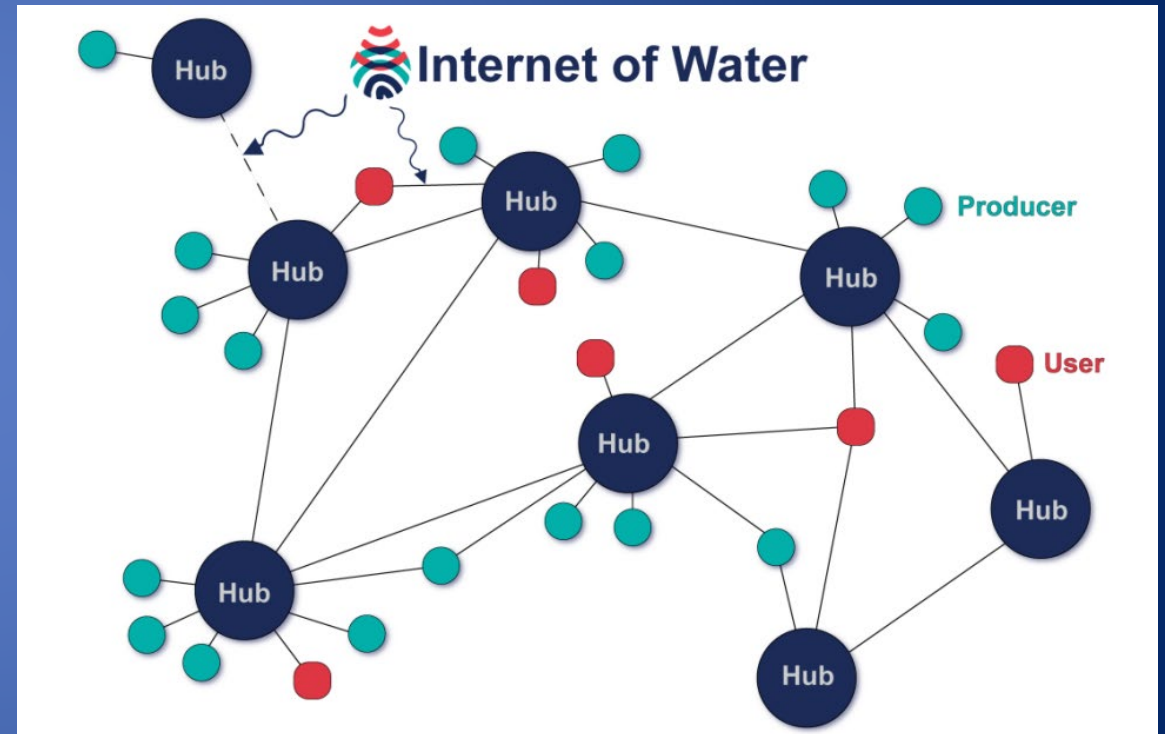
Tony Willardson, WSWC Executive Director
Adel Abdallah, WaDE Program Manager
Ryan James, WaDE Data Analyst



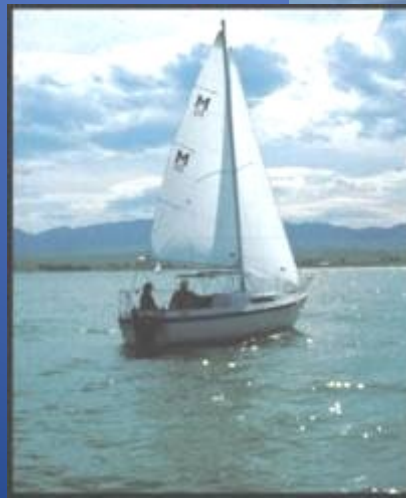
WESTERN STATES
WATER COUNCIL

Outline

- Background: Why WaDE?
- Architecture: How does it work?
- Collaboration with USGS/WUDR
- Demo and Use Cases
- Next Steps



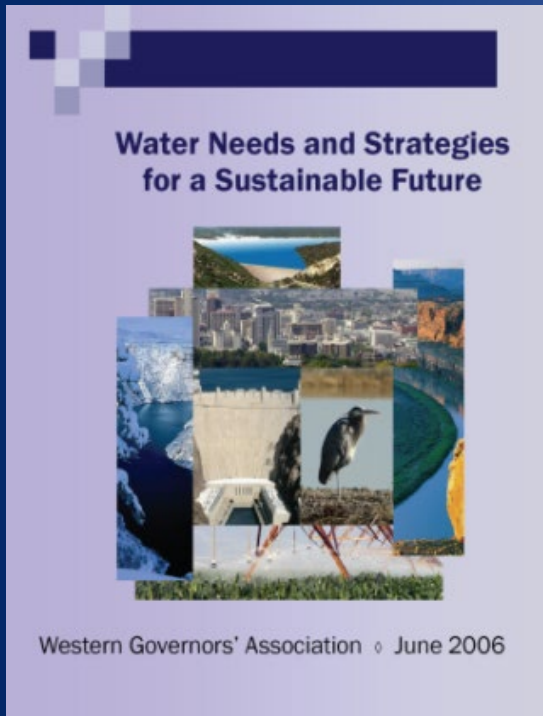
The future growth and prosperity of the western states depend upon the availability of adequate quantities of water of suitable quality to meet or diverse economic and environmental needs.



2006 WSWC-WGA Water Report

To encourage sustainable growth policies and plans, states should identify the water demands and impacts associated with future growth.

Additionally, states should develop integrated growth and water resource scenarios so that the consequences of various growth scenarios can be evaluated for both the near and long term.







- Albuquerque
- Denver
- Las Vegas
- Los Angeles
- Phoenix
- Salt Lake City
- San Diego
- Tucson.

Water Data Exchange (WaDE) Program

Historical Perspective

- Water and energy nexus
- Enable states to share water data with each other, federal agencies, and the public in a streamlined and interoperable way to facilitate planning efforts



**Sandia
National
Laboratories**



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WaDE through Phases

PHASE I (2012-2018):

Establish the WaDE program, build relationships, and create WaDE 1.0 data system

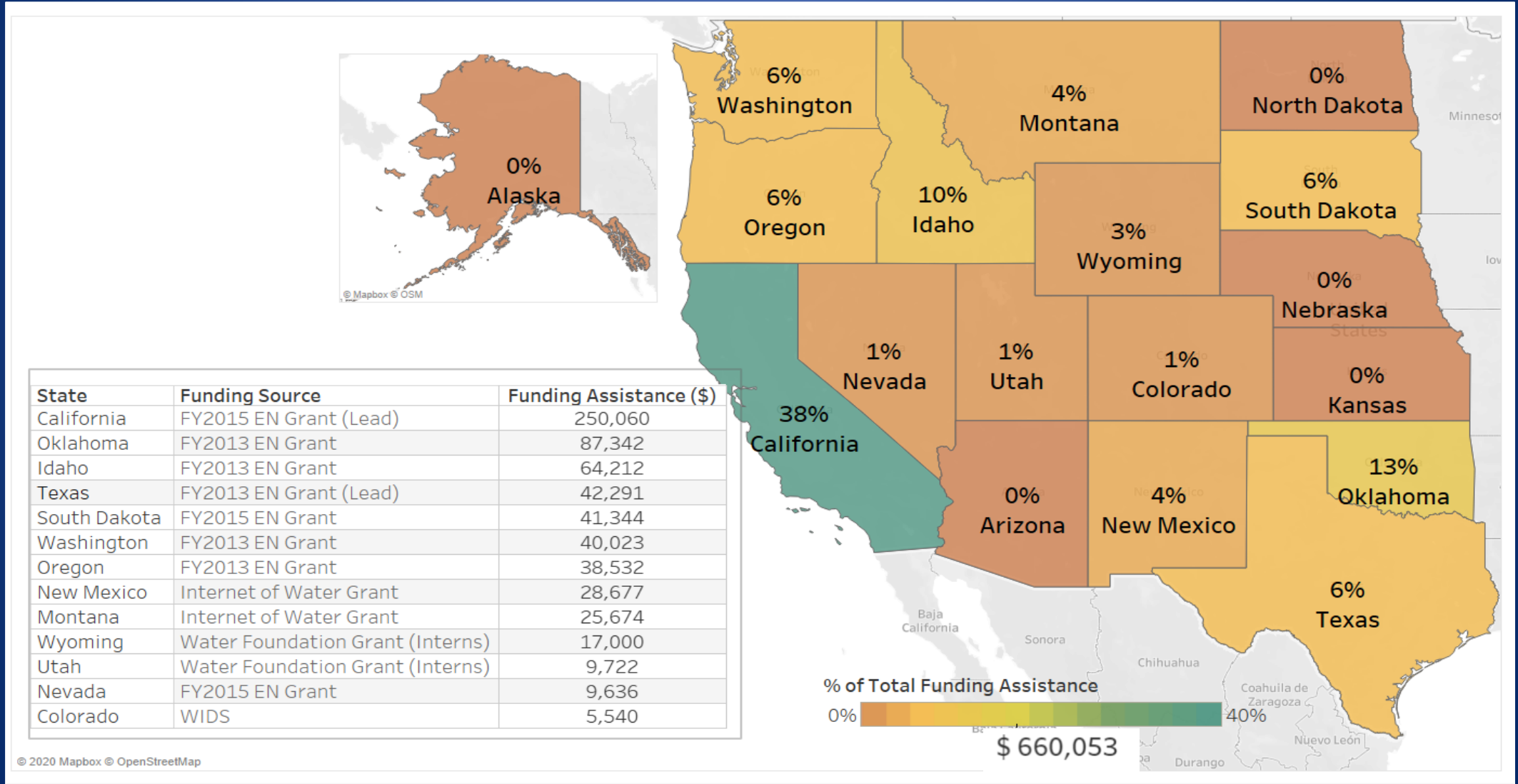
PHASE II (2019-2021):

Improve schema to 2.0, leverage cloud hosting and build interoperability for use cases

PHASE III (2022-2026 & beyond):

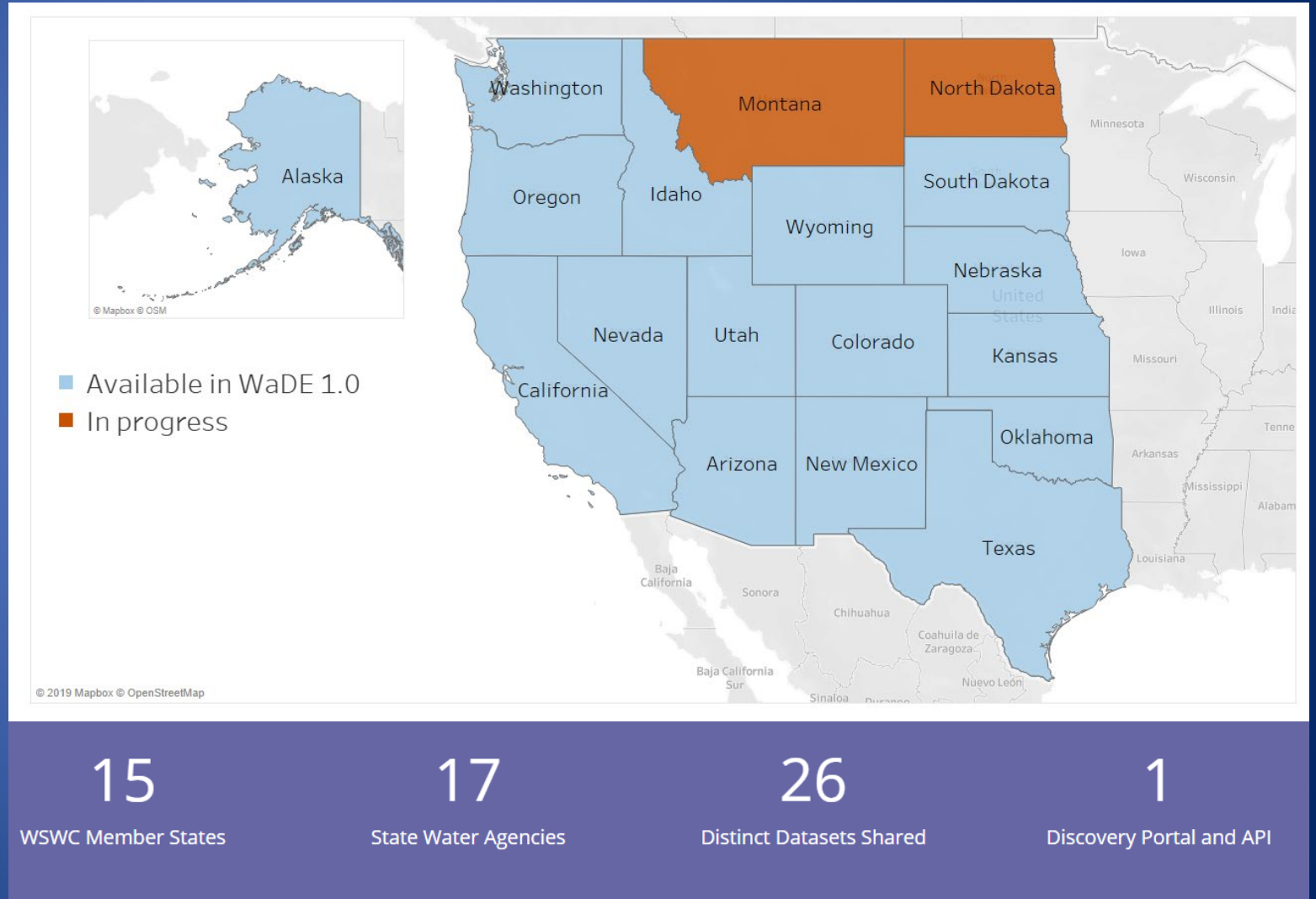
Launch WaDE portal, demonstrate interoperable use cases, automate data imports, explore options to sustain the program operations

Assistance to Secure **Funding** to Member States



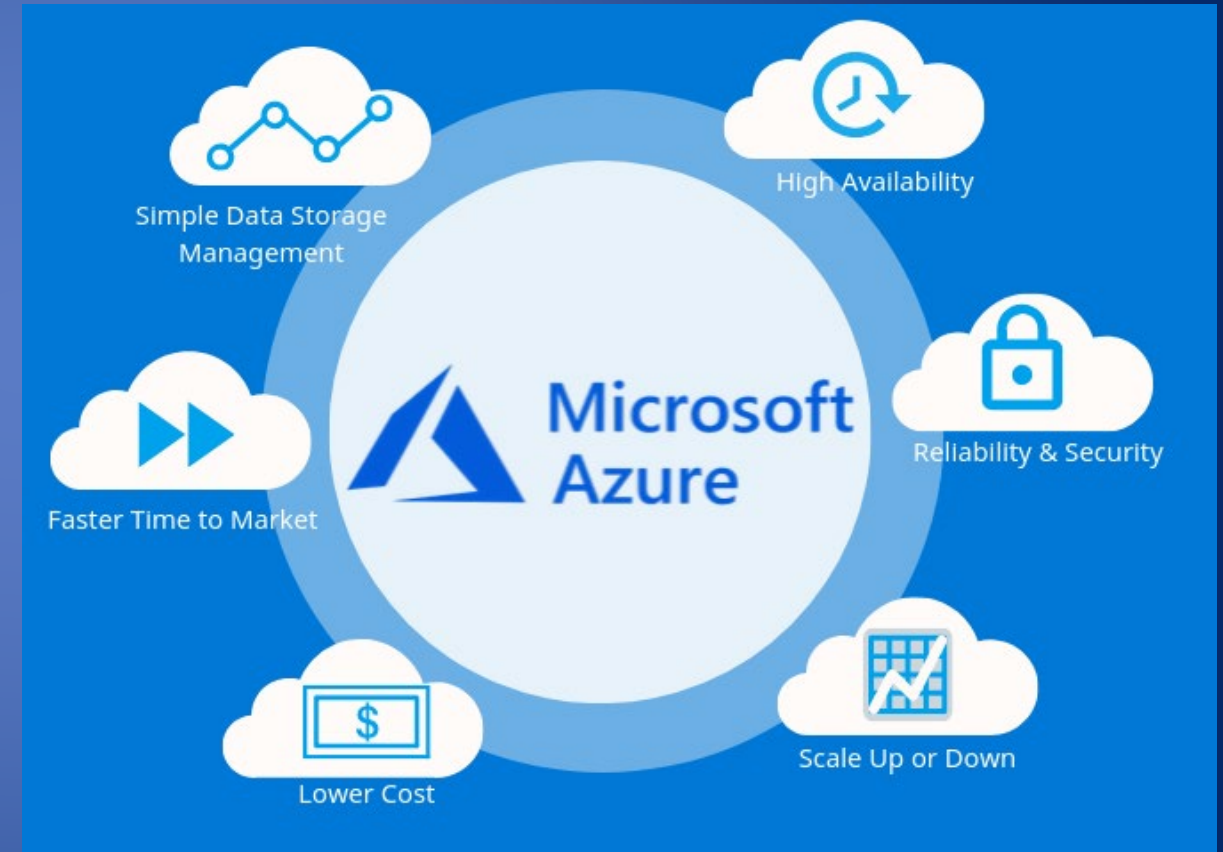
Available Data in WaDE Phase I: 2012-2018

1. Water rights
2. Aggregated water budget estimates
3. Site-specific use and withdrawals
4. Regulatory overlays

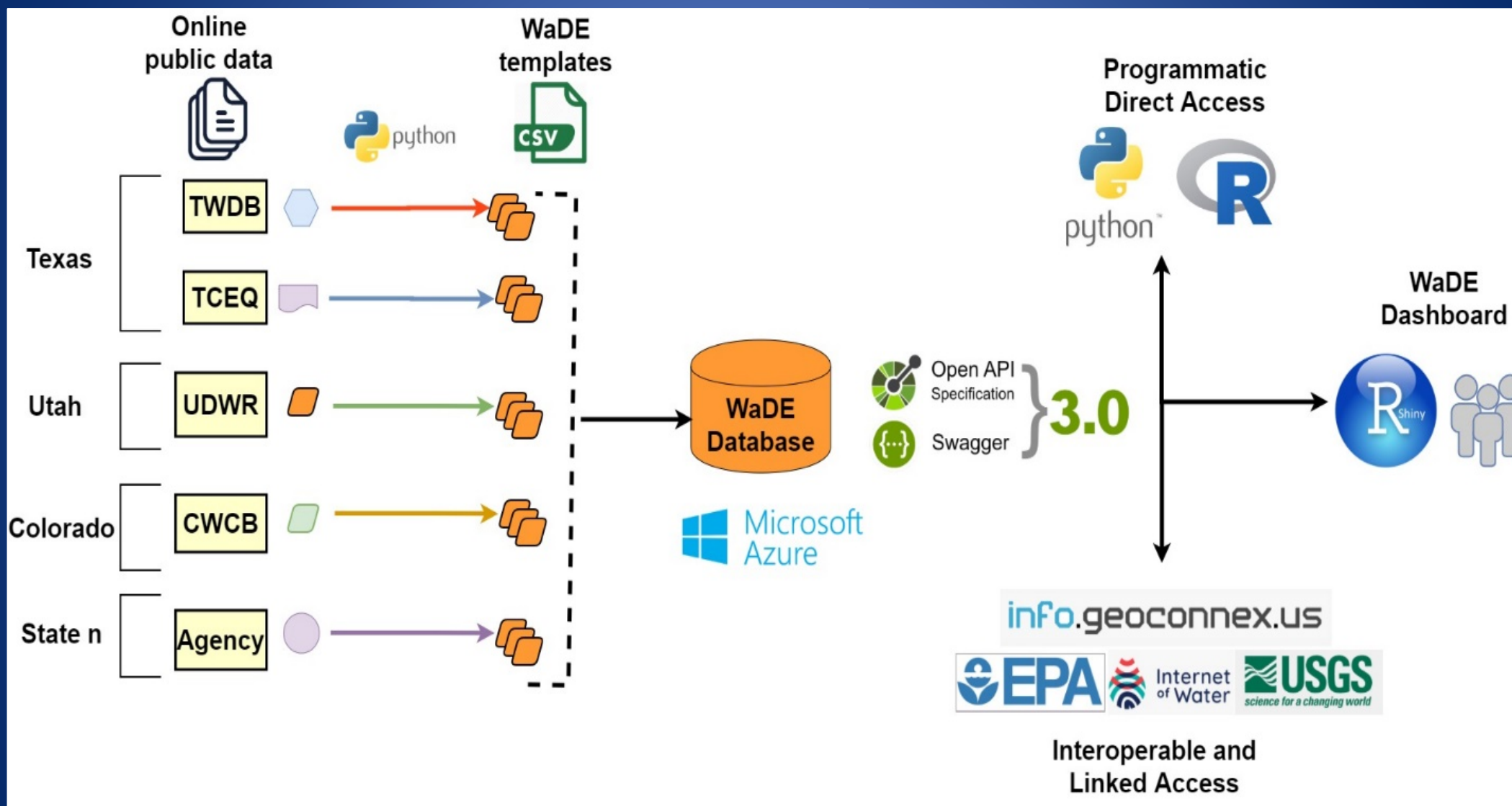


Why WaDE Phase II?

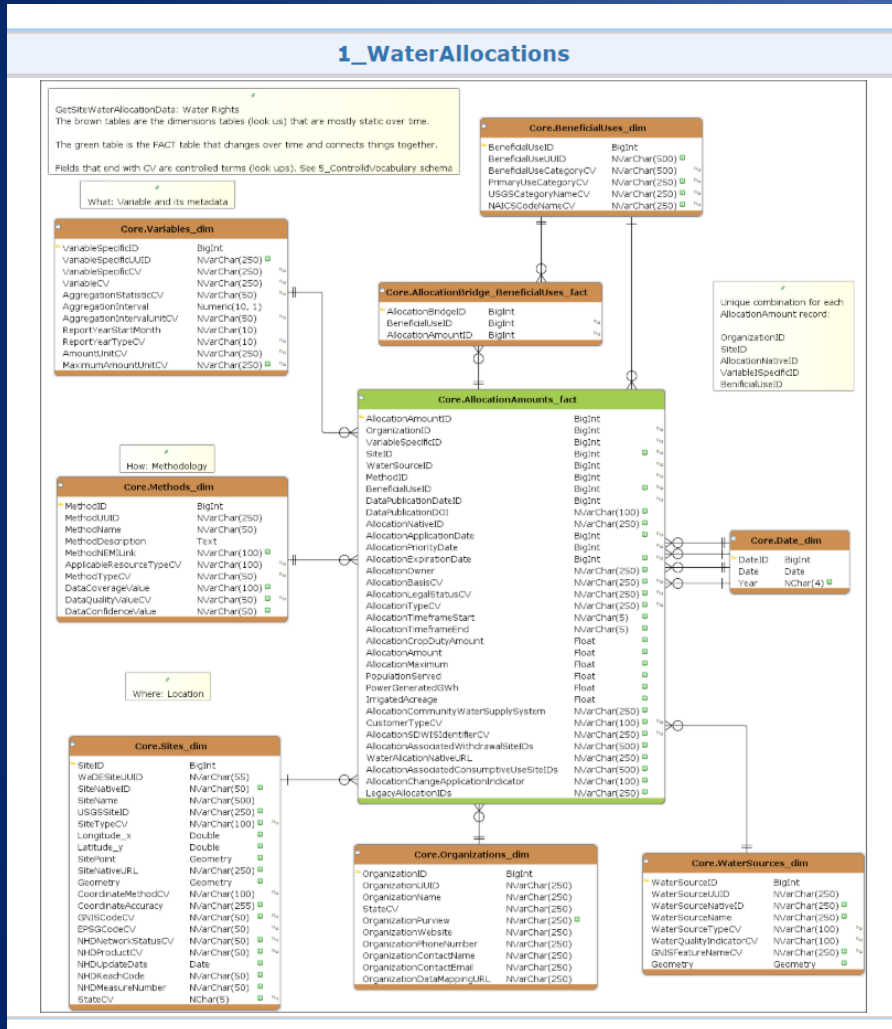
- Improve **scalability**, monitoring, updates, and efficiency
- Support **geospatial and time series** water use data in a centralized system
- Agreed-upon metadata and vocabularies across the **Councils' members and with USGS**



Water Data Exchange Architecture 2.0



WaDE 2.0 Schema and API



<https://schema.westernstateswater.org>

Servers

<https://wade-api.azure-api.net/v1>

Azure Production



WaDE Admins Secured WaDE Admin-only calls

Developers Operations available to regular developers

GET

/SiteAllocationAmounts retrieves water allocations (water rights) data for a site

GET

/SiteAllocationAmountsDigest retrieves water allocations (water rights) data for a site

GET

/AggregatedAmounts retrieves time series data for aggregate data (water budgets within geospatial areas)

GET

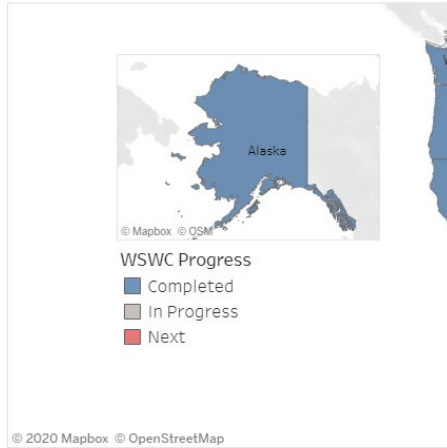
/SiteVariableAmounts retrieves time series data for given site and specific variable for a site

GET

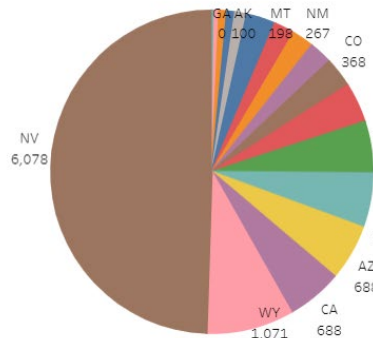
/AggRegulatoryOverlay retrieves data for each of the HUC, county, or planning region's regulatory and institutional concerns.

<https://app.swaggerhub.com/apis/WesternStatesWater/WaDE2.0>

Vocabulary Fetch Progress Map

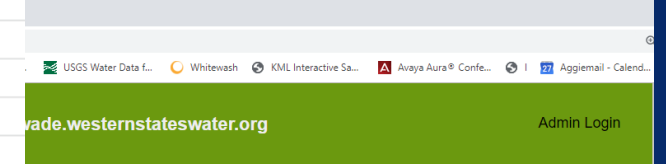


Number of Vocabulary Per State



Name	State	WaDEBeneficialUse
Net Effect On River	CO	Environmental
72-12-1 Prospecting or development of natural	NM	Environmental
Sediment Control	MT	Environmental
Water Quality Improvement	ID	Environmental
Water Quality Improvement From Storage	ID	Environmental
Water Quality Improvement Storage	ID	Environmental
Fire	CO	Fire
Fire Protection	CA, ID, MT, OR, WA	Fire
Fire Protection From Storage	ID	Fire
Fire Protection (Instream)	OR	Fire
Fire Protection Storage	ID	Fire
Anadromous and Resident Fish Habitat (Instream)	OR	Fish
Fish and game propogation	NM	Fish
Fish And Wildlife	MT, ND, OR	Fish
Fish and Wildlife Preservation and Enhancement	CA	Fish
Fish Culture	OR	Fish
Fishery	CO, MT	Fish
Fishery Enhancement (Instream)	OR	Fish
Fish Habitat	ID	Fish
Fish Habitat From Storage	ID	Fish
Fish Habitat Storage	ID	Fish
Fish Propagation	ID, WA	Fish
Fish Propagation From Storage	ID	Fish
Fish Propagation Storage	ID	Fish
Fish Raceways	MT	Fish
Recreation Fish Wildlife	OK	Fish
100 Year Flood Flow	ID	Flood Control
Flood Control	MT, NM, ND	Flood Control
Flood Control Storage	ID	Flood Control
Flow Augmentation	OR	Flood Control
Flow Through Fish Pond	MT	Flood Control
Mitigation By Delivery	ID	Flood Control
Mitigation By Delivery From Storage	ID	Flood Control

ary



led Vocabularies Registry for the Data Exchange(WaDE)

istent use of terminology (i.e., Controlled Vocabularies) to describe attributes of the nteen Western US States while they still retain the use of their native terms. The le data query across states and regional analysis. Click at the tables below to existing vocabularies or suggest new ones to be added. Scroll to the bottom for

o left to suggest a new term. Once submitted, we will receive an email of the vocabulary, or reject it in case it is similar to an existing one. Scroll to the bottom for hosted on [Google Sheets](#) and deployed to this registry.

te over recorded time series values within a time interval. For example, 100 cfs of ation statistic calculated over a time interval like a month.

se for which the method is used (e.g. surface water, groundwater, storage,

WaDE 2.0 Controlled Vocabulary Attempt

A	B	C
Name	WaDEname	State
Adjudicated	Adjudicated	CA
AdjudicatedCertificate	Adjudicated	WA
Adjudication Decree	Adjudicated	UT
Klamath Adjudication	Adjudicated	OR
Klamath Adjudication claim	Adjudicated	OR
Adverse Use	Adverse	UT
Application to Appropriate	Application / Change / Permit / Temporary	UT
ChangeROE	Application / Change / Permit / Temporary	WA
Fixed-Time Application	Application / Change / Permit / Temporary	UT
MitigatedPermit	Application / Change / Permit / Temporary	WA
Permit	Application / Change / Permit / Temporary	WA
PROVISIONAL PERMIT	Application / Change / Permit / Temporary	MT
QuincyBasinPermit	Application / Change / Permit / Temporary	WA
Seasonal	Application / Change / Permit / Temporary	OK
ShortTerm	Application / Change / Permit / Temporary	WA
Temporary	Application / Change / Permit / Temporary	OK
Temporary Application	Application / Change / Permit / Temporary	UT
Temporary Permit	Application / Change / Permit / Temporary	
TEMPORARY PERMIT	Application / Change / Permit / Temporary	MT
TemporaryDonation	Application / Change / Permit / Temporary	WA
Waste Water Change	Application / Change / Permit / Temporary	CA
Appropriative	Appropriative	CA
Appropriative (State Filing)	Appropriative	CA

Collaboration with USGS Water-Use Data and Research Program



Percent of total funding expended/awarded

- 0 - 10
- 20 - 40
- 40 - 60

USGS
United States Geological Survey

United States Geological Survey
Water Availability and Use Science Program

Water Use Data and Research (WUDR) Data Transfer Guidance

complete
Aquatic
USGS
(system) and
Water-Use
expected
store water-

nt of data
rs the
d guidance
y of their
s for USGS-
grantees
Western
provide
ith States
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data as

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Data that
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age with
es which are
icipating as

expected

completion date of August 2019. USGS is providing input to this effort to make the data more easily integrated with NWIS and to ensure the schema covers USGS data requirements. When complete, the schema, related database components, and API documentation will be made available on the WaDE web site. A draft version can be viewed [here](#).

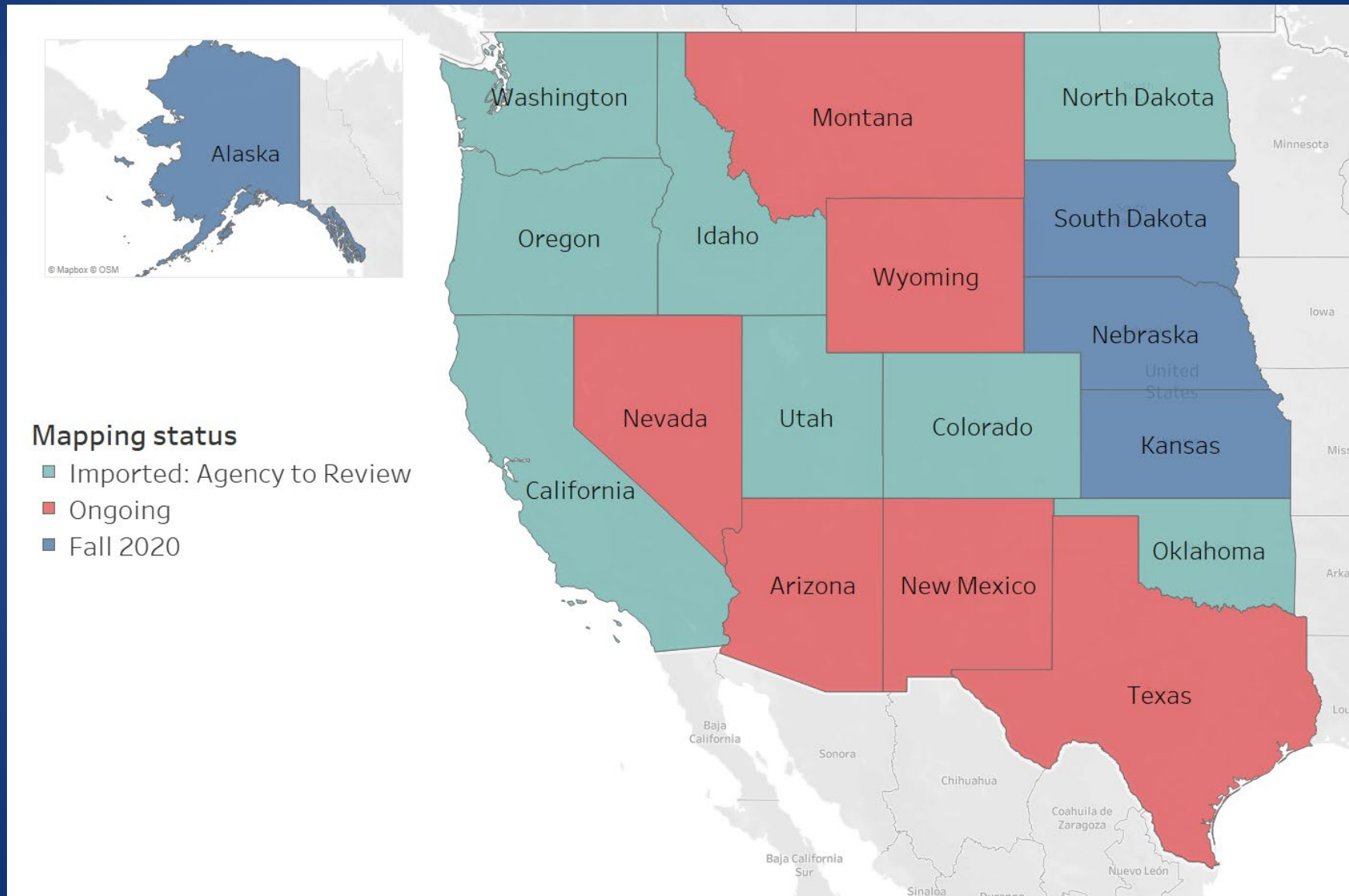
10%

43%

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<https://water.usgs.gov/wausp/wudr/files/WUDR-USGS-data-transfer-guidance.pdf>

Water Rights Data Mapping Status



WaDE Demo Apps and Examples

Water Rights App

- Water rights **prior 1922** in the Colorado River Basin
- Water rights for **fish and wildlife and instream flow**
- **Federal** water rights
- **Forest Service** water rights
- **US Army** water rights

Aggregate Basin-wide Water Use App

- Time series of basin water use across the West
- USBOR Upper Colorado Basin water **budget data**

Western States Water Rights Portal: Demo

 <https://www.westernstateswater.org/>

WSWC POD Water Allocation Map

A web tool used to located point of diversion sites for water rights across the Western United States.

DISCLAIMER: This tool is under construction, not for public use, and has not yet been approved by our member states.

Instructions

Use filters tools to reduce selection. Click on point to view more information in tables below.

Inputs

Reset Inputs

Legend Type Color

Beneficial Use

Site Type

Abandoned, Aquifer, Canal / Ditch / Stream, D

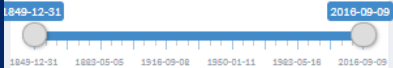
Water Source Type

Groundwater, Other, Reservoir / Storage, Surf

Allocation Owner

Other, United States of America, US Army, US

Priority Date (yyyy-mm-dd)



River Basin

Colorado River Basin, Rio Grande River Basin,

State

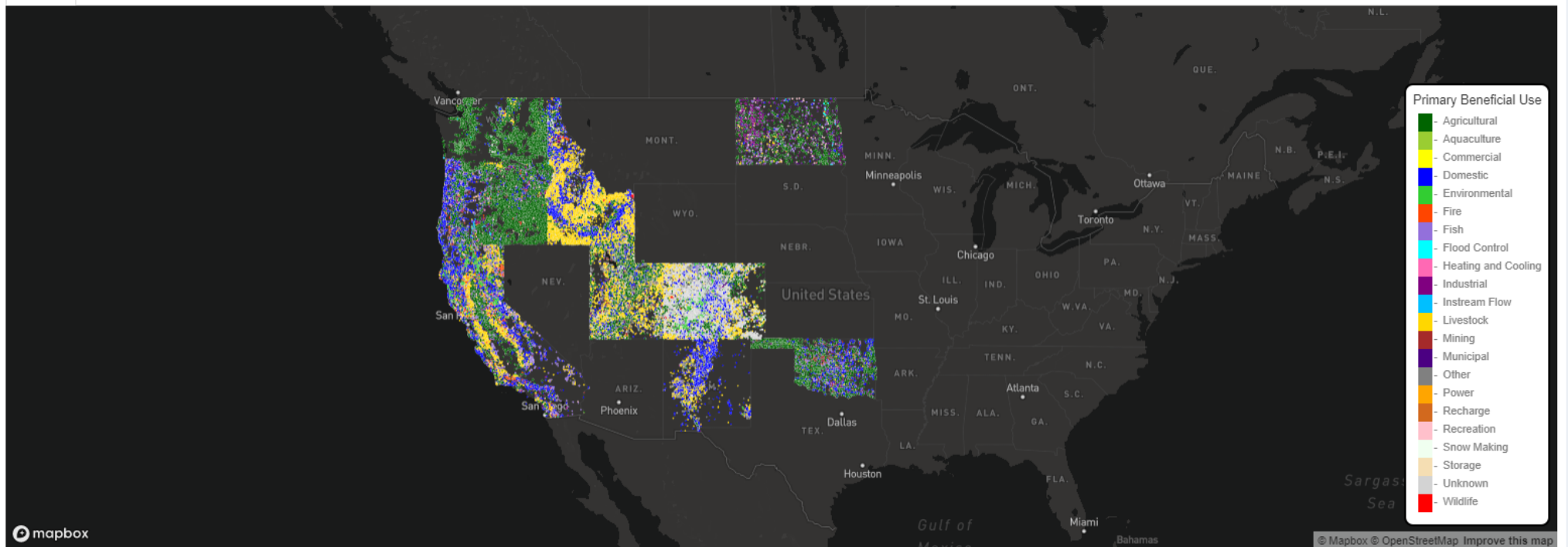
CA, CO, ID, ND, NM, OK, OR, TX, UT, WA

Primary Beneficial Use

Agricultural, Aquaculture, Commercial, Dome

All Sites

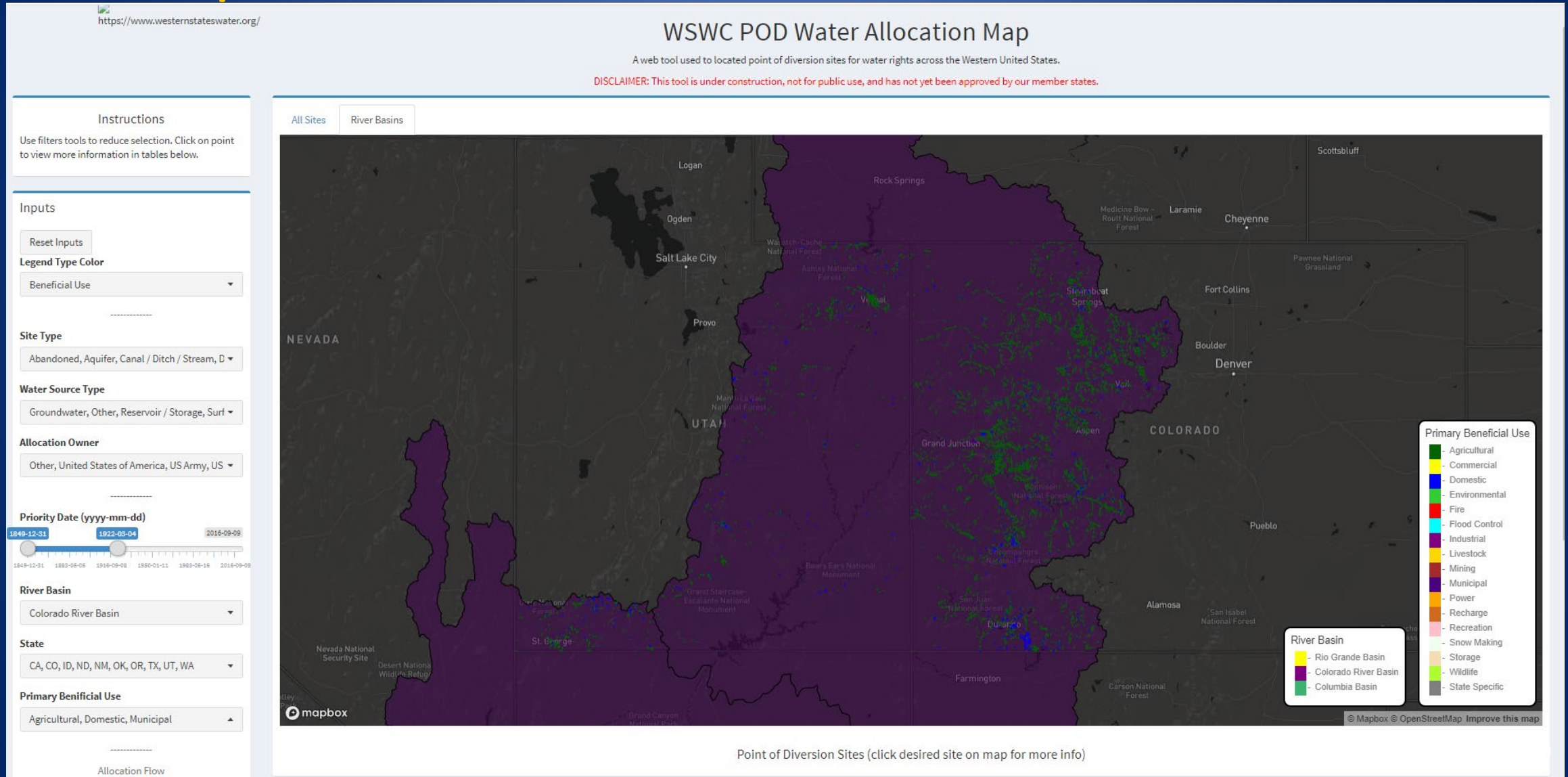
River Basins



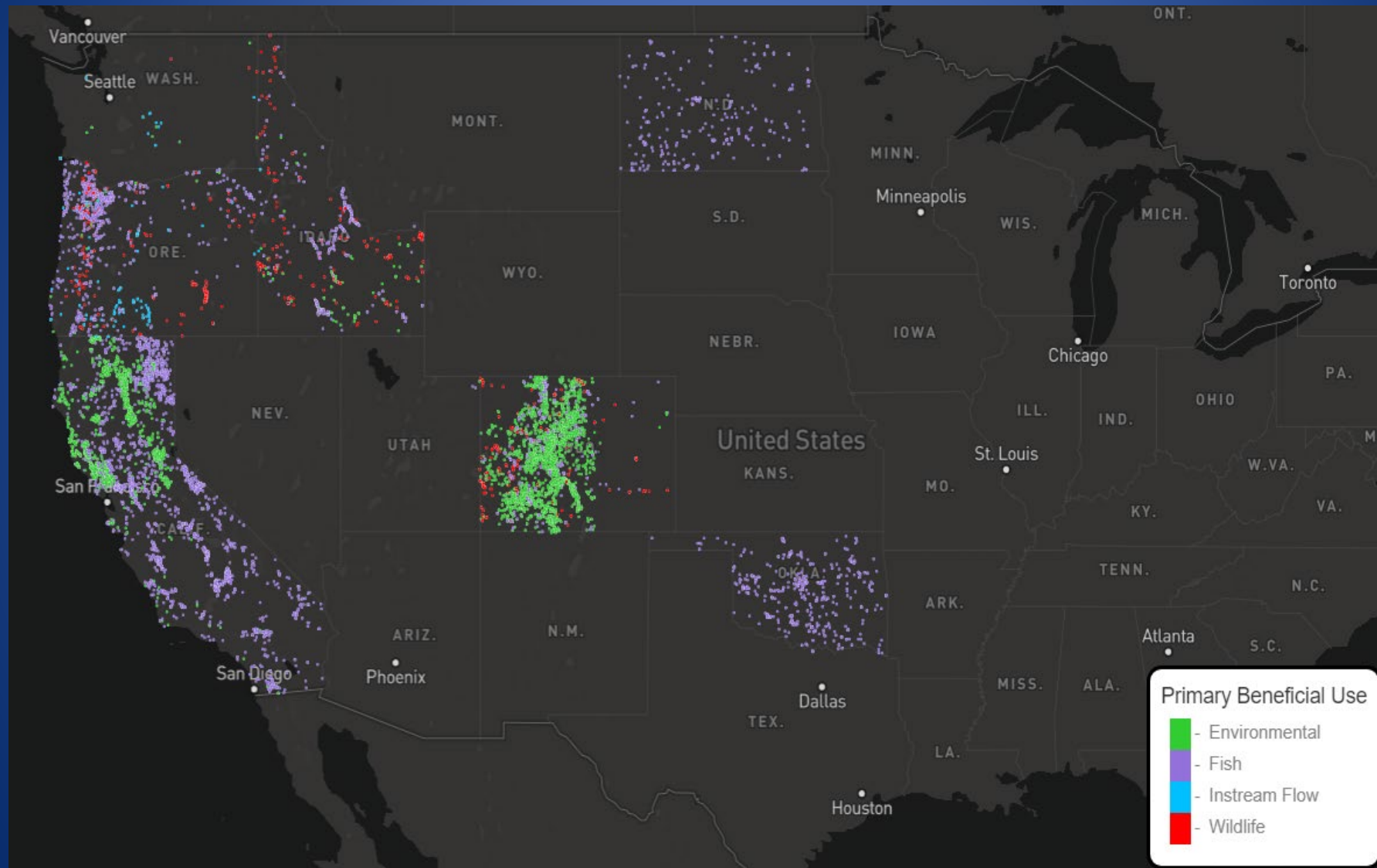
Point of Diversion Sites (click desired site on map for more info)

Organizations

What are the irrigation and municipal water rights prior 1922 in the Colorado River Basin?



What are the water rights for **fish and wildlife**, **instream flow**, **environmental** beneficial uses in the West?



State recognized rights for **federal** water uses in the West

 <https://www.westernstateswater.org/>

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Inputs

Reset Inputs

Legend Type Color

Owner

Site Type

Abandoned, Aquifer, Canal / Ditch / Stream, D

Water Source Type

Groundwater, Other, Reservoir / Storage, Surf

Allocation Owner

United States of America, US Army, US Bureau

Priority Date (yyyy-mm-dd)

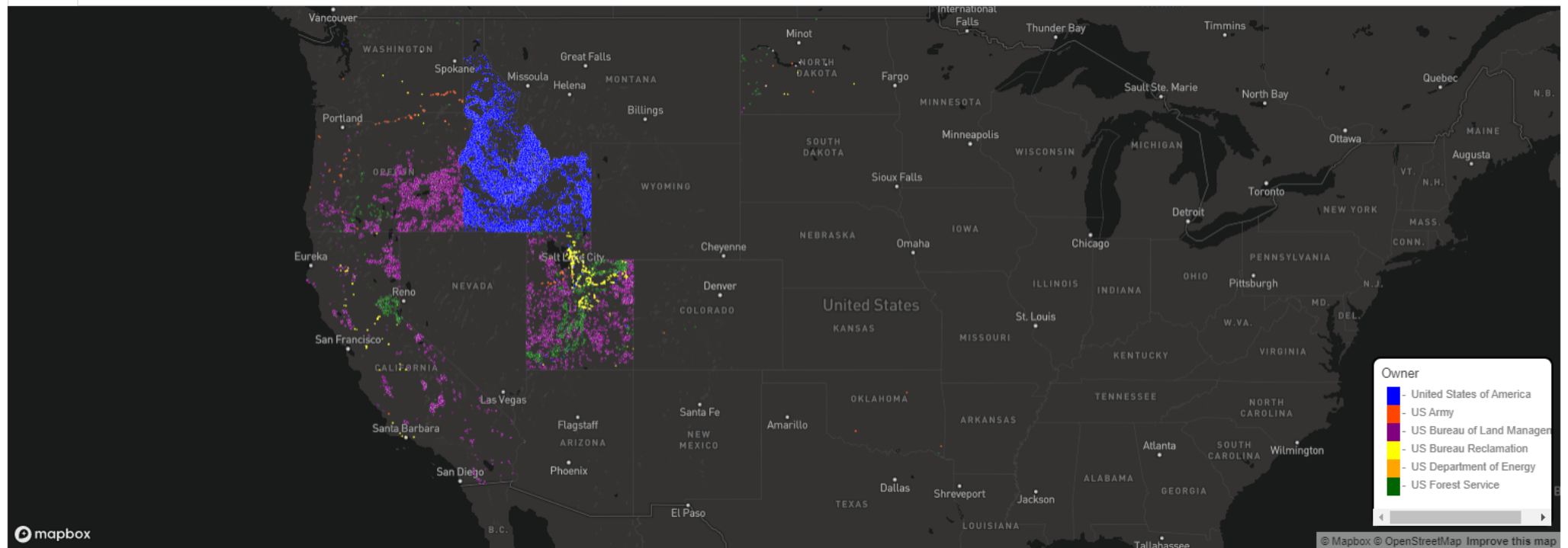
1849-12-31 2016-09-09

River Basin

Colorado River Basin, Rio Grande River Basin,

State

All Sites River Basins



Point of Diversion Sites (click desired site on map for more info)

State recognized Forest Service water uses in the West

<https://www.westernstateswater.org/>

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Instructions

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Inputs

Reset Inputs

Legend Type Color

Owner

Site Type

Abandoned, Aquifer, Canal / Ditch / Stream, D

Water Source Type

Groundwater, Other, Reservoir / Storage, Surf

Allocation Owner

US Forest Service

Priority Date (yyyy-mm-dd)

1849-12-312016-09-09

River Basin

Colorado River Basin, Rio Grande River Basin,

State

CA, CO, ID, ND, NM, OK, OR, TX, UT, WA

Primary Beneficial Use

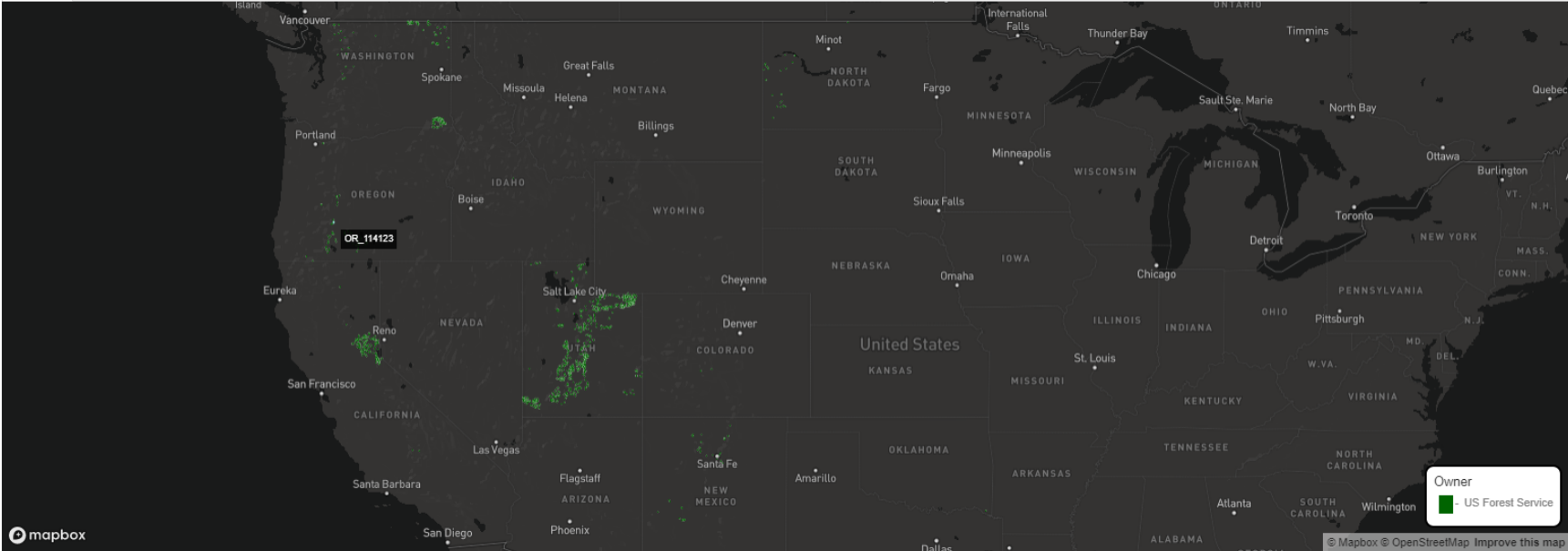
Agricultural, Aquaculture, Commercial, Dome

Allocation Flow

Include Empty Values (Null)?

Minimum CFS

All SitesRiver Basins



Point of Diversion Sites (click desired site on map for more info)

Organizations

Show 10 entries

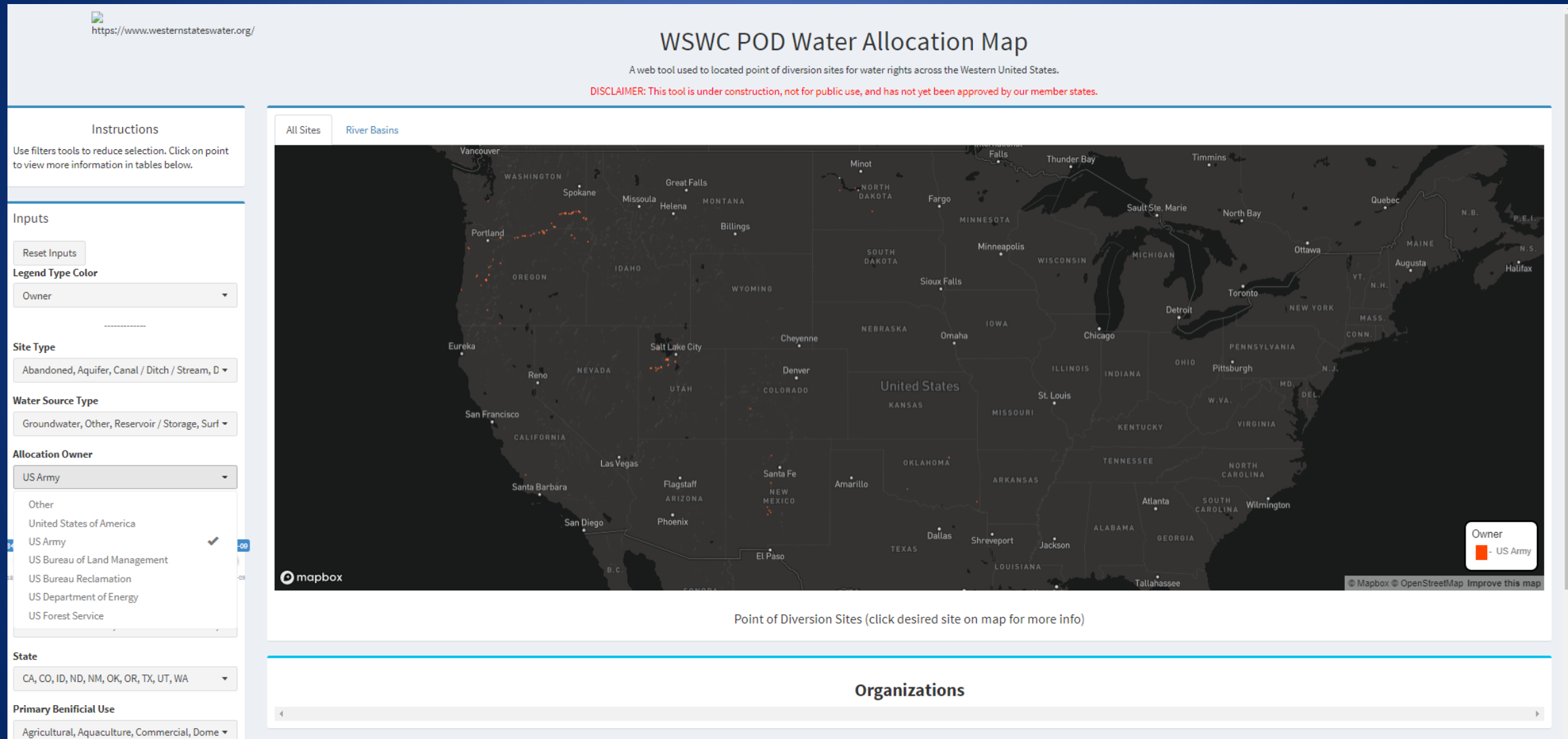
Search:

OrganizationName	OrganizationPurview	OrganizationWebsite	OrganizationPhoneNumber	OrganizationContactName	OrganizationContactEmail	OrganizationState
Utah Division of Water Resources	Water Planning	https://water.utah.gov/	801-538-7280	Craig Miller	craigmiller@utah.gov	UT

Showing 1 to 1 of 1 entries

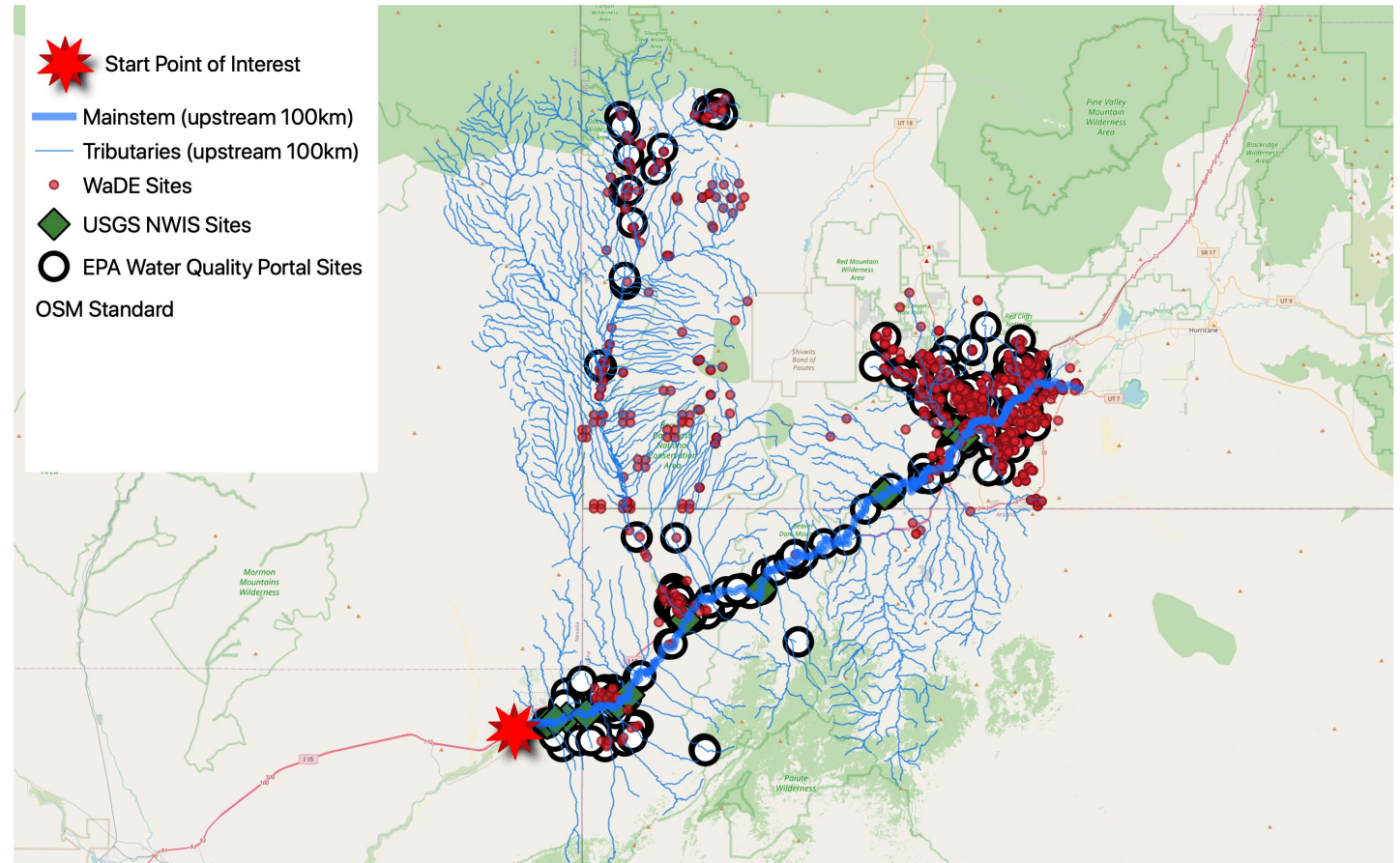
Previous1Next

State recognized **US Army** water uses in the West

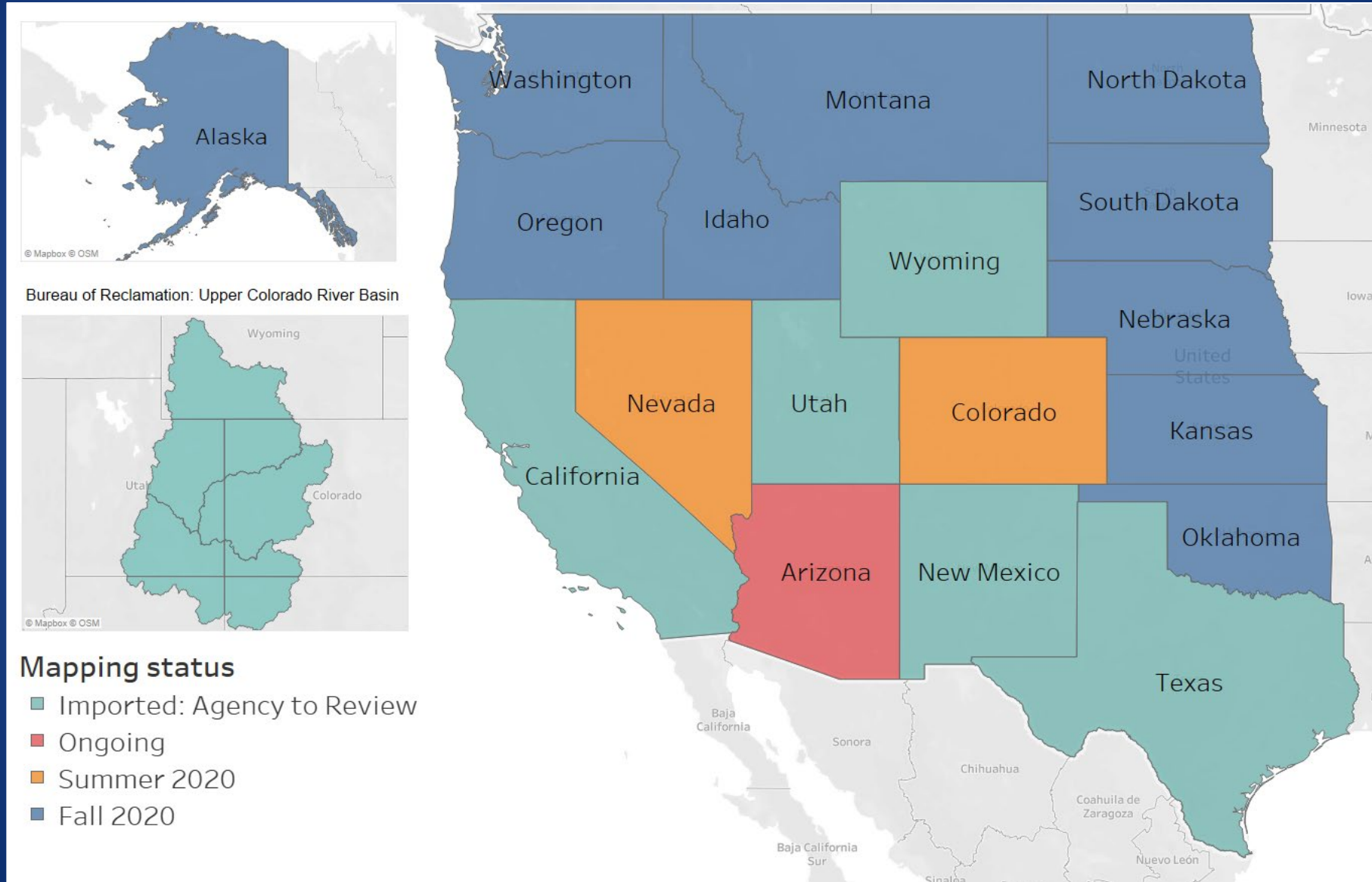


Interoperability: WaDE, USGS, and EPA

- Network-Linked Data Index (NLDI)
- Geoconnex.us



Aggregate Water Use Data Mapping Status



Consumptive Use Interoperable Data and Modeling Experiment Workgroup



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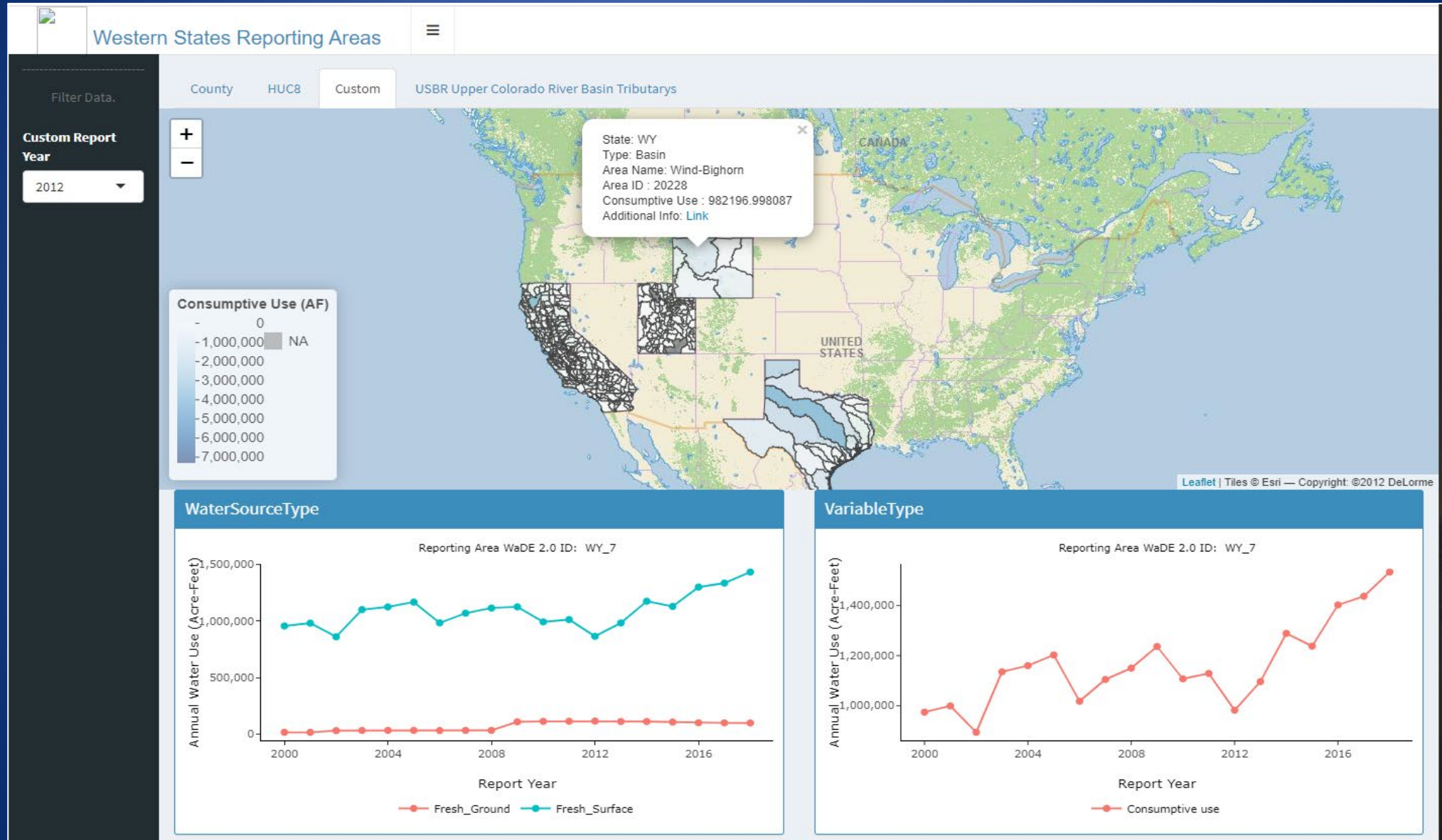


Internet
of Water™

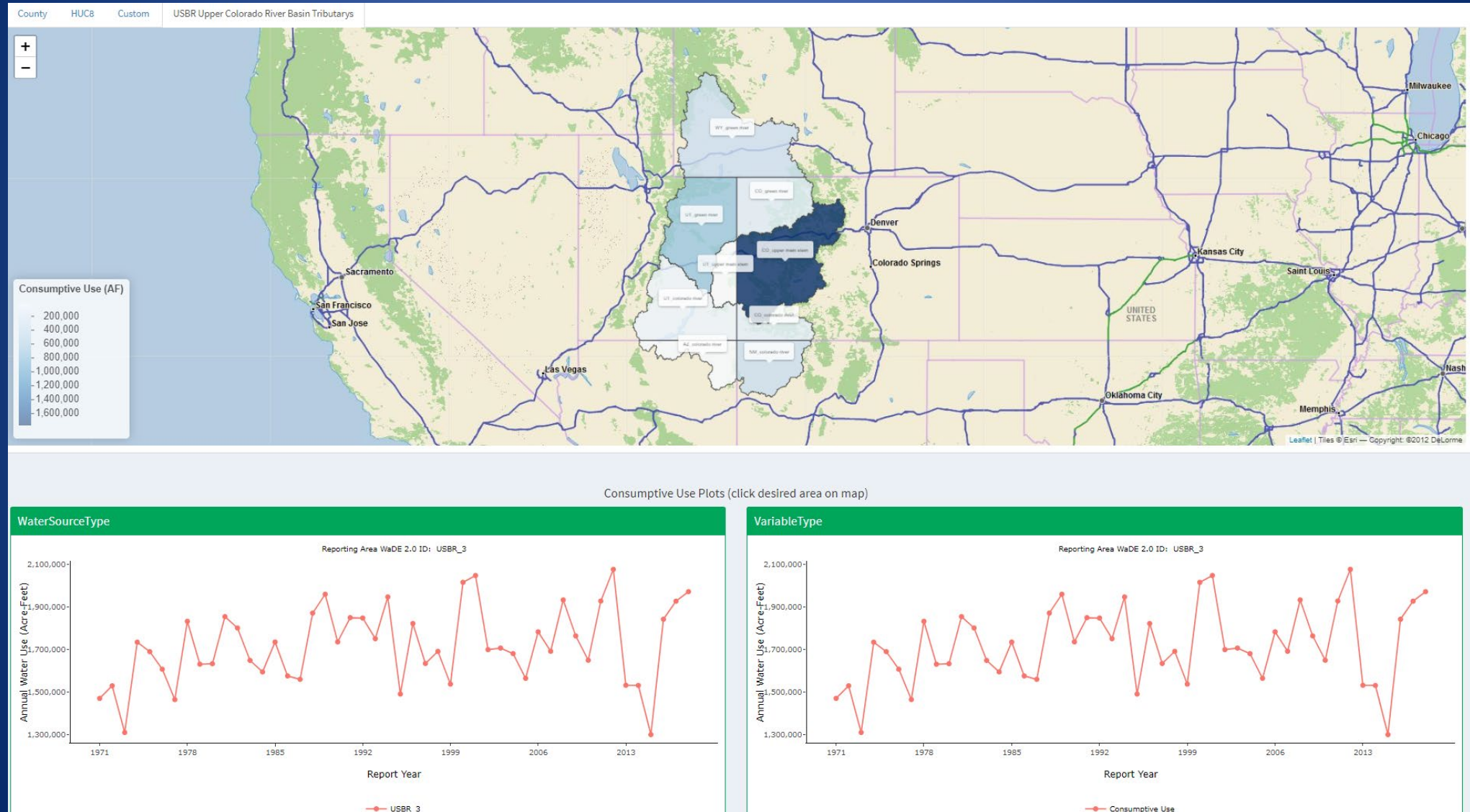


**The Second Colorado River Basin Data and Modeling
Roundtable (May 27-28, 2020)**

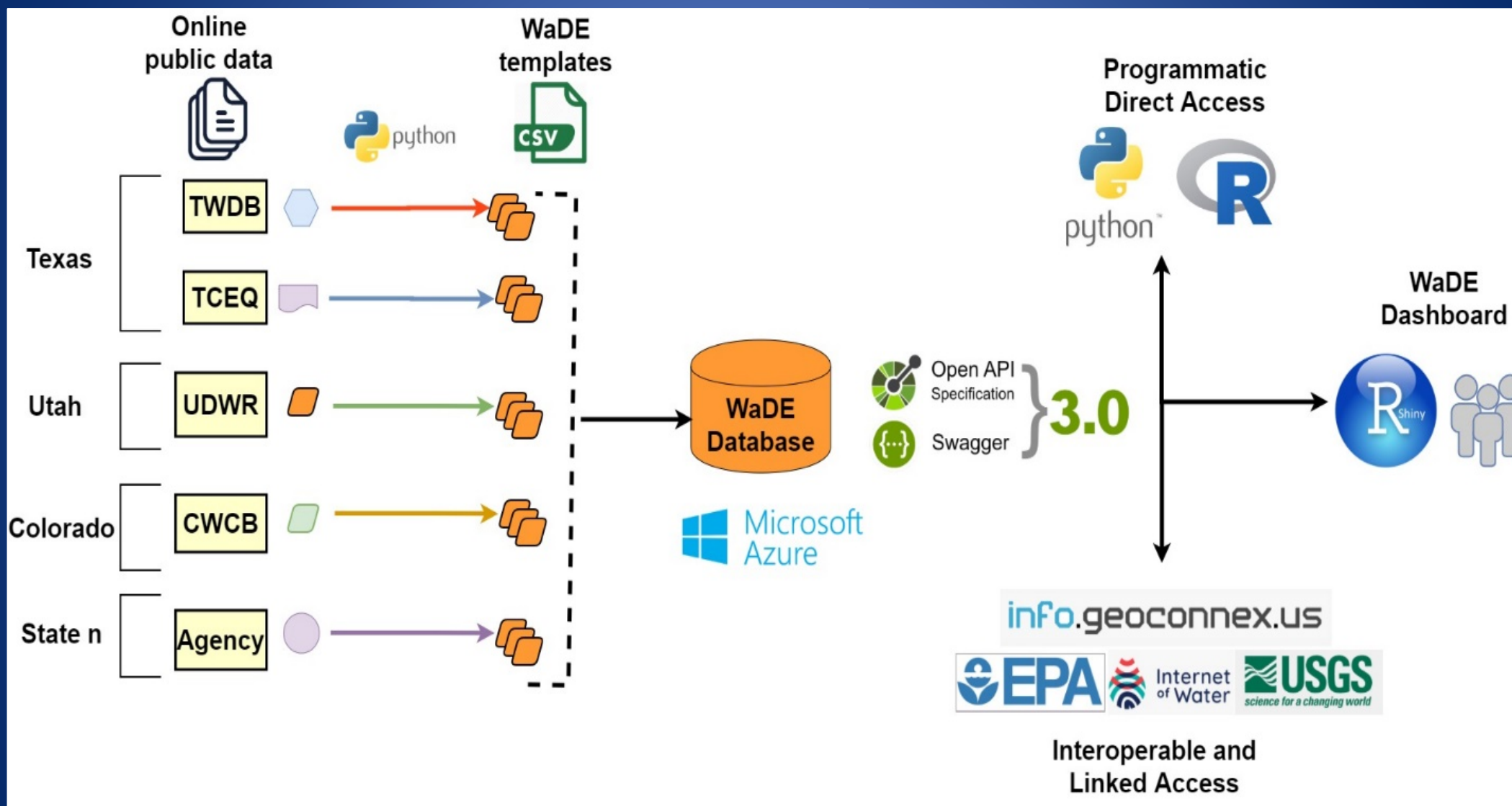
Basin-Wide Water Use Data



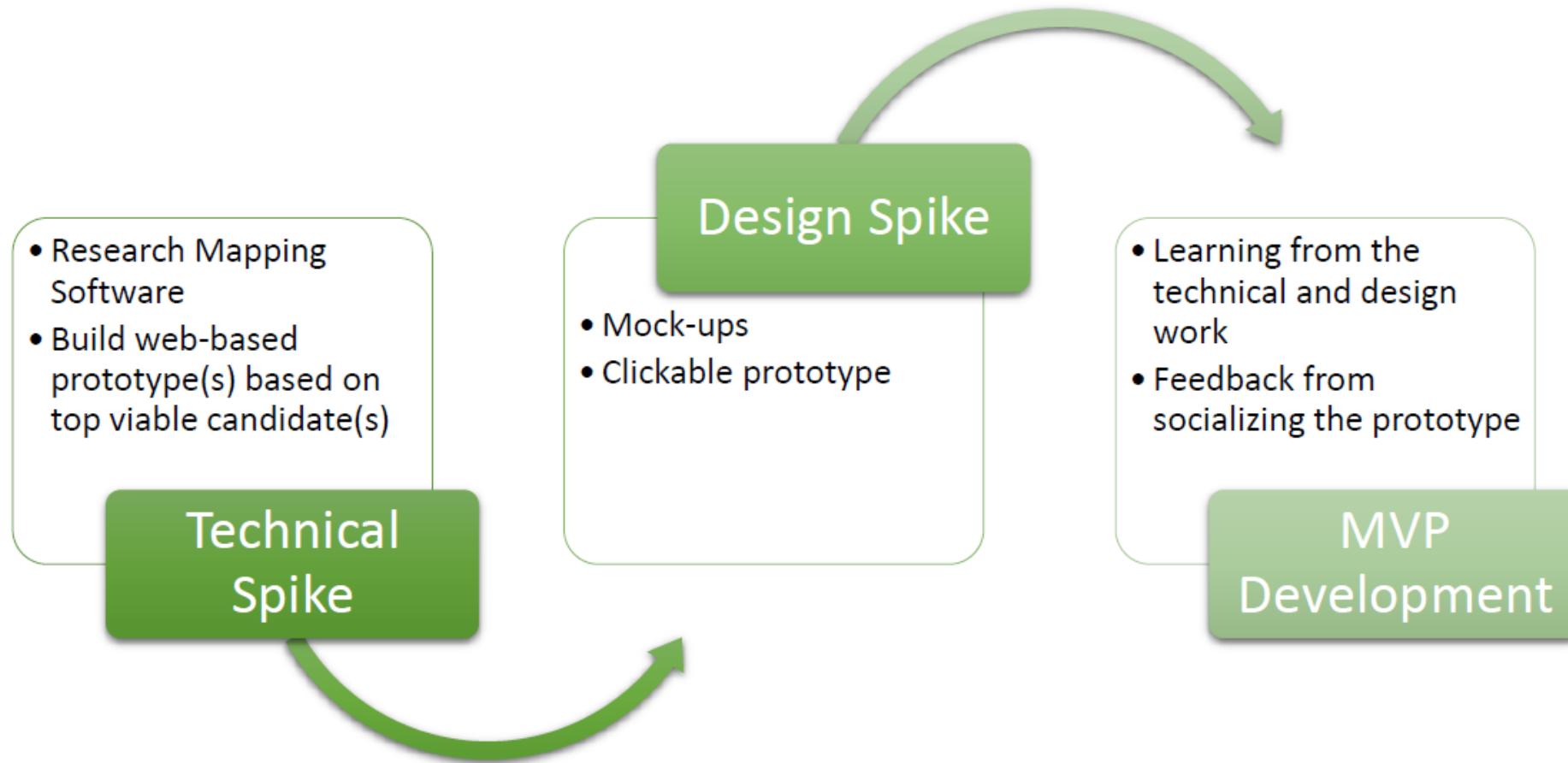
USBOR Upper Colorado River Basin Water Budget Data



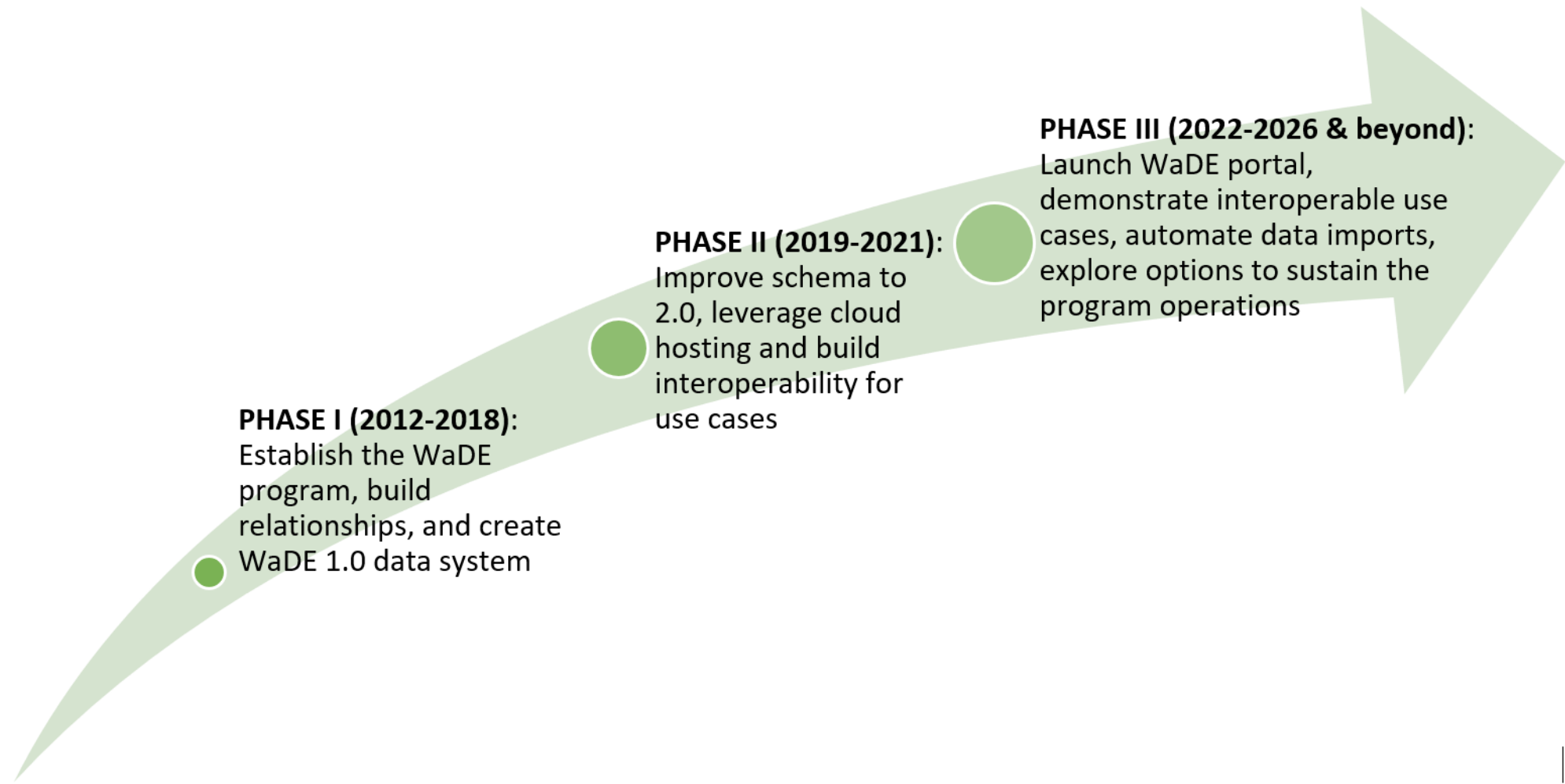
Water Data Exchange Architecture 2.0



WaDE 2.0 Portal: Supporting User-Friendly Use Cases



WaDE Phase III



Why Does this **WaDE Program** Matter?

1

- Enable Regional Water and Energy Planning

2

- Support Water Transfers and Markets

3

- Improve State-Federal-Tribal Cooperative Federalism

4

- Improve Interstate Watershed Transparency and Cooperation

5

- Enable Water Data-Driven Research and Science: Objective Analysis and Modeling

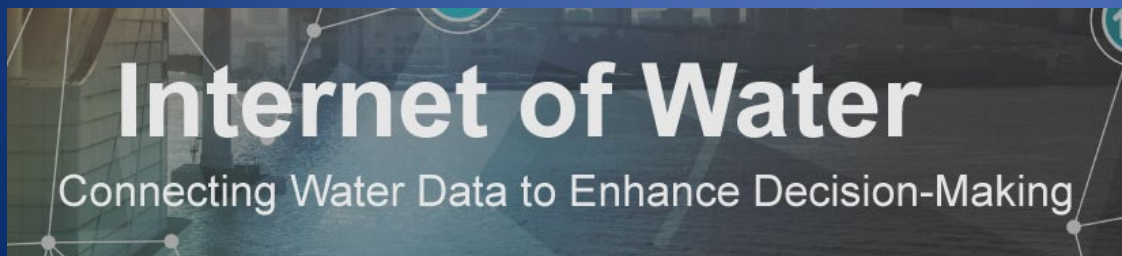
Next steps

- Continue **connecting** member states data into WaDE
- Work with our IT Contractor on designing **WaDE Portal 2.0**
- Support WaDE data interoperability with USGS and IOW **Geoconnex** U.S. Hydrologic Features
- **Beta release WaDE 2.0** system to our partners and then the public in early in 2021

Funders, Collaborators & Partners

Water Foundation
Mitchell Foundation
MOORE Foundation

EPA Exchange Network Grant Program
Western States Water Agencies



Thank You for Tuning in!

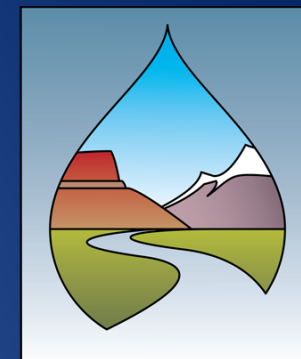
How Can WaDE Help You?

Tony Willardson, WSWC Executive Director

Adel Abdallah, WaDE Program Manager

Ryan James, WaDE Data Analyst

www.westernstateswater.org



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