

The Water Supply Challenge for the West

NAIPO

Western Regional Summit
Salt Lake City, Utah
September 26, 2024

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Executive Director



WESTERN STATES
WATER COUNCIL

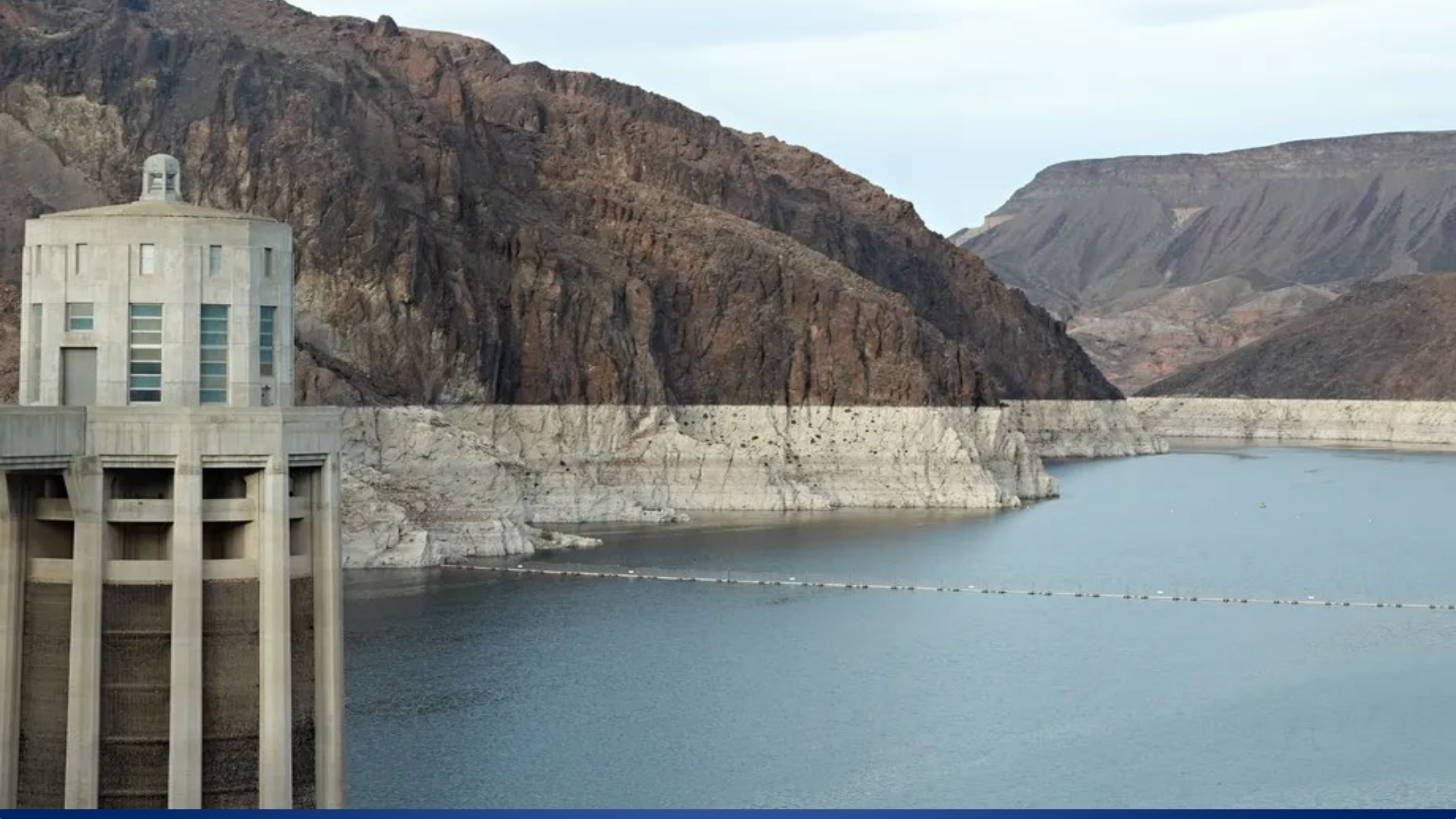


Water availability and water policy have not always been primary factors in decisions about where and how to grow!

Water in the West is an increasingly scarce and precious resource.

Hoover Dam/Lake Mead



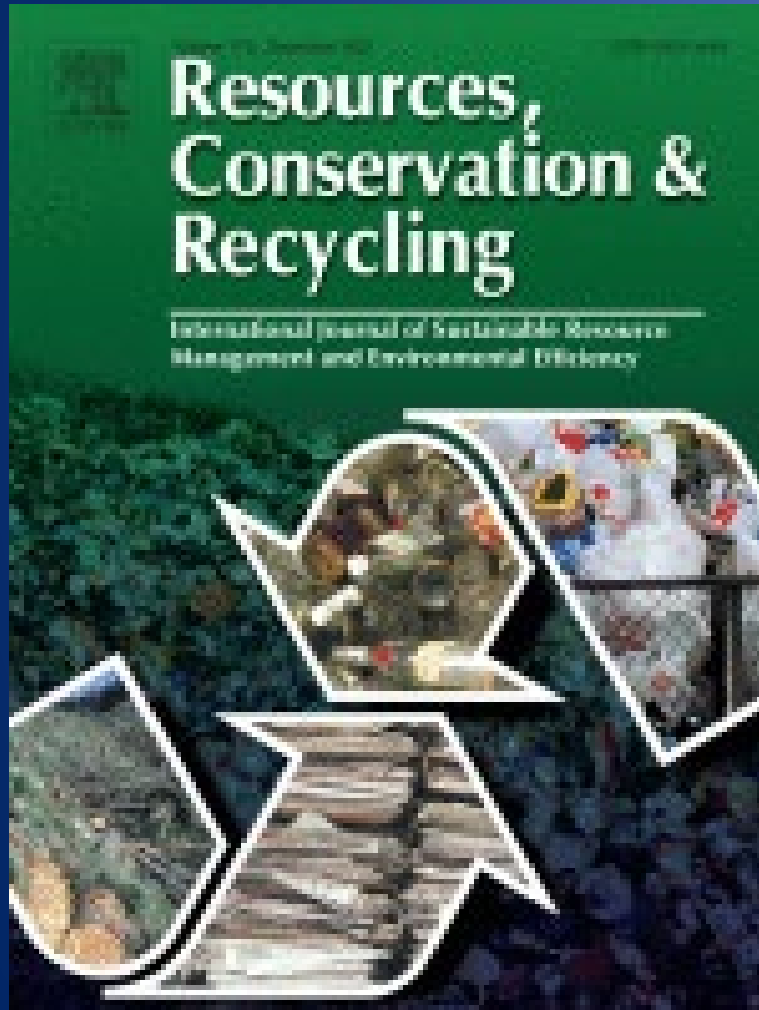


Las Vegas Valley Water District Lake Mead Intake



<https://www.msn.com/en-us/news/us/las-vegas-water-intake-now-visible-at-drought-stricken-lake-mead/ar-AAWMXsD>

Water savings of LEED-certified buildings



- The LEED rating system awards credits for a variety of criteria, including water efficiency.
- LEED certification indicates that the building is designed to conserve water.
- Water performance gap refers to the gap between designed and actual water savings.
- We find evidence of the water performance gap for LEED buildings.
- LEED buildings do not save water usage compared to similar non-LEED buildings.

Science Direct, Volume 175, December 2021

Western States Water Council

A Voice for Water in the West Since 1965

- Appointed members advising 18 Western Governors on water policy issues.

Mission: “To ensure that the West has an adequate, secure and sustainable supply of water of suitable quality to meet its diverse economic and environmental needs now and in the future”

- Provides collective western state voice
- Fosters state/state, state/tribal and federal/state collaboration
- Coordinates with a Western Federal Agency Support Team (WestFAST)



Water Data Exchange (WaDE) Program

Transforming Western Water Planning, Management, and Policy

By Sharing States Water Data Since 2011



Western States Federal Agency Support Team

A Declaration of Cooperation

*Working Together for the Sustainable and
Efficient Use of Western Water Resources*

We, as representatives of our respective Federal agencies, do hereby declare our intent to cooperate as members of a Western States Federal Agency Support Team (WESTFAST) partnership. We will work together whenever and wherever possible throughout the 17 Western States to promote and educate the public on the benefits of sustainable and efficient use of water resources.

We declare that WESTFAST supports a continued commitment on the part of Federal, and State organizations; working with local, Tribal, and other stakeholders; to improve the effectiveness of collaboration to seek watershed solutions to water issues in the Western States. This effort emphasizes proactive, voluntary, participatory and incentive-based approaches to water resource management and conservation assistance programs throughout the Western States.

We hereby declare that we as WESTFAST partners will collaborate with the Western States Water Council to guide the development of an appropriate action plan for this partnership.

We hereby declare to support, in concept, the establishment of a Federal liaison position to work with the WESTFAST members and the Western States Water Council in developing a collaborative work plan to carry forward joint water resource initiatives. Contributory cost-sharing such a position will be based on authorized and available funds.

Army Corps of Engineers
Bureau of Land Management
Bureau of Reclamation
Environmental Protection Agency
National Oceanic & Atmospheric
Administration
Natural Resources
Conservation Service
U.S. Fish & Wildlife Service
U.S. Forest Service
U.S. Geological Survey
U.S. Department of Energy
National Aeronautics and Space
Administration
U.S. Dept. of Defense
National Park Service

Governor Ronald Reagan

“I am impressed with the need for the states of the West to look beyond sectional interests and to approach water resource development on a regional basis. Few endeavors offer more challenge...and greater potential for lasting benefit. Unless we are successful, lack of water will soon limit development throughout much of the West...”

“I am convinced that the best approach to westwide regional planning is through cooperative state action. I see no need, certainly at this time, for the states to look to Washington to act as a broker in this endeavor.”

Water Needs and Strategies
for a Sustainable Future



Western Governors' Association ◊ June 2006

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.

Pressing Water Issues

- Growth & related economic & environmental needs
- Limited data regarding water supplies and demands
- Competing or poorly defined water rights
- Aging and often inadequate infrastructure
- Unpredictable climate and extreme events
(little ability to predict seasonal/subseasonal supply)
- Constantly evolving regulatory landscape

WSWC Vision Statement

Effectively addressing these challenges will require stronger collaboration and cooperation that transcends political and geographic boundaries between states, federal agencies, tribes, and local communities.



WSWC Principles

- States have the pivotal role in water planning, as well as allocating and protecting the resource.
- Success will depend in large part on state initiative and innovation.
- Federal agencies should use state water plans to help determine national water policy and priorities that best align federal agency support to states; and to inform decision making regarding regional water issues.

WSWC Principles

- Water must be recognized as a critical public policy priority given the importance of the resource to our public health, economy, food security, environment, and western way of life.
- We must cultivate a western water conservation ethic through greater understanding of, and appreciation for, water's value.

Water Policy & Economics

- In the West, water availability is central to economic growth
- Water is treated both as public and private property
- In some ways, the whole is greater than the sum of its parts, as some uses are non-consumptive and it's use by one person does not diminish its availability for another user (but water quality impacts)
- Instreamflows for recreation such as rafting, floating, swimming and fishing are non-consumptive uses, as is hydropower generation
- Water reclamation, recycling and reuse are increasingly important

LAKE POWELL JULY 2020



Water Rights Doctrines

- Riparian Rights
- Reasonable Use
- Appropriations Doctrine
- Absolute Ownership
- Correlative Rights (Proportionate Use)
- Federal Reserved Water Rights
 - Military, Wilderness and other Reservations
- Tribal Trust Water Rights

Water Law 101

- Law of Prior Appropriation (well defined rights)
- First in Time, First in Use (protect Investments)
- Priority Dates and Consumptive Water Use
- Reasonable Beneficial Use - Water Duties
- Use it or Lose it! (non-speculation)
- Prohibits Waste (generally defined by custom)
- Forfeiture and Abandonment Statutes (flexibility)
- No Injury (new uses or changes in use)
- Water Rights Transfers (POD and POU changes)

The Law of the River

- Colorado River Compact
- Boulder Canyon Project Act
- California Seven Party Agreement
- Mexican Water Treaty
- Upper Colorado River Basin Compact
- Colorado River Storage Project
- Arizona v. Calif Supreme Court Decision
- Supplemental Decree
- Consolidated Decree
- Colorado River Basin Project Act
- Long Range Operating Criteria
- Minute 242
- Colorado River Basin Salinity Control Act

WSWC Water Data Exchange (WaDE)

The Western States Water Council has worked together with state and federal agencies to create the **Water Data Exchange**, an online portal that will enable states to share their water data with each other, federal agencies, and the public via a common platform. The Governors encourage the use of state water data in planning for both the public and private sectors.

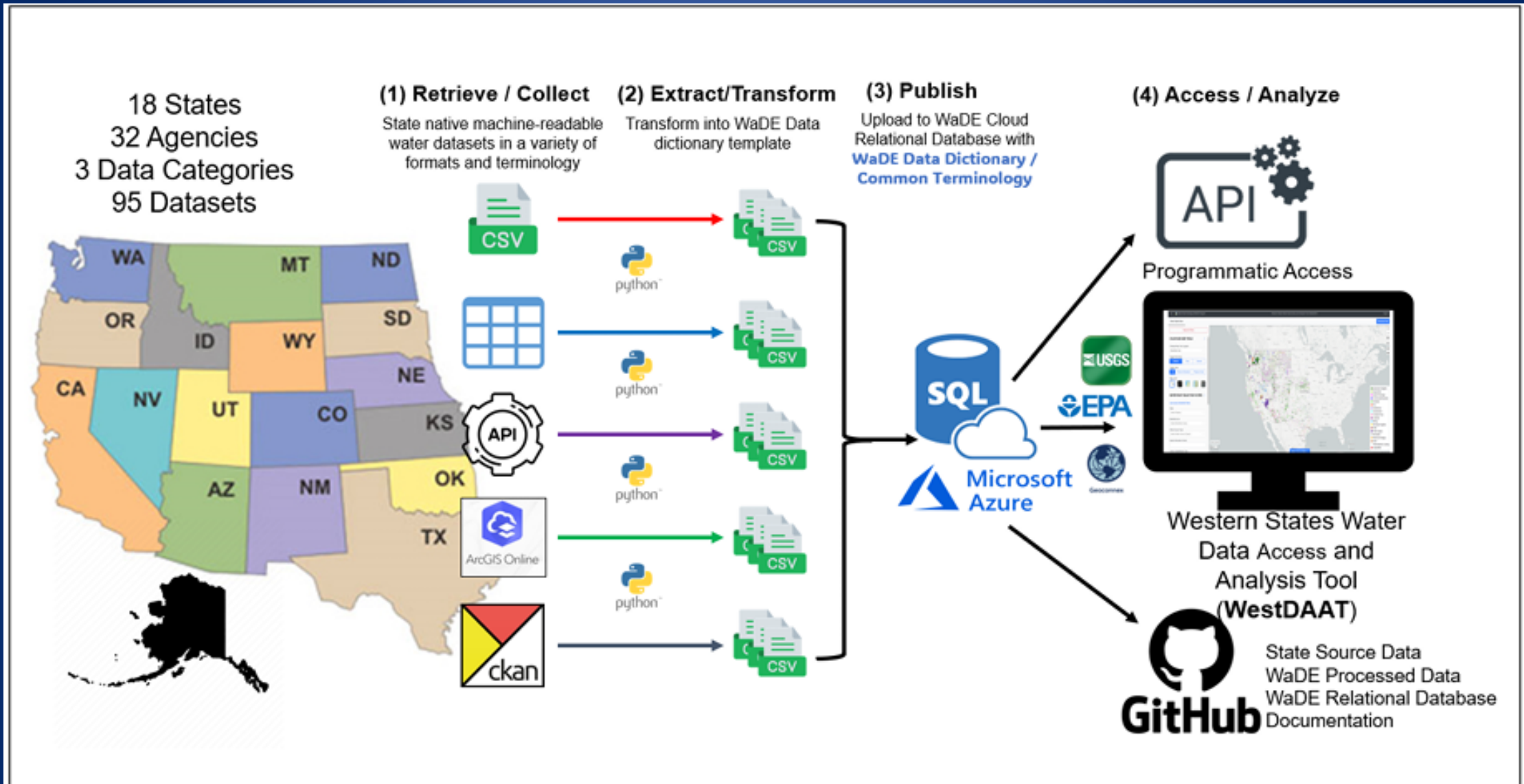


Figure A1: WaDE 2.0 architecture to streamline access to western states water rights, water use, and water supply data as FAIR through a streamlined and standardized service.



Water Rights Data

Download Data

Reset All Filters

COLOR AND SIZE TOOLS

Change Map Color Legend

Beneficial Use

Toggle Point Size

Default

Flow

Volume

Toggle View

All

Points of Diversion

Places of Use

Map Layer



WATER RIGHT SELECTION FILTERS

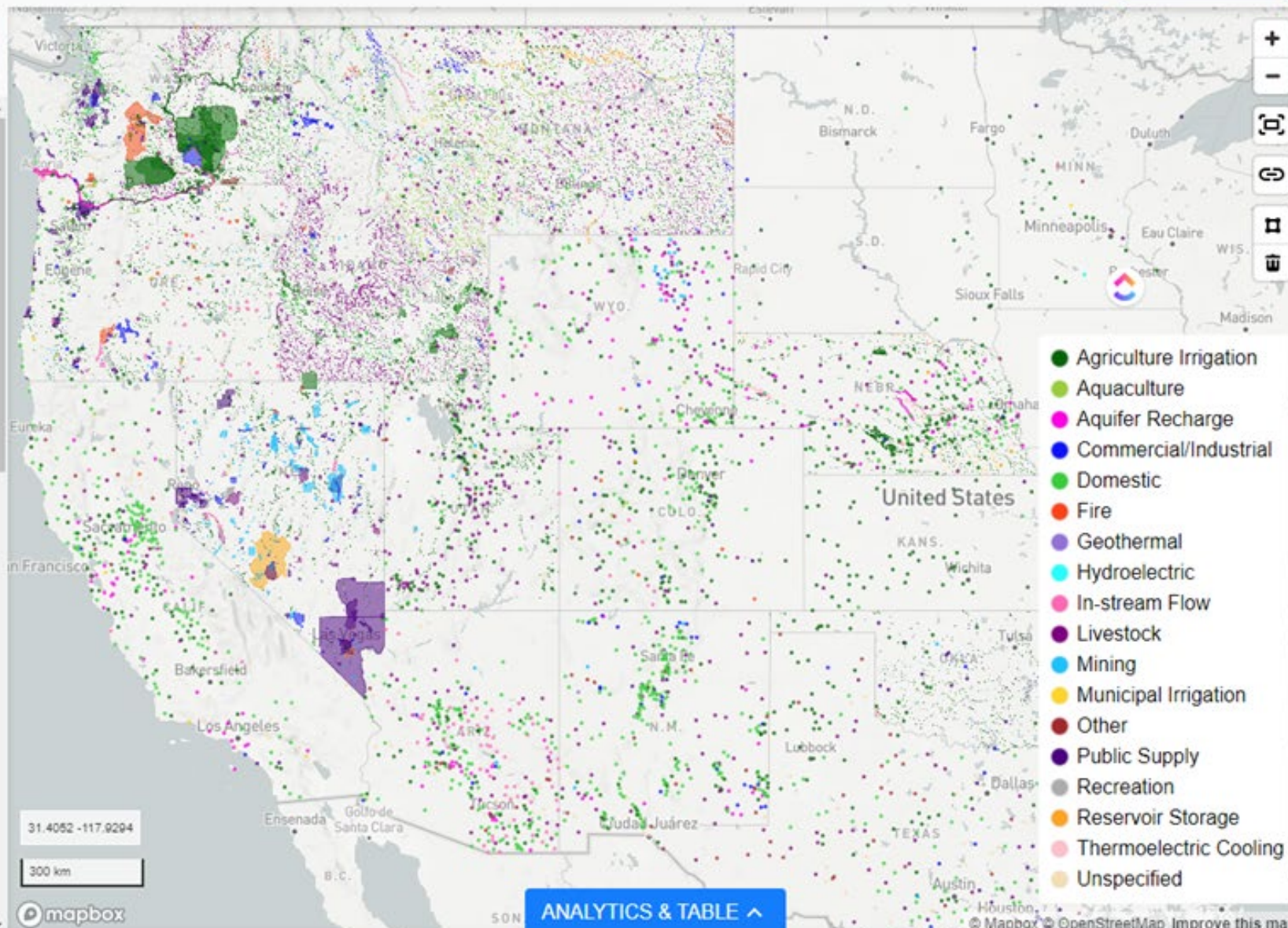
[Learn about WestDAAT filters](#)

State

Select State(s)

Beneficial Use

Select Beneficial Use(s)



ANALYTICS & TABLE

Water Rights Data Throughout The West

Water Data Exchange (WaDE) Program | Western States Water Data Access and Analysis Tool (WestDAAT) | Sign In

Water Rights Data Download Data

[Reset All Filters](#)

COLOR AND SIZE TOOLS

Change Map Color Legend: Beneficial Use

Toggle Point Size: Default | Flow | Volume

Toggle View: All | Points of Diversion | Places of Use

Map Layer: [Icons]

WATER RIGHT SELECTION FILTERS

[Learn about WestDAAT filters](#)

State: Select State(s)

Beneficial Use: Select Beneficial Use(s)

Water Source Type: Select Water Source Type(s)

Search Allocation Owner

Map: [Map of Western US with water rights points] ANALYTICS & TABLE

Chart Summary | [Data Table](#)

[Learn about WestDAAT analytics](#)

Count of Water Rights

2,164,594 Rights

Beneficial Use	Count
Agriculture Irrigation	~1,000,000
Domestic	~500,000
Livestock	~300,000
Other	~100,000
Unspecified	~100,000
In-stream Flow	~50,000
Commercial/Industrial	~50,000
Public Supply	~50,000
Aquifer Recharge	~50,000

Cumulative Flow (CSF) of Water Rights

17,937,946.73 (CFS)

Beneficial Use	Cumulative Flow (CFS)
Agriculture Irrigation	~8,000,000
Hydroelectric	~4,000,000
Domestic	~2,000,000
Livestock	~1,000,000
Other	~500,000
Unspecified	~500,000
In-stream Flow	~200,000
Commercial/Industrial	~200,000
Public Supply	~200,000
Reservoir Storage	~200,000
Recreation	~200,000

Cumulative Volume (AF) of Water Rights

627,142,241.86 (AF)

Beneficial Use	Cumulative Volume (AF)
Hydroelectric	~300,000,000
Agriculture Irrigation	~150,000,000
Domestic	~75,000,000
Livestock	~40,000,000
Other	~20,000,000
Unspecified	~20,000,000
In-stream Flow	~10,000,000
Commercial/Industrial	~10,000,000
Public Supply	~10,000,000
Reservoir Storage	~10,000,000
Recreation	~10,000,000

WaDE | WSWC | | [Known Issues](#) | [FAQ](#) | [Feedback](#)

[*https://westdaat.westernstateswater.org/](https://westdaat.westernstateswater.org/)



Cities served in/out of CRB

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

Irrigation Water Rights Prior 1922



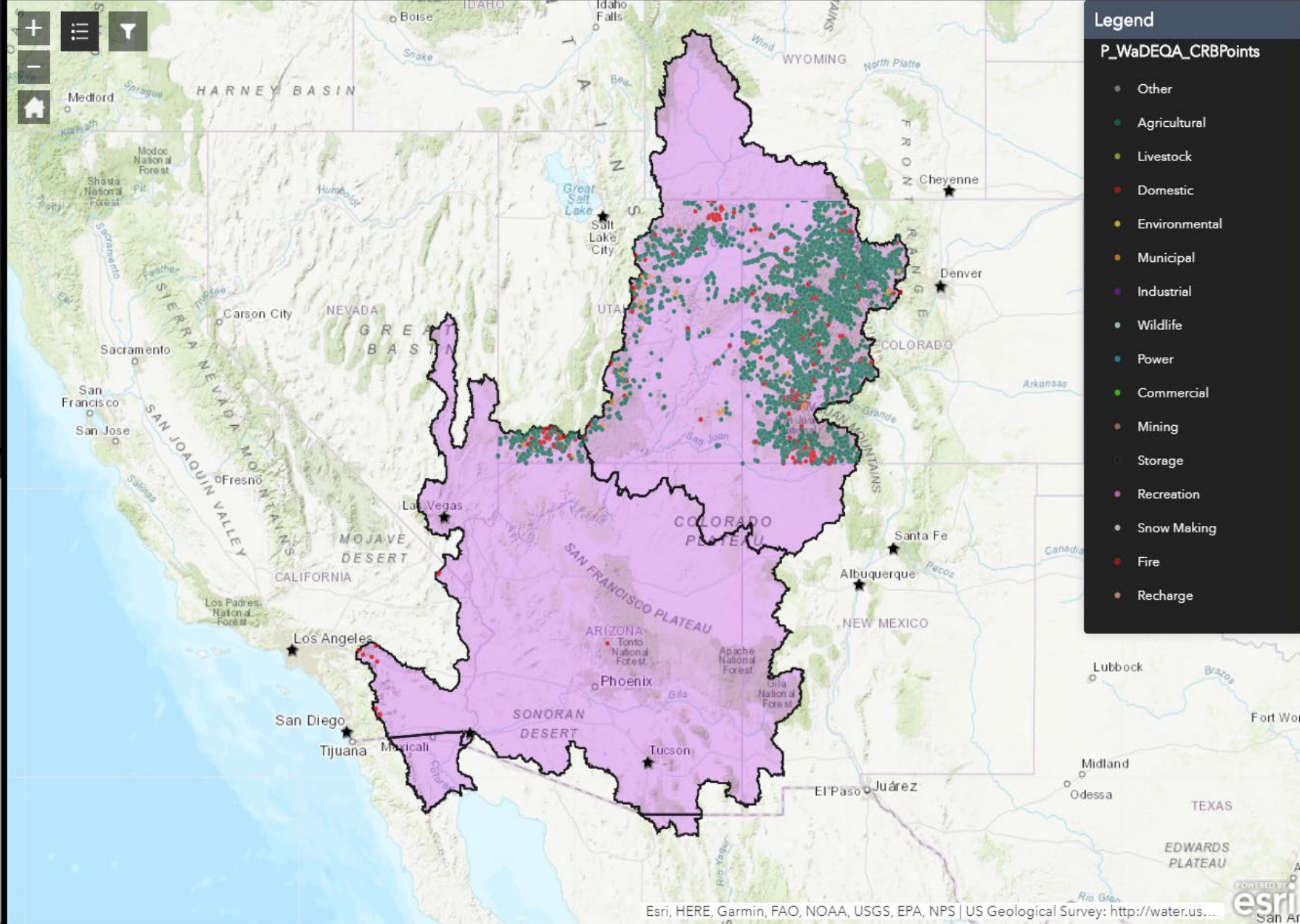
Infographic

Flow Amount (CFS)



Infographic_2

Maximum Volume Limit (AF)



CRB: Water Rights Prior 1922

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Water Rights Data [Download Data](#)

[Reset All Filters](#)

[Learn about WestDAAT filters](#)

State:

Beneficial Use:

Water Source Type:

Search Allocation Owner:

Owner Classification Type:

River Basin Area:

Availability of Priority Date and Amounts:

Priority Date: to

Flow Range (CFS): to

[ANALYTICS & TABLE](#)

[Chart Summary](#) | [Data Table](#)

[Learn about WestDAAT analytics](#)

Count of Water Rights

83,116 Rights

Beneficial Use	Count
Agriculture Irrigation	~45,000
Livestock	~25,000
In-stream Flow	~10,000
Public Supply	~5,000
Other	~2,000
Domestic	~1,000
Unspecified	~1,000

Cumulative Flow (CSF) of Water Rights

87,522.03 (CFS)

Beneficial Use	Cumulative Flow (CFS)
Agriculture Irrigation	~60,000
Commercial/Industrial	~15,000
Livestock	~5,000
Public Supply	~2,000
Reservoir Storage	~1,000
Domestic	~1,000

Cumulative Volume (AF) of Water Rights

1,490,432.18 (AF)

Beneficial Use	Cumulative Volume (AF)
Agriculture Irrigation	~1,000,000
Commercial/Industrial	~200,000
Unspecified	~100,000
Public Supply	~50,000

Set Priority Date to 01/01/1922

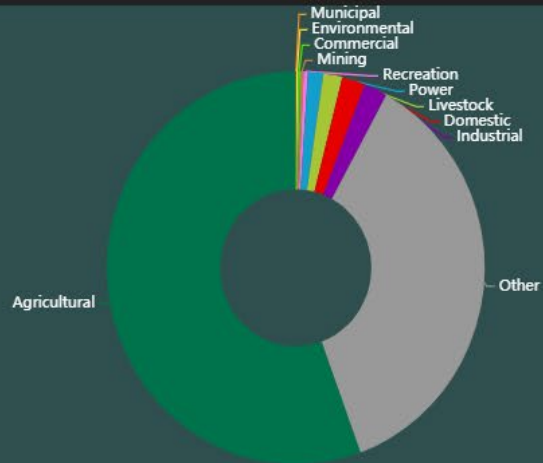
WaDE | WSWC | | [Known Issues](#) | [FAQ](#) | [Feedback](#)

Water Rights Data



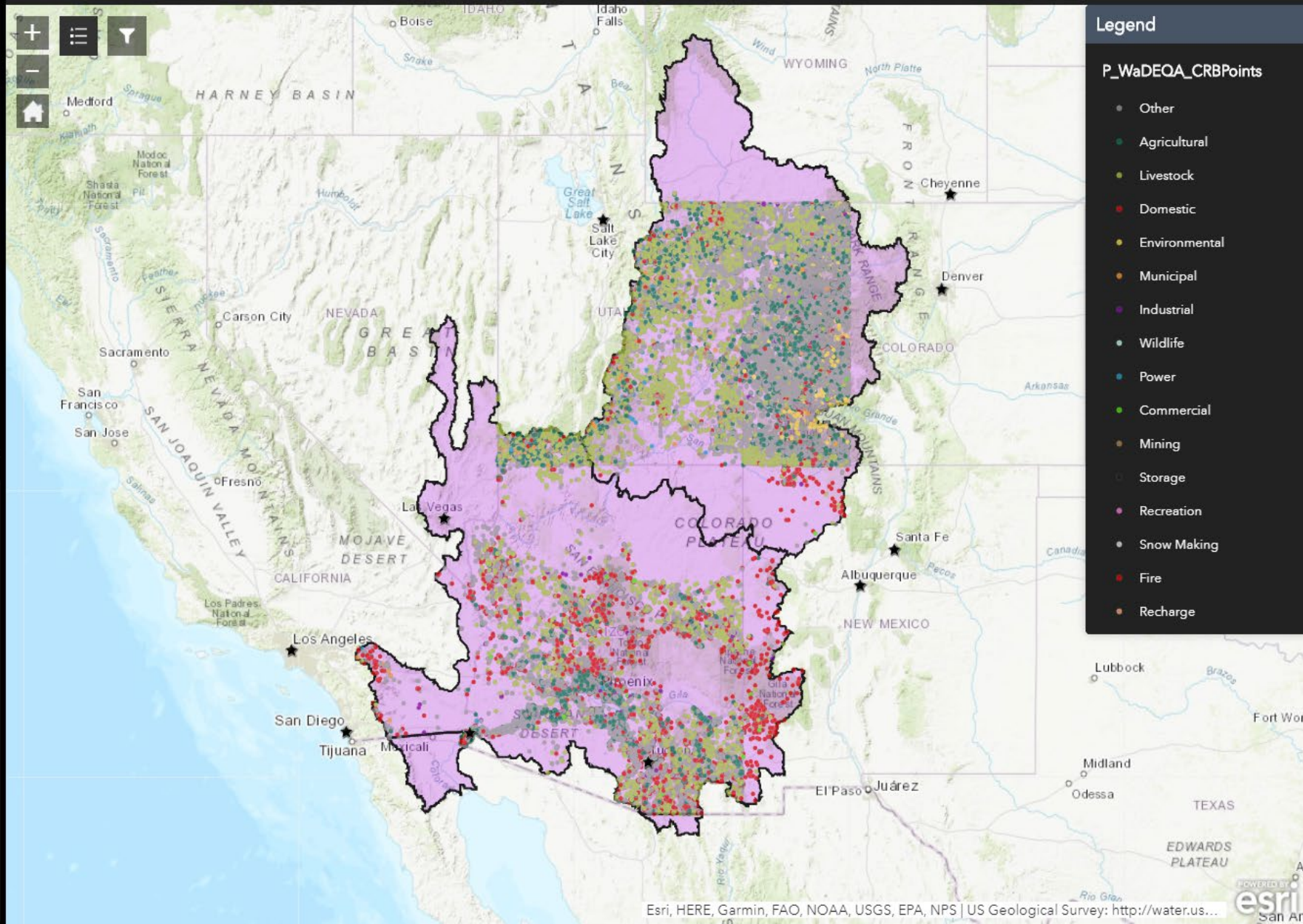
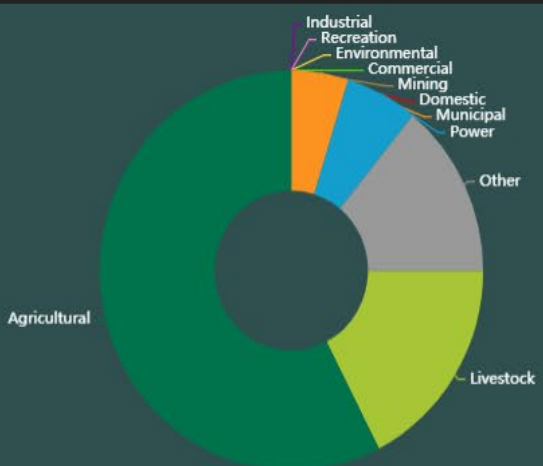
Infographic

Flow Amount (CFS)



Infographic_2

Maximum Volume Limit (AF)



CRB: Water Rights

Water Data Exchange (WaDE) Program | Western States Water Data Access and Analysis Tool (WestDAAT) | Sign In

Water Rights Data Download Data

[Reset All Filters](#)

Toggle Point Size: Default | Flow | Volume

Toggle View: All | Points of Diversion | Places of Use

Map Layer:

WATER RIGHT SELECTION FILTERS

[Learn about WestDAAT filters](#)

State:

Beneficial Use:

Water Source Type:

Search Allocation Owner:

Owner Classification Type:

River Basin Area: ×

Availability of Priority Date and Amounts:

Expand Analytics & Table

ANALYTICS & TABLE

[Chart Summary](#) | [Data Table](#)

[Learn about WestDAAT analytics](#)

Count of Water Rights
435,328 Rights

Beneficial Use	Count
Agriculture Irrigation	~180,000
Domestic	~100,000
Livestock	~50,000
Other	~30,000
In-stream Flow	~10,000
Unspecified	~10,000
Commercial/Industrial	~5,000
Public Supply	~5,000
Mining	~5,000
Aquaculture	~5,000

Cumulative Flow (CSF) of Water Rights
449,370.61 (CFS)

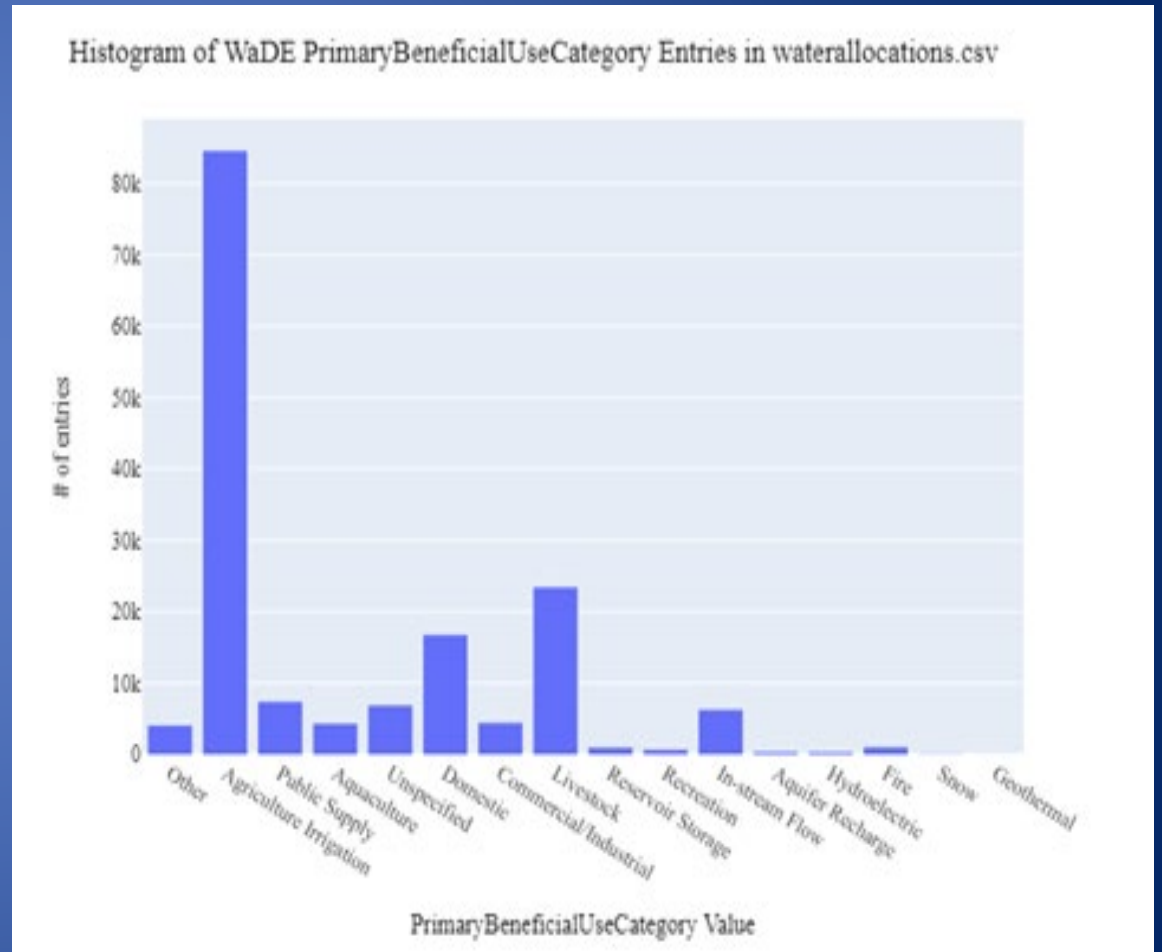
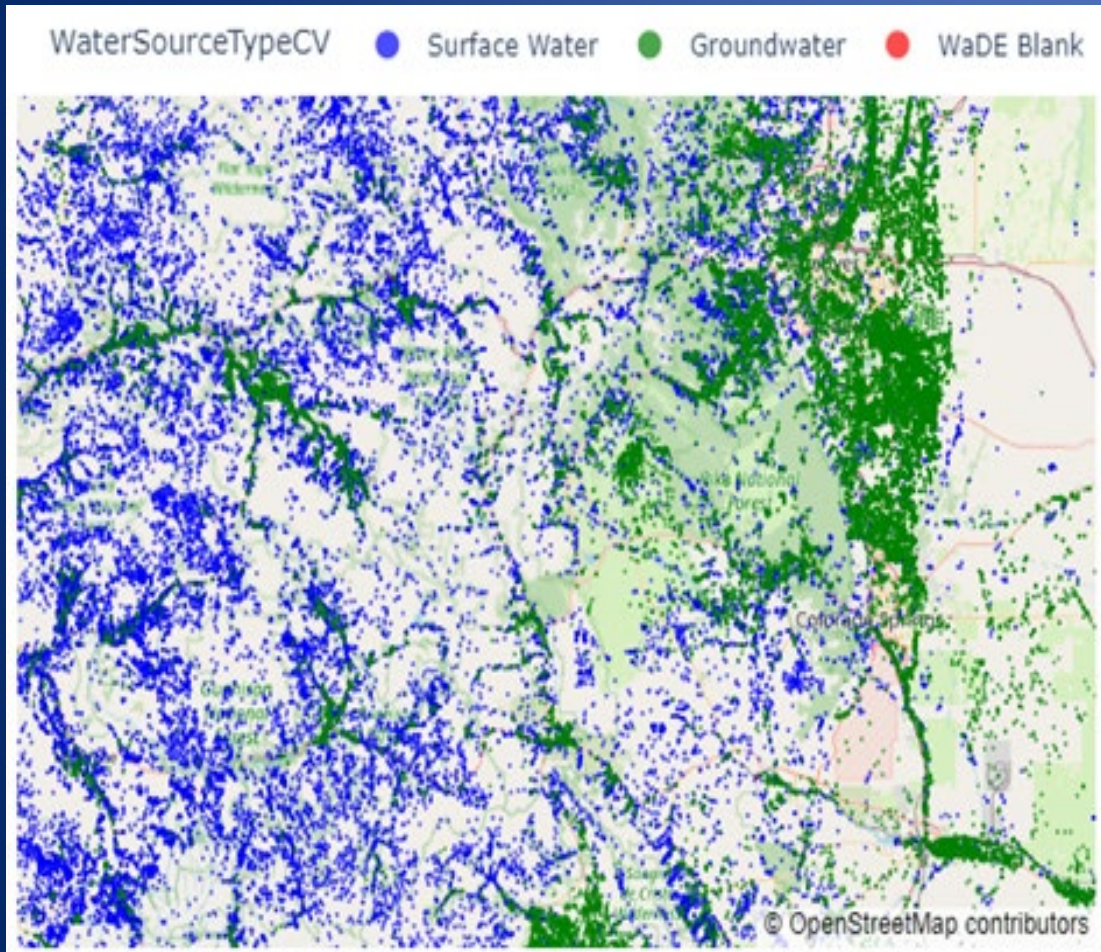
Beneficial Use	Cumulative Flow (CFS)
Agriculture Irrigation	~200,000
Domestic	~100,000
Commercial/Industrial	~50,000
Unspecified	~30,000
Livestock	~20,000
Hydroelectric	~10,000
In-stream Flow	~10,000
Recreation	~5,000
Public Supply	~5,000
Reservoir Storage	~5,000
Other	~5,000

Cumulative Volume (AF) of Water Rights
15,097,411.33 (AF)

Beneficial Use	Cumulative Volume (AF)
Agriculture Irrigation	~8,000,000
Hydroelectric	~4,000,000
Domestic	~2,000,000
Other	~1,000,000
Public Supply	~1,000,000
Reservoir Storage	~500,000
Mining	~500,000

WaDE | WSWC | | [Known Issues](#) | [FAQ](#) | [Feedback](#)

Colorado Water Resources Fact Sheet



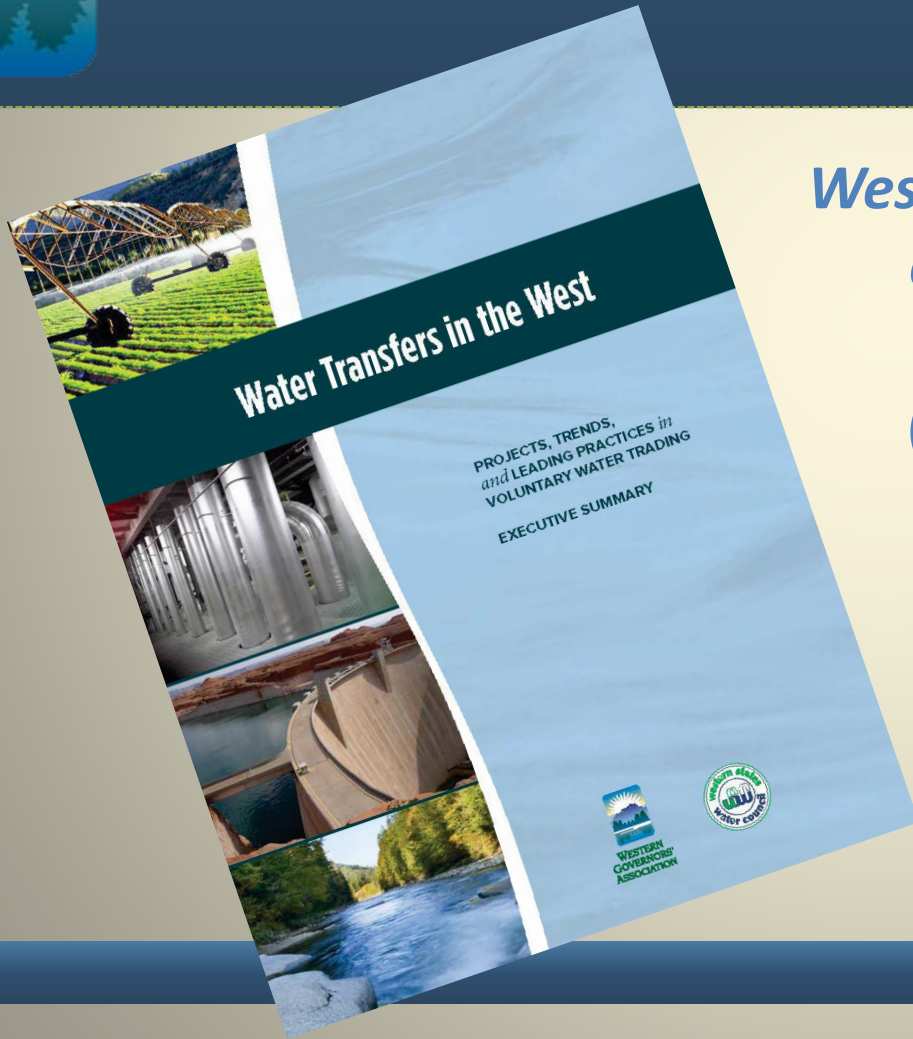
Collaborative Water Management

- Water Conservation
- Ground Water Recharge
- Water Banking
- Water Reuse and Recycling
- Water Marketing and Transfers
- Snow Pack Augmentation
- Desalination
- Water Quality Protections
- Las Vegas water use down while population is up
- Arizona Groundwater Bank
- MWD proposes joint project
- Instate voluntary water transfers
- Upper Basin Projects
- Lower Basin & Mexico
- Upper Basin Salinity Control Projects



Water Transfers in the West:

Projects, Trends, and Leading Practices in Water Trading



Western Governors believe states should identify and promote innovative ways to allow water transfers from agricultural to other uses (including urban, energy and environmental) while avoiding or mitigating damages to agricultural economies and communities

Policy 11-7

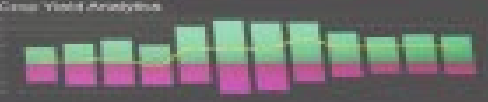




H: 5 M
V: 2 M/S
D: 15 M



- Crop Yield
- Soil Moisture
- Crop Damage
- Farm Map
- Water Stress



Agrimet Weather Station



Alternatives to Avoid Buy & Dry

- Rotational Fallowing
- Deficit Irrigation
- Water Banks
- Interruptible Supply Agreements
- Split-Season Leases
- Buy/Lease Back
- Piping and Lining Canals and Ditches
- Alternative cropping types
- Community Mitigation Funds



NASA TV



Transforming Water Management in the U.S. West with NASA Data

Building upon more than two decades of research, a new web-based platform called [OpenET](#) will soon be putting NASA data in the hands of farmers, water managers and conservation groups to accelerate improvements and innovations in water management.

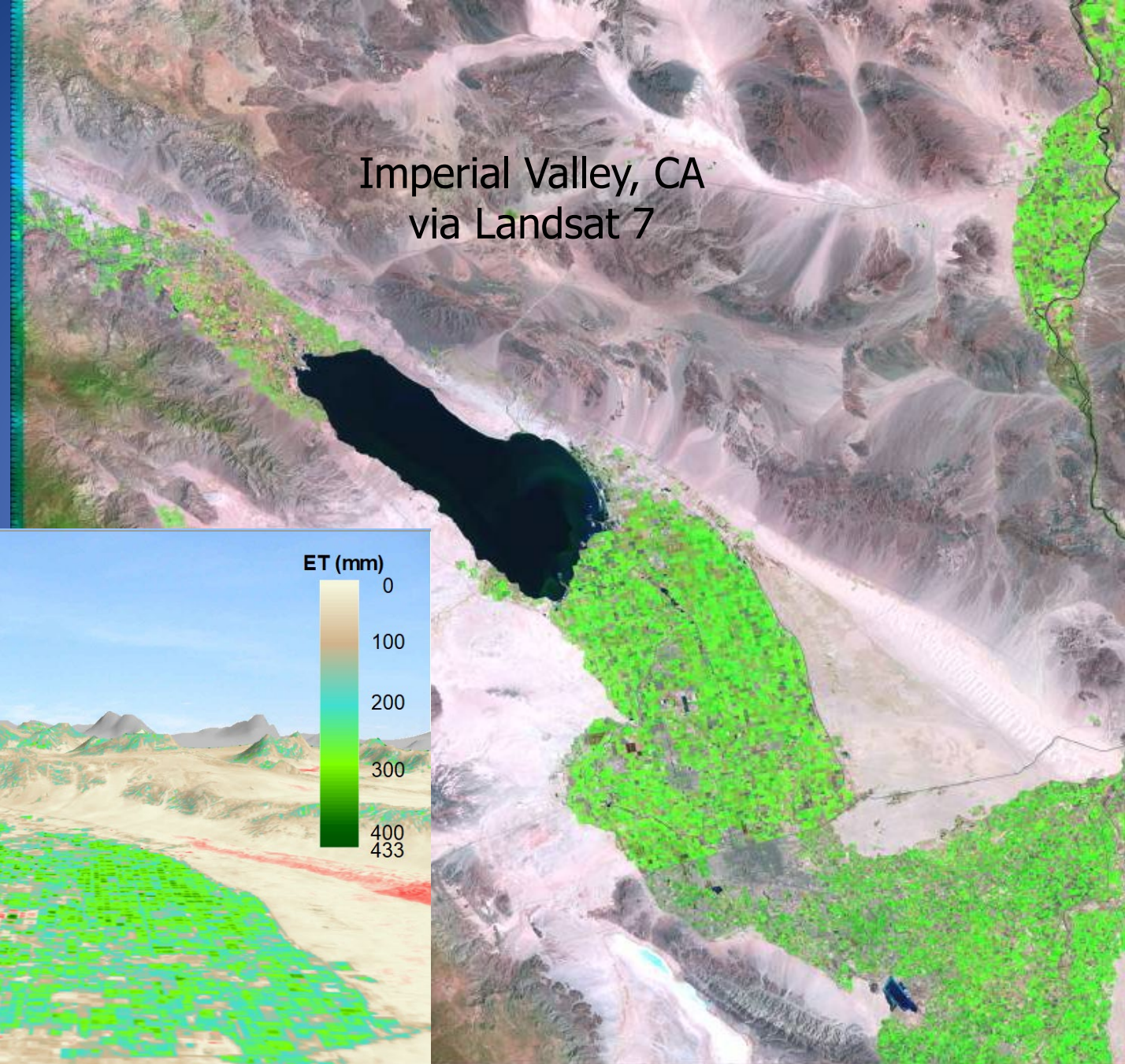
OpenET uses publicly available data and open source models to provide satellite-based information on evapotranspiration (the "ET" in OpenET) in areas as small as a quarter of an acre and at daily, monthly and yearly intervals.

Evapotranspiration is the process by which water is transferred from the land to the atmosphere, by water leaving the soil (evaporation) and water lost through

MORE STORIES



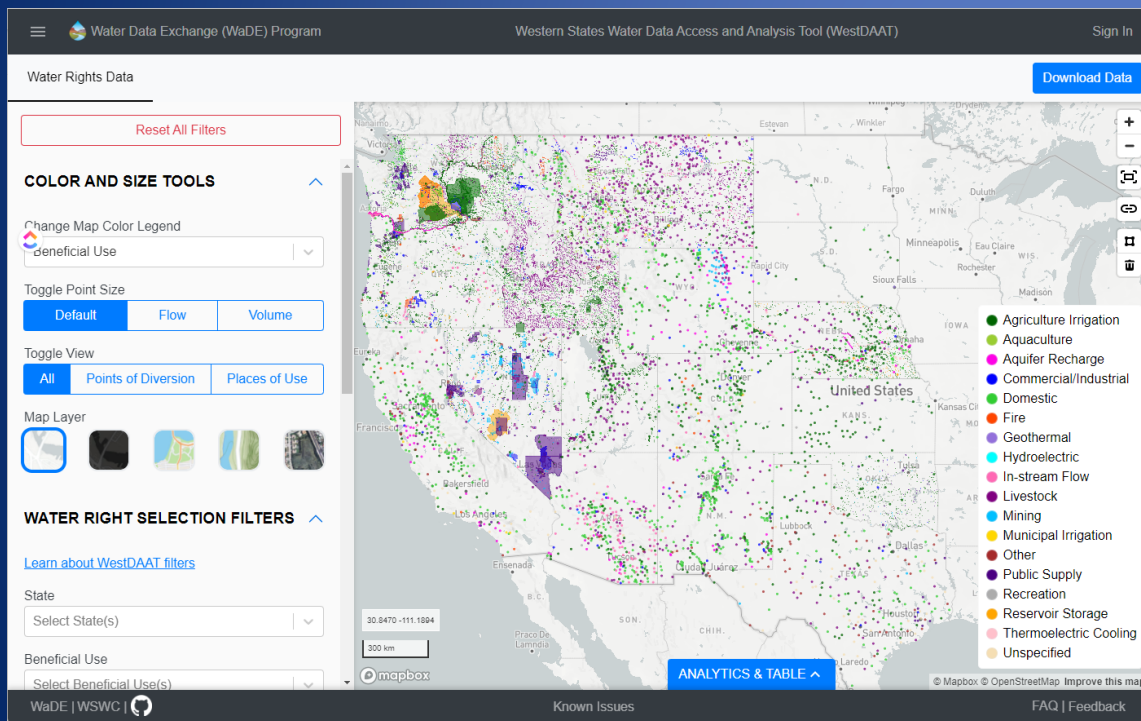
Shortage
Sharing and
Intentionally
Created
Surplus (ICS)
Water



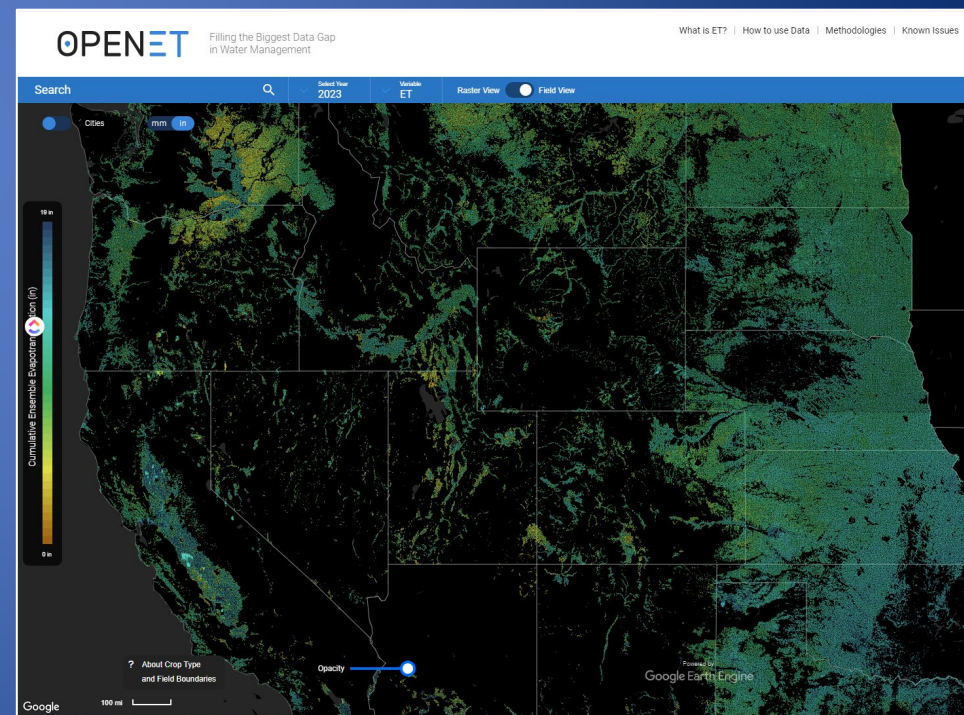


The Western Water Conservation Application Tool (WestCAT)

Facilitating voluntary, temporary, in-state, and compensated conservation programs through efficiency, fallowing, or switching to a different less water-intensive crop



Western Water Rights Data Access and Analysis Tool (WestDAAT)



Open Access Evapotranspiration (OpenET)



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Consumptive Use

- Uses may be consumptive or non-consumptive
- Most water rights based on consumptive use, not diversions or withdrawals
- Consumptive use not widely measured directly
- May require costly case-by-case analysis
- USGS national water use report dropped estimates of consumptive use as unreliable in 1995
- Agriculture is the predominant western water use measured both by diversions and consumption
- Recoverable losses and irrecoverable losses
- Basinwide v. individual water use efficiencies