



Data Visualization: Leveraging ArcGIS Online

Presented by Paula Dillon, GIS Analyst

June 30, 2016



The New York Times

The Opinion Pages | OP-ED CONTRIBUTOR

Water Is Broken. Data Can Fix It.

By CHARLES FISHMAN MARCH 17, 2016

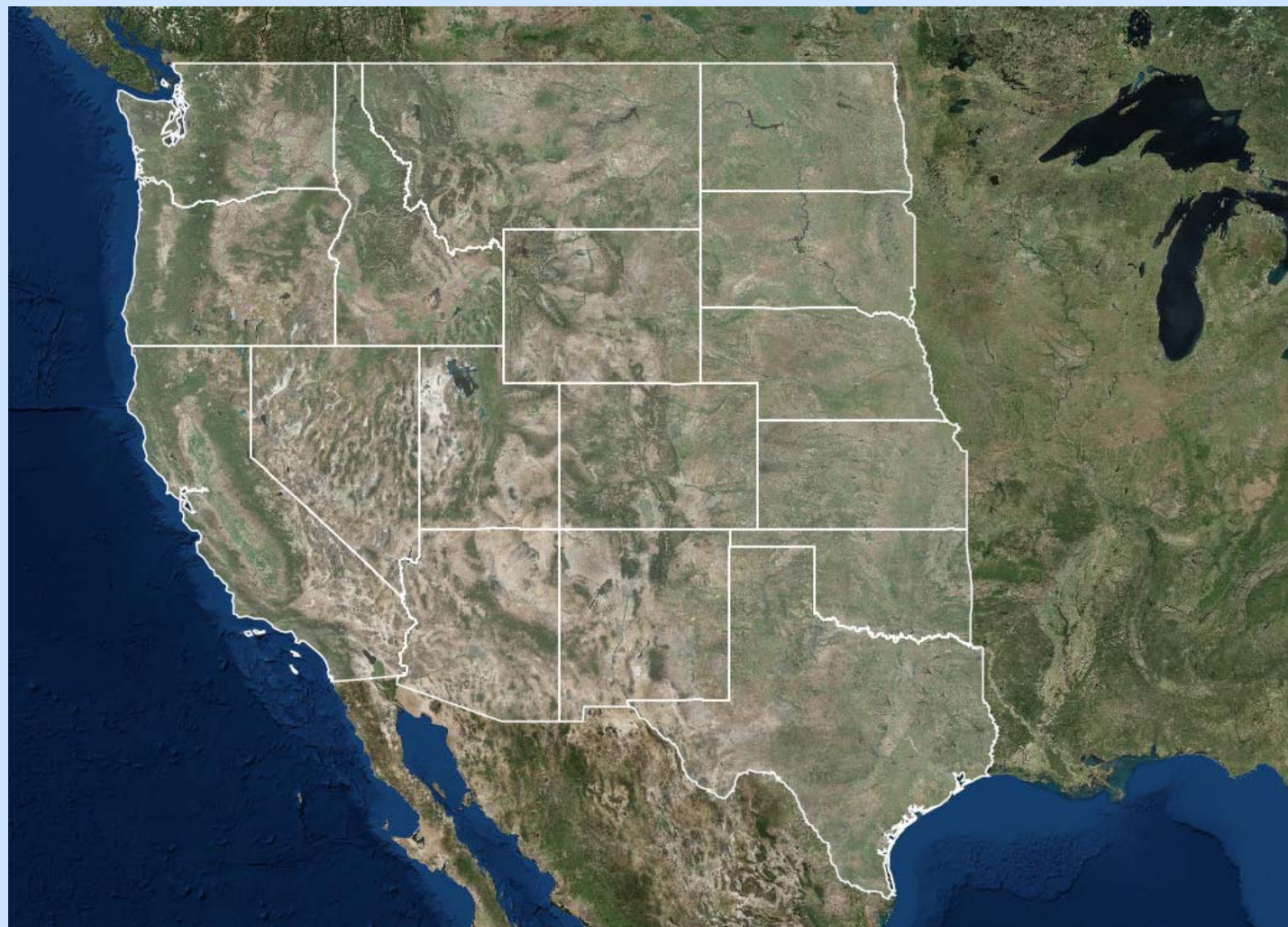


Sprinklers in an agricultural field in California. Max Whittaker for The New York Times

Water needs and
strategies for a
sustainable future

Where's the data?

Federal agencies
Academic researchers
Journalists
Politicians
Utility planners



**Western
States
Water
Council**

Water Data
Exchange

WaDE



**What type of
data we shared**

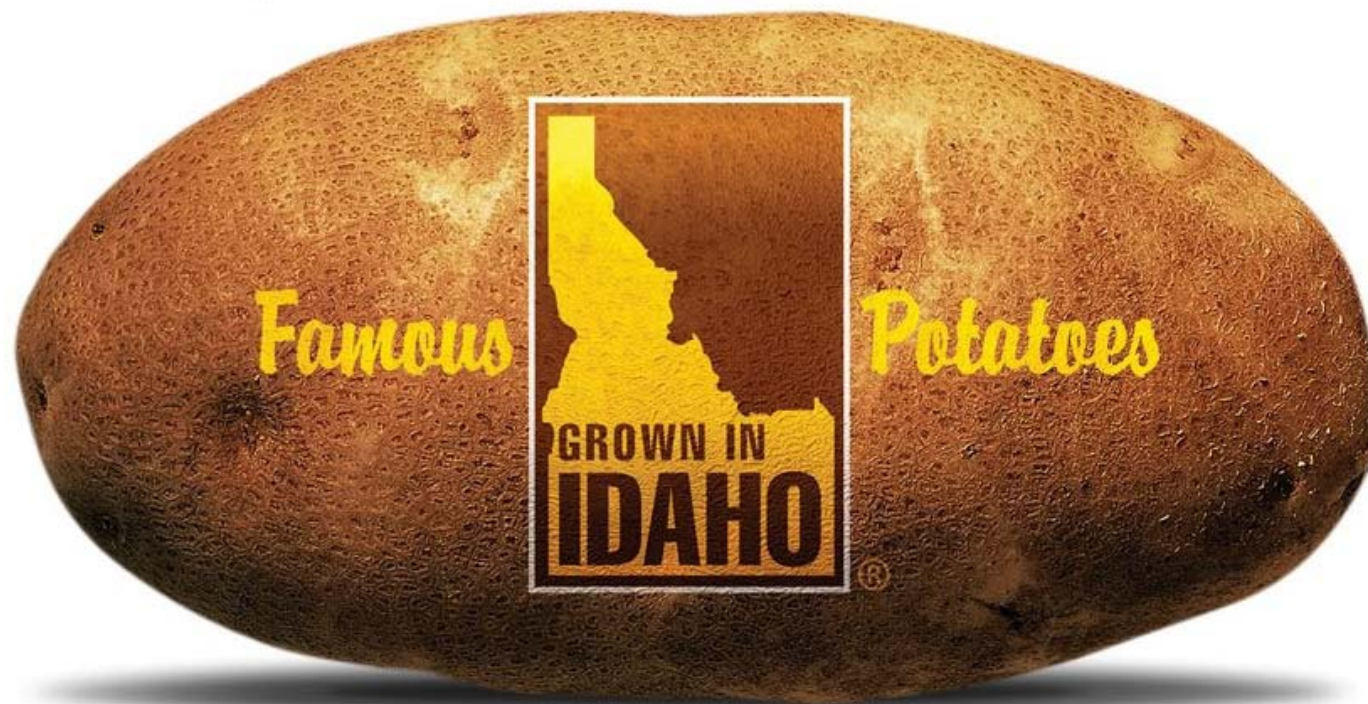


**How we shared
our water data**



**How we enabled
data visualization**







TUESDAY, AUG. 26, 2014, 5:34 A.M.

Scalia praises Idaho's Snake River Basin water rights adjudication

**Water
Right**

Allocations



U.S. Supreme Court Justice Antonin Scalia gives the keynote speech at the Snake River Adjudication celebration dinner at the Boise Center on the Grove in Boise, Idaho, on Monday, Aug. 25, 2014. (AP / Otto Kitsinger)



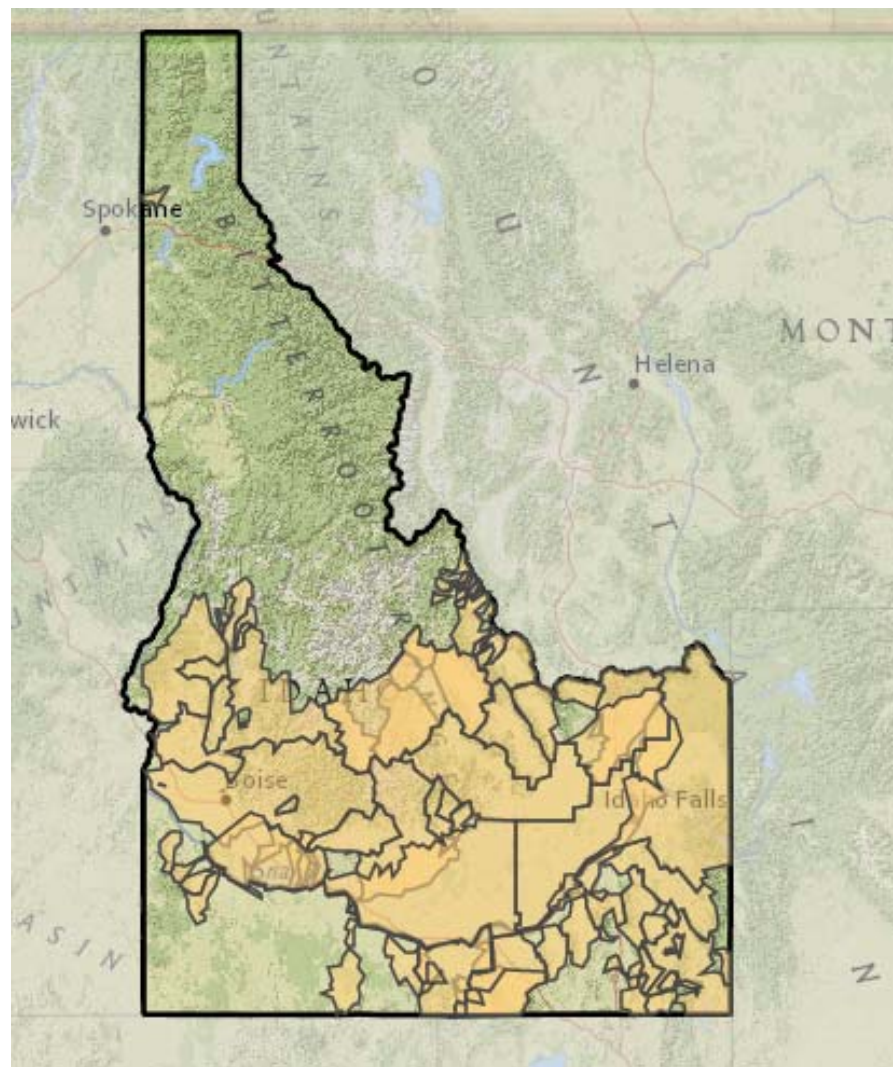
Type of Data

Water Districts

Watermaster records
rate data (cfs) for the
delivery of water:

Some flow meter.

Some calculated.

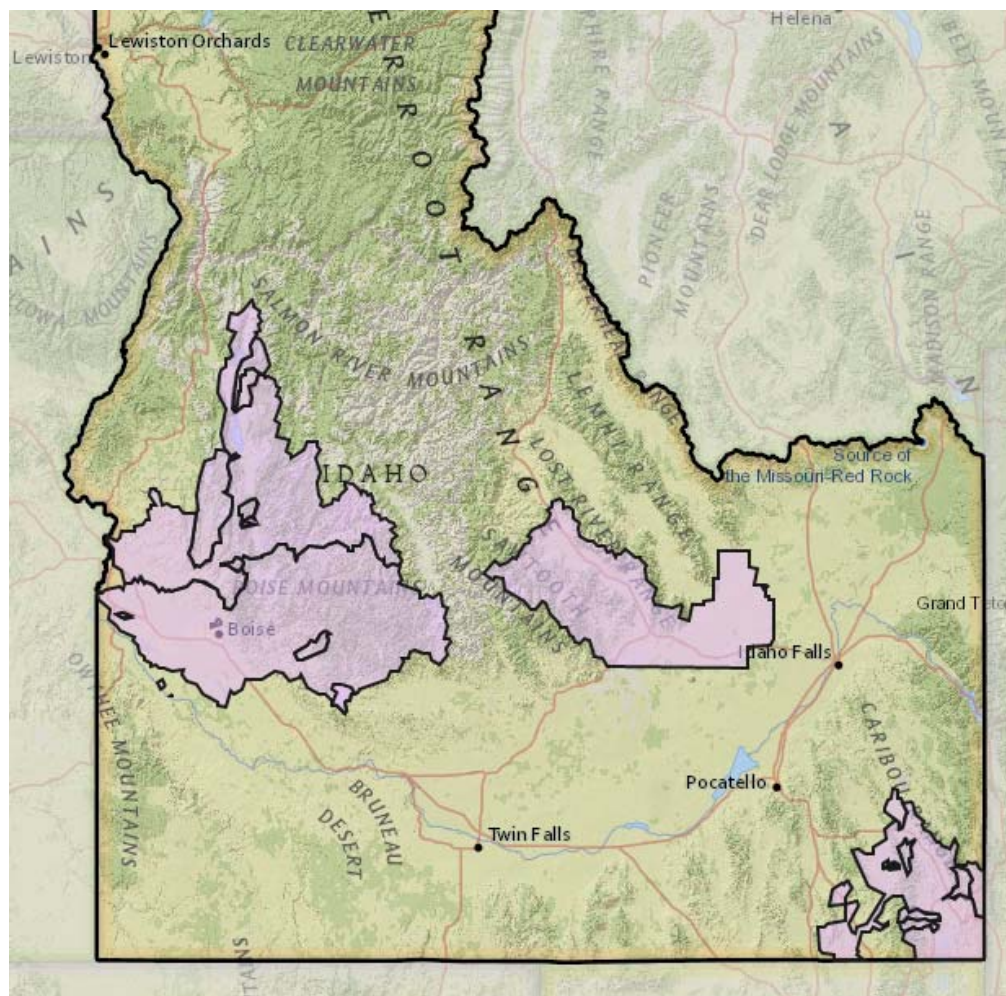


Type of Data

Water Right Accounting

Daily values for flows, diversions or reservoir contents in some water districts.

Based on the natural flow available, water rights accounting determines which water rights are in priority.



Type of Data

WMIS

Water Measurement Information System

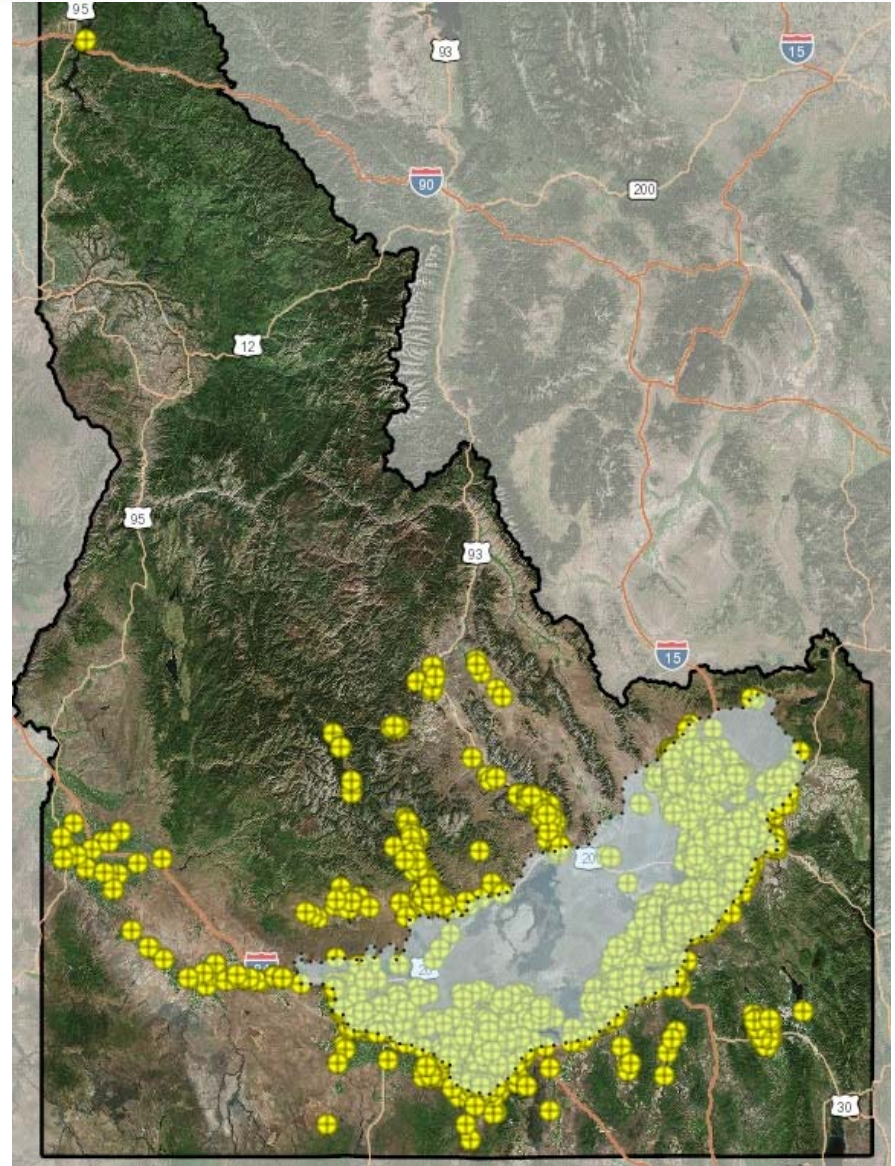
Annual volume.

Primarily irrigation wells on
the Eastern Snake River
Plain Aquifer.

Some surface water points
of diversion.



Type of Data



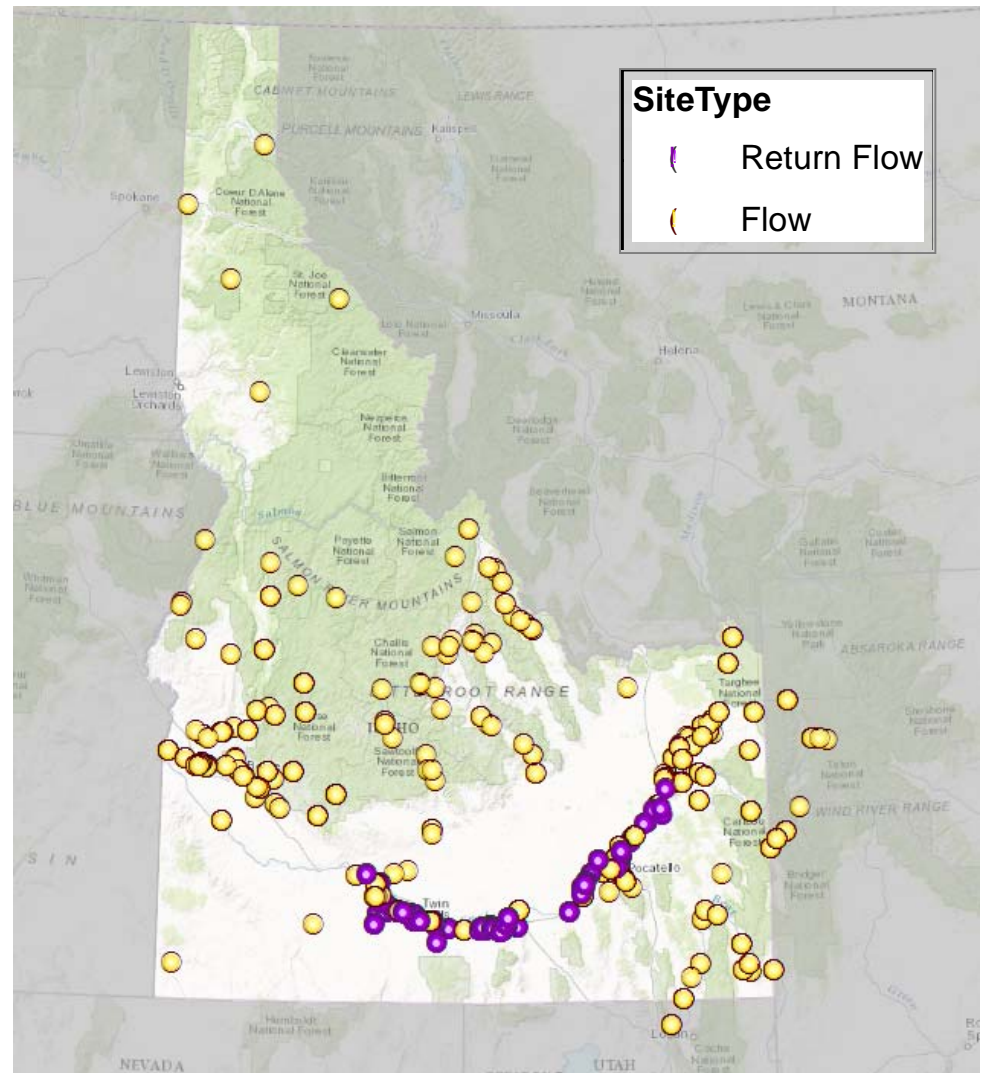
Hydrologic Time Series

Time series records for
some:

- Surface and groundwater diversions
- Return flows
- Ground water levels

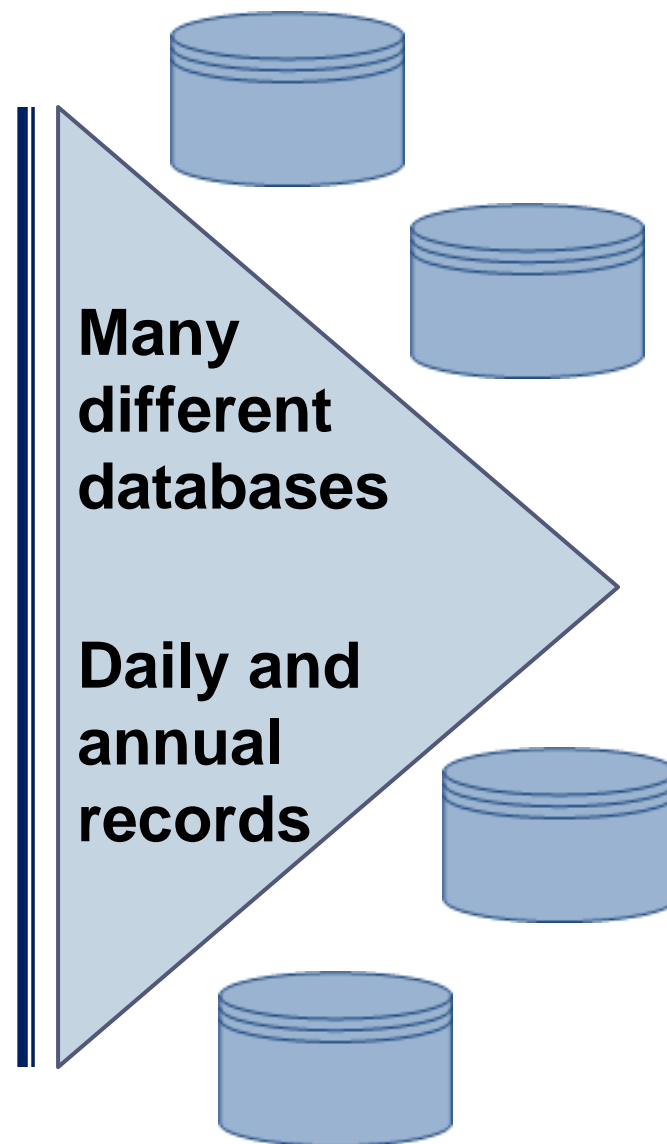


Type of Data



Types of Data

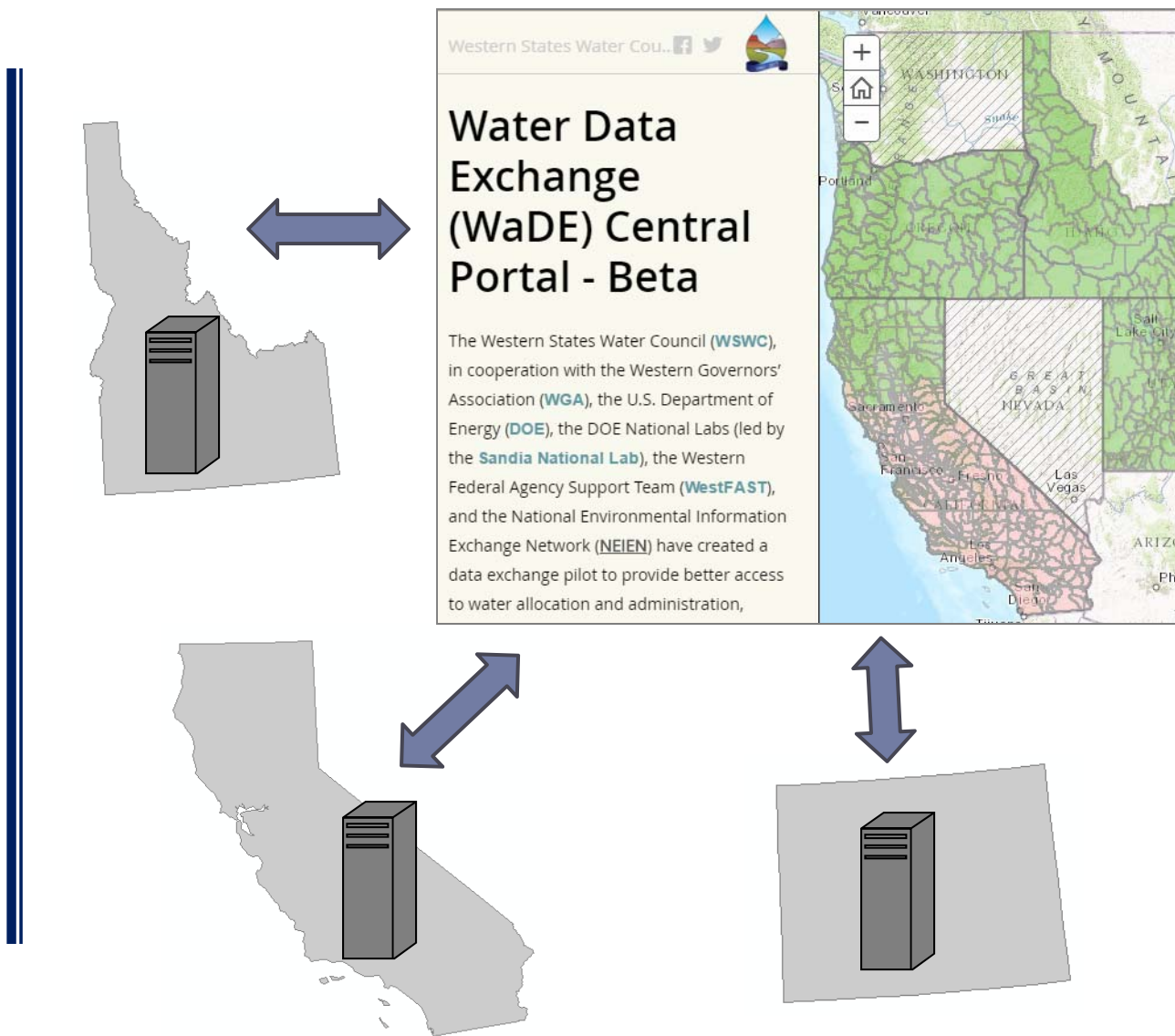
- Allocation of water (Water Rights)
- Delivery of water in Water Districts
- Flows and reservoir content from Water Right Accounting
- WMIS (mostly ground water pumped)
- Flows and return flows for some sites (hydrologic time series)



How does it work?

Each state maintains a central data catalog for regions within its boundaries.

The WaDE Central Portal map provides a link to each state's catalog.



How data is
shared

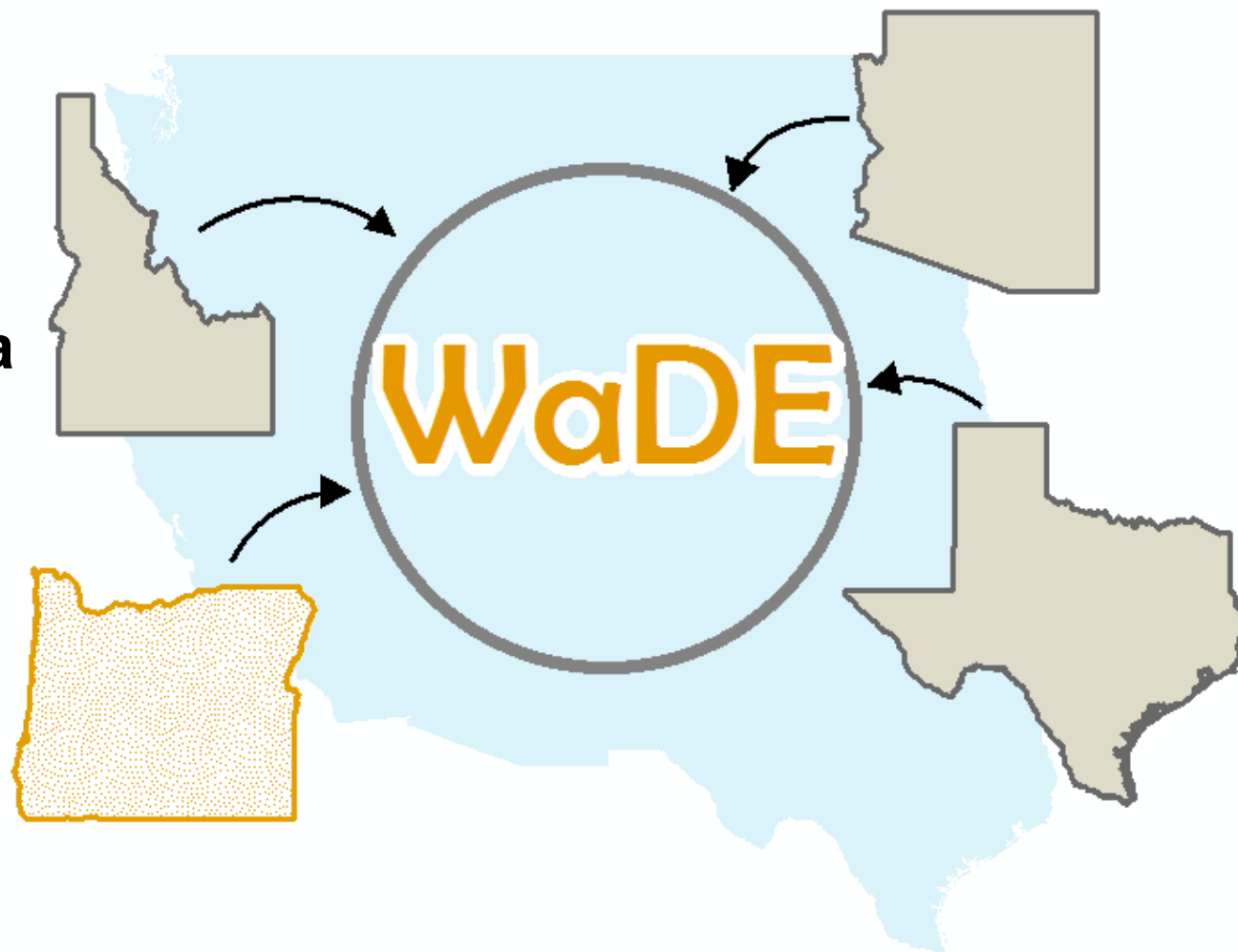
State Components

Standard database schema

Variability between states

Web Services

Accesses the database



How data is
shared

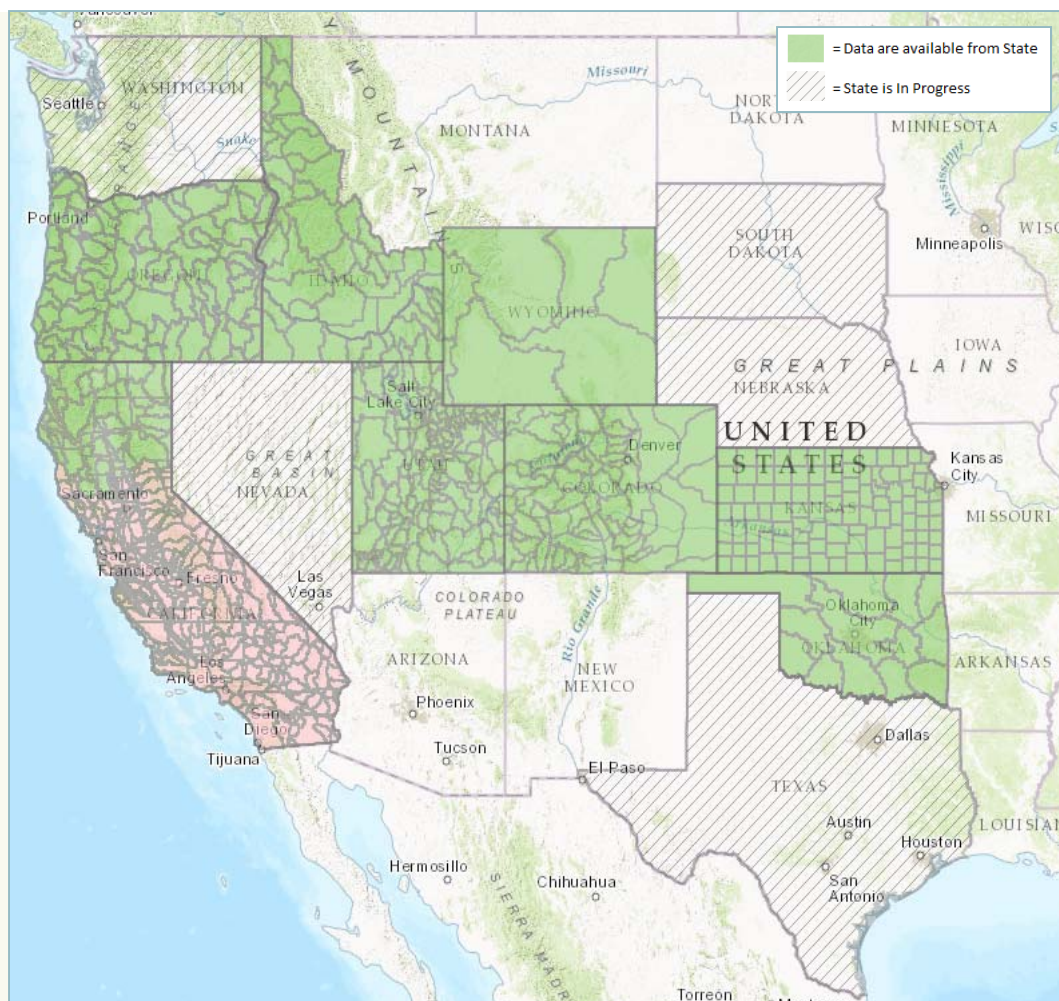
WaDE Central Portal

AGOL Map Journal

Water Data Exchange (WaDE) Central Portal - Beta

The Western States Water Council ([WSWC](#)), in cooperation with the Western Governors' Association ([WGA](#)), the U.S. Department of Energy ([DOE](#)), the DOE National Labs (led by the [Sandia National Lab](#)), the Western Federal Agency Support Team ([WestFAST](#)), and the National Environmental Information Exchange Network ([NEIEN](#)) have created a data exchange pilot to provide better access to water allocation and administration, water supply, and water use data that are generated by western states.

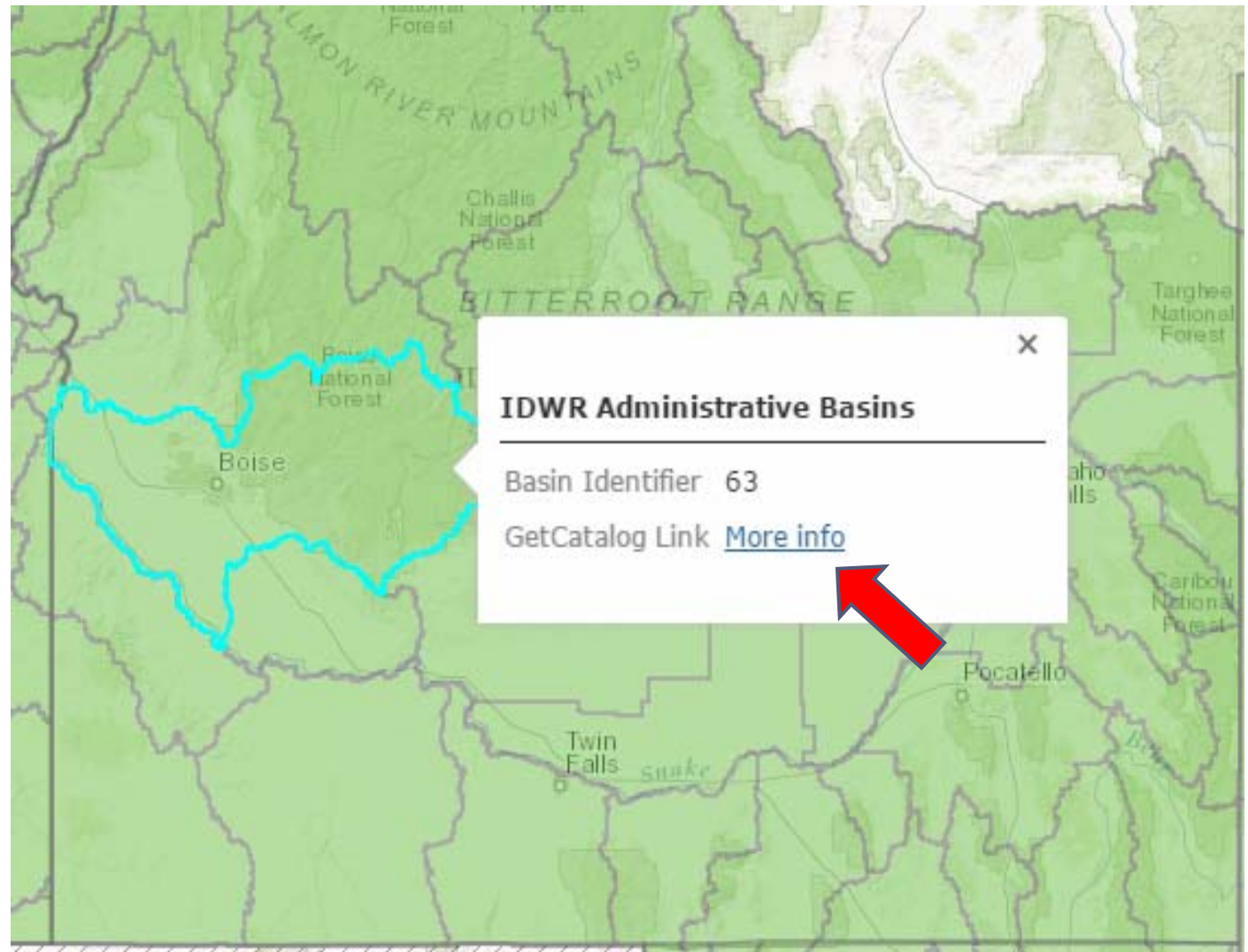
The portal works by maintaining a central data catalog for regions within each state. Clicking on the catalog link accesses the GetCatalog webservice, which retrieves an up-to-date listing of



How data is shared

WaDE Central Portal

Clicking on the catalog link accesses the *GetCatalog* webservice which retrieves a listing of the types of data that are available.





Western States Water Council - Water Data Exchange (WaDE) Catalog

[Back to Map](#)[About](#)

Data shared within WaDE are organized by "reports," which are yearly encapsulations of the data, either a water year (Oct. 1st - Sep. 30th), an irrigation year (Nov. 1st - Oct. 31st), or a calendar year. There may be multiple reports for any given year based on the methods used to generate that report.

****NOTICE**** For all data provided, please review the associated methodology information thoroughly to discover data provenance and quality before using, especially when comparing data between states or organizations.

Organization: Idaho Department of Water Resources

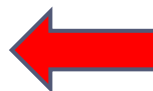
Geospatial Reporting Unit: REPORTUNIT - 63

For a listing of methods used by Idaho Department of Water Resources and shared within WaDE, [click here](#).

To retrieve summary-level and detailed data by report and by data category and type:

*Note: Requests for DETAILED DATA may have more extensive data-retrieval times. Please be patient while the query is retrieved to your browser. The query retrieval could take several minutes depending on website traffic and your network speeds. Use the table below to access detailed datasets by report, data category, and data type.

Report	Data Category*	Data Type	View by Data Type
2012	DETAIL	RETURN	View Data
2015	DETAIL	DIVERSION	View Data
2016	DETAIL	ALLOCATION	View Data
2016	DETAIL	DIVERSION	View Data



Water Allocations (Total Amount for Water Right/Permit)

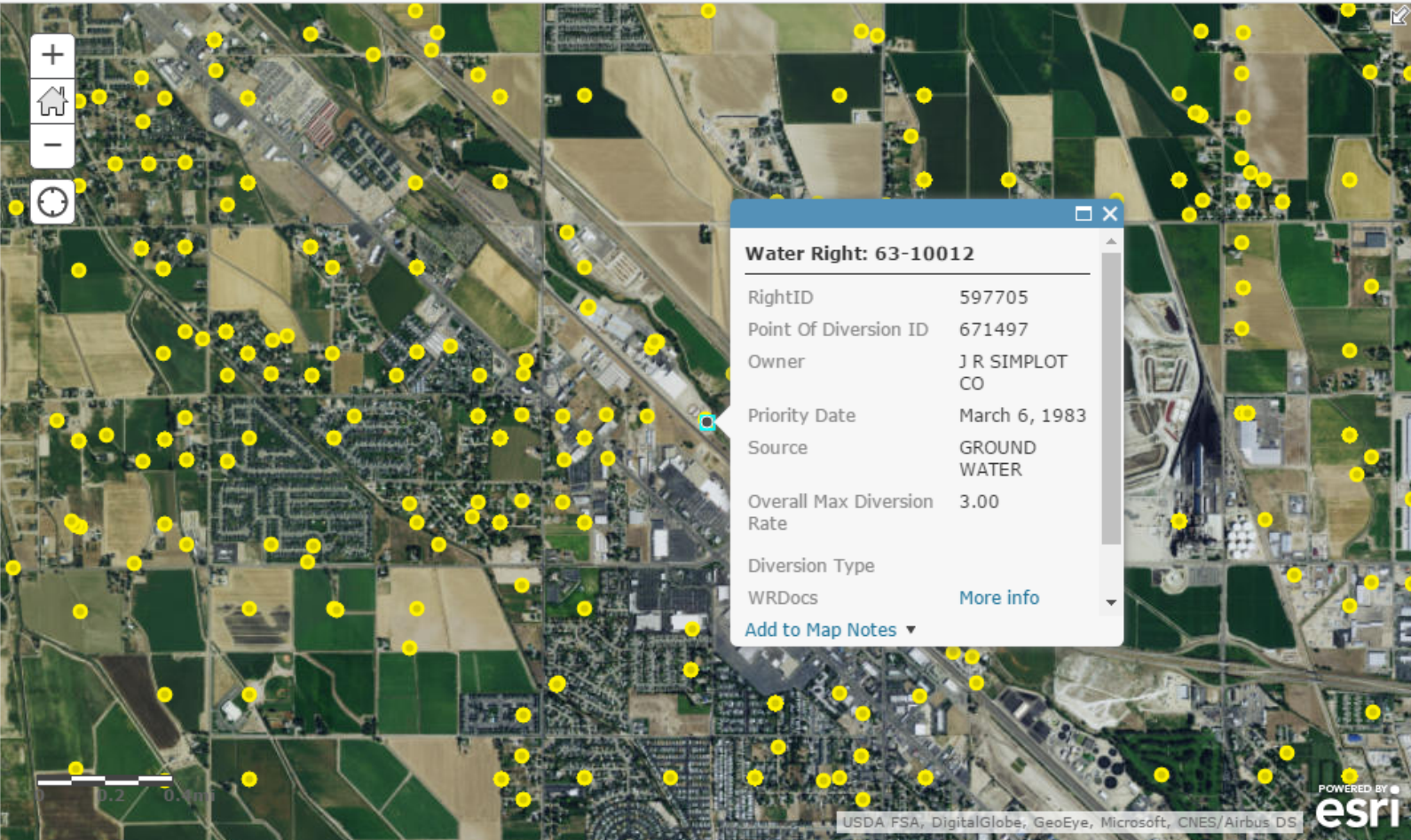
*Water may be allocated using a volume, a flowrate, or both (flowrate with volume as a maximum diversion).

**The total amount of water actually diverted from all diversions associated with this allocation OR the total amount of water that flowed for the allocation if no diversion was made, for example, an instream flow amount.

Allocation ID	Allocation Owner	Priority Date	Legal Status	Reporting Unit	County	HUC	GIS Feature	Beneficial Use	Source Type	Fresh/Saline	Total Volume for Allocation*
63-1	STAR SPRINGS LP	1886-06-01	Decreed	63	16001	170501140404	586024	IRRIGATION	SURFACE	FRESH	
63-100	CLYDE J COOK TRUST	1899-10-07	Decreed	63	16039	170501131102	556686	IRRIGATION	SURFACE	FRESH	
63-10000	RICHARD A KLEIN	1983-02-14	License	63	16027	170501140507	99960	COOLING, DOMESTIC, HEATING	GROUND	FRESH	10.800
63-10005	FLORENCE E GUENGERICH	1983-03-11	License	63	16027	170501140803	57545	DOMESTIC	GROUND	FRESH	6.000
63-10007	SHANE BEUS	1983-03-04	Decreed	63	16001	170501140601	378762	DOMESTIC, STOCKWATER	GROUND	FRESH	6.600
63-10008	GERRY A HARDING	1983-03-24	Decreed	63	16001	170501140404	561632	IRRIGATION	GROUND	FRESH	22.500
63-10010	MONROE M LEE	1983-05-16	License	63	16001	170501140203	101697	DOMESTIC	GROUND	FRESH	1.200
63-10011	ALTON R HARRIS	1983-03-29	Decreed	63	16039	170501130506	372963	DOMESTIC	GROUND	FRESH	2.400
63-10012	J R SIMPLOT CO	1983-03-07	Decreed	63	16027	170501140507	597705	INDUSTRIAL	GROUND	FRESH	155.000
63-10013A	WENDELL B PLATT	1983-04-06	License	63	16027	170501140801	99961	IRRIGATION	GROUND	FRESH	

ArcGIS ▼ Water Right RightID Search Modify Map Sign In

[Details](#) | [Basemap](#) | [Share](#) | [Print](#) | [Measure](#) ▼ 597705 ✕ 🔍



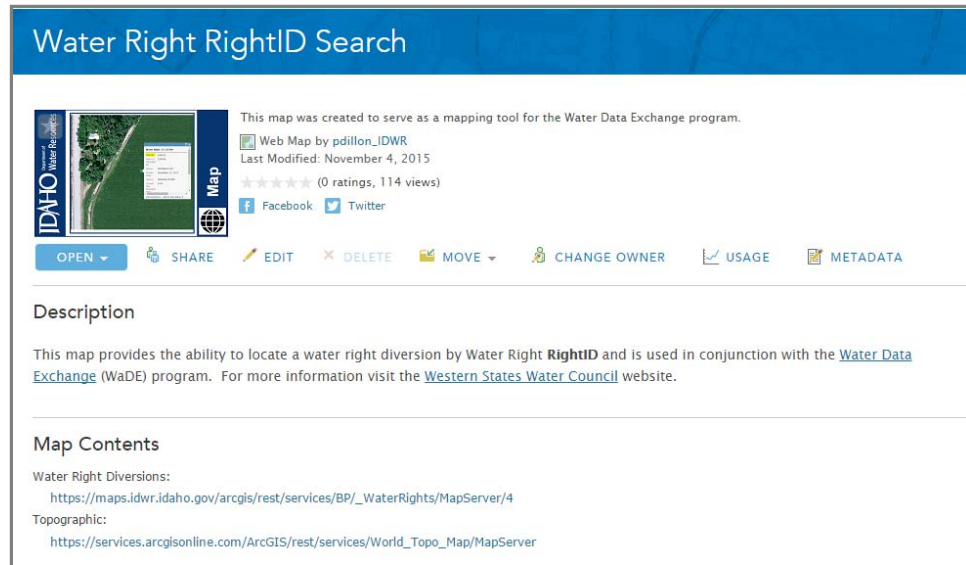
Water Right: 63-10012

RightID	597705
Point Of Diversion ID	671497
Owner	J R SIMPLOT CO
Priority Date	March 6, 1983
Source	GROUND WATER
Overall Max Diversion Rate	3.00
Diversion Type	
WRDocs	More info
Add to Map Notes ▼	

USDA FSA, DigitalGlobe, GeoEye, Microsoft, CNES/Airbus DS **esri** POWERED BY

How did we do that?

- Created an AGOL map
- Configured for search



Application Settings Select the tools and capabilities to enable in applications that access this web map

☐ Routing
☒ Measure Tool
☒ Basemap Selector
☒ Find Locations [-]

Hint text

☒ By Layer

Layer	Field	Condition
Water Right Diversic	RightID	Equals

Construct URL

Get the URL for
the map

Append the find
Parameter

Store the URL
in the
database.

<https://idwr.maps.arcgis.com/home/webmap/viewer.html?webmap=79db025ceef543818d3d03ce83757b79>

&find=

<https://idwr.maps.arcgis.com/home/webmap/viewer.html?webmap=79db025ceef543818d3d03ce83757b79&find=>

REPORT_ID	WFS_ID	WFS_DATATYPE	WFS_ADDRESS	WFS_FEATURE_ID_FIELD
2016	1	DIVERSION	http://www.arcgis.com/home/webmap/viewer.html?webmap=79db025ceef543818d3d03ce83757b79&find=	PointOfDiversionID
2016	2	ALLOCATION	http://www.arcgis.com/home/webmap/viewer.html?webmap=79db025ceef543818d3d03ce83757b79&find=	RightID

Find Water Right

onclick event
in web service
appends
RightID to the
map URL then
passes the
entire string to
the browser.

REPORT_ID	WFS_ID	WFS_DATATYPE	WFS_ADDRESS	WFS_FEATURE_ID_FIELD
2016	1	DIVERSION	http://www.arcgis.com/home/webmap/viewer.html?web...	PointOfDiversionID
2016	2	ALLOCATION	http://www.arcgis.com/home/webmap/viewer.html?web...	RightID

HUC	GIS Feature	Beneficial Use
170501140404	586024	IRRIGATION
170501131102	556686	IRRIGATION

<https://idwr.maps.arcgis.com/home/webmap/viewer.html?webmap=79db025ceef543818d3d03ce83757b79&find=586024>



Data Visualization

AGOL

1. WaDE Central Portal

Choose an area to access the catalog

2. Idaho's WaDE Detail

View location of detail



Data Visualization **AGOL Advantages**

- **Rapid Deployment**
- **No programming required**
- **Malleable**
Construction of URL can be done on the fly.
- **Provides Visual / Spatial Component to non-spatially enabled data**



**What type of
data we shared**



**Where we shared
our water data**



**How we enabled
data visualization**

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Policies Publications ▾ WestFAST ▾ **WaDE ▾**



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