

# Modern Water Data Infrastructure for 21st Century Water Management



Internet  
of Water

Partnerships for progress





Internet  
of Water®

# VISION

*The Internet of Water envisions a world engaged in sustainable water resources management and stewardship enabled by open, shared, and integrated water data.*



*Integrated management requires*

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integrated data



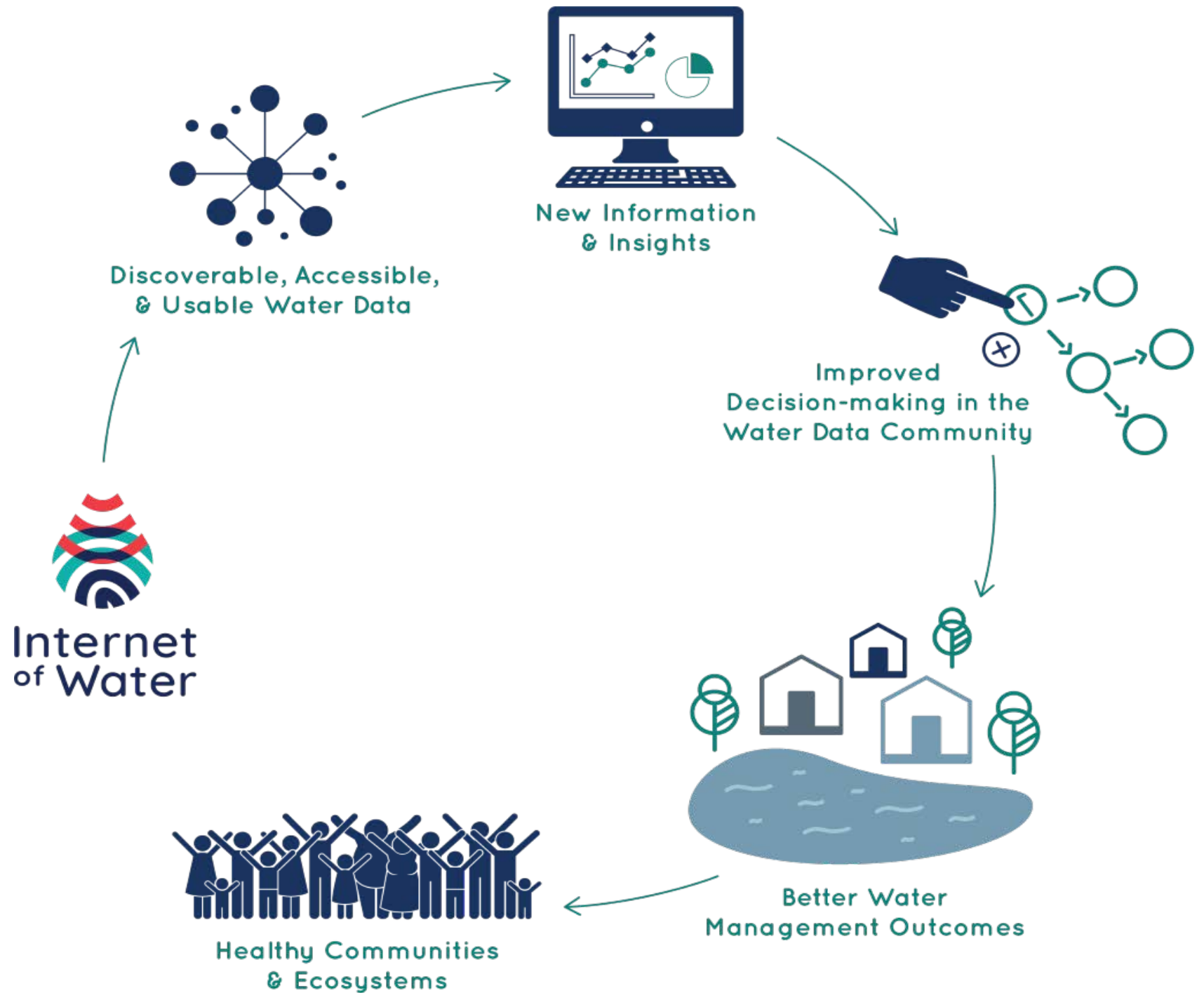


To create a  
**full picture**

*We need to*

**find  
access  
use**

*As many pieces of the  
puzzle as possible*



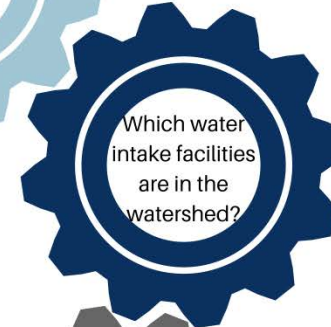
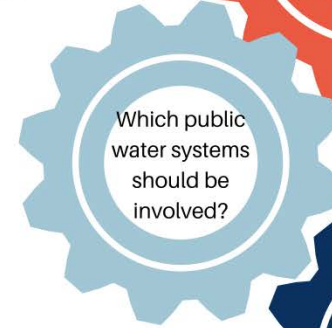


## An internet of water supports decision-making

Effective policy decisions begin with an important question



Policy makers need information to make good decisions.



Data are needed to create good information for decision-making.



The IoW helps you find and access data.



**Access to good data leads to more effective policy decisions.**



# Approach



# Modern Water Data FAIR Principles

A worker in a blue jumpsuit and white hard hat is reviewing a tablet at a water treatment facility. The background shows large concrete structures and a cloudy sky.

**Findable/Discoverable**

**Accessible**

**Interoperable**

**Re-usable**



# Strategies for Modern Water Data

A person wearing a blue jacket and a white hard hat is looking at a tablet. They are standing in front of a large industrial water treatment facility with several large rectangular tanks and metal structures. The sky is overcast.

**Promote data and meta data standards; advance data literacy**

**Create tools for discoverability and accessibility**

**Build water data hubs by geography and theme**

**Build products, tools, and collaborative projects to address real-world water problems**

**Build a community of practice and sustainable network**



# Tools



## How Geoconnex works



### Persistent IDs

A persistent, unique identifier for each location or feature for which data is published



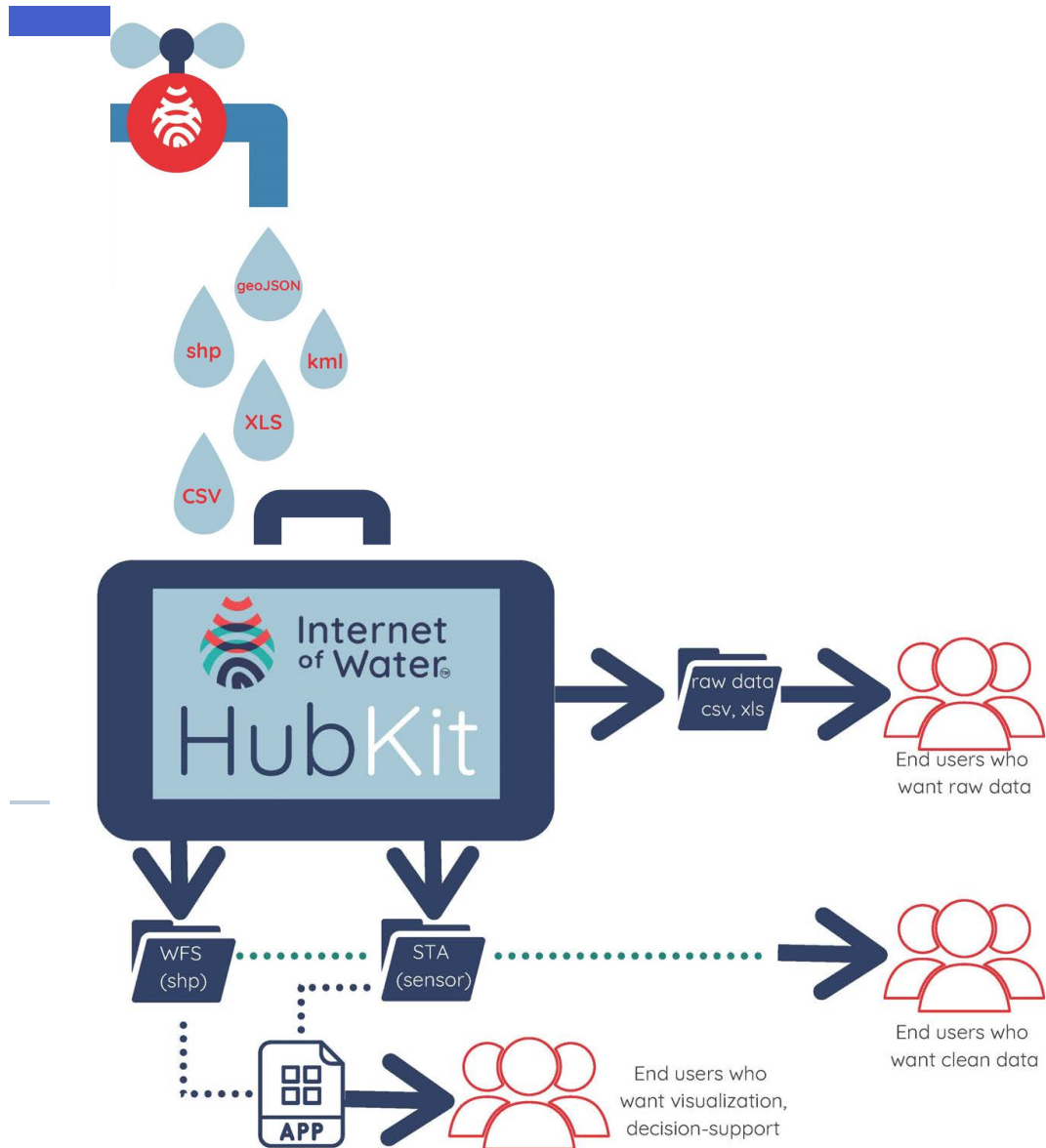
### Landing Pages

Provide stable locations on the internet representing real-world features that data can link to and be linked from



### Links Data

Enables data to be linked together based on geography, hydrography, and key words



# HubKit

A collection of modular software components that enable storage, metadata documentation, and publication of time series, spatial, and tabular data using OGC Standard web services.

## User Friendly Interface

Easily configured with other data sources

Includes a data translation feature



A scenic landscape featuring snow-capped mountains and a calm lake. The sun is low on the horizon, creating a warm, golden glow. The word "Engagement" is overlaid in large, white, sans-serif font across the center of the image.

# Engagement



# IoW P2P Network



[About](#) [Pilots](#) [Resources](#) [Data Stories](#) [Events](#) [Connect](#)

## Peer-to-Peer Network

The Internet of Water's Peer-to-Peer (P2P) Network is a community of practice designed to connect members from across the nation who are working on modernizing their agency's water data infrastructure.

Are you an active employee of a state, local, or tribal government agency? Do you work for a water utility or river basin commission?

Come join us!

[REGISTER HERE](#)



### Webinars

A Webinar series, designed based upon the needs and most pressing water data questions facing P2P participants, will feature state agency and industry experts on water data.



### Spotlights

Monthly Spotlights on P2P participants will feature how their agency approaches the challenges of modernizing their water data infrastructure.



### Forum

An open Forum will allow P2P participants to post specific questions and give feedback to others in the network.



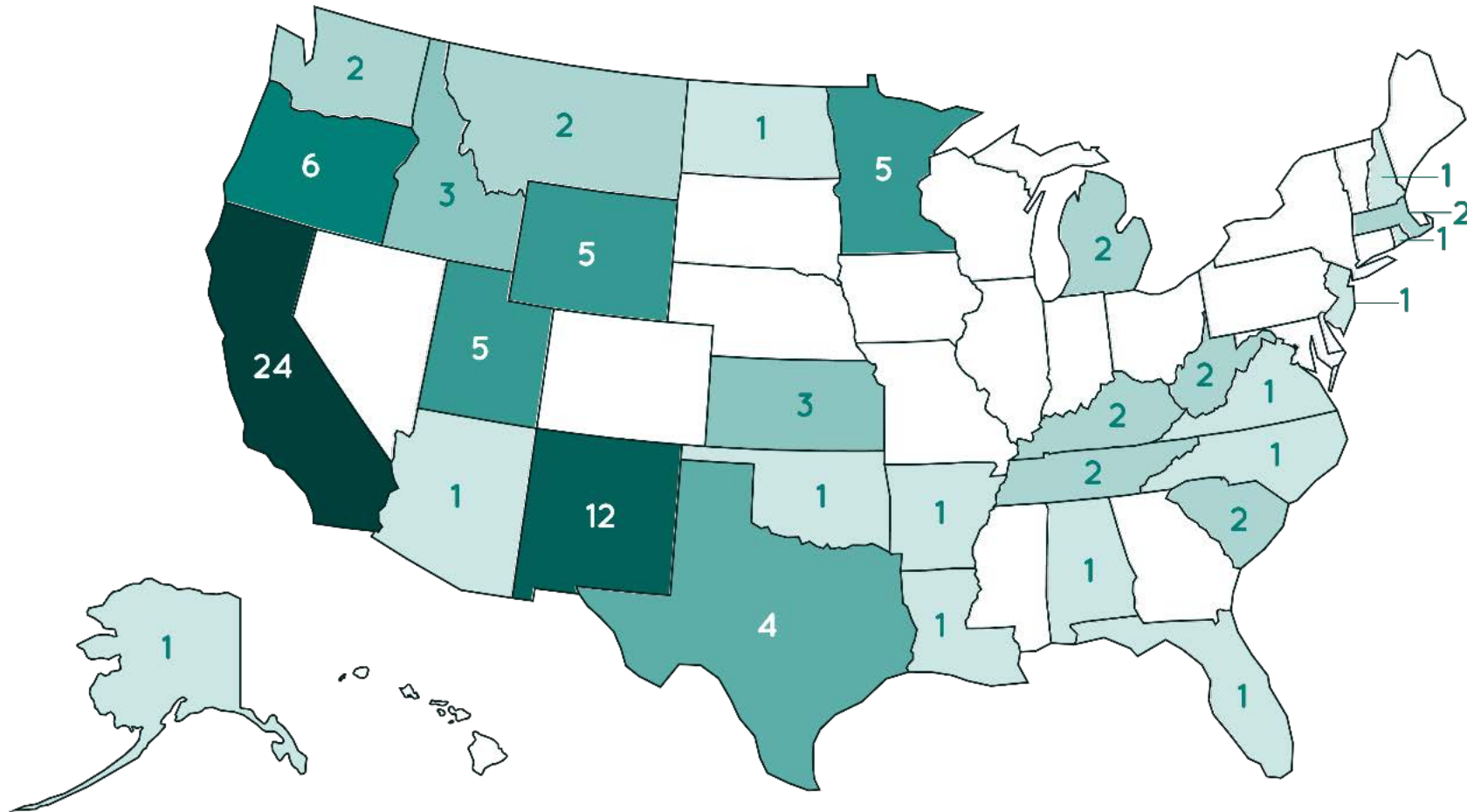
### Directory

A professional Directory of P2P participants will enable members to communicate directly with one another on shared interests.





# IoW P2P Network Members





# California

Partnering with state agencies





# Texas

Building the TX Water Data Hub from the ground up

Texas Water Data Hub; Boerne Water Data Hub





# North Carolina

Water Supply Dashboard





# New Mexico

Water Data Initiative



## 2020 PLAN



### Water Data Initiative: Plan for Implementation of the Water Data Act

The New Mexico Water Data Initiative will improve water management and planning by making basic, essential data interoperable, as it is shared openly from state agencies, as well as other data providers who choose to participate. Information and tools can be developed from the data to support data-driven decisions and planning.

April 1, 2020

Prepared by the New Mexico Bureau of Geology and Mineral Resources in collaboration with our partners

Point of Contact  
Stacy Timmons

According to legislation – the agencies develop and submit a plan to the governor and appropriate interim legislative committees.

### GOALS FOR NMWDI

1. Provide IT support to improve data sharing
2. Develop robust IT and data infrastructure plan
3. Refine data standards
4. Continue stakeholder engagement opportunities

Includes appendix of materials and budget needs from agencies

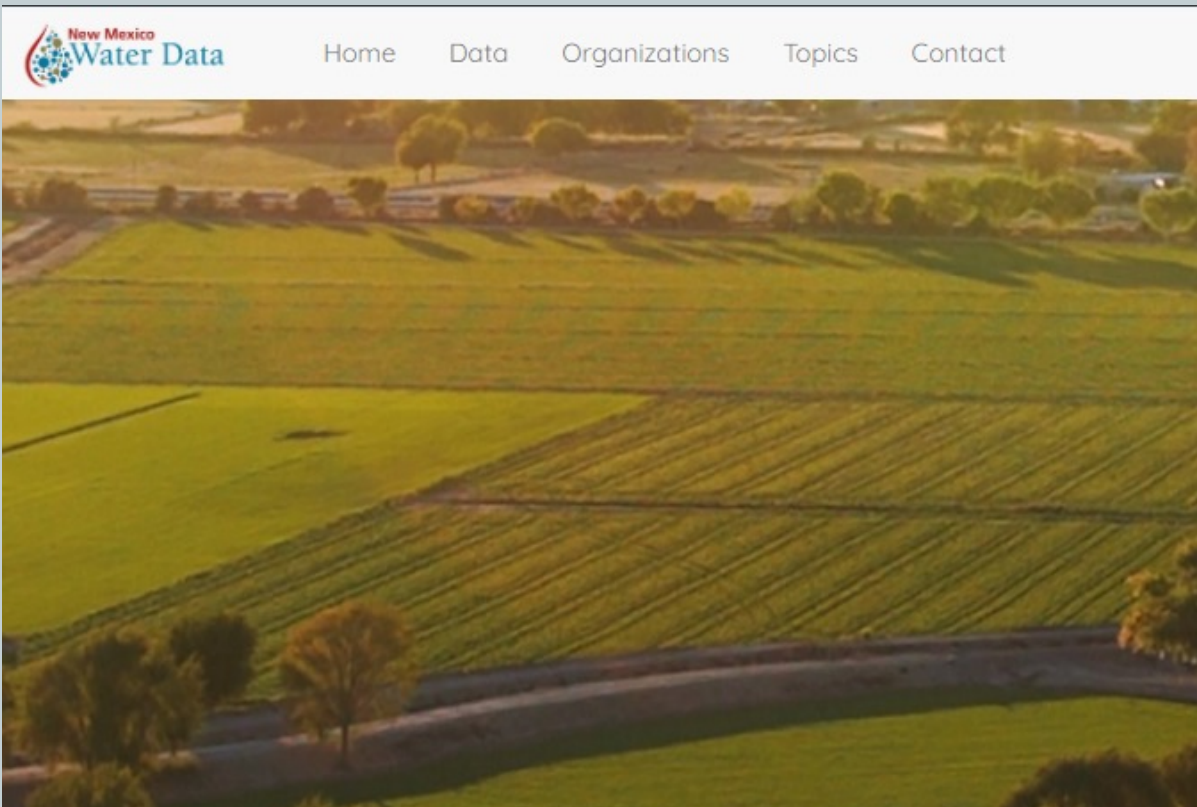
To be updated September 2021

[newmexicowaterdata.org](http://newmexicowaterdata.org)



# DATA CATALOG

- Initial data inventory where we can illuminate the different data sources & their readiness
- Built in CKAN platform (open source) on google cloud



43 organizations found

Order by: Name Ascending



**Albuquerque Bernalillo County Water Utility Authority**  
The Albuquerque Bernalillo County Water Utility Authority provides water and...  
2 Datasets



**Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)**  
The Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) was...  
1 Dataset



**All About Watersheds**  
The All About Watersheds Information Clearinghouse provides centralized...  
1 Dataset



**Arch Hurley Conservancy District**  
The Tucumcari Project,



**Federal Emergency Management Agency (FEMA)**  
For 38 years, FEMA's mission remains: to lead America to prepare for,...



**Elephant Butte Irrigation District**  
3 Datasets



**Carlsbad Irrigation**  
1 Dataset



**Internal Boundary Water Commission**  
Established International Boundary Commission

6 datasets found for "groundwater levels"

Order by:



**Carlsbad Irrigation**  
1 Dataset

**NMBGMR groundwater level measurements**  
Manual groundwater levels for wells in the state of New Mexico.  
CSV

**Collaborative Groundwater Monitoring Network**  
The Collaborative Groundwater Monitoring Network is a statewide well measurement network, with a variety of ways (i.e. pressure, acoustic, and manual...  
API

**Elephant Butte Irrigation District Groundwater Data**  
Groundwater data within EBID region, including shallow groundwater wells, nested piezometers, and...  
HTML

**Seven Rivers Monitoring Network**  
ISC measures groundwater levels monthly in a network of wells in and surrounding its Pecos Settlement well field in the Seven Rivers area.  
XLSX HTML

**NMBGMR Interactive Map**  
An interactive map of data maintained by the NM Bureau of Geology. This includes water quality data, levels, and AMP study area data. Groundwater level data points...  
HTML

# FEDERATING NM WATER DATA

## 1. Agencies collect, maintain and host data

- Only share data when ready & QCed
- Align with data standards as much as possible

## 2. Share data

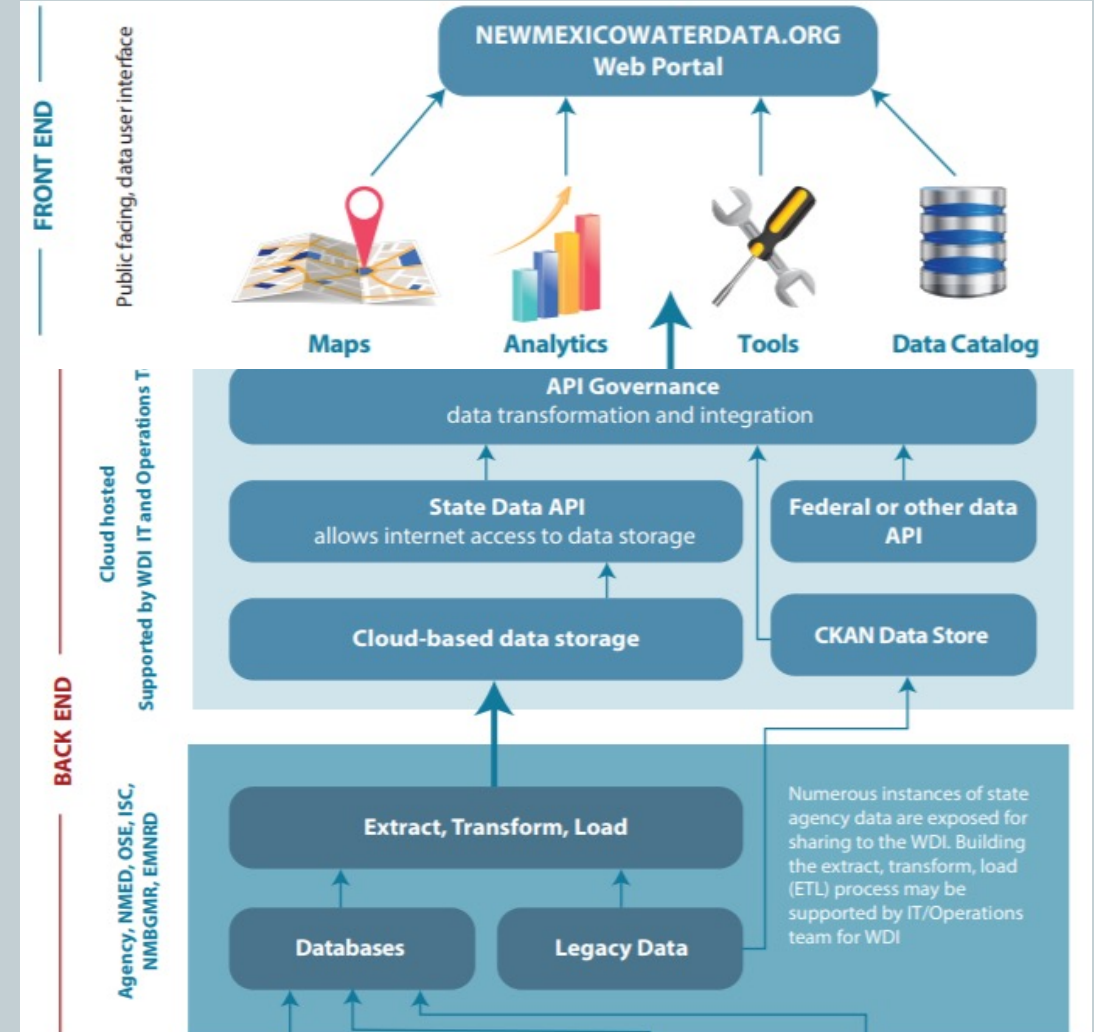
- Work with IT team to connect using open source tools (OGC's SensorThings API)

## 3. Integrate data

- Collaborating to build transformations

## 4. Easy access to data

- Data available to build tools, analytics, or download and use through web interface

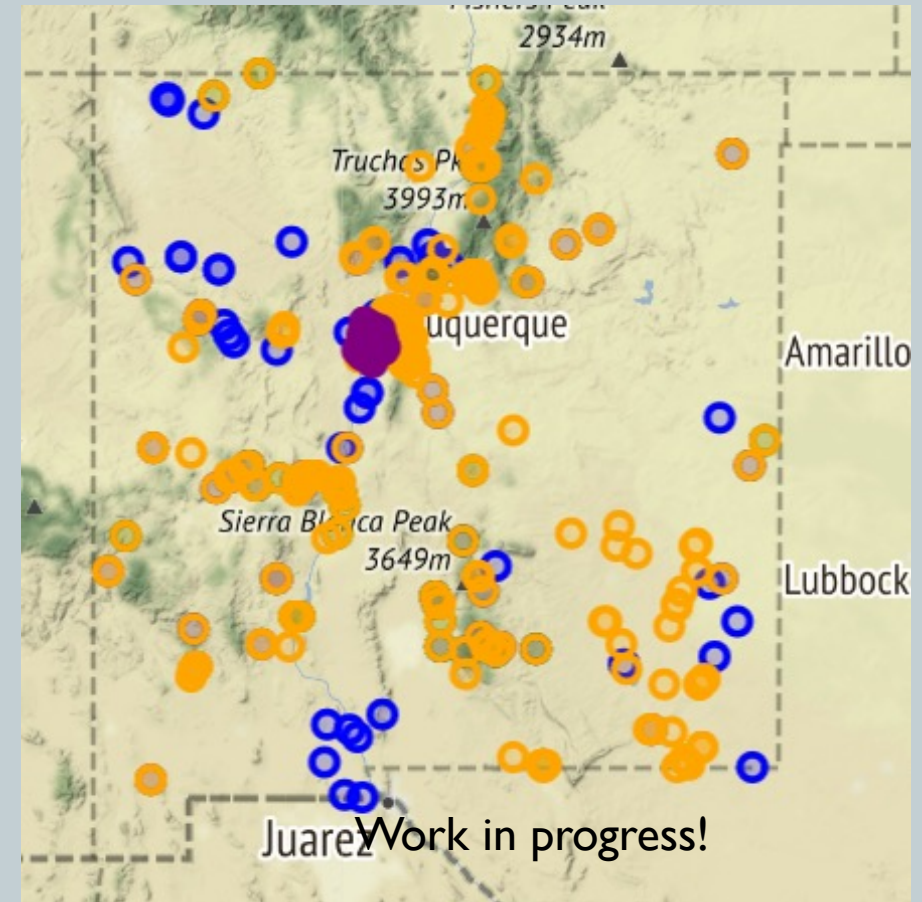




# GROUNDWATER LEVELS A USE CASE

Where do we have active monitoring of groundwater levels?

And (more importantly) where do we not?



A crosswalk of common agency datasets is below:

| Recommended Standard (NGWMN)            | USGS                   | NMBGMR                 | ABQ                       | OSE  |
|---|------------------------|------------------------|---------------------------|--|
| Agency Cd                               | agency_cd              | Calculate in crosswalk | Calculate in crosswalk    | Calculate in crosswalk                     |
| Site No                                 | site_no                | PointID, OSEWellID     | sys_loc_code, facility_id | OSE Well #                                 |
| Time                                    | lev_tm                 | TimeMeasured           |                           | Time                                       |
| Date                                    | lev_dt                 | DateMeasured           | measurement_date          | Date                                       |
| Depth to Water Below Land Surface in ft | lev_va                 | DepthToWaterBGS        | water_level               | Depth to Water (feet below ground surface) |
| Accuracy Value                          | lev_acy_cd             | Need                   |                           |  |
| Water level in feet relative to NAVD88  | Calculate in crosswalk | Calculate in crosswalk | Calculate in crosswalk    | Calculate in crosswalk                     |
| Observation Method                      | lev_meth_cd            | MeasurementMethod      | measurement_method        |  |

Confluence Home Recent

Technical Working Group

Pages

- CKAN Catalog Review
- Standards Development
  - Glossary of Terms
  - Standard Units
  - Site Metadata
- Water Quantity-Related Datasets
  - Groundwater Levels
  - Produced Water Injections/G...
  - Water Use
- Water Quality-Related Datasets
- Sensor Things



# Internet of Water<sup>TM</sup>

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