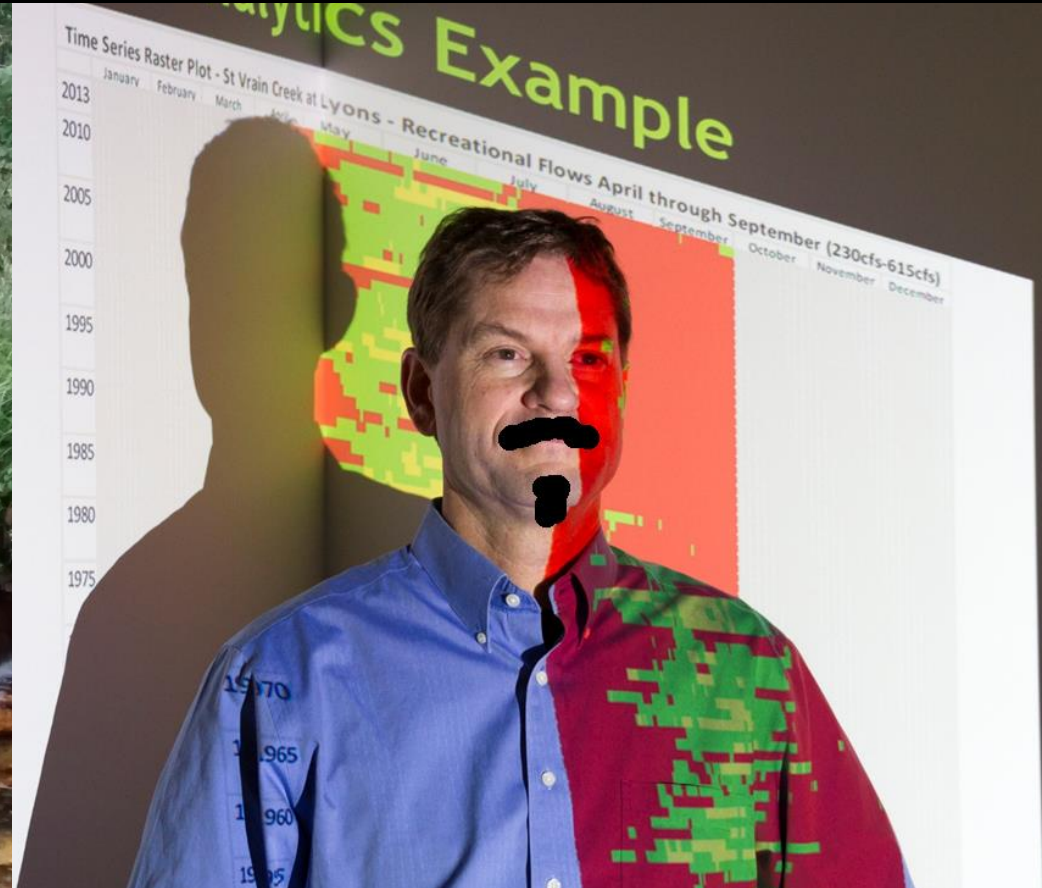


Status and Benefits of Open Water Data

Colorado Water Congress, January 24, 2018



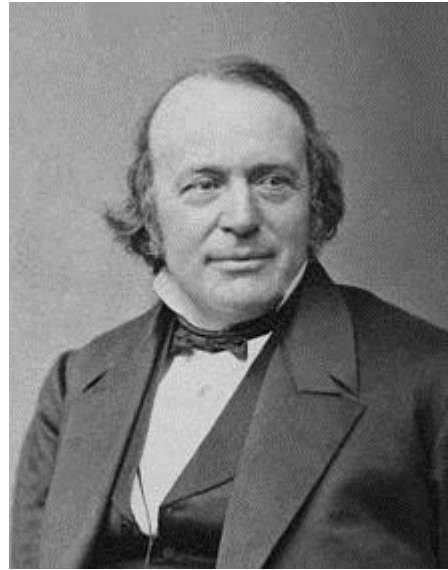
openwater
FOUNDATION

Steve Malers, Open Water Foundation
steve.malers@openwaterfoundation.org
www.openwaterfoundation.org

Data without Context

“Facts are stupid until brought into connection with some general law”

- Louis Agassiz (1807-1873)



<http://ice.lindahall.org/section4.shtml>

https://en.wikipedia.org/wiki/Louis_Agassiz

Context - Climate Change

Secure | <https://www.nasa.gov/press-release/long-term-warming-trend-continued-in-2017-nasa-noaa>



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NASA Pinpoints Cause of Earth's Recent Record Carbon Dioxide Spike
3 months ago

NASA, NOAA Data Show 2016 Warmest Year on Record Globally
a year ago

NASA, NOAA to Announce 2016 Global Temperatures, Climate Conditions
a year ago

NASA Plans Another Busy Year for Earth Science Fieldwork
a year ago

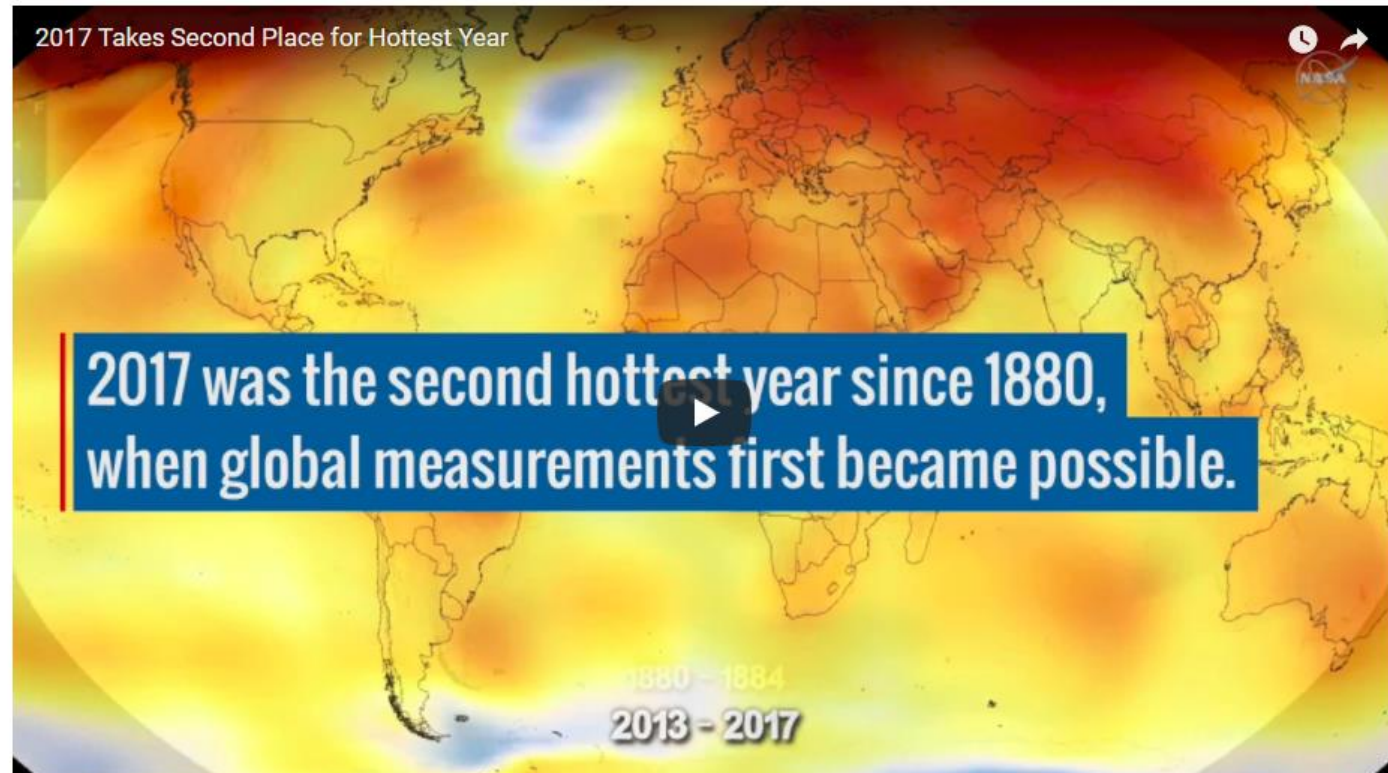
NASA Successfully Launches NOAA Advanced Geostationary Weather Satellite
a year ago

From NYC to Rio: NASA Helps Cities Address Climate Risks
a year ago

Climate

Jan. 18, 2018
RELEASE 18-003

Long-Term Warming Trend Continued in 2017: NASA, NOAA



Context - Natural Disasters

abcnews.go.com/US/federal-report-2017-shattered-us-damage-record-natural/story?id=52507313



VIDEO

LIVE

SHOWS



https://en.wikipedia.org/wiki/List_of_U.S._states_and_territories_by_GDP

Federal report says 2017 shattered US damage record for natural disasters

\$306.2B (does not consider loss of work?)

By BILL HUTCHINSON · Jan 21, 2018, 7:37 PM ET



2016 State GDP

14	14	Washington	476,770	2.58
15	15	Maryland	382,437	2.07
16	16	Indiana	347,249	1.88
17	17	Minnesota	339,096	1.83
18	18	Tennessee	331,868	1.79
19	19	Colorado	322,644	1.74
20	20	Wisconsin	313,088	1.69
21	21	Arizona	305,849	1.65
22	22	Missouri	299,113	1.62
23	23	Connecticut	259,918	1.40
24	24	Louisiana	236,999	1.28
25	25	Oregon	227,286	1.24
26	26	South Carolina	209,859	1.18
27	27	Alabama	205,625	1.11
28	28	Kentucky	196,681	1.06

CO 2017 budget: \$26.8 B
CO Water Plan Needs: \$40B ?
Amazon HQ2 = \$5B construction



WATCH | Federal report says 2017 shattered US damage record for natural

Context - Commerce



The Big Ditch had so far been a colossal flop, and Teddy Roosevelt desperately needed an engineering genius who could take over the job and “make the dirt fly.”
- David McCullough

“There are three diseases on the Isthmus,” he told them, “yellow fever, malaria, and cold feet. And the worst of these is **cold feet**.”
- John Frank Stevens, Chief Engineer, Panama Canal

“100 years on Panama Canal still vital to ag economy”

<http://mashable.com/2015/11/15/panama-canal-construction>

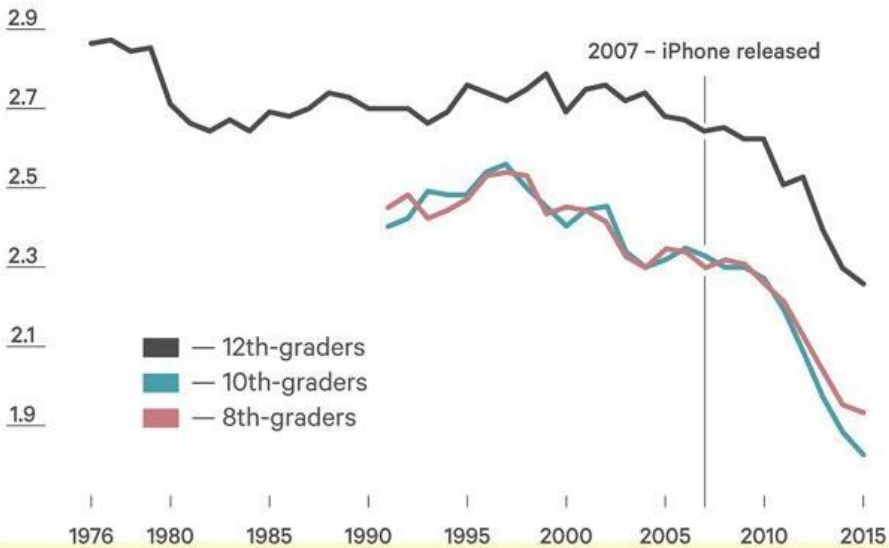
<http://netnebraska.org/article/news/924495/100-years-panama-canal-still-vital-ag-economy>

Context - Social Trends

Has the smart phone destroyed a generation?

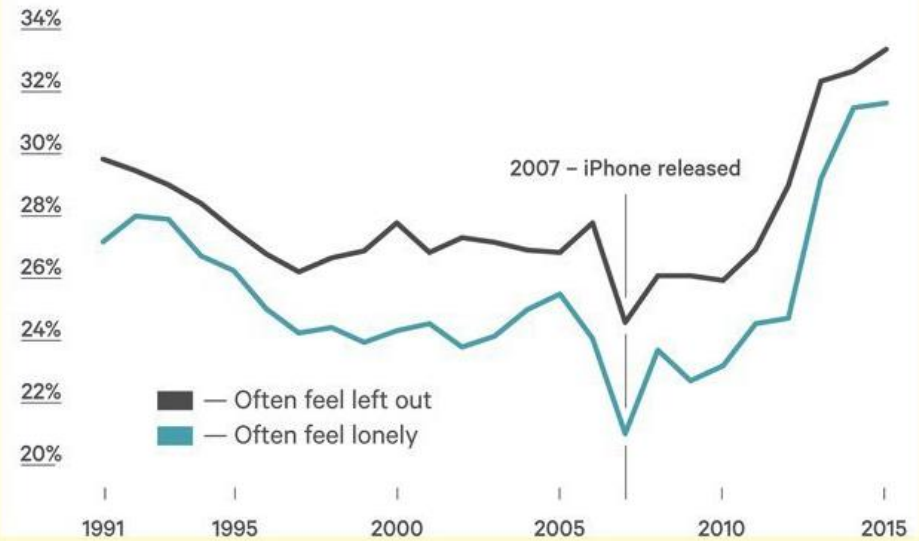
Not Hanging Out With Friends

Times per week teenagers go out without their parents



More Likely to Feel Lonely

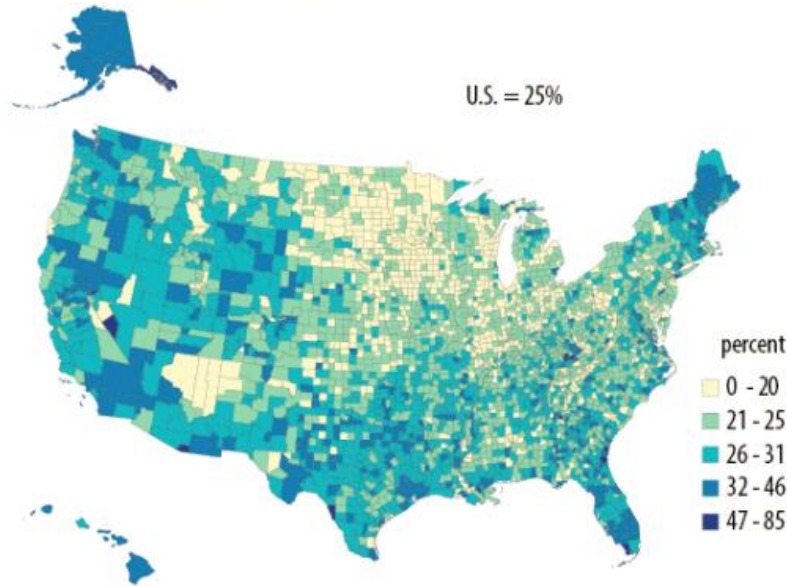
Percentage of 8th-, 10th-, and 12th-graders who agree or mostly agree with the statement "I often feel left out of things" or "A lot of times I feel lonely"



<https://www.theatlantic.com/magazine/archive/2017/09/has-the-smartphone-destroyed-a-generation/534198/>

Context - Farming

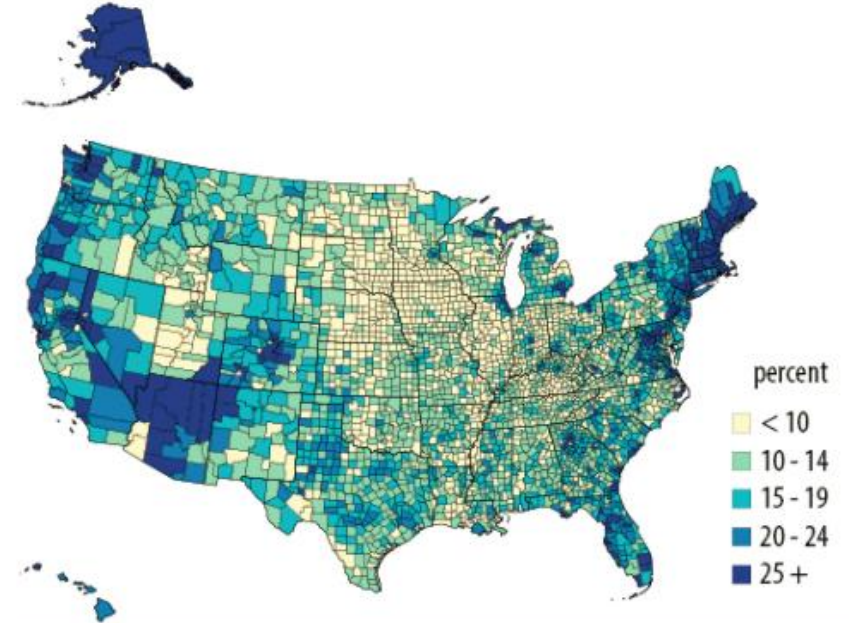
Beginning Farmers as Percent of All Farmers, by County, 2012
(percent on current operation ten years or less)



Source: USDA NASS, 2012 Census of Agriculture.

Figure 1

Farms with Female Principal Operator, by County, 2012

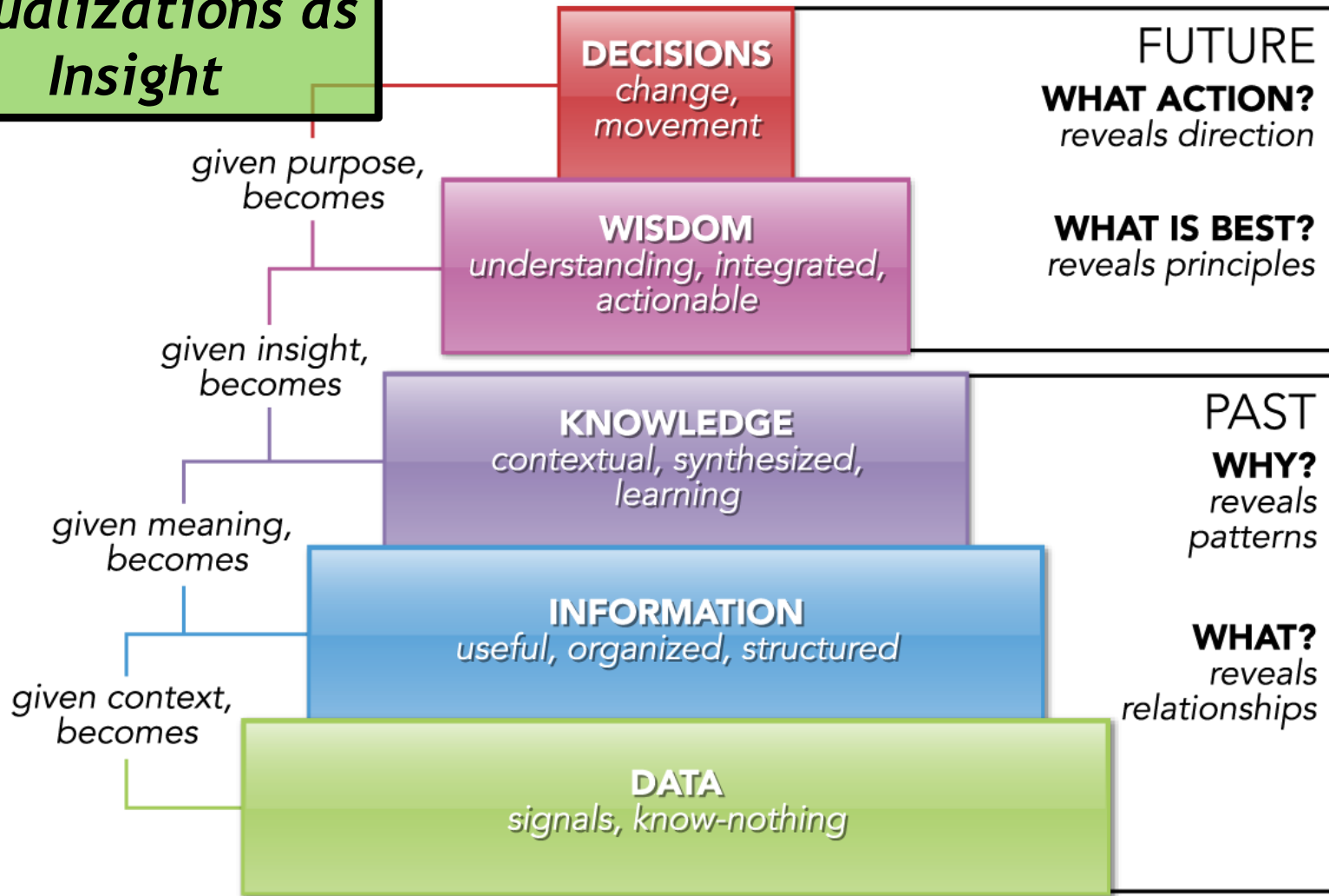


Source: USDA NASS, 2012 Census of Agriculture.

<https://www.theatlantic.com/magazine/archive/2017/09/has-the-smartphone-destroyed-a-generation/534198/>

Open Data as Infrastructure for Innovation

**Visualizations as
Insight**



Data as Infrastructure

<https://www.pursuant.com/blog/redefining-fundraising-data/>

water



Who provides context and perspective?

All Images News Videos Shopping More Settings Tools

About 4,500,000,000 results (0.76 seconds)

Water News

Top stories



Scientists Discover Clean Water Ice Just Below Mars' Surface

Wired

2 days ago



Water is not only available on Mars, it's easily accessible, NASA finds

Digital Trends

2 hours ago



Raw water is a dangerous 'natural food fad that promises health but gives...

NBC News

14 hours ago

→ More for water

Google loves Wikipedia

Water - Wikipedia

<https://en.wikipedia.org/wiki/Water>

Water is a transparent and nearly colorless chemical substance that is the main constituent of Earth's streams, lakes, and oceans, and the fluids of most living organisms. Its chemical formula is H₂O, meaning that each of its molecules contains one oxygen and two hydrogen atoms that are connected by covalent bonds.

Properties of water · Drinking water · Water pollution · Water resources

Water Quality | Fort Collins Utilities - City of Fort Collins

<https://www.fcgov.com/utilities/what-we-do/water/water-quality>

View public notice regarding the recent Treatment Technique Violation issued by the Colorado Department of Public Health and Environment (CDPHE). Vea el aviso público en español aquí. Fort Collins Utilities does not solicit water quality testing at homes or businesses, though some private companies do. Utilities' ...

Local Information



More images

Water

Chemical compound

What is it?



Water is a transparent and nearly colorless chemical substance that is the main constituent of Earth's streams, lakes, and oceans, and the fluids of most living organisms. [Wikipedia](#)

Boiling point: 212°F (100°C)

Density: 1 g/cm³

Molar mass: 18.01528 g/mol

Melting point: 32°F (0°C)

IUPAC ID: Water, Oxidane

People also search for

View 10+ more



Sugar

Fruit

Vegetable

Table salt

More about Water

Sources include: USDA

Feedback

Open Data Definition

- **Accessible to all** - the data becomes accessible outside of the organization that generated or collected it
- **Machine-readable** - data must be usable, which means it must be made available in formats that are easily used by third-party applications
- **Free - zero or low costs** for data access and openness
- **Unrestricted rights to use** - data that is unencumbered by contractual or other restrictions leads to the maximum potential of innovation
 - “Generating Economic Value through Open Data” in “Beyond Transparency”

Observations on Status of Open Data

- Demands for access to data and transparency are increasing... for all data.
- Many government entities are making progress on open data
...but at the same time data access is being cut back at some levels.
- There are still many barriers and resistance to publishing open data.

A Balance of Transparency and Privacy

Medical science / Your medical data

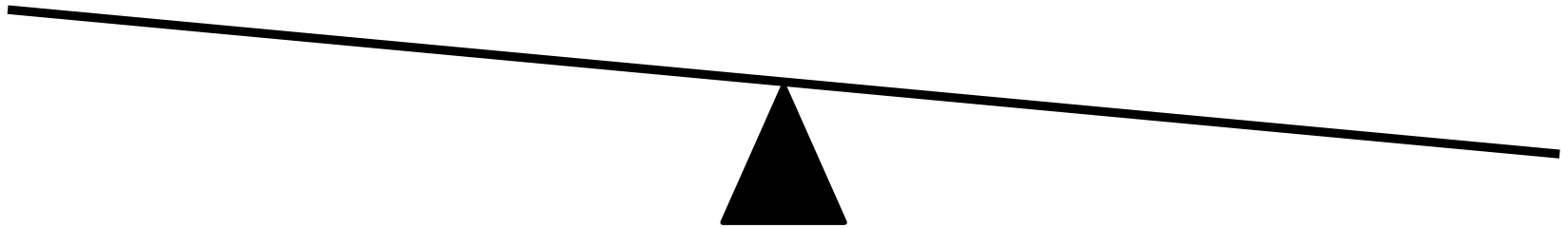
Laws and legal rulings / Your court case

Science in general / Your intellectual property

Water as a public resource / Your customer and
system data

Government budgets / Your tax records

Public process / Private process



Benefits of Open Data

- Open access
- Collaboration (break down silos)
- Transparency
- Reduce costs
- Innovation

Increased Access to Data in Colorado

- **Water Efficiency Data Portal data now public:**
<http://cwcb.state.co.us/water-management/waterEfficiency/Pages/ReportingWaterUseWaterConservationData.aspx>
- **Colorado Open Records Act updates to require machine-readable formats (2017)**
<https://leg.colorado.gov/bills/sb17-040>
- **Federal Open Water Data Initiative**
<https://acwi.gov/spatial/owdi/>
- **Bureau of Reclamation Web Services**
<https://water.usbr.gov/>
- **CO DWR Updated Web Services**
Coming soon (see other Colorado Water Congress presentation)

USGS - National Water Census

Secure | <https://water.usgs.gov/watercensus/data-products.html>



National Water Census

[Home](#) [Program Overview](#) [History](#) [Water Budgets](#) [Collaboration](#) [Data & Products](#)



Data Discovery

- ◆ [National Water Census Data Portal](#)

Research Topics

- ◆ [Streamflow](#)
- ◆ [Groundwater](#)
- ◆ [Evaporative Loss](#)
- ◆ [Water Use](#)
- ◆ [Ecological Water](#)
- ◆ [Water Quality](#)

Focus Area Studies

- ◆ [Apalachicola-Chattahoochee-Flint Basin](#)
- ◆ [Coastal Carolinas](#)
- ◆ [Colorado River Basin](#)
- ◆ [Delaware River Basin](#)
- ◆ [Red River](#)
- ◆ [Upper Rio Grande Basin](#)

Pilot Studies

- ◆ [Southwest Alluvial Basins](#)
- ◆ [Great Lakes \(U.S.\)](#)

Data & Products

The National Water Census Data Platform



A major component of the Water Census is the [National Water Census Data Platform](#), which relies on a series of new data management practices to enable integration and delivery of water budgets information alongside other data of interest to managers, such as water use data or ecological assessment criteria. Eventually, end users of water budget data (i.e. management agencies and decision-makers) will be able to access an integrated online database in a form that will enable them to construct local and regional water budgets. Key components of the National Water Census Data Platform that are currently in development include:

A database of hydrologic indicators, addressing:

- Precipitation
- Evapotranspiration
- Water in storage in snowpack, icefields, and large lakes
- Groundwater level indices
- Rates of groundwater recharge
- Changes in groundwater storage
- Stream and river runoff characteristics
- Stream and river baseflow characteristics
- Total water withdrawals by source
- Interbasin transfers
- Consumptive uses
- Return flows
- Irrigated surface and groundwater supplies used for existing demands

USGS - NHDPlus High Resolution

Secure | <https://www.usgs.gov/media/images/nhdplushydroregionsmap>



SCIENCE

Topics, centers, missions

PRODUCTS

Maps, data, publications

NEWS

Releases, I'm a reporter

CONNECT

Contact, chat, social media

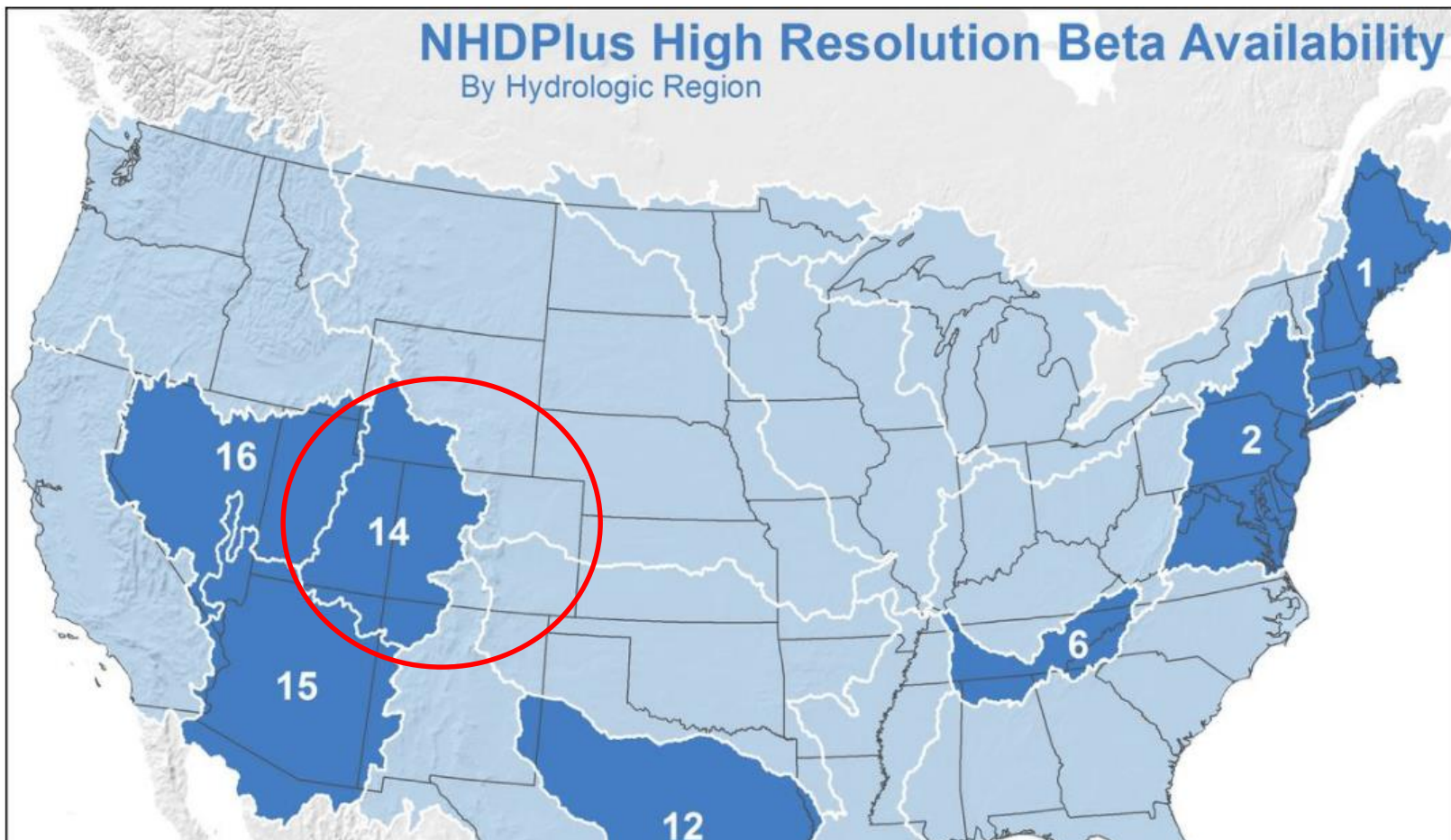
ABOUT

Organization, jobs, budget

Search



NHDPlus_HR_HydroRegionsMap



Reclamation Water Information System

Secure | https://water.usbr.gov



RECLAMATION
Managing Water in the West



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[News & Multimedia](#)

Reclamation Water Information System (RWIS)

Reclamation / RWIS

[RWIS](#)

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[Map](#)

[Query Tool](#)

[About RWIS](#)

[Downloads](#)

[API Information](#)

[Help](#)

[Contact Us](#)

Reclamation Water Information System

The Reclamation Water Information System (RWIS) is a pilot version of a Reclamation-wide system for viewing, accessing, and downloading Reclamation's data via a centralized data portal. The RWIS pilot serves representative time-series water data from each Reclamation region. With the RWIS pilot you can:

- Locate Reclamation sites and access current and historical water data by browsing an interactive map.
- Search for water data by location or data type with the query tool.
- Get machine readable water datasets to use as input for your models and analyses via manual downloads or automated data exchange via web service. Use the web service/API URL to feed data to your own applications.

This is a pilot system. Please notify us about any errors, bugs, data requests, feature recommendations, or other feedback so we can improve the site.

[Contact Us](#)



WANT TO KNOW MORE?

[What could I do with RWIS?](#)

[What general questions can RWIS answer?](#)

[How can I create tools with RWIS?](#)

[How can I use RWIS data in my analyses?](#)

[RISE Overview Fact Sheet](#)

[RWIS & RISE Frequently Asked Questions](#)

[Monthly project updates](#)

Colorado Information Marketplace (data.colorado.gov)



- Authority ▼
 - Official
 - Community
- Categories ▼
 - Agriculture
 - Business
 - Demographics
 - Economic Growth
 - Education ▼
 - Water ×
 - Show All...
- View Types ▼
 - Calendars

20 Results filtered by Categories > Water View Types > Datasets Clear All

Sort by Most Relevant ▼

<h3>DWR Water Right Net Amounts</h3> <p>A Water Right is a property right that is either conditional or absolute and conveys the right to use a particular amount of water, with a specified priority date as confirmed by the water court. The... More</p> <p>Tags water right, gocode</p> <p style="text-align: right;">API Docs</p>	<p>Updated January 21, 2018</p> <p>Views 8,806</p>
<h3>DWR Well Application Permit</h3> <p>All well applications and permits issued.</p> <p>Tags well, application, permit, gocode</p> <p style="text-align: right;">API Docs</p>	<p>Updated January 21, 2018</p> <p>Views 5,808</p>
<h3>DWR Calls History</h3> <p>Division of Water Resources (DWR) Call History. The Call is a term used by the state engineer to effectively communicate the administrative status of the natural stream. The Call communicates... More</p> <p>Tags gocode, administrative call</p> <p style="text-align: right;">API Docs</p>	<p>Updated January 21, 2018</p> <p>Views 4,877</p>

OpenColorado.org

data.opencolorado.org/dataset?q=water

Data

Blog

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Open Water Foundation



0



Datasets

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Groups

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Organizations

UDFCD (16)

City and County of ... (16)

City of Boulder (8)

City of Arvada (5)

Pitkin County (3)

Gilpin County (2)

Denver Regional Cou... (1)

Colorado State Demo... (1)

City of Westminster (1)

City of Fort Collins (1)

Groups

There are no Groups that match this search

Tags

water



55 datasets found for "water"

Order by: Relevance



DRCOG: NCR Water Bodies

Water features collected by NCR (North Central All-Hazards Emergency Management Region) from Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin,...

KML WMS ZIP

Pitkin County: WaterFeatureLine

Water feature lines including streams, rivers, lakes and ponds.

SHP dwg KML JSON CSV XML gdb

Pitkin County: WaterFeaturePoly

Water feature polygons including rivers, lakes and ponds.

SHP dwg KML JSON CSV XML gdb

City of Arvada: Water Quality Report

New DWR Web Services

Application name Home API

ASP.NET Web API Help Page

Introduction

Data provided by the Colorado Division of Water Resources.

For additional help in creating URLs to retrieve values based on resource fields see the following help documents:

[Ground Water Levels](#)

[Ground Water Measurement Time Series](#)

[Administrative Calls](#)

AdministrativeCalls

Returns administrative calls. See documentation for optional query parameters and output formats

API	Description
GET api/v2/admincalls/active	Return list of active administrative calls
GET api/v2/admincalls/active/{div}	Returns list of active administrative calls by water division
GET api/v2/admincalls/historic	Returns list of historic administrative calls (see documentation for optional query parameters)
GET api/v2/admincalls/{call_id}	Return administrative call by call ID

GroundWater

Returns groundwater level related data. See documentation for optional query parameters and output formats

API	Description
GET api/v2/groundwater/waterlevels	Returns GroundWaterSearchResult from filters - See documentation for optional querystring parameters
GET api/v2/groundwater/waterlevels/{wellId}	Return groundwater search by well ID
GET api/v2/groundwater/wellmeasurements	Return list of GroundWaterMeasurements - See documentation for optional querystring parameters

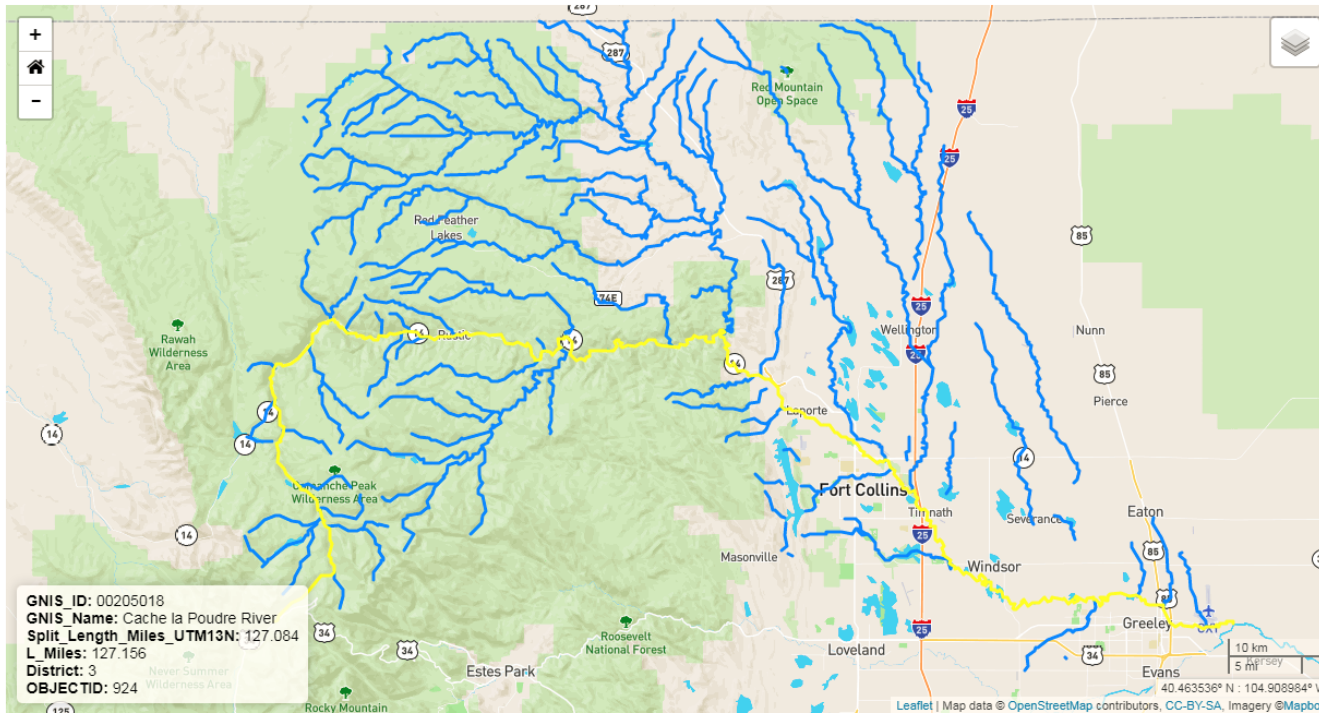
Source Water Route Framework

data.openwaterfoundation.org/co/cdss-data-spatial-bybasin/view-map.html

Source Water Route Framework - Colorado Water District 03 - Cache la Poudre River

Feature Attributes

- OBJECTID: 924
- GNIS_ID: 00205018
- GNIS_Name: Cache la Poudre River
- L_Miles: 127.16
- SHAPE_Length: 204640.74
- District: 3
- Split_Length_Miles_UTM13N: 127.08



Download Data Files

GeoJSON (2,269 kb)

Shapefile (1,495 kb)

CSV (10 kb)

Helpful Information

- Large datasets may take longer to load and view, depending on internet and computer speed. GeoJSON datasets larger than 50 MB (~50,000 kb) are considered large. All district datasets are typically small enough to view.
- Hover over any marker, line, or polygon feature to display important attributes for the feature.
- Click on any marker, line, or polygon feature to display all attributes.

** The source data for all the above spatial data files can be accessed via the [CDSS GIS Data](#) web page.

** See also the [CDSS MapViewer](#) for a comprehensive list of statewide spatial datasets

Number of Features

121

Created by [the Open Water Foundation](#)

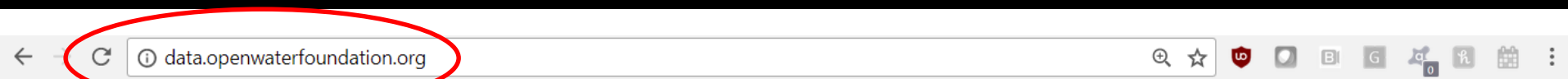
Open Data Standards

- comma-separated-value
- JSON, GeoJSON
- XML
- Excel is a start!

Observations

- We need more open water-related datasets that are maintained over time and are available for projects ... **need ongoing investment in open datasets.**
- Major water resources studies often spend a lot of time finding and processing data (or reusing outdated data)...**can be more efficient.**
- Datasets from major studies are often not published in an accessible and understandable way... **need to publish machine-readable datasets.**

Example - Municipal Water Providers





Open Water Foundation / Data

See also other Open Water Foundation websites:

- data.openwaterfoundation.org (this website) - useful datasets related to water resources
- learn.openwaterfoundation.org - learning resources
- models.openwaterfoundation.org - models and analyses (may include visualizations)
- projects.openwaterfoundation.org - OWF project pages to demonstrate and archive project work
- software.openwaterfoundation.org - software tool projects
- viz.openwaterfoundation.org - interesting and useful data visualizations

Value-added datasets based on public data

Dataset ID	Focus	Spatial Extent	Preview Image	Description	Related Visualization	Dataset Link
owf-data-co-municipalities	Municipal	Colorado		multiple sources. This dataset facilitates relating detailed data from multiple sources. The dataset is maintained under version control in GitHub. Use the link on the right to access data and use the GitHub repository Issues to provide feedback.	working on data visualization for municipal data.	Colorado municipalities dataset on GitHub
owf-data-co-municipal-water-providers	Municipal	Colorado		OWF has created a dataset containing all Colorado municipal water providers (utilities, water districts, etc.) cross-referencing identifiers from multiple sources. This dataset facilitates relating detailed data from multiple sources. The dataset is maintained under version control in GitHub. Use the link on the right to access data and use the GitHub repository Issues to provide feedback.	OWF is working on data visualization for municipal water provider data.	Colorado municipal water providers dataset on GitHub
				Colorado Roundtable basins , corresponding to		

Data Management - Excel on GitHub

GitHub, Inc. [US] | <https://github.com/OpenWaterFoundation/owf-data-co-municipal-water-providers>

This repository Search Pull requests Issues Marketplace Explore

OpenWaterFoundation / owf-data-co-municipal-water-providers

Unwatch 1 Star 0 Fork 0

Code Issues 4 Pull requests 0 Projects 0 Wiki Insights Settings

Open Water Foundation dataset for Colorado municipal water providers

GitHub provides version control for electronic files

Add topics

19 commits 1 branch 0 releases 2 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

kswaim Add in website URLs for over half of providers Latest commit 876880c 23 days ago

analysis	Add in website URLs for over half of providers	23 days ago
data-orig-process	Add in data-orig-process folder and files	a month ago
data-orig	Fix FIPS_IDs and DOLA_LG_IDs to be formatted as text in main dataset	25 days ago
data	Add in website URLs for over half of providers	23 days ago
.gitattributes	Initial README.md and Git configuraiton files	3 months ago
.gitignore	Update to include original data downloads and edits to README	2 months ago
README.md	Add in website URLs for over half of providers	23 days ago

Dataset Documentation

GitHub, Inc. [US] | <https://github.com/OpenWaterFoundation/owf-data-co-municipal-water-providers>

owf-data-co-municipal-water-providers

This repository contains the [Open Water Foundation \(OWF\)](#) dataset for Colorado municipal water providers. This is a foundational dataset that provides unique identifiers and other data for municipal water providers. The identifiers can be used to link other datasets, such as municipalities. OWF has created and is maintaining this dataset to facilitate work on various data analysis and visualization projects in Colorado.

Repository Contents

**Documentation
itself is versioned**

The repository contains the following:

analysis/	TSTool software command files to process data into useful forms.
Process-xlsx-to-csv.TSTool	TSTool command file that processes the core dataset from .xlsx to .csv.
Process-xlsx-to-geojson.TSTool	TSTool command file that processes the core dataset from .xlsx to .geojson.
data-orig/	Folder containing original data files downloaded from agency websites.
Colorado-FIPS-Places.xlsx	The data file containing original data download from the U.S. Census Bureau.
Colorado-GNIS-Civil.csv	The data file containing original data download from the Geographic Names Information System.
Colorado-LocalGovernment-IDs.csv	The data file that is the attribute table of the GIS shapefile downloaded from the Colorado Information Marketplace's Municipalities.
Colorado-Municipal-Boundaries.geojson	Exported spatial data file from the Colorado Information Marketplace's Municipalities.
Colorado-Municipality-PointLocation.csv	Saved attribute table of Colorado-Municipal-Boundaries.geojson that contains unique identifiers for each municipality.
Colorado-PWS-IDs.csv	The data file containing original data download from the EPA's Safe Drinking Water Act.
Colorado-Special-Districts.geojson	Exported spatial data file from the Colorado Information Marketplace's All Other.
Colorado-WaterProvider-PointLocation.csv	Saved attribute table of Colorado-Special-Districts.geojson that contains unique identifiers for each water provider.
README.md	Explanation of folder contents, description of data files, and the method of data collection.
data/	Folder containing data files.

Access to Original Dataset File

GitHub, Inc. [US] | <https://github.com/OpenWaterFoundation/owf-data-co-municipal-water-providers/tree...>

This repository Search Pull requests Issues Marketplace Explore

OpenWaterFoundation / [owf-data-co-municipal-water-providers](#) Unwatch 1 Star 0 Fork 0

Code Issues 4 Pull requests 0 Projects 0 Wiki Insights Settings

Branch: master [owf-data-co-municipal-water-providers / data /](#) Create new file Upload files Find file History

kswaim Add in website URLs for over half of providers Latest commit 876880c 23 days ago

File	Commit Message	Time
..		
Colorado-Municipal-Water-Provider...	Add in website URLs for over half of providers	23 days ago
Colorado-Municipal-Water-Provider...	Add in processing of GeoJSON file, delete unnecessary GeoJSON files, ...	a month ago
Colorado-Municipal-Water-Provider	Add in website URLs for over half of providers	23 days ago
WaterProvider-County-Relate.csv	Colorado-Municipal-Water-Providers.xlsx to BNDSS_ID, and edit BNDSS_IDs to only ...	2 months ago

Original dataset file is versioned and alternate formats and analyses are generated using automation

Cross-referenced Identifiers

kswaim Add in website URLs for over half of providers 876880c 23 days ago
1 contributor

csv and other file formats can be viewed online

Search this file...

	WaterProviderName	FIPS_ID	FIPS_ID_Flag	GNIS_ID	GNIS_ID_Flag	DOLA_LG_ID	DOLA_LG_ID_Flag	BNDSS_ID
2	96 Pipeline Company		N		N		N	96PipeWC
3	Academy Water and Sanitation District		N		N	21001	G	AcademyWSD
4	Aguilar, Town of	00760	G	2412339	G	36001	G	Aguilar
5	Akron, Town of	00925	G	2412340	G	61002	G	Akron
6	Alameda Water and Sanitation District		N		N	30001	G	AlamedaWSD
7	Alamosa, City of	01090	G	2409673	G	02003	G	Alamosa
8	Aldasoro Ranch and Homeowners Company		N		N		N	AldasoroWS

Unique identifiers are key to using the dataset

Useful Data, Including Spatial Data

kswaim Add in website URLs for over half of providers 876880c 23 days ago

1 contributor

532 lines (531 sloc) | 93 KB Raw Blame History

Other useful properties, temporal data, and spatial data, from various sources

Search this file...

D	OWF_ID_Flag	LocalGovtType	EntityStartYear	EntityStartYear_Flag	EntityEndYear	EntityEndYear_Flag	County_CSV
WC	G	Company		x		x	Crowley
nyWSD	G	Water and Sanitation District		x		x	El Paso
	G	Municipality		x		x	Las Animas
	G	Municipality		x		x	Washington
daWSD	G	Water and Sanitation District		x		x	Jefferson
sa	G	Municipality		x		x	Alamosa
roWS	G	Company		x		x	San Miguel

Simple Spatial Data Visualization

The screenshot shows the GitHub interface for the repository 'OpenWaterFoundation / owf-data-co-municipal-water-providers'. The commit history table is as follows:

Commit Message	Time Ago
..	
Colorado-Municipal-Water-Provider... Add in website URLs for over half of providers	23 days ago
Colorado-Municipal-Water-Provider... Add in processing of GeoJSON file, delete unnecessary GeoJSON files, ...	a month ago
Colorado-Municipal-Water-Provider... (Colorado-Municipal-Water-Providers.geojson) half of providers	23 days ago
WaterProvider-County-Relate.csv Add OWF_ID, which is similar to BNDSS_ID, and edit BNDSS_IDs to only ...	2 months ago

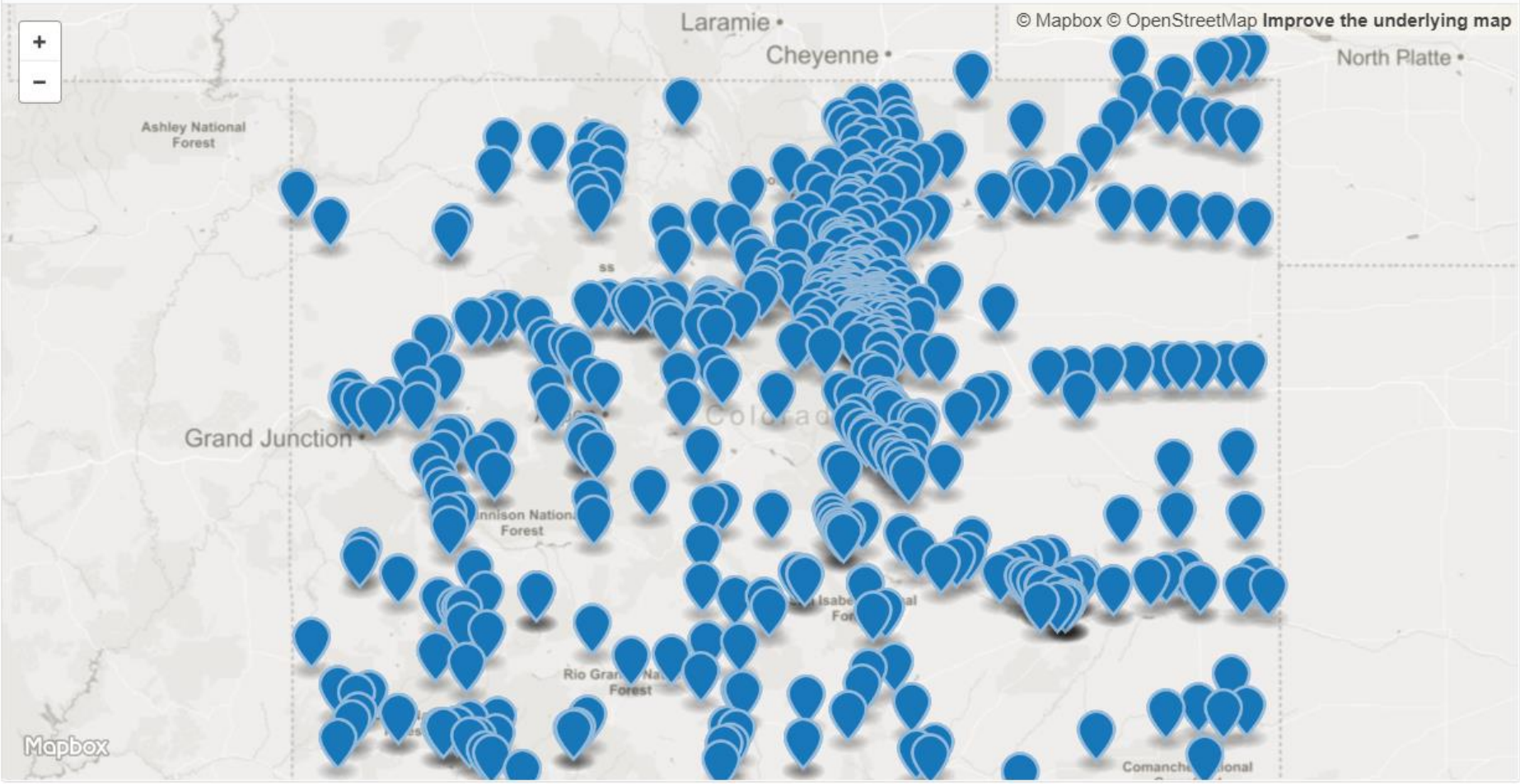
GeoJSON (geojson) files are an open spatial data format, can also provide shapefiles and other spatial data formats

Simple Spatial Data Visualization

GitHub, Inc. [US] | <https://github.com/OpenWaterFoundation/owf-data-co-municipal-water-providers/blob/master/data/Colora...> 🔍 ☆ 📄 📱 🗑️

18907 lines (18906 sloc) | 583 KB

⏪ 📄 Raw Blame History 📱 ✎ 🗑️




Using the Datasets

- The dataset files can be downloaded and used directly (Excel) or by other software such as geographic information systems (GIS) or models
- Automate processing

One option: Publish to an Open Data Portal

Secure | <https://data.colorado.gov/browse?category=Water&limitTo=datasets>

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Search

20 Results filtered by **Categories > Water** **View Types > Datasets** Clear All Sort by Most Relevant

Authority	Official	Community					
Categories	Agriculture	Business	Demographics	Economic Growth	Education	Water	Show All...
View Types	Calendars						

DWR Water Right Net Amounts Water Dataset	
A Water Right is a property right that is either conditional or absolute and conveys the right to use a particular amount of water, with a specified priority date as confirmed by the water court. The... More	Updated January 21, 2018 Views 8,806
Tags water right, gocode API Docs	

DWR Well Application Permit Water Dataset	
All well applications and permits issued. More	Updated January 21, 2018 Views 5,808
Tags well, application, permit, gocode API Docs	

DWR Calls History Water Dataset	
Division of Water Resources (DWR) Call History. The Call is a term used by the state engineer to effectively communicate the administrative status of the natural stream. The Call communicates... More	Updated January 21, 2018 Views 4,877
Tags gocode, administrative call API Docs	

Use Software for Automation

- Access data on web
- Automate workflows using software
- Implement quality control

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← → ↻ projects.openwaterfoundation.org/owf-proj-co-cwcb-2016-snodas/prototype/index.html#

Colorado's Decision Support Systems (CDSS) SNODAS Tools

About Data Analysis

Colorado's Mean SWE is displayed in the map using a legend similar to the National Weather Service. The SNODAS Tools website provides access to an archive of daily products.

- The website is best viewed on a widescreen display. If the layout seems out of order, try maximizing to fill the display. **Ctrl** and **minus** can be used to zoom out until the layout seems to be in correct order.
- Hover over a basin to see the daily mean SWE value and other daily statistics.
- Use the **Select Date** button to display historical data for a specified day.
- Enter animation start and end dates, press **Submit**, and then press the play button to view the animation of daily SWE data.
- Click on a basin in the map to select the basin or use the **Select Basin** to select from the basin list. Then click on buttons in the lower right to display graphs.
- Once a graph has been opened, click anywhere on the screen to close the graph view and return to the main screen.
- Reposition the map by holding the mouse button down and dragging.
- Zoom in and out of the map using the control in the upper left, or use the mouse wheel.
- Use the **Data** tab on the left to access data files.

Development of the SNODAS Tools was funded by the [Colorado Water Conservation Board](#). The tools were developed by the [Open Water Foundation](#). Project resources are available on the [OWF SNODAS project website](#).

This website is under development with a scheduled completion date of June 30, 2017. It is likely that changes in the site's functionality and access to data will occur until then.

Contact: Steve Malers,
steve.malers@openwaterfoundation.org

Website version 1.0.3 (2017-04-03)

Select Date SNODAS Date: 2017-04-03

SNODAS Animation

Starting Date: (earliest available date: 2003-09-30) 2016-10-01

Ending Date: (latest available date: 2017-04-03) 2017-04-03

Increment (days): (Default is set to 1) value between 1 and 10

Submit

2017-04-03

Select Basin

Selected Basin ID: SCKC2
 Basin Name: SAGUACHE CREEK NEAR SAGUACHE, CO

SNODAS Snow Cover Graph

SNODAS SWE Graph

SNODAS SWE Volume Graph

SNODAS SWE 1 Week Change Graph

SNODAS SWE Volume Gain, Cumulative Graph

Created by the Open Water Foundation for the Colorado Water Conservation Board

Visualization - GapMinder

SNODAS Data

Sep-2016

SWE Cumulative(x), SWE Cumulative % of Mean(y), SWE Cumulative Upstream Total(size), Basin(color)

Basin

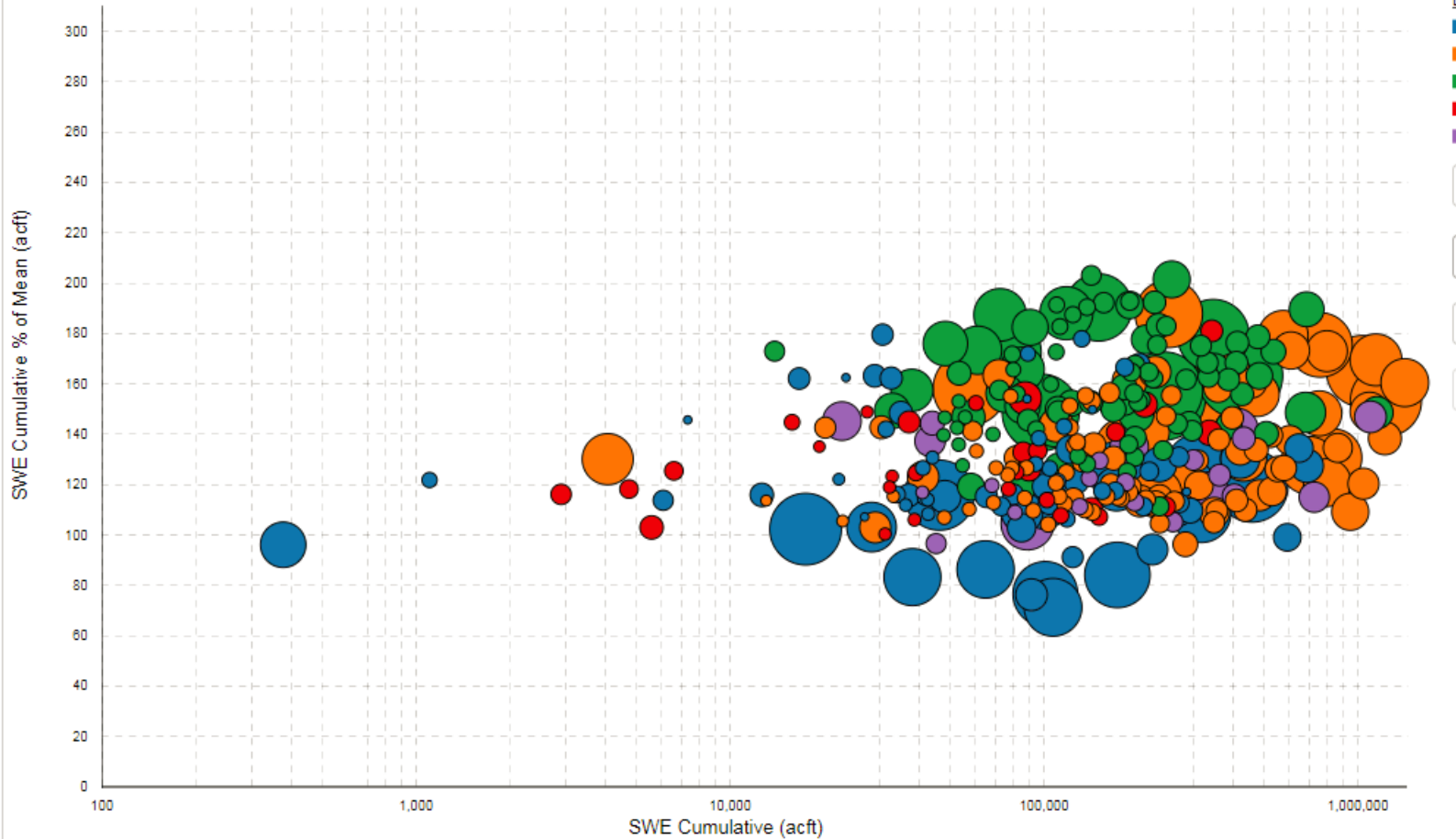
- ABRFC
- CBRFC
- MBRFC
- NCWCD
- WGRFC

Select All Markers

Select Individual Marker...

Turn Tracer On

Turn Annotations On



September-30

Oct-2015 Nov-2015 Dec-2015 Jan-2016 Feb-2016 Mar-2016 Apr-2016 May-2016 Jun-2016 Jul-2016 Aug-2016 Sep-2016



LOCAL_ID: GBYC2LO

Date: Sep-2016

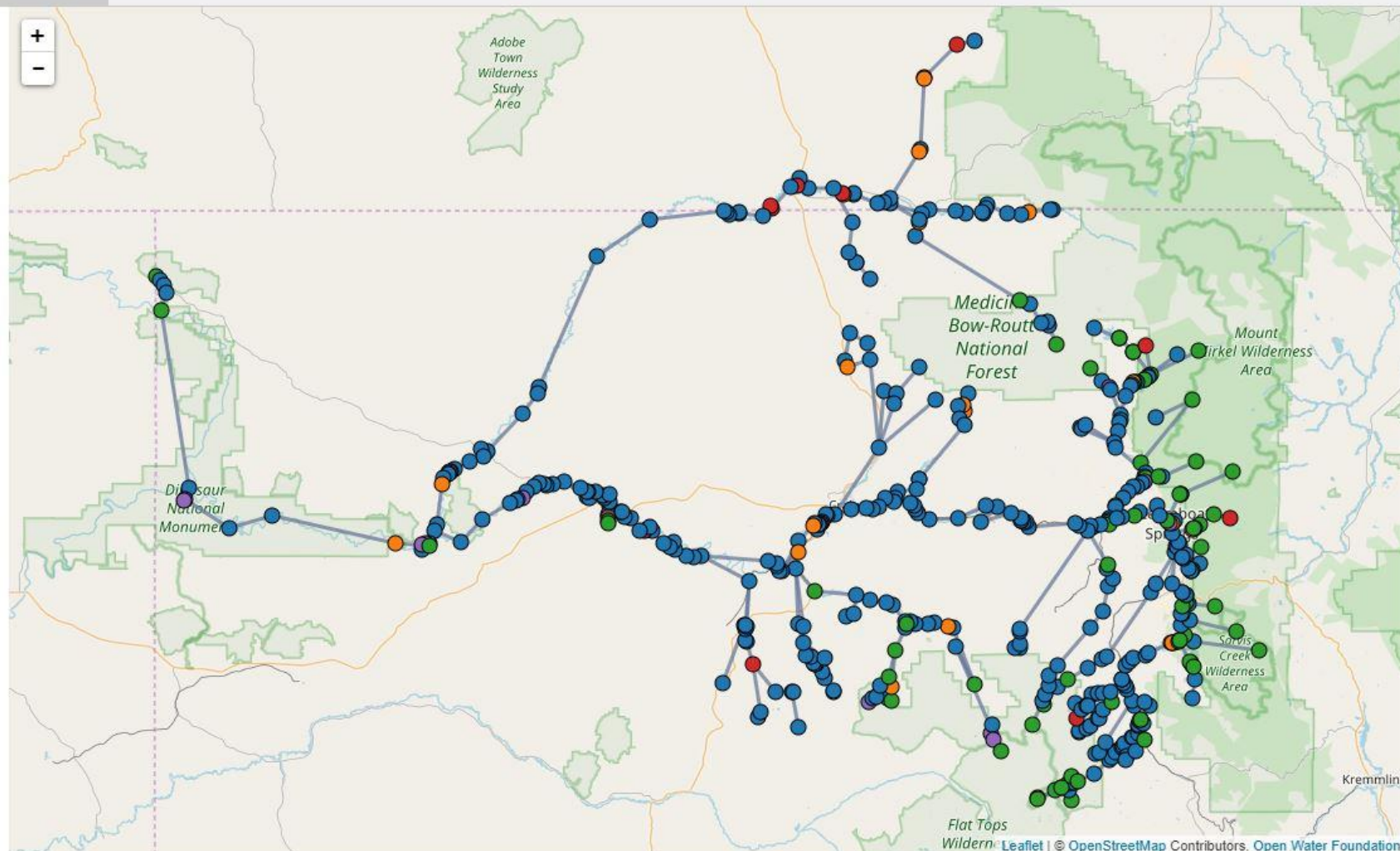
SWE Cumulative (acft): 90056.00

SWE Cumulative % of Mean (acft): 125.81

SWE_UpstreamTotal_Cumulative: 456315.00

Stream Network Visualization

Network Data Documentation Sources



NodeName: 44_ADY019_YampaRnrMa_DIV
NodeType: Diversion
GWMax: -999
Comment: 44_ADY019
Connected entities: MAYBELL CANAL _FLO, Five Pines-Roberts D_DIV

Source: YAMPA RIVER AT DEERL_FLO
Target: 55_ADY026_YampaR@Gre_DIV
GWMax: -999

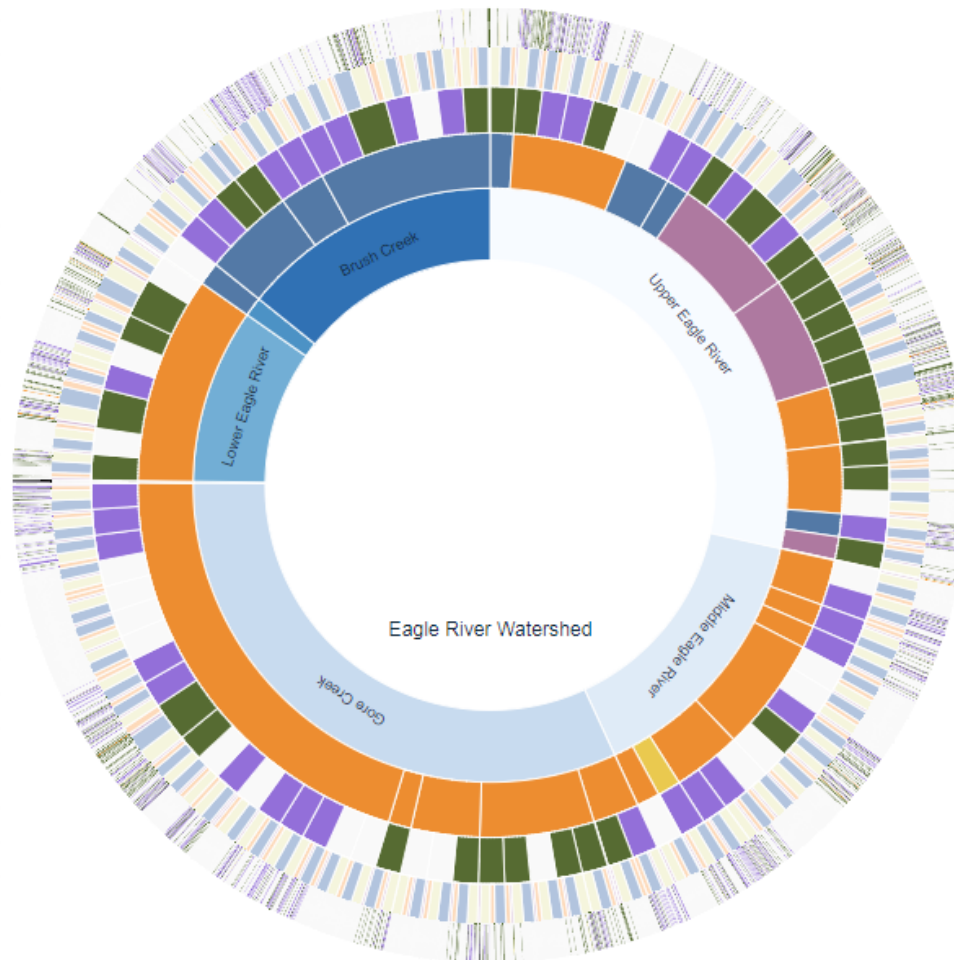
River Health

Visualization Documentation Data Sources

Eagle River Health - Sunburst Visualization

Eagle River Watershed-HUCName-SegmentID-StationName-UseClass-Indicator

HUCName	Upper Eagle River
SegmentID	COUCEA05c_A
ReachDescription	Mainstem of the Eagle River from a point immediately above Martin Creek to a point immediately above the confluence with Gore Creek.
StationID	USGS-393627106264000
StationName	Eagle River Above Gore Creek Nr. Minturn, Co
OrganizationID	USGS-CO
UseClass	Aquatic_Life
Category	Metals
Indicator	Lead
Units	ug/l
valueType	Dissolved
Censored	1
Minimum	0
Percentile_15th	0.0614
Median	0.1325
Percentile_85th	0.29885
Maximum	0.449
DateOfMax	4/22/2014
standard	$(1.46203 - (\log(\text{hardness}) * 0.145712)) * \exp(1.273 * (\log(\text{hardness}) - 4.705))$
StandardsExceeded	NA
Impaired	NA
Assessment	Poor Resolution



Legend

Assessment Colors:

- Acceptable
- Concern
- Data Gap
- Good
- Poor
- Poor Resolution

SegmentID (Category_303d):

- 1
- 2
- 3
- 3a
- 3b
- 4
- 4a
- 4b
- 4c
- 5

UseClass:

- Agriculture
- Aquatic_Life
- Human_Health
- Recreation

HUCName > SegmentID > StationName > UseClass > Indicator

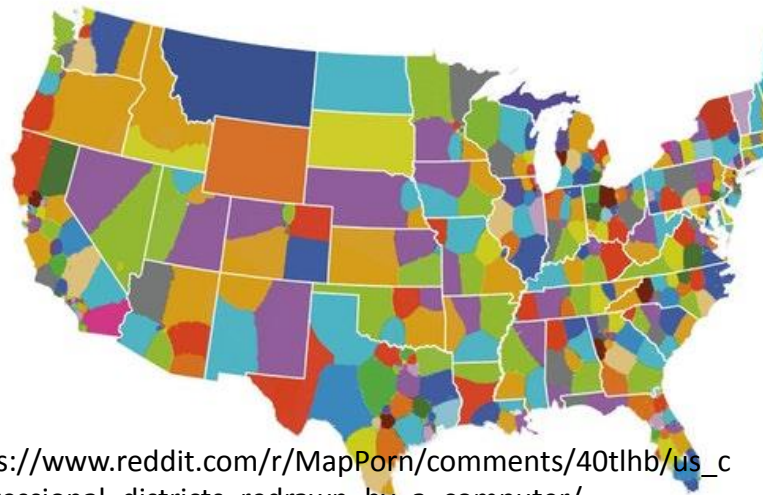
Upper Eagle River > COUCEA05c_A > Eagle River Above Gore Creek Nr. Minturn, Co > Aquatic_Life > Lead

A Little Political Data

Current congressional district map



Computer-drawn map to optimize compactness



← → ↻ ⓘ bdistricting.com/2010/CO/

Colorado Redistricting

From 2010 data

2010 Redistricting Home

Alabama	Congress House	Senate
Alaska	- House	Senate
Arizona	Congress House	Senate
Arkansas	Congress House	Senate
California	Congress Assembly	Senate
Colorado	Congress House	Senate
Connecticut	Congress House	Senate
Delaware	- Senate	House
Florida	Congress House	Senate
Georgia	Congress House	Senate
Hawaii	Congress House	Senate
Idaho	Congress House	Senate
Illinois	Congress House	Senate
Indiana	Congress House	Senate
Iowa	Congress House	Senate
Kansas	Congress House	Senate
Kentucky	Congress House	Senate
Louisiana	Congress House	Senate
Maine	Congress Senate	
Maryland	Congress House	Senate
Massachusetts	Congress House	Senate
Michigan	Congress House	Senate
Minnesota	Congress House	Senate
Mississippi	Congress House	Senate
Missouri	Congress House	Senate
Montana	- Senate	House
Nebraska	Congress Legislature	
Nevada	Congress Assembly	Senate
New Hampshire	Congress Senate	
New Jersey	Congress General	Senate
New Mexico	Congress House	Senate
New York	Congress Assembly	Senate

Colorado Congress



7 districts

Colorado House of Representatives



65 districts

Colorado Senate



35 districts

https://www.reddit.com/r/MapPorn/comments/40tlhb/us_congressional_districts_redrawn_by_a_computer/

United States Pirate Party

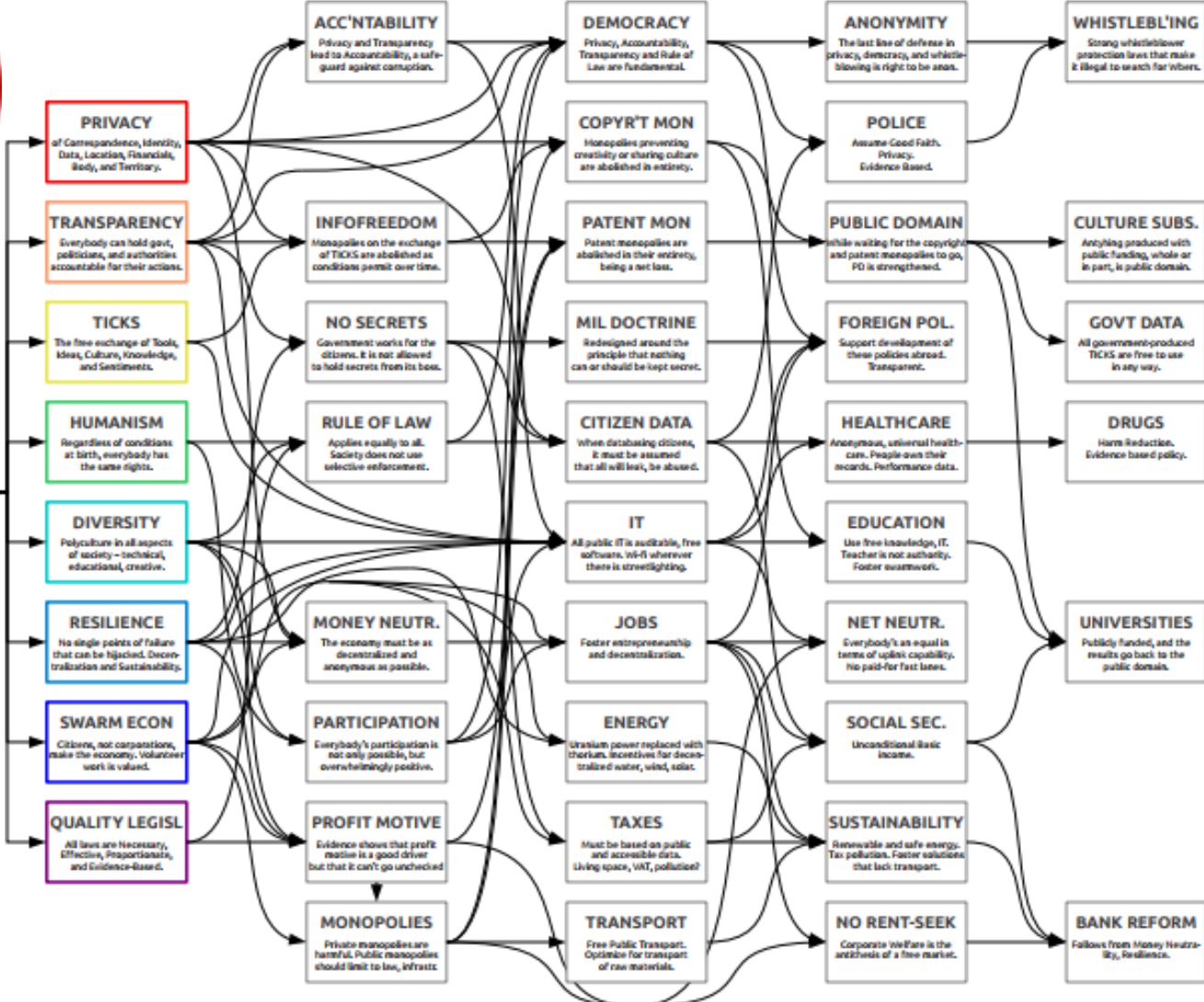
Philosophies and Policies of the Pirate Wheel

Boxes under Foundation and Principles are clickable for more information, with the rest coming later

<http://falkvinge.net/files/2012/manual/PirateWheel-2012-11-10.pdf>



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Predictions for 2018

- Transparency will be a national political issue.
- There will be significant progress publishing, accessing, and using open water data in Colorado.
- Key projects and organizations will catalyze the use of open data.
- Organizations will increasingly use open data and data-driven stories to present issues through the lens of each organization.

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