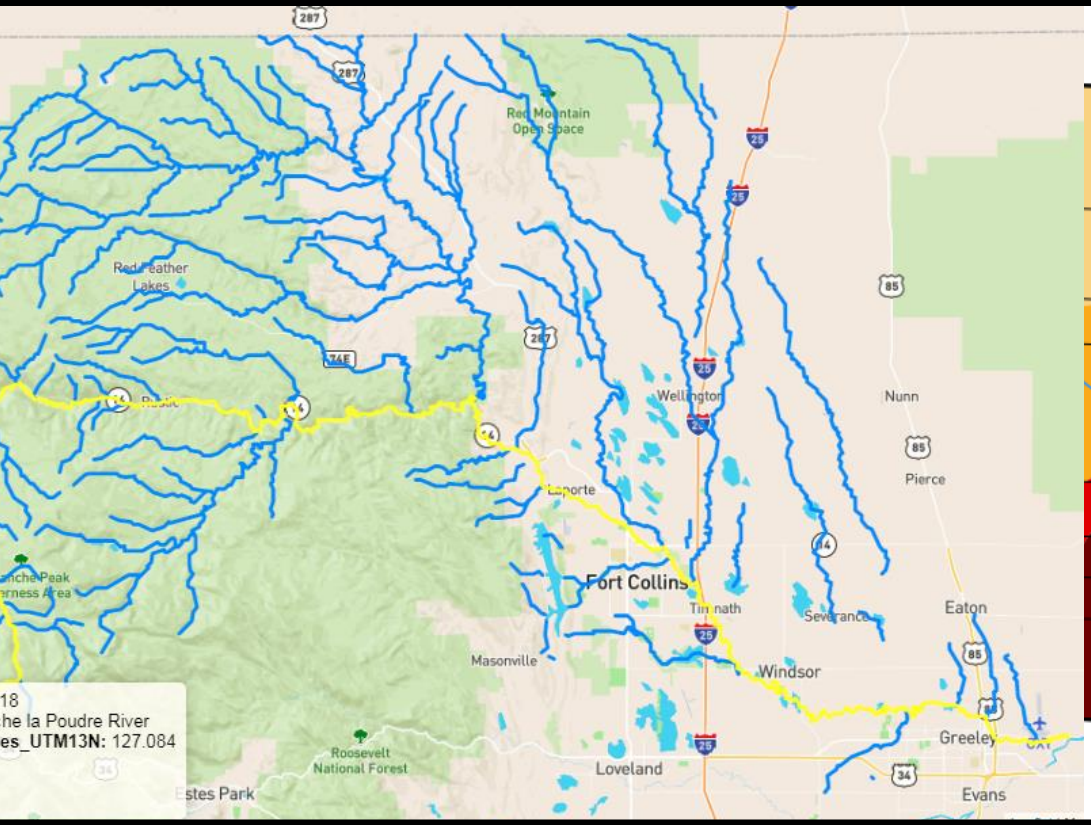
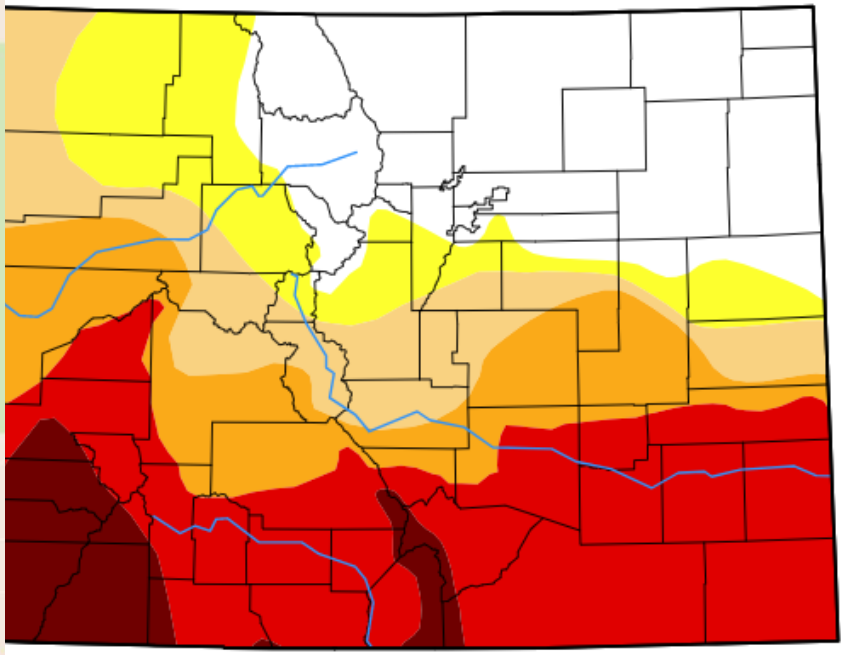
Colorado WaterWise Open Source Resources

June 14, 2018





openwater FOUNDATION

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

Open Water Foundation

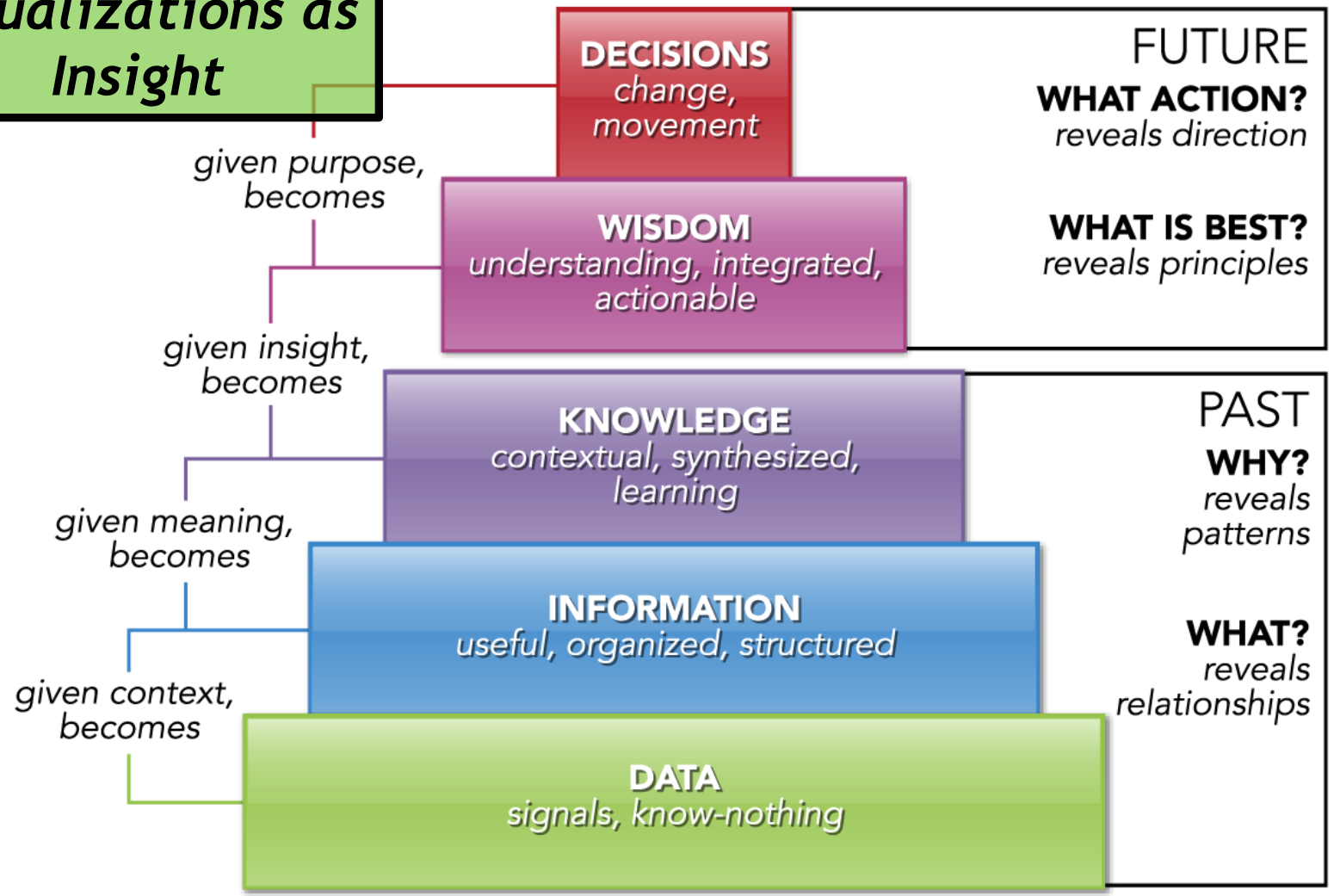
Social enterprise 501(c)3 nonprofit focusing on developing open source software and open data tools to help make better decisions about water resources. Water is a public resource, and water data and software tools should also be public.

open data | open software | open decisions

openwaterfoundation.org

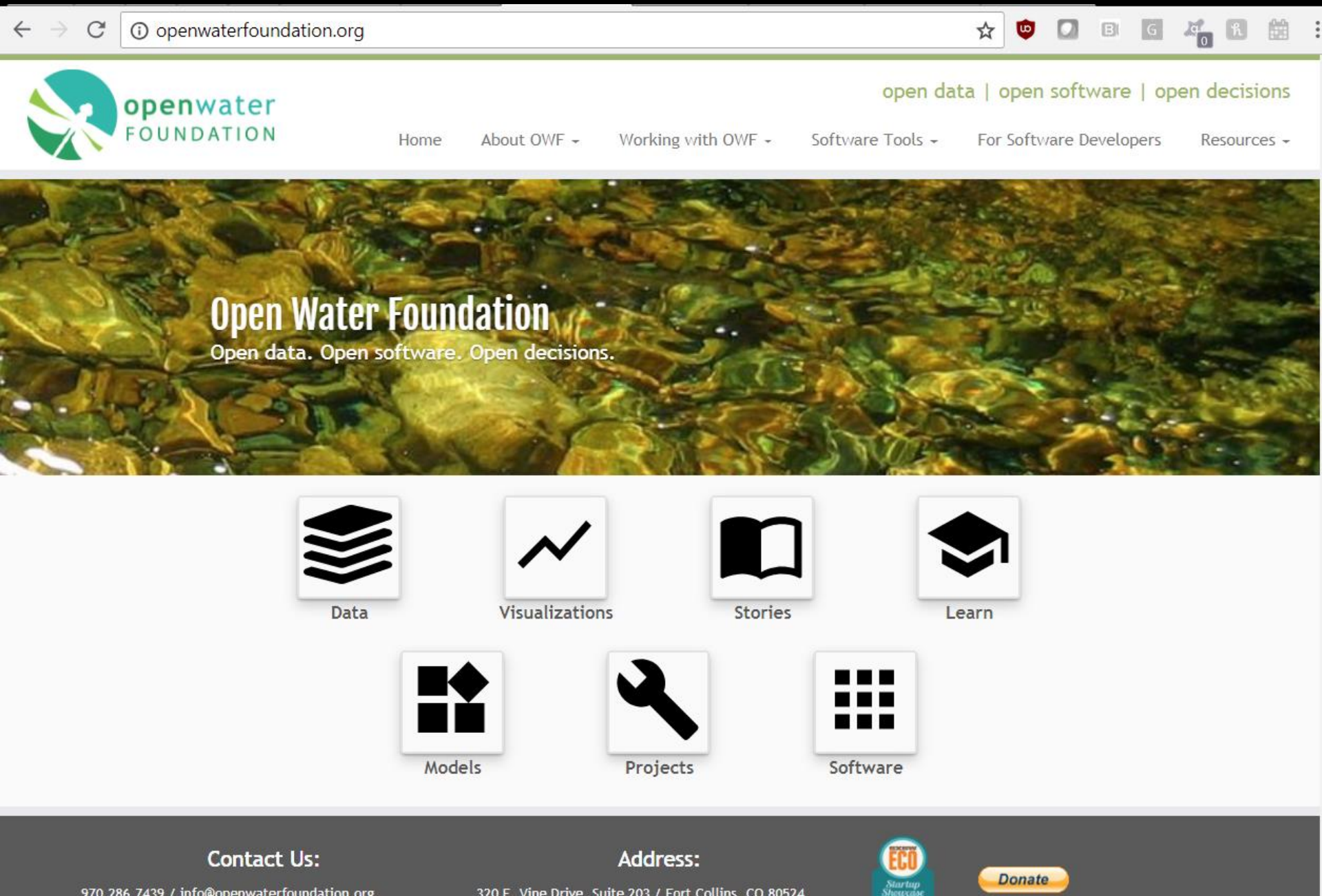
Open Data as Infrastructure for Innovation

Visualizations as Insight



Data as Infrastructure

Open Collaboration



Colorado WaterWise

The mission of Colorado WaterWise is to connect stakeholders, provide resources, and serve as the collaborative leader in efficient use of urban water in Colorado.

Context - Climate Change

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

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- NASA Successfully Launches NOAA Advanced Geostationary Weather Satellite
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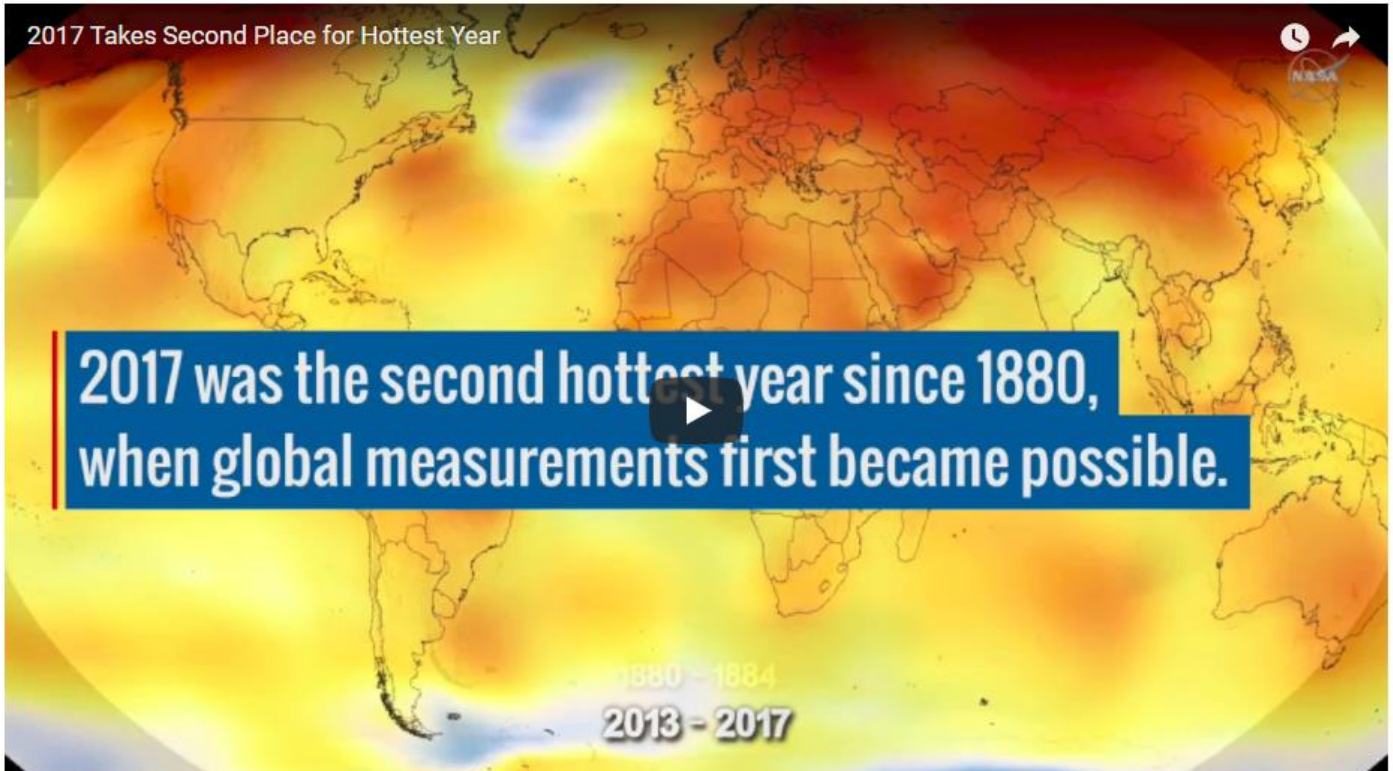
- From NYC to Rio: NASA Helps Cities Address Climate Risks
  a year ago

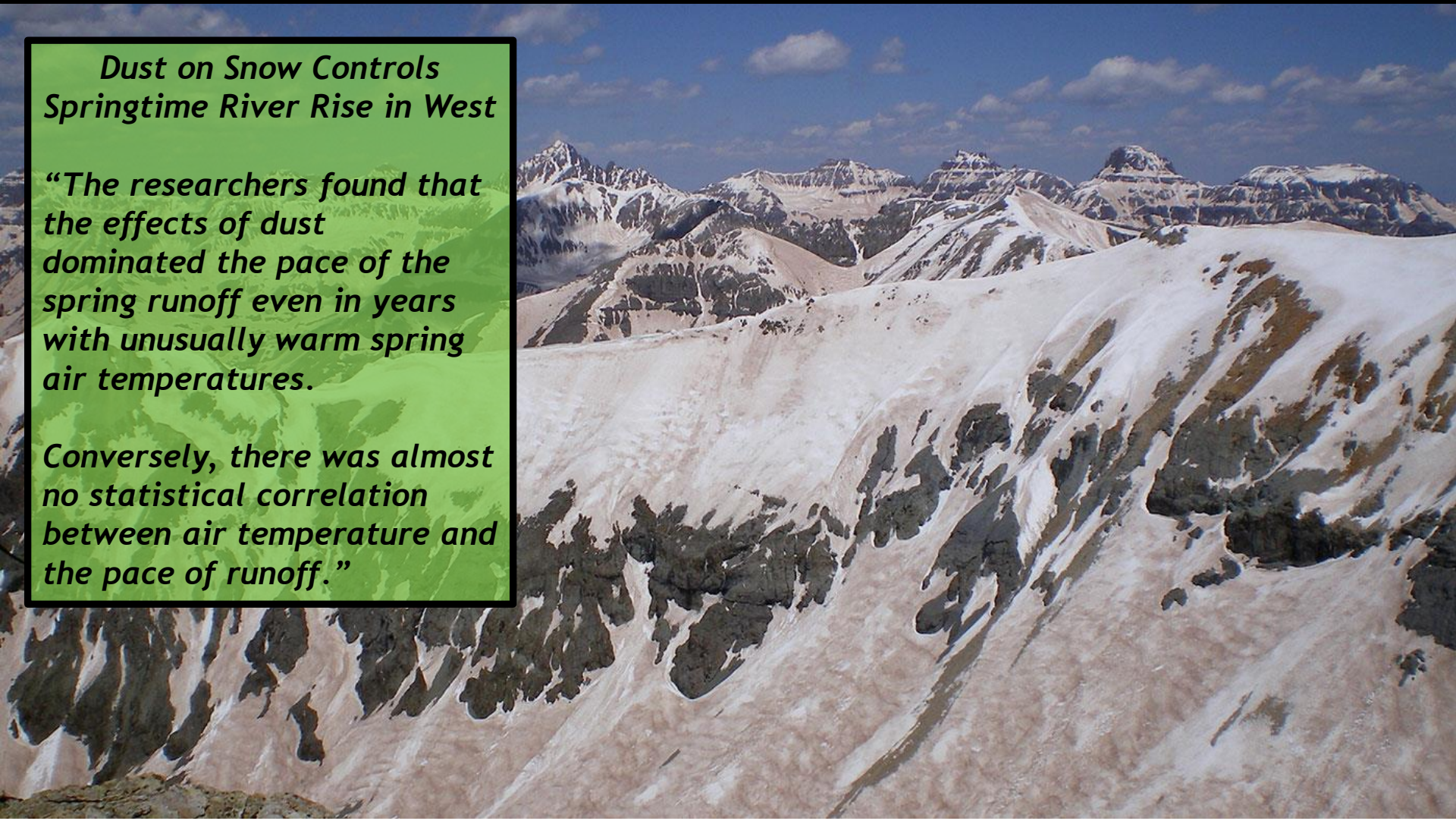
Climate

Jan. 18, 2018
RELEASE 18-003

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



Context - Dust on Snow



Dust on Snow Controls Springtime River Rise in West

"The researchers found that the effects of dust dominated the pace of the spring runoff even in years with unusually warm spring air temperatures.

Conversely, there was almost no statistical correlation between air temperature and the pace of runoff."

https://www.jpl.nasa.gov/news/dust-on-snow-controls-springtime-river-rise-in-west

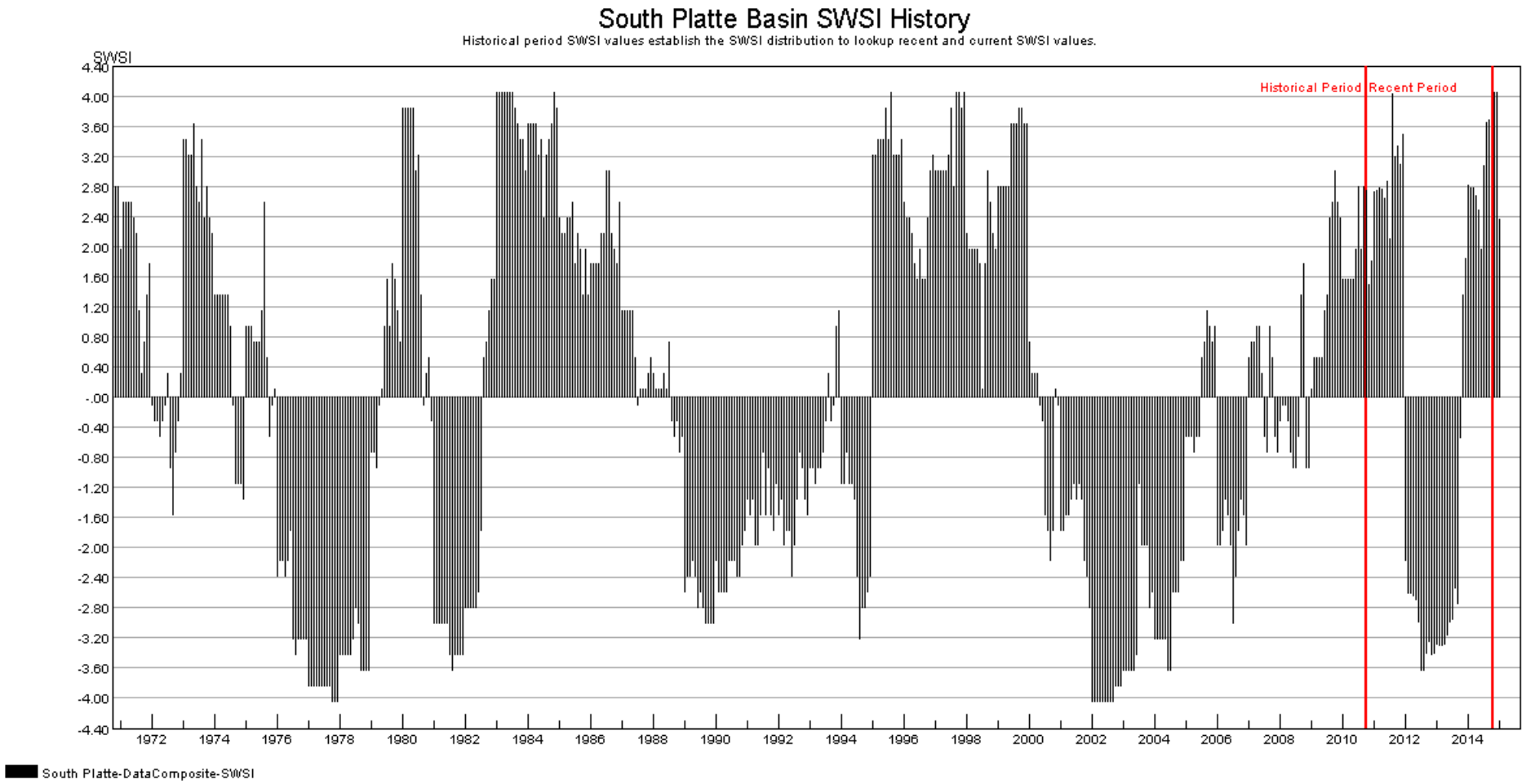
Photo credit: NASA

Context – World Risks

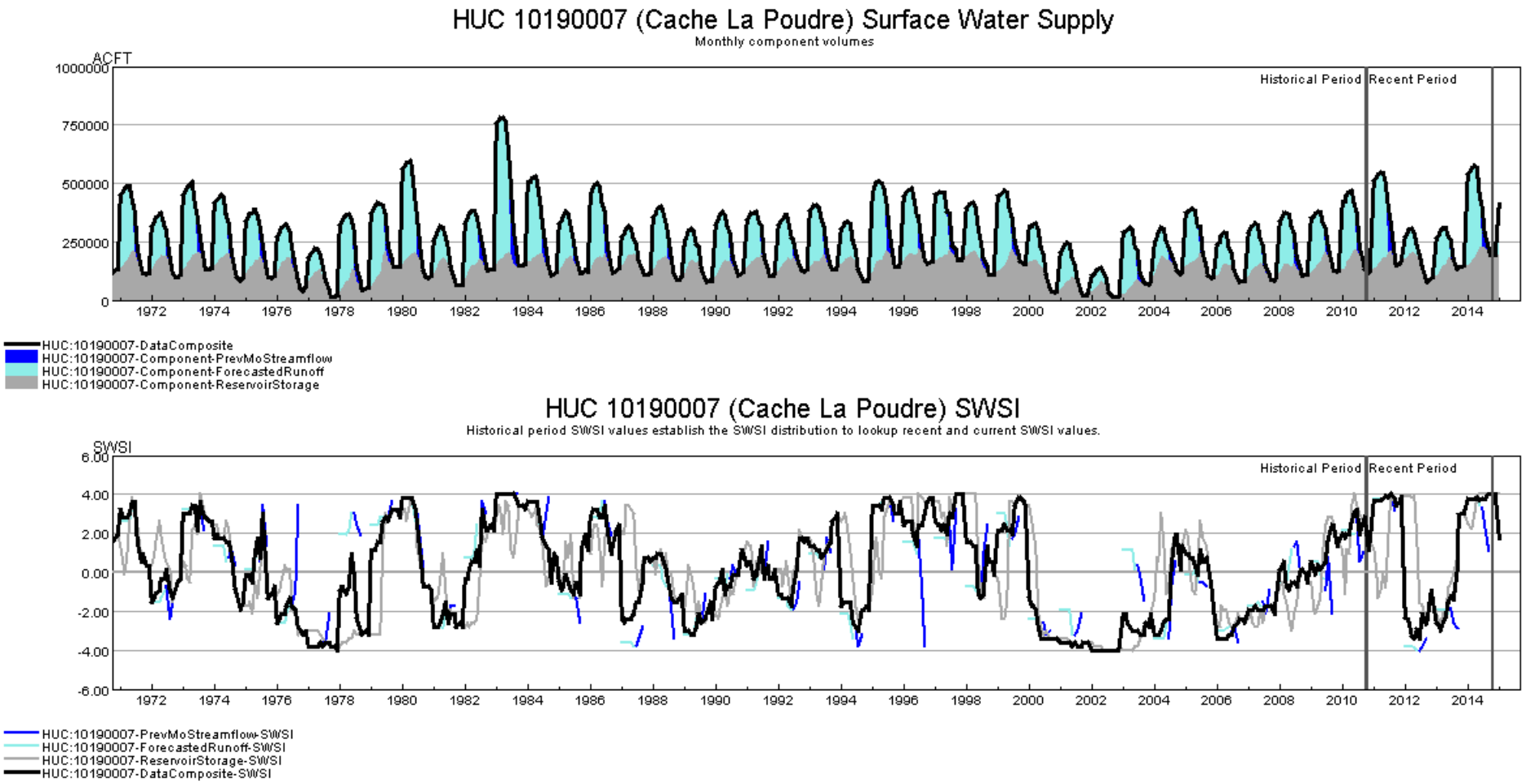
"Climate and tech pose the biggest risks to our world in 2018"

World Economic Forum:
https://www.weforum.org/agenda/2018/01/the-biggest-risks-in-2018-will-be-environmental-and-technological
Photo by Ross Stone on Unsplash

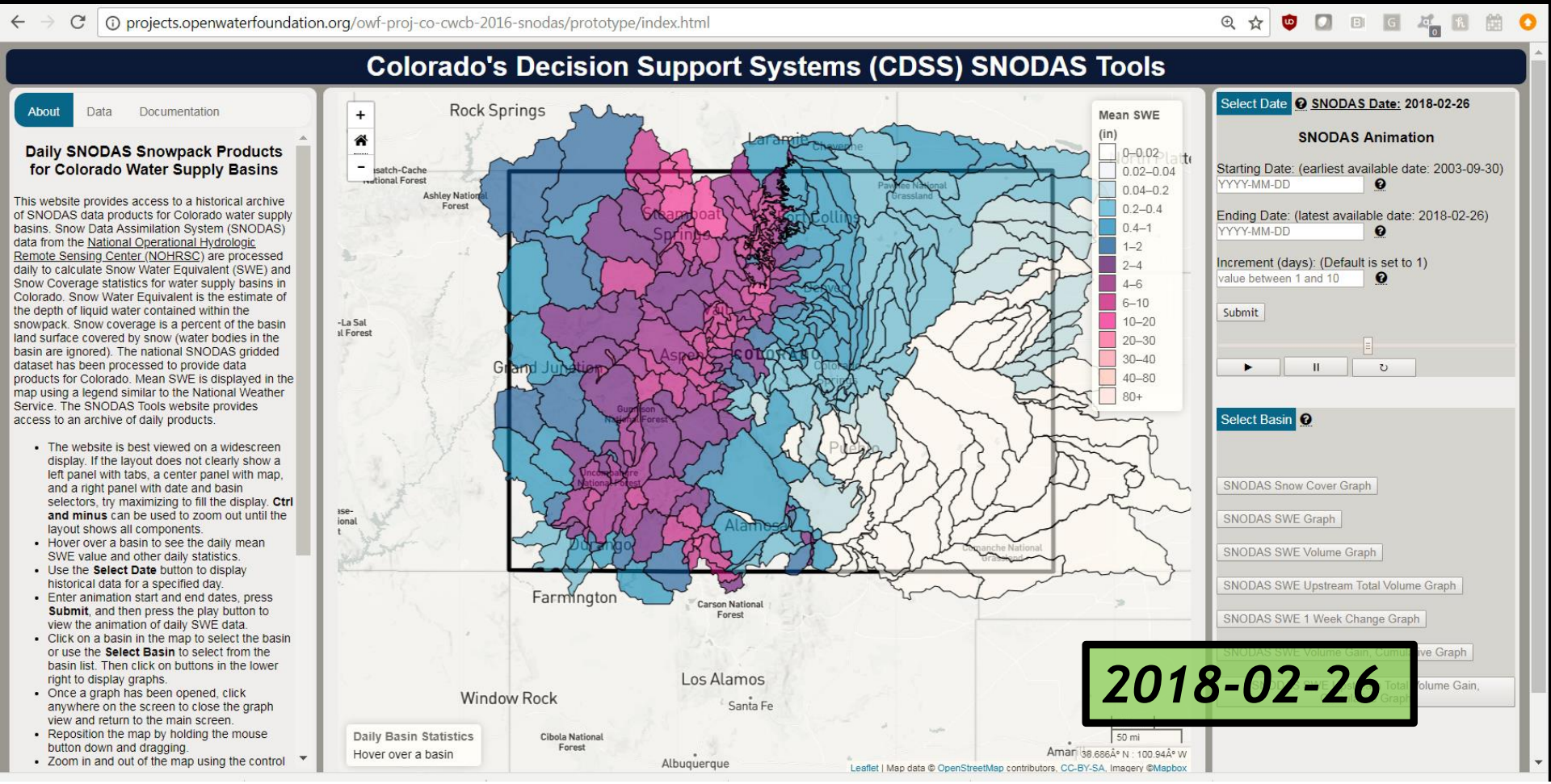
Surface Water Supply Index (SWSI)



SWSI at Hydrologic Unit Code Scale

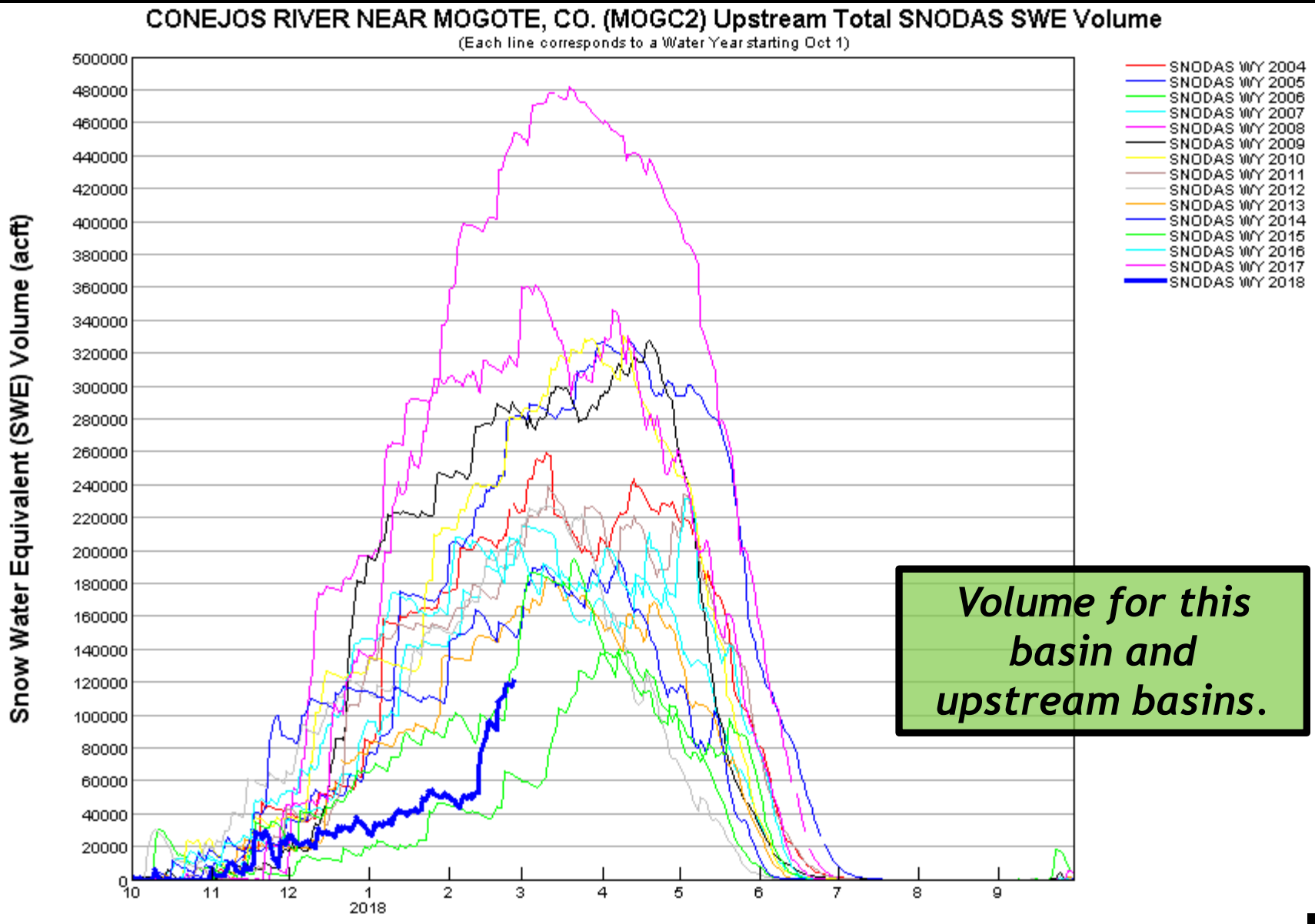


SNODAS Tools



http://snodas.cdss.state.co.us/app/index.html

SNODAS Total Upstream SWE Volume



Volume for this basin and upstream basins.

“Gapminder” Snowpack

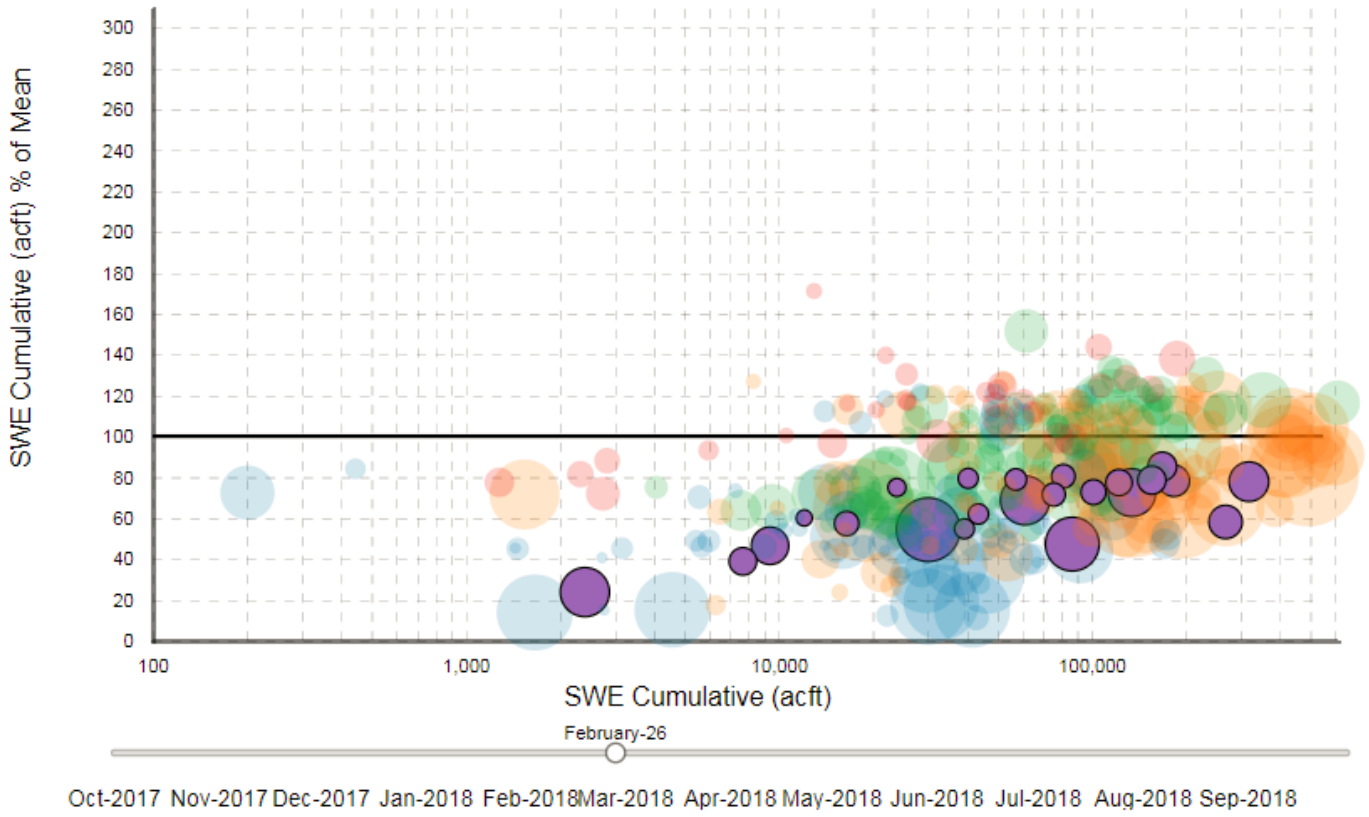
viz.openwaterfoundation.org/co/owf-viz-co-snodas-gapminder/

Gapminder | Documentation | Data | Sources

SNODAS Data

Feb-2018

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 LOCAL_I

Turn Tracer On

Turn Annotations Off

Water Year: 2018

Speed:

LOCAL_ID:
Date:
SWE_Cumulative:

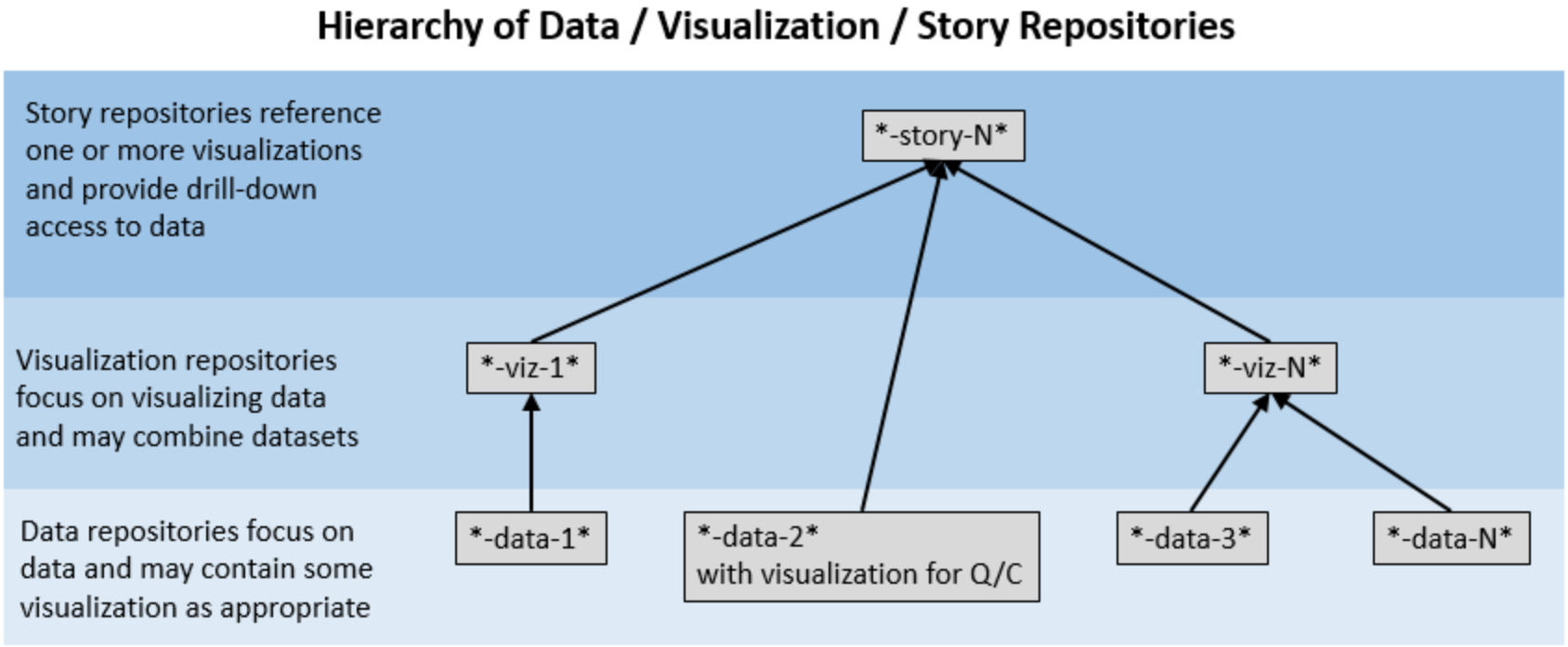
http://viz.openwaterfoundation.org

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

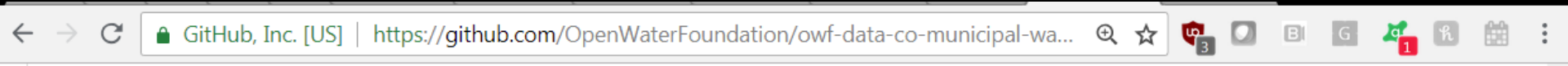
- "Generating Economic Value through Open Data" in "Beyond Transparency"

Data, Visualizations, Stories



https://github.openwaterfoundation.org

Data, Visualizations, Stories



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.

The following sections provide a summary of the project repository:

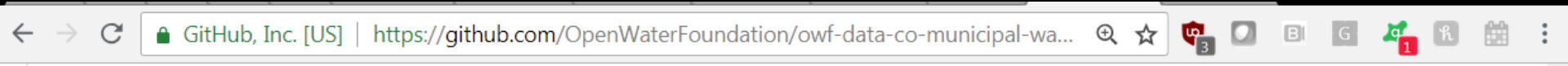
- Repository Contents
- Attribution
- Data Workflow
- How to Use the Data
- License
- Contributing
- Maintainers
- Contributors

Repository Contents

The repository contains the following:

https://data.openwaterfoundation.org

Open Data for Water Use Efficiency



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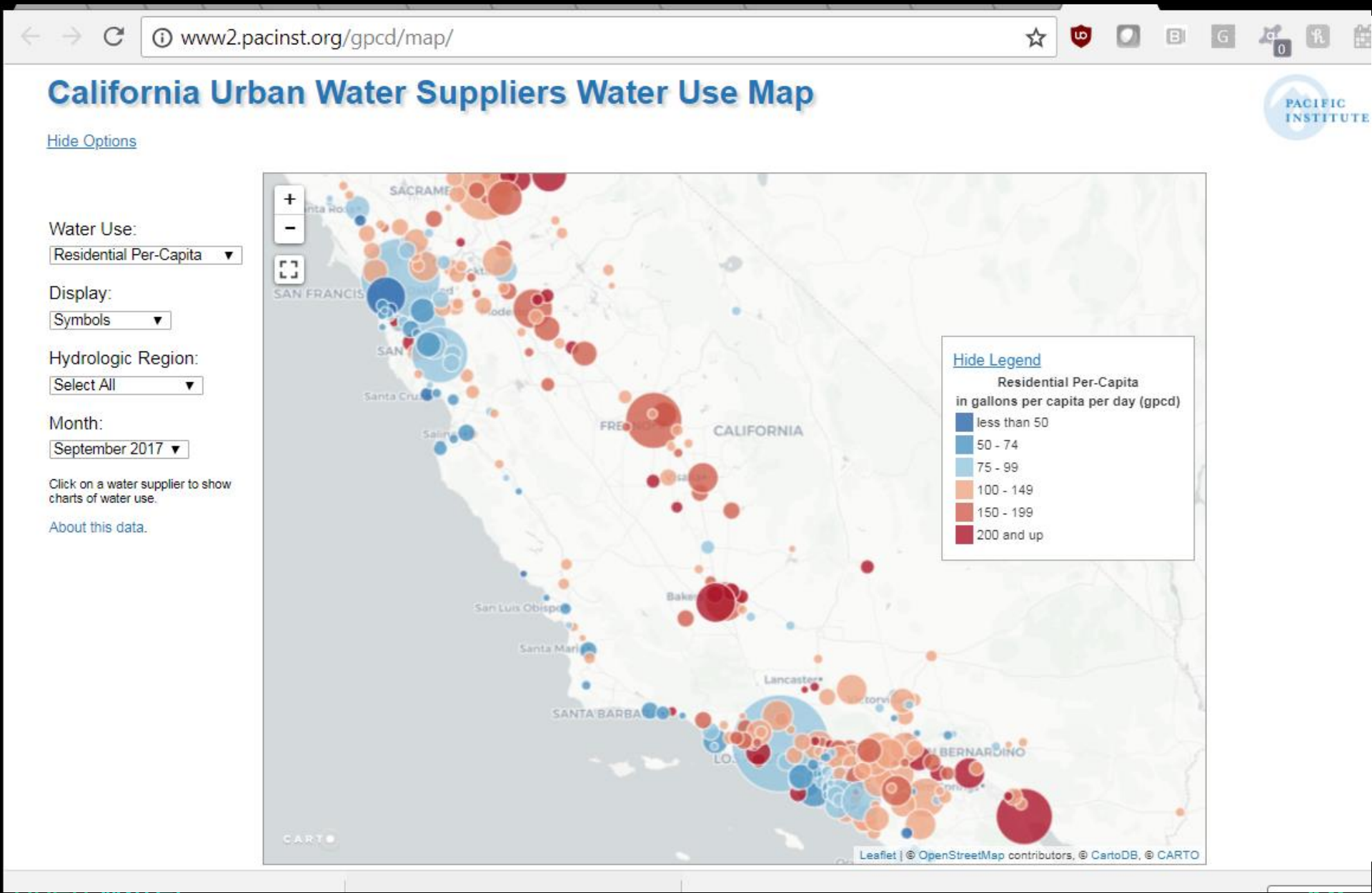
Water Use: California Drought Example



COLORADO RIVER
URBAN WATER USE
DATA AVAILABILITY AND METRICS

PREPARED BY:

openwater FOUNDATION

IN ASSOCIATION WITH

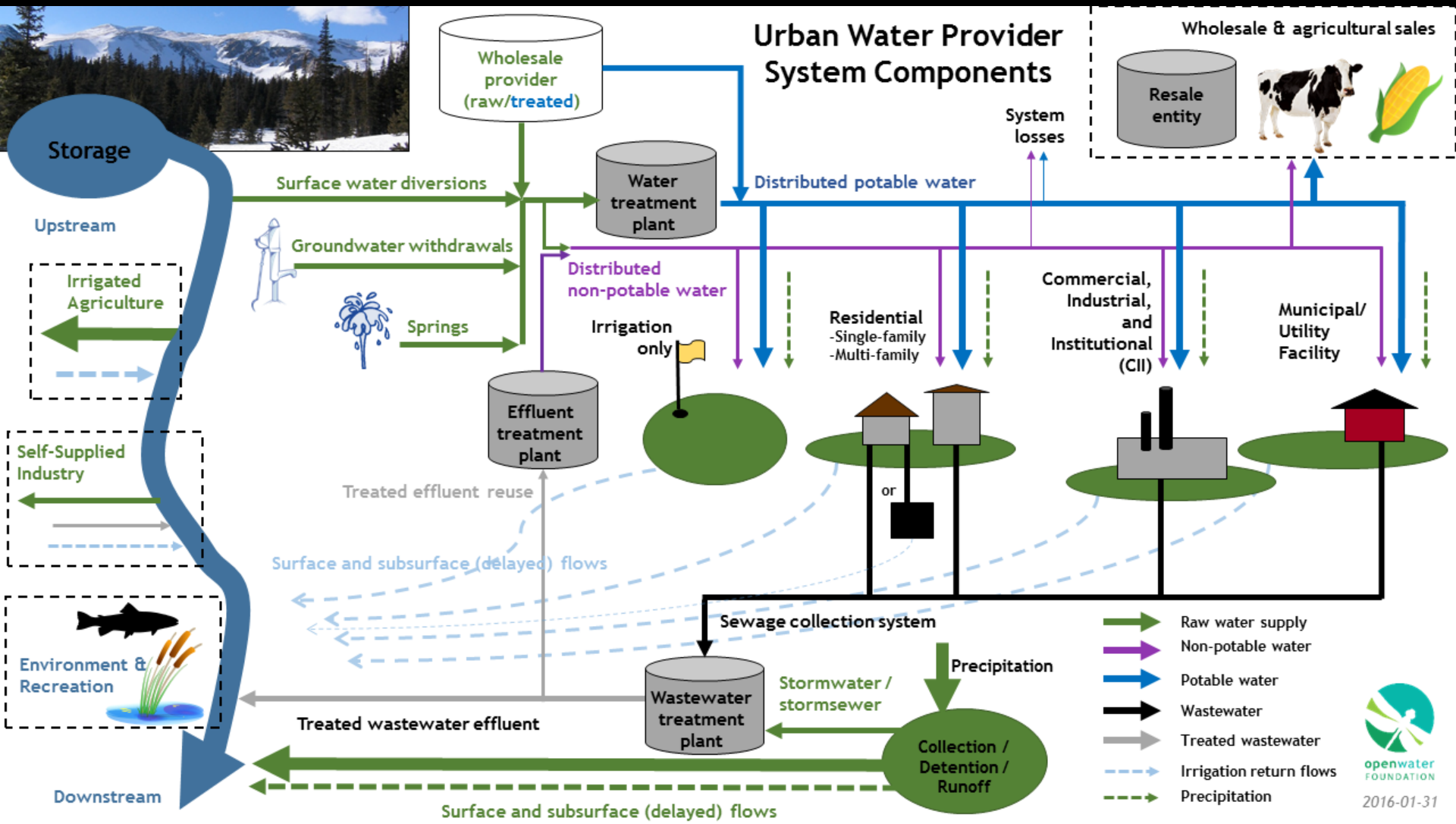
WaterDM DEMAND MANAGEMENT

FEBRUARY 12, 2018

ORIGINAL VERSION:
OCTOBER 23, 2015

http://openwaterfoundation.org/resources/presentations-and-publications

Water Use in System



http://viz.openwaterfoundation.org

Water Efficiency Planning

cwcb.state.co.us/water-management/waterEfficiency/Pages/main.aspx

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Home > Water Management > Water Efficiency

Water Management

- **Water Efficiency**
  - Water Efficiency Planning
  - Reporting of Water Use and Water Conservation Data (HB10-1051)
  - Water Conservation Technical Advisory Group
- Drought
- Flood
- Water Supply

Water Efficiency

What Is Water Efficiency?

Quite simply, water efficiency is doing more with less – not doing without. Water efficiency efforts include the practices, techniques and technologies that extend water supplies and other resources (e.g. energy) by either saving water or through substituting with alternative supplies such as reuse. This, in turn, frees up water supplies for other uses, such as new development, stored drought reserves, agricultural leases, and environmental uses (e.g. instream flows). Water efficiency is inclusive of water conservation and includes both system demands and customer water demands.

Additional Information

- Watch "Doing More with Less" Water Efficiency Film
- AWWA Water Conservation Resource Community
- Financing and Rate Setting for Water
- A Communications Roadmap for Enhancing the Value of Water (2011)

Why Plan for Water Efficiency?

Colorado's water supply as demands increase from a growing population. As the Statewide Water Supply Initiative

Need an open dataset of water efficiency plans

HB 10-1051 Water Use Efficiency Portal

cwcb.state.co.us/water-management/waterEfficiency/Pages/ReportingWaterUseWaterConservationData.aspx

Water Management

Water Efficiency

- Water Efficiency Planning
- **Reporting of Water Use and Water Conservation Data (HB10-1051)**
- Water Conservation Technical Advisory Group

Drought

Flood

Water Supply Planning

Basin Roundtables

Water Projects & Programs

South Platte Groundwater

Reporting of Water Use and Water Conservation Data (HB10-1051)

Background

In 2010, the Colorado General Assembly adopted HB10-1051 which requires covered entities (retail water providers who sell 2,000 acre feet or more of water annually) to report, on an annual basis, water use and conservation data to be used for statewide water supply planning. The bill directed the CWCB to adopt guidelines regarding the reporting of water use and conservation data by covered entities (Guidelines), and to report to the legislature regarding the Guidelines.

HB10-1051 directed the CWCB to develop reporting Guidelines through a public participation process that included outreach to stakeholders from water providers with geographic and demographic diversity, nongovernmental organizations, and water conservation professionals.

The reporting Guidelines include clear descriptions of customer categories, uses, and measurements; how the Guidelines will be implemented; and how data will be reported to the Board.

Goals

Statewide water supply planning efforts, such as the Statewide Water Supply Initiative (SWSI), which utilizes future statewide water demand projections with-and-without various levels of municipal and industrial water conservation, rely on statewide water use and water conservation data.

Data reported under HB10-1051 will further support statewide

HB10-1051 Timeline

House Bill 10-1051 requires the following actions be completed no later than the indicated dates:

- **February 1, 2012**: CWCB adopts Guidelines and reports to legislature regarding the Guidelines.
- **June 30, 2014 through June 30, 2020**: Annual covered entity reporting for the previous calendar year.
- **February 1, 2019**: CWCB reports to legislature on the Guidelines and data collected under the Guidelines.
- **July 1, 2020**: Legislation sunsets.

For Public Users: In line with Colorado's Transparency Online Project and the next revision of the Statewide Water Supply Initiative (SWSI), the Colorado Water Conservation Board is opening the HB10-1051 data for research purposes to foster innovation. Colorado's water future is uncertain and a broader dissemination of water use and water conservation data will support more research arenas in defining and implementing solutions to the statewide water supply-demand gap.

DISCLAIMER:

The purpose of the HB10-1051 data reporting, per Section 37-60-126(4.5)(a), C.R.S., is to provide water use and conservation data for statewide water supply planning. The data collection process is designed to provide better, more frequent, and more

Questions?

Secure | https://data.colorado.gov

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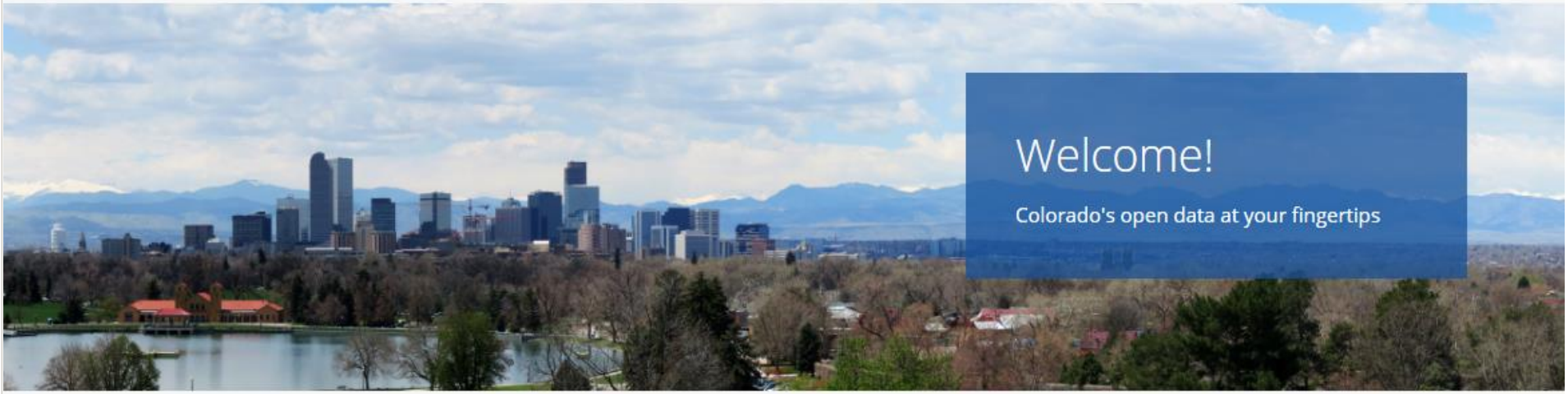

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Water

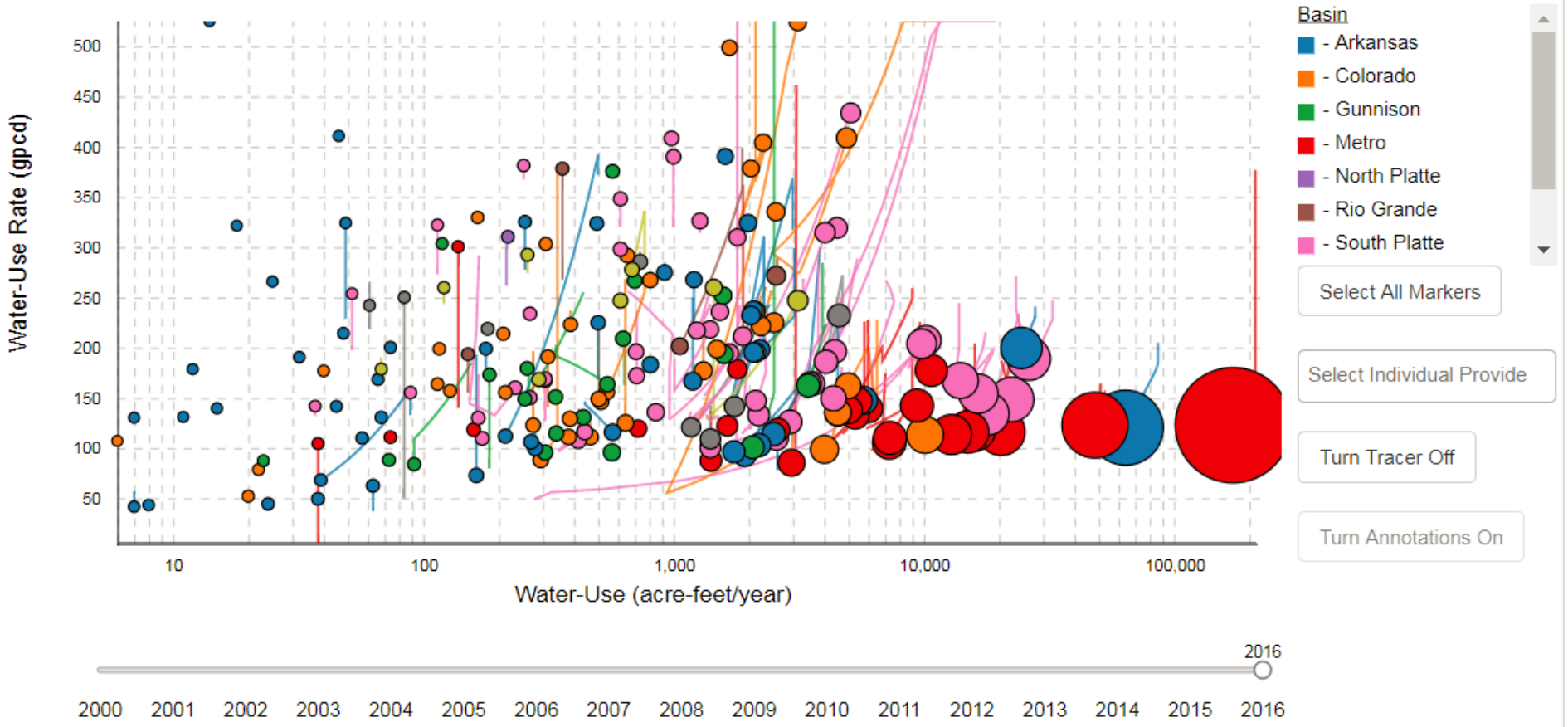
“Gapminder” Water Use Efficiency

Visualization | Documentation | Data | Sources

Water Providers in Colorado

2016

Population(size), Basin(color), Water-Use(x), and Water-Use Rate(y).



Provider: Town of Eagle
Year: 2016
WaterUse_AFY: 1490.00
GPCD: 198.52

Challenges and Opportunities

- Cross-jurisdictional datasets are difficult.
- Collaboration can save time and lead to great results…but also takes time.
- Funding is needed at all levels.
- How to measure conservation and efficiency?
- Opportunity to develop foundational open datasets and tools.
- Innovation and evolution comes from multiple entities.

Share It

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open data | open software | open decisions
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