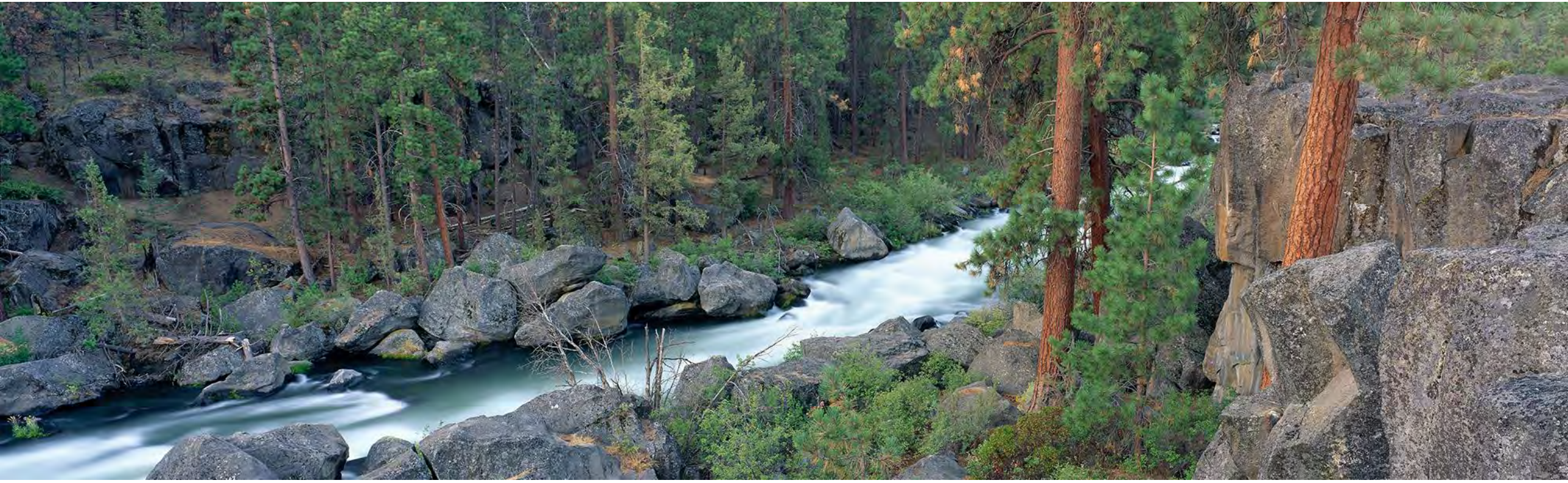
Who Uses Water in Central Oregon?

Cities, Farms, Rivers, and How It's Distributed



Lori Faha

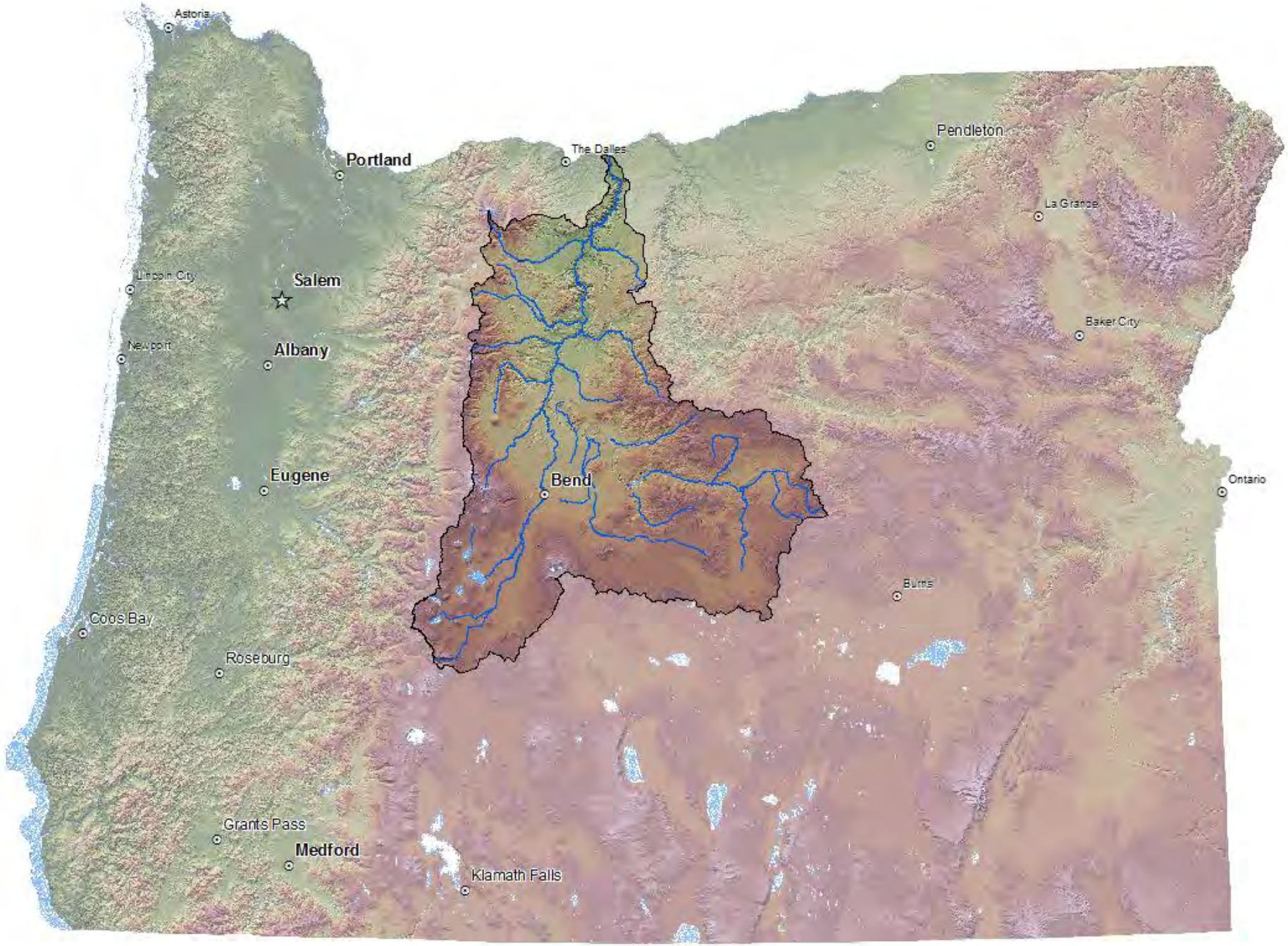
BEND 100 YEARS OF WATER
Celebrating a Century of Exceptional Water Service

Jeremy Giffin

OREGON WATER RESOURCES DEPARTMENT

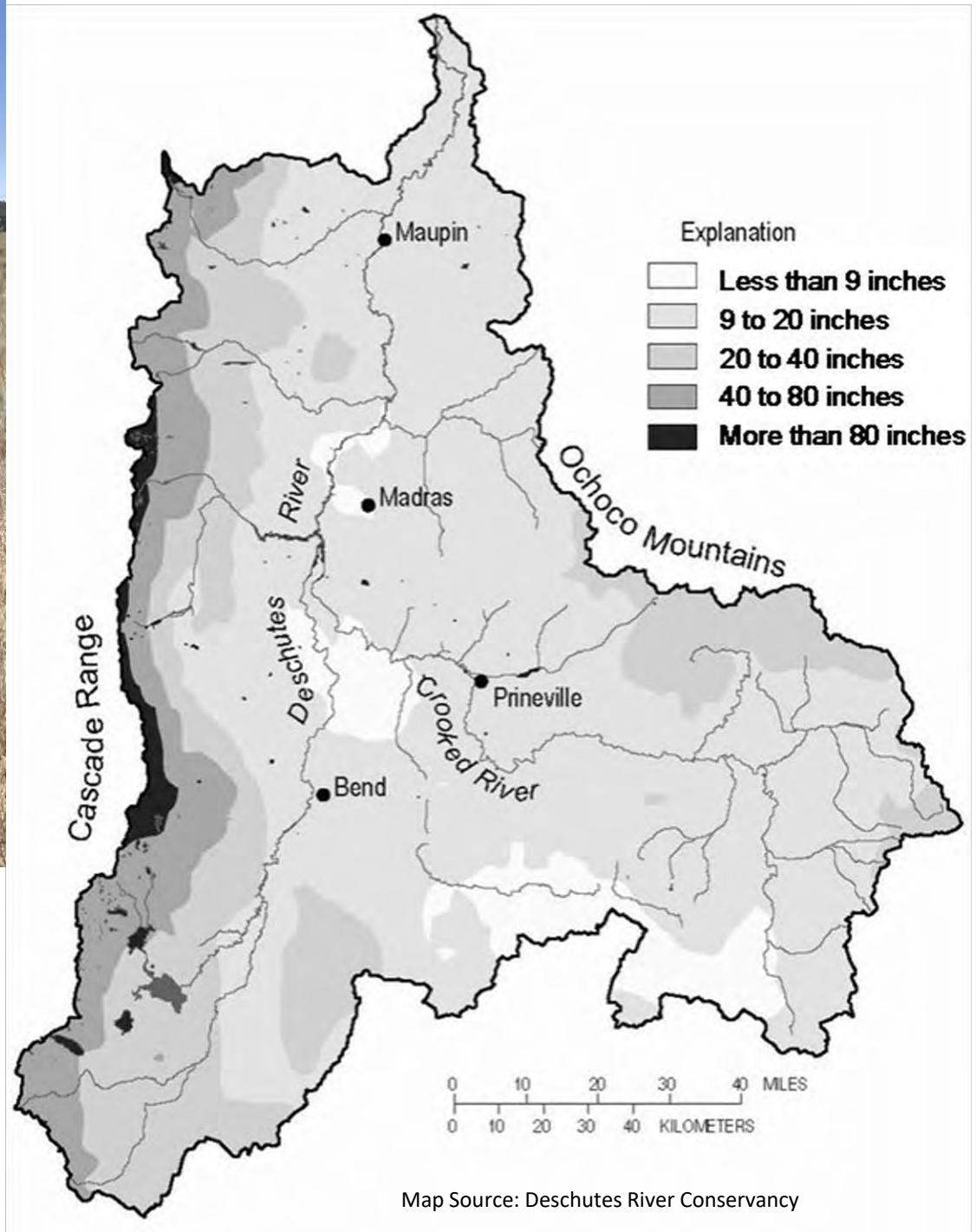
Lisa Seales

DESCHUTES RIVER CONSERVANCY


Astoria
Portland
The Dalles
Pendleton
La Grande
Lincoln City
Salem
Baker City
Newport
Albany
Eugene
Bend
Ontario
Burns
Coos Bay
Roseburg
Grants Pass
Medford
Klamath Falls

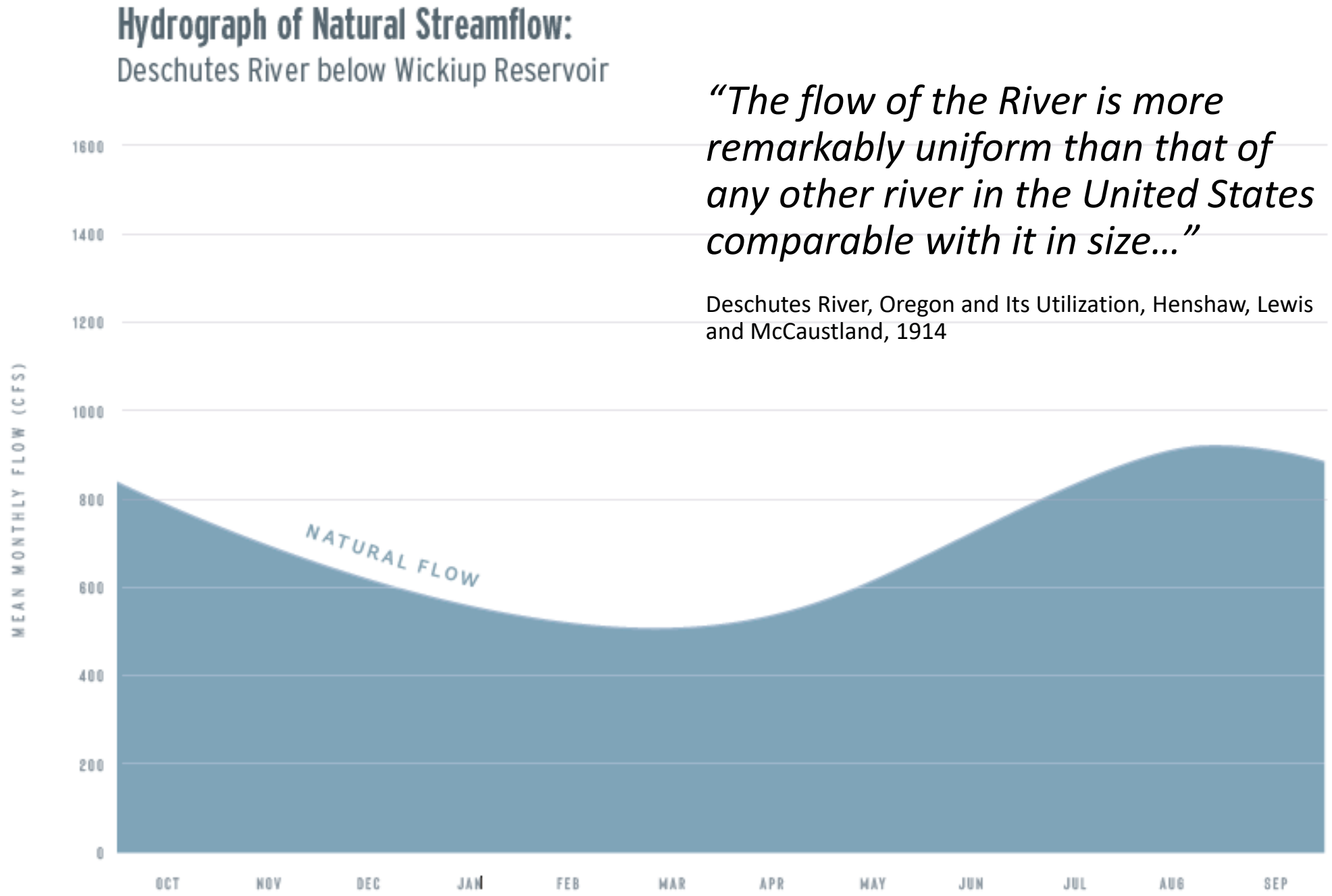
The Deschutes Basin

Distribution of Precipitation



Map Source: Deschutes River Conservancy

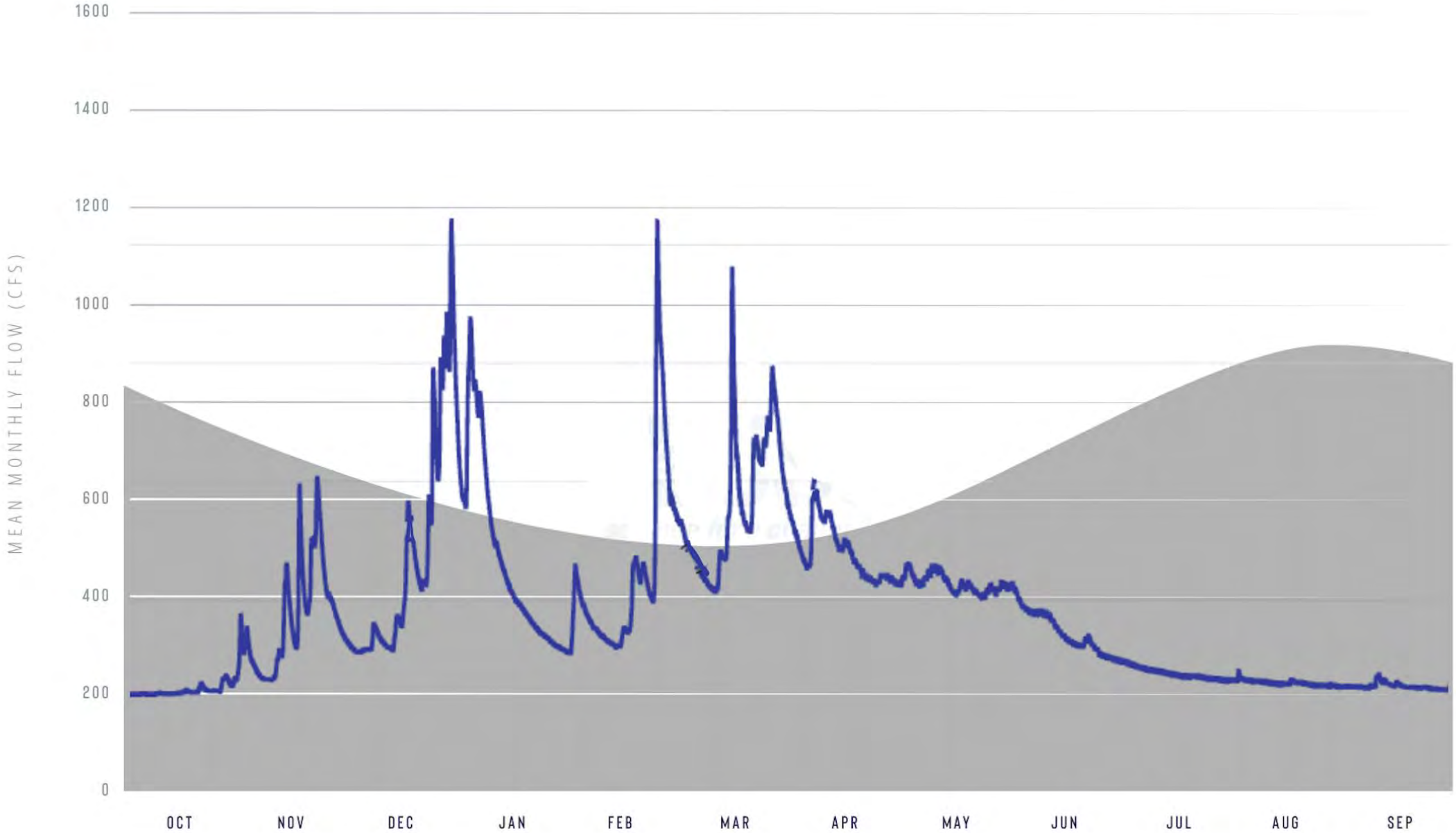
Source: Muir Way Maps



"The flow of the River is more remarkably uniform than that of any other river in the United States comparable with it in size…"

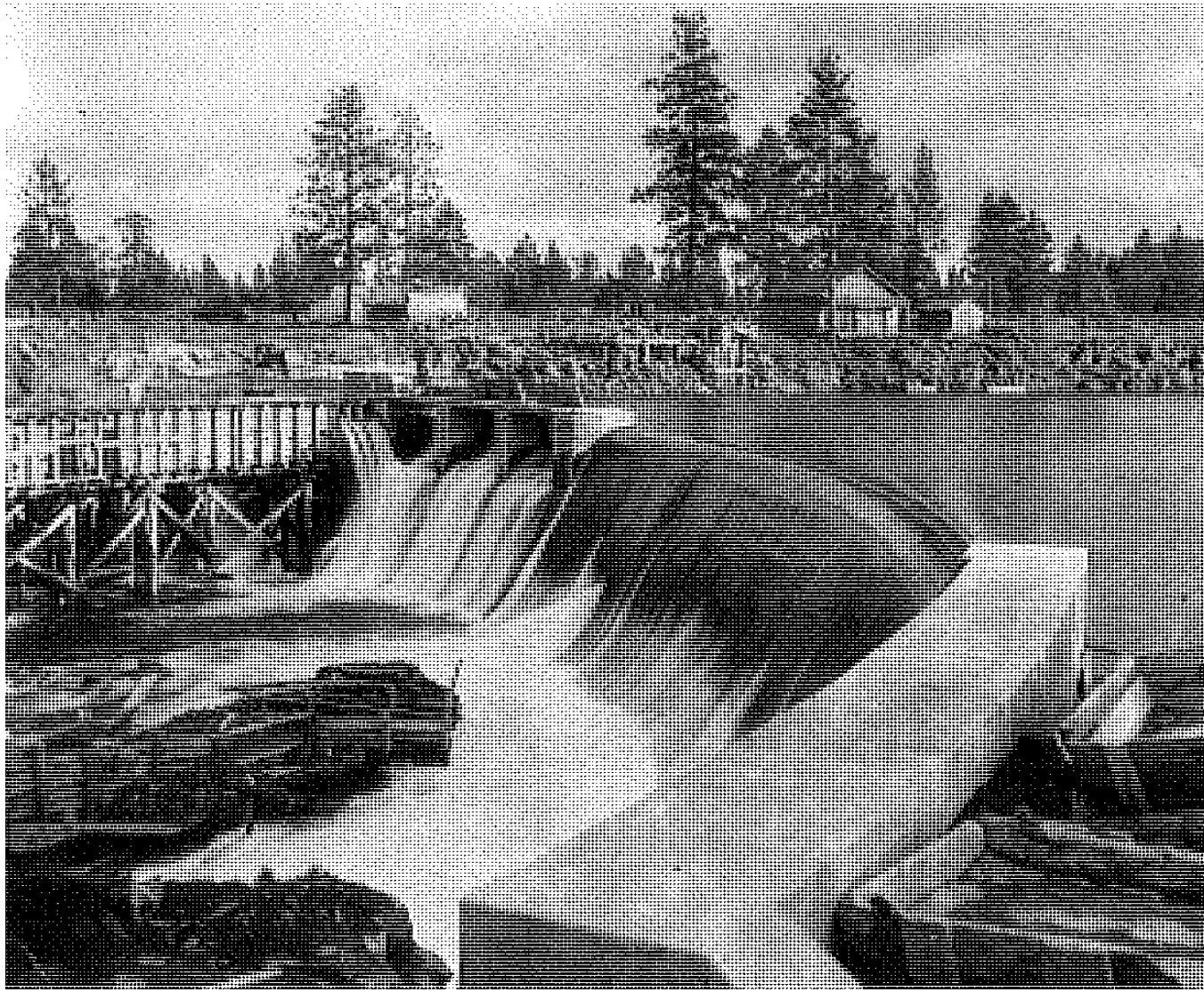
Deschutes River, Oregon and Its Utilization, Henshaw, Lewis and McCaustland, 1914

Groundwater-Fed vs. Run-Off Driven Hydrograph:

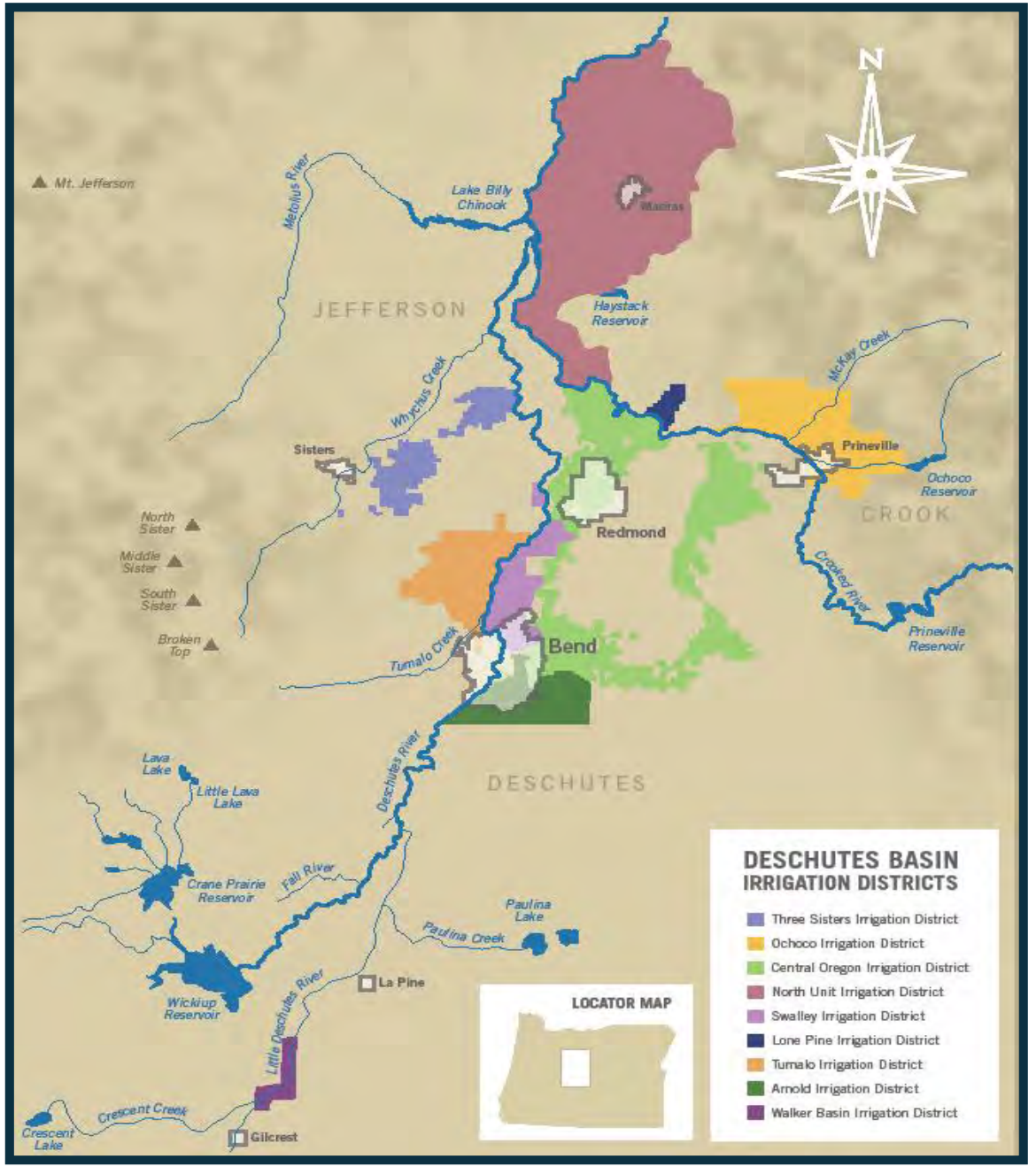


Deschutes History

- Carey Act (1894)
- Reclamation Act (1902)
- Deschutes River fully appropriated by 1913
- Upper basin reservoirs built for additional water (1922-1949)
- Gentleman's agreement (1962)
- Instream water rights act (1987)
- Change from a timber/agricultural community to a scenic/recreation community
- Maintain promises of the past while improving the natural system

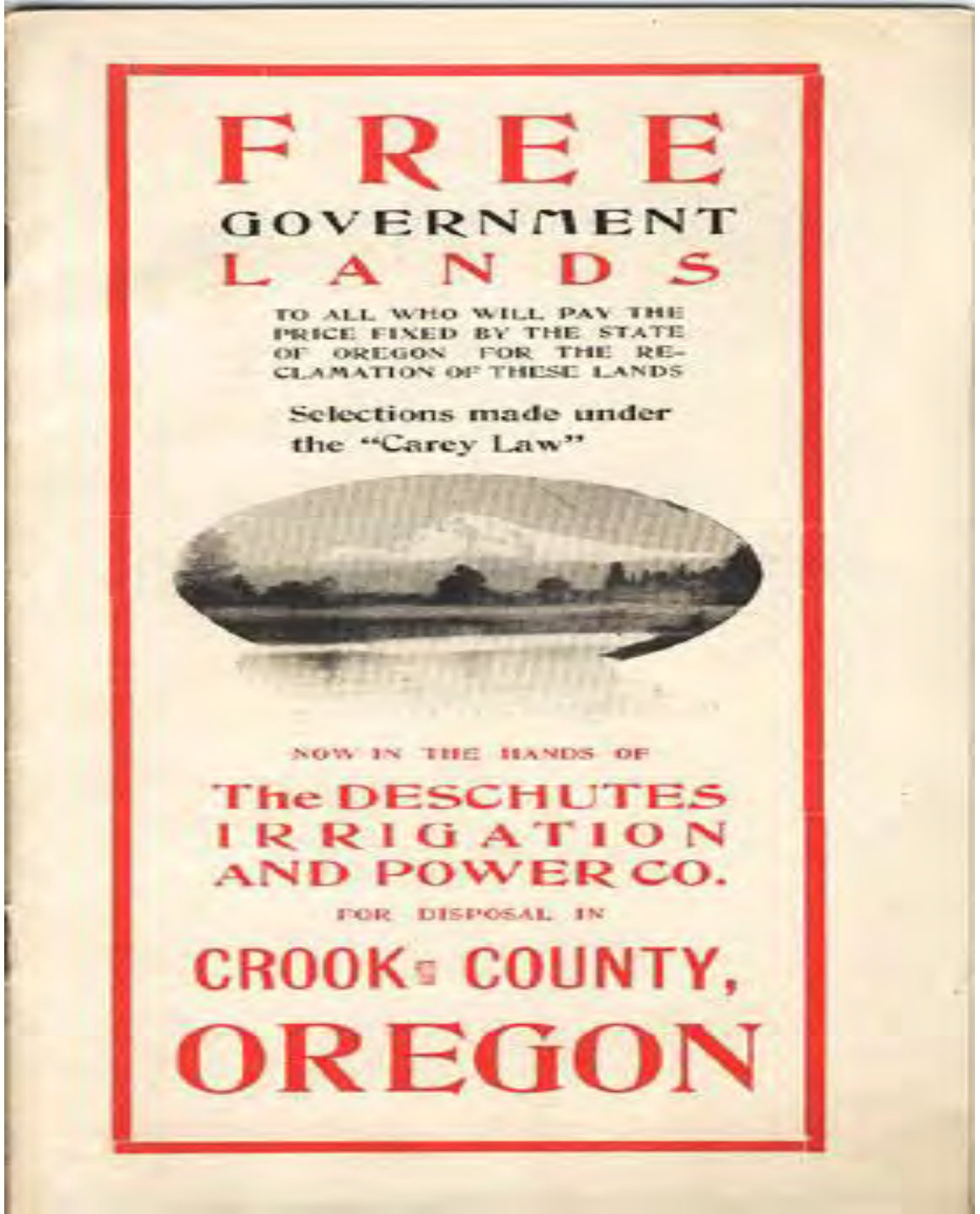


District	Priority
Swalley	1899
Central Oregon	1900 & 1907
Lone Pine	1900
Arnold	1905
Tumalo	1905
North Unit	1913
Deschutes River	1983



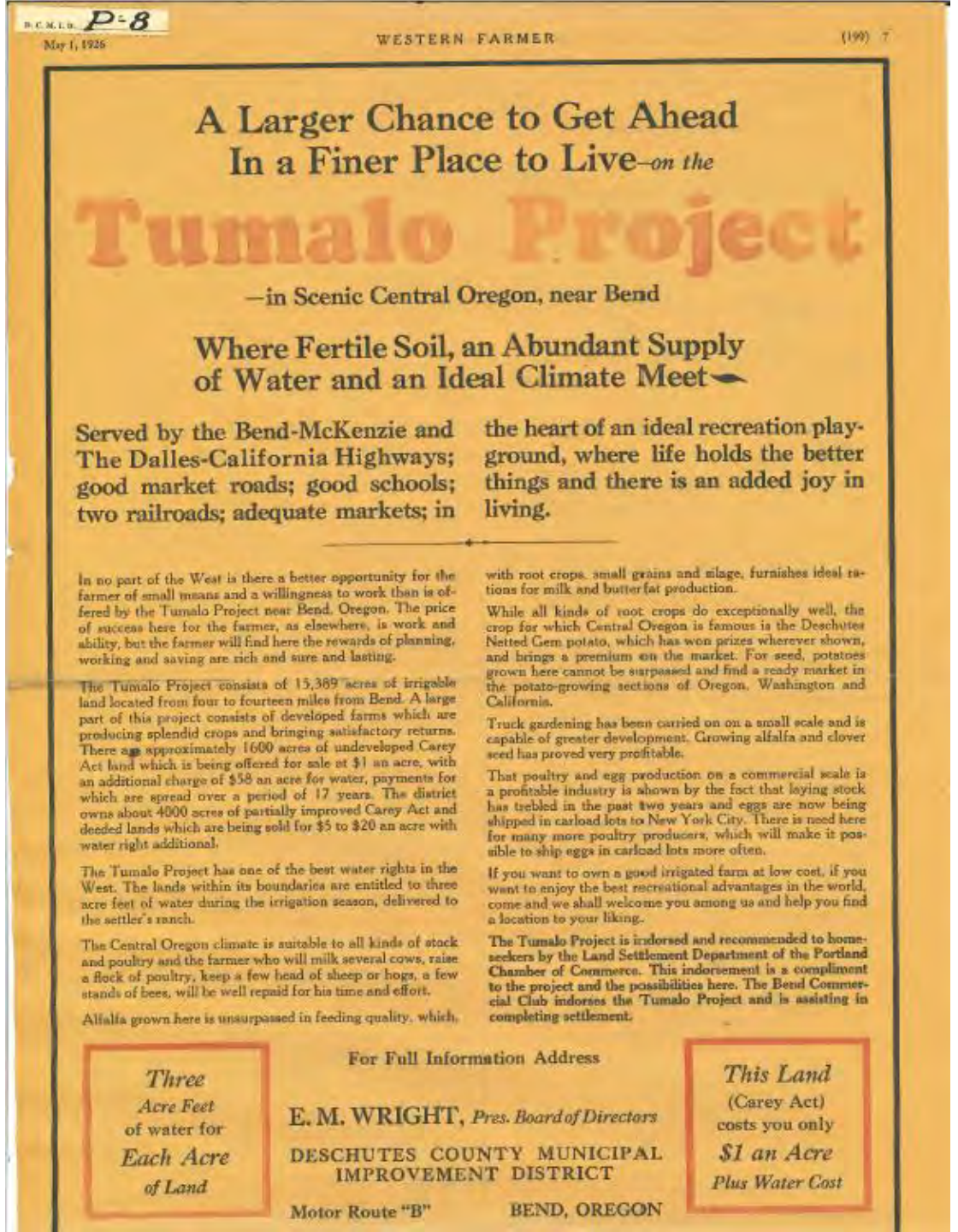
Carey Act of 1894

- Oregon accepted the Carey Act in 1901 on the condition that private developers fronted the capital to make the project viable
- Settlers were given 160 acres as long as they irrigated at least 20 acres



Carey Act

- Projects grossly over exaggerated and underfunded
- All ditch companies were dismal failures in Central Oregon because Oregon required the developers to lure in homesteaders
- You simply couldn't financially establish a project without full federal government backing



P-8

May 1, 1926 WESTERN FARMER (199) 7

A Larger Chance to Get Ahead In a Finer Place to Live—*on the*

Tumalo Project

—in Scenic Central Oregon, near Bend

Where Fertile Soil, an Abundant Supply of Water and an Ideal Climate Meet

Served by the Bend-McKenzie and The Dalles-California Highways; good market roads; good schools; two railroads; adequate markets; in the heart of an ideal recreation playground, where life holds the better things and there is an added joy in living.

In no part of the West is there a better opportunity for the farmer of small means and a willingness to work than is offered by the Tumalo Project near Bend, Oregon. The price of success here for the farmer, as elsewhere, is work and ability, but the farmer will find here the rewards of planning, working and saving are rich and sure and lasting.

The Tumalo Project consists of 15,389 acres of irrigable land located from four to fourteen miles from Bend. A large part of this project consists of developed farms which are producing splendid crops and bringing satisfactory returns. There are approximately 1600 acres of undeveloped Carey Act land which is being offered for sale at $1 an acre, with an additional charge of $58 an acre for water, payments for which are spread over a period of 17 years. The district owns about 4000 acres of partially improved Carey Act and deeded lands which are being sold for $5 to $20 an acre with water right additional.

The Tumalo Project has one of the best water rights in the West. The lands within its boundaries are entitled to three acre feet of water during the irrigation season, delivered to the settler's ranch.

The Central Oregon climate is suitable to all kinds of stock and poultry and the farmer who will milk several cows, raise a flock of poultry, keep a few head of sheep or hogs, a few stands of bees, will be well repaid for his time and effort.

Alfalfa grown here is unsurpassed in feeding quality, which, with root crops, small grains and silage, furnishes ideal rations for milk and butter fat production.

While all kinds of root crops do exceptionally well, the crop for which Central Oregon is famous is the Deschutes Netted Gem potato, which has won prizes wherever shown, and brings a premium on the market. For seed, potatoes grown here cannot be surpassed and find a ready market in the potato-growing sections of Oregon, Washington and California.

Truck gardening has been carried on on a small scale and is capable of greater development. Growing alfalfa and clover seed has proved very profitable.

That poultry and egg production on a commercial scale is a profitable industry is shown by the fact that laying stock has trebled in the past two years and eggs are now being shipped in carload lots to New York City. There is need here for many more poultry producers, which will make it possible to ship eggs in carload lots more often.

If you want to own a good irrigated farm at low cost, if you want to enjoy the best recreational advantages in the world, come and we shall welcome you among us and help you find a location to your liking.

The Tumalo Project is indorsed and recommended to homeseekers by the Land Settlement Department of the Portland Chamber of Commerce. This indorsement is a compliment to the project and the possibilities here. The Bend Commercial Club indorses the Tumalo Project and is assisting in completing settlement.

Three Acre Feet of water for *Each Acre of Land*

For Full Information Address

E. M. WRIGHT, *Pres. Board of Directors*

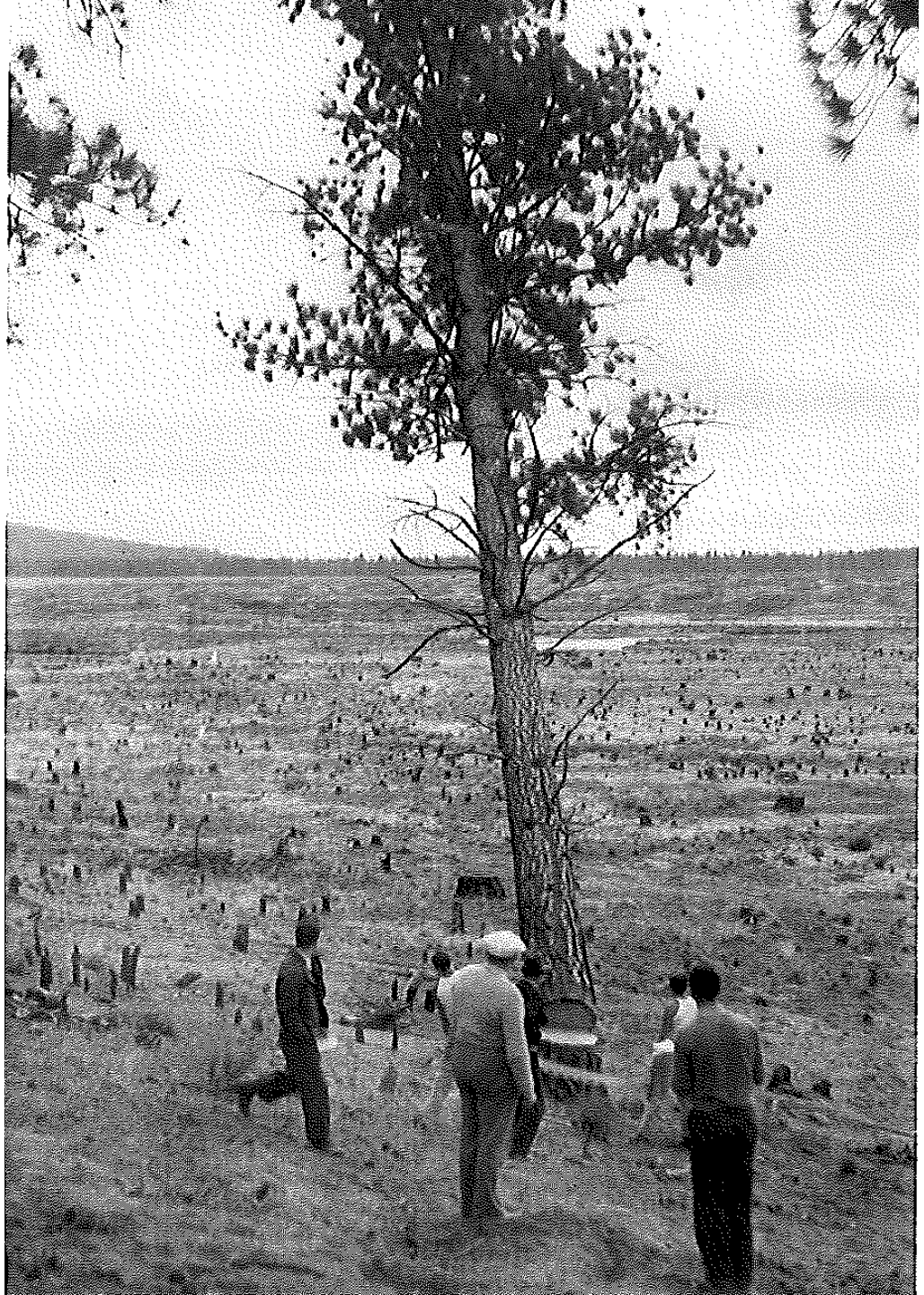
DESCHUTES COUNTY MUNICIPAL IMPROVEMENT DISTRICT

Motor Route "B" BEND, OREGON

This Land (Carey Act) costs you only *$1 an Acre Plus Water Cost*

Reclamation Act of 1902

- Early studies by BOR said it was crazy to invest in lava landscape that loses half the water
- The Great Depression caused the government to look again
  - FDR-New Deal, Civilian Conservation Corps, Conscientious Objectors
- Built Prineville Reservoir
- Built Wickiup Reservoir
- Rebuilt Crane Prairie
- Rebuilt Crescent Lake



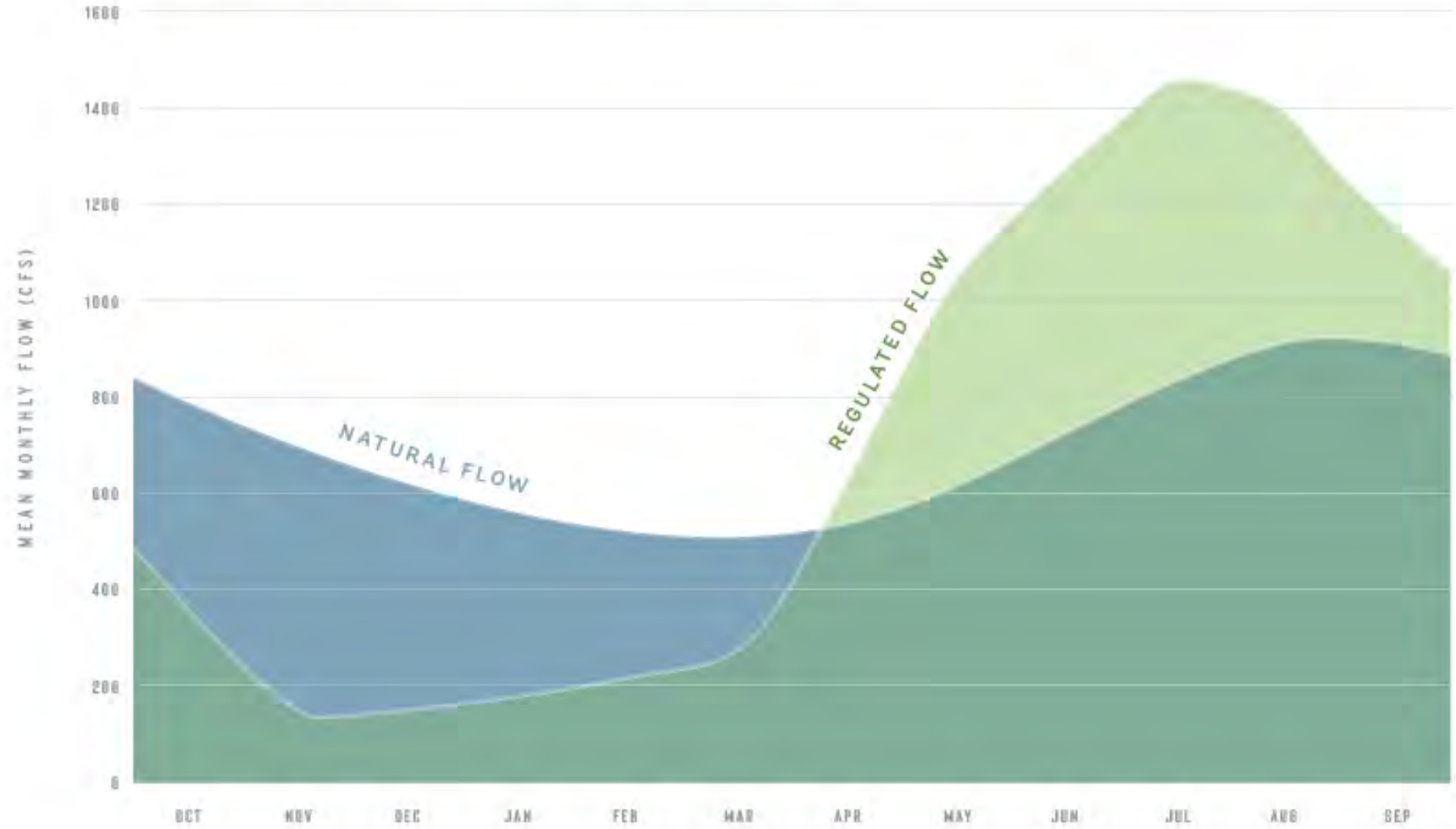
The Deschutes River Then and Now

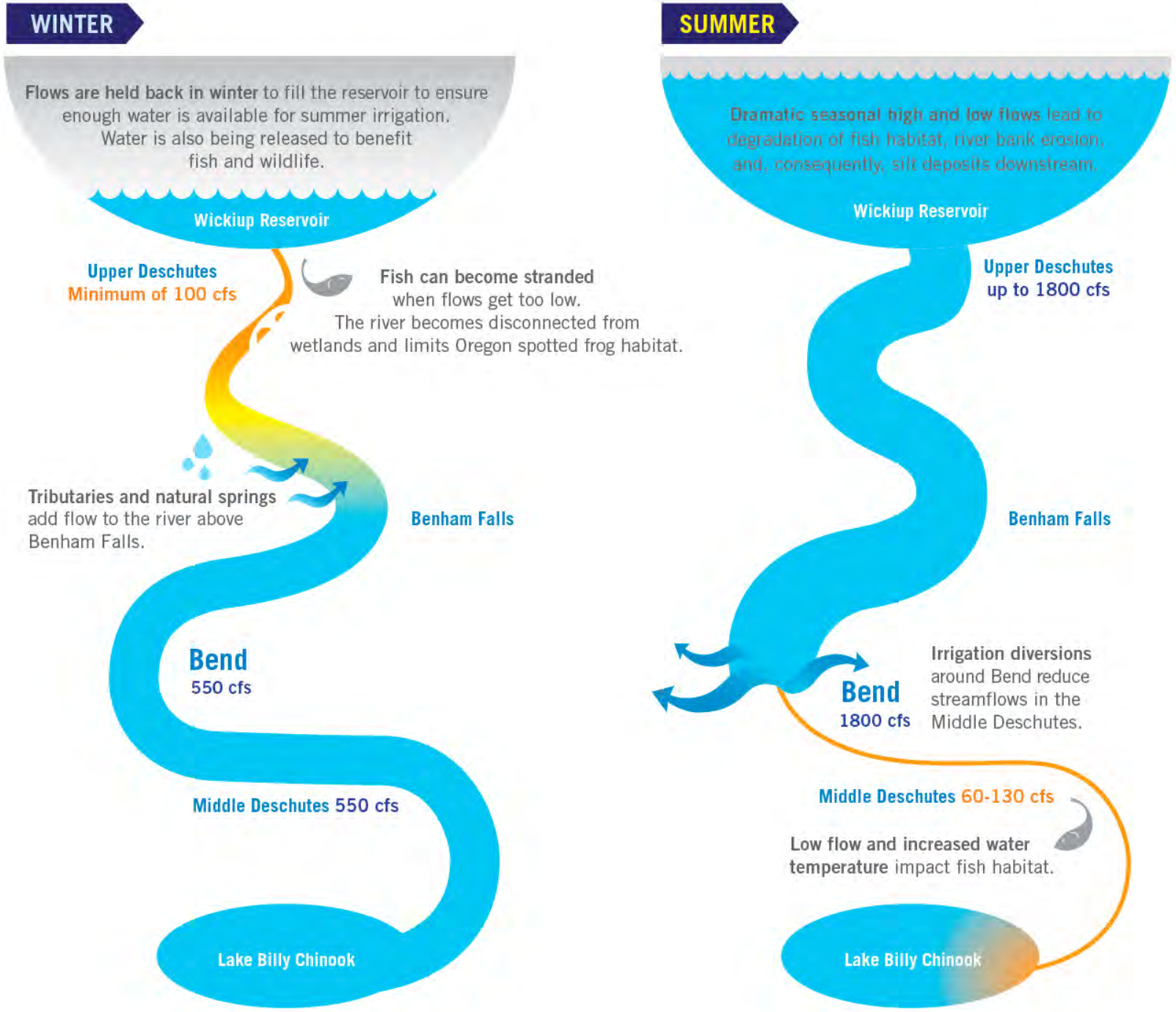
- 1913: All surface water appropriated
- 1922-1949: Storage facilities in place
- Next 50+ years the river system operates under this regulated system

- Habitat Conservation Plan
- Increased flows below Bend from 30 to 140 cfs
- Flows in the Upper Deschutes increase from 20 to 100+ cfs

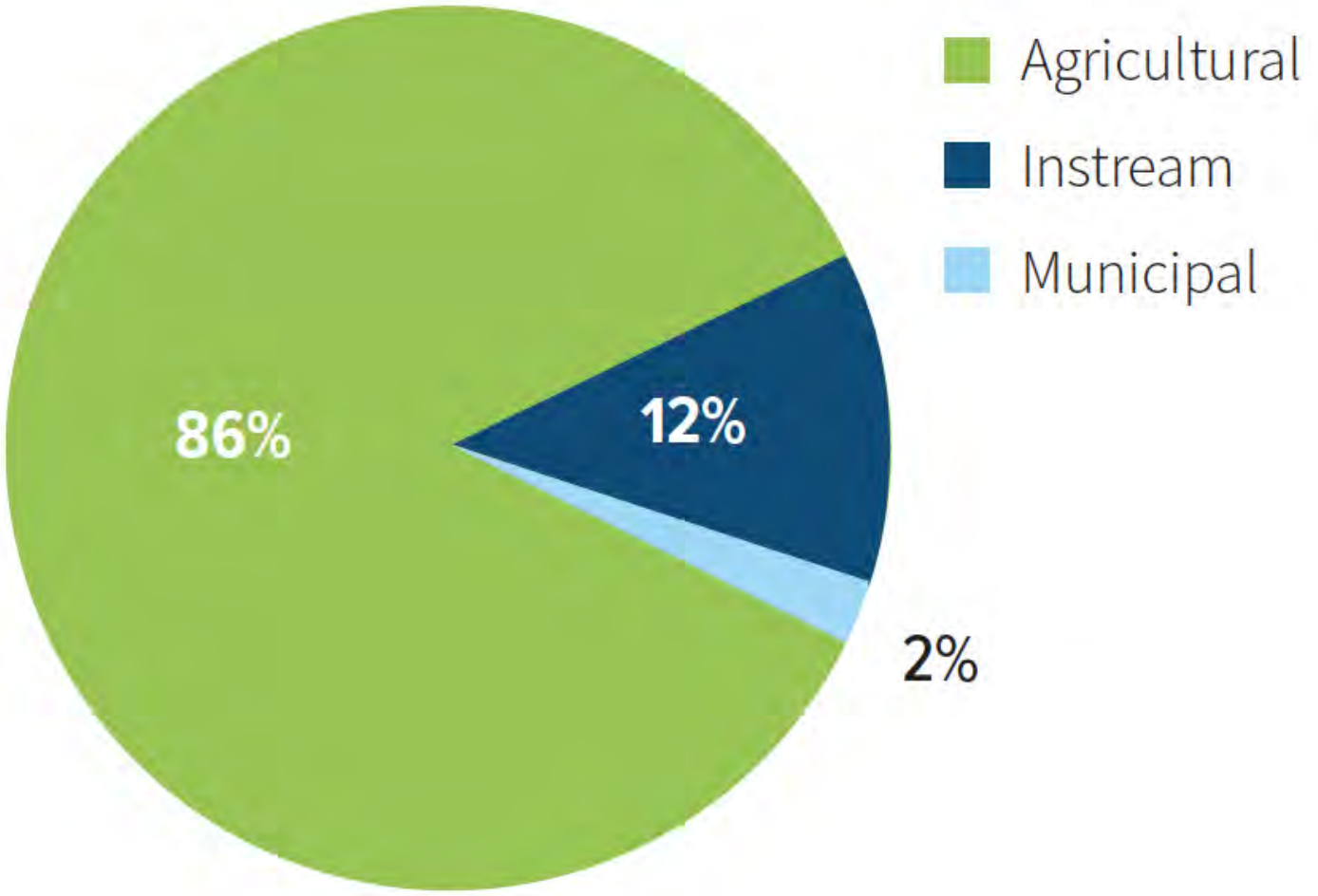
Hydrograph of Natural and Regulated Streamflows:

Deschutes River below Wickiup Reservoir (1983-present)

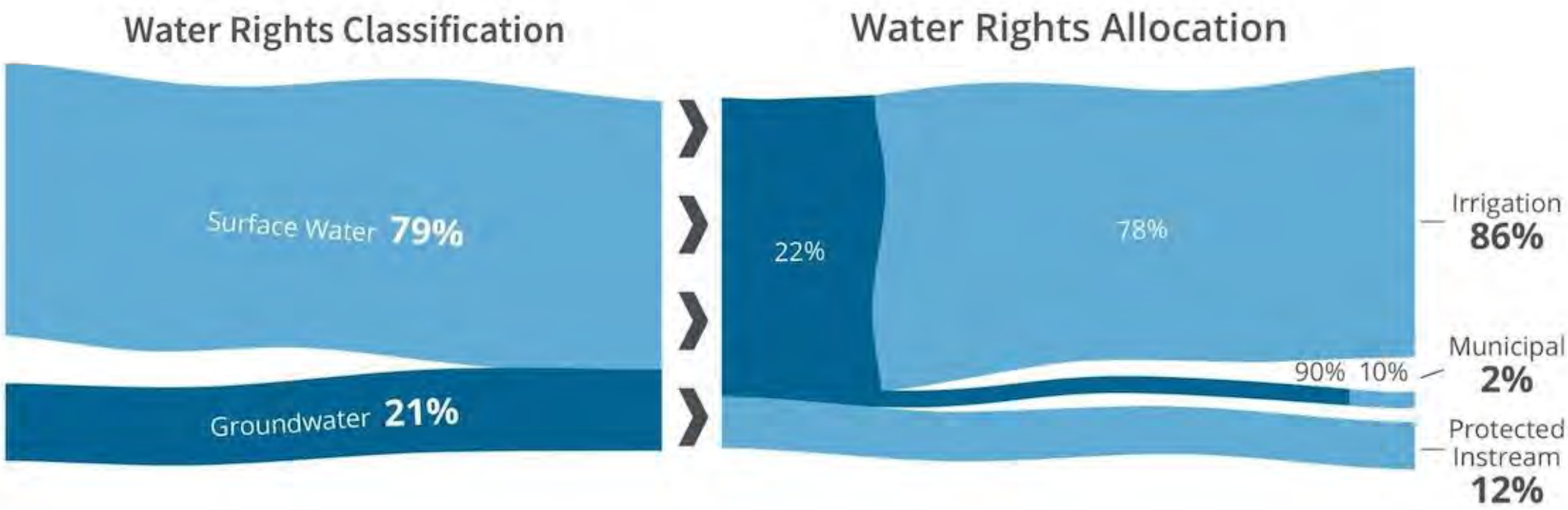



WINTER
Flows are held back in winter to fill the reservoir to ensure enough water is available for summer irrigation. Water is also being released to benefit fish and wildlife.
Wickiup Reservoir
Upper Deschutes
Minimum of 100 cfs
Fish can become stranded when flows get too low. The river becomes disconnected from wetlands and limits Oregon spotted frog habitat.
Tributaries and natural springs add flow to the river above Benham Falls.
Benham Falls
Bend
550 cfs
Middle Deschutes 550 cfs
Lake Billy Chinook
SUMMER
Dramatic seasonal high and low flows lead to degradation of fish habitat, river bank erosion, and, consequently, silt deposits downstream.
Wickiup Reservoir
Upper Deschutes
up to 1800 cfs
Benham Falls
Bend
1800 cfs
Irrigation diversions around Bend reduce streamflows in the Middle Deschutes.
Middle Deschutes 60-130 cfs
Low flow and increased water temperature impact fish habitat.
Lake Billy Chinook

Current Water Rights Distribution in the Deschutes Basin



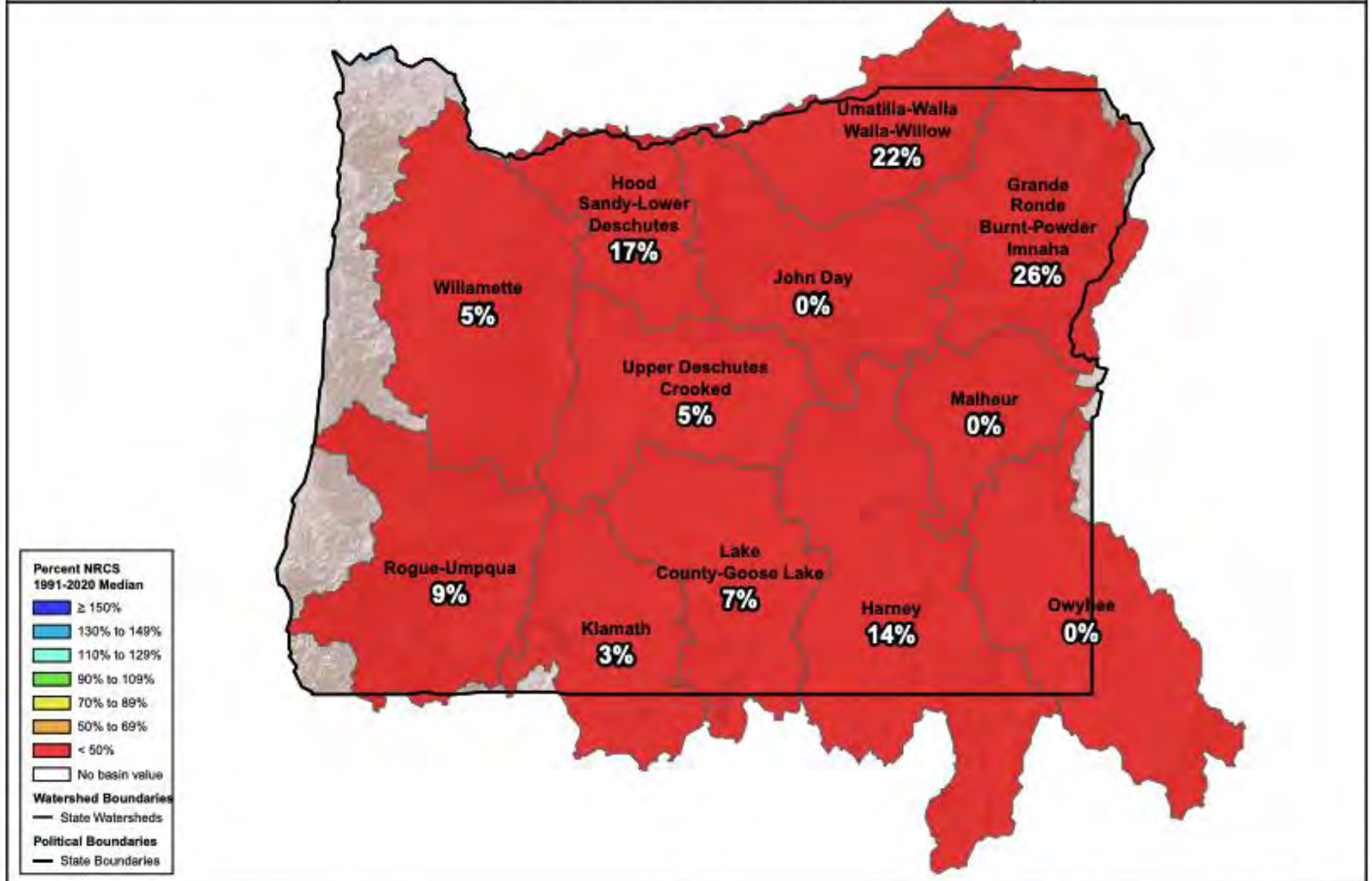
Water Rights in the Deschutes Basin Above Lake Billy Chinook



DESCHUTES RIVER CONSERVANCY

Source: Upper Deschutes Basin Study, 2018

Snow Water Equivalent	Oregon SNOTEL Percent NRCS 1991-2020 Median	April 14, 2026, end of day



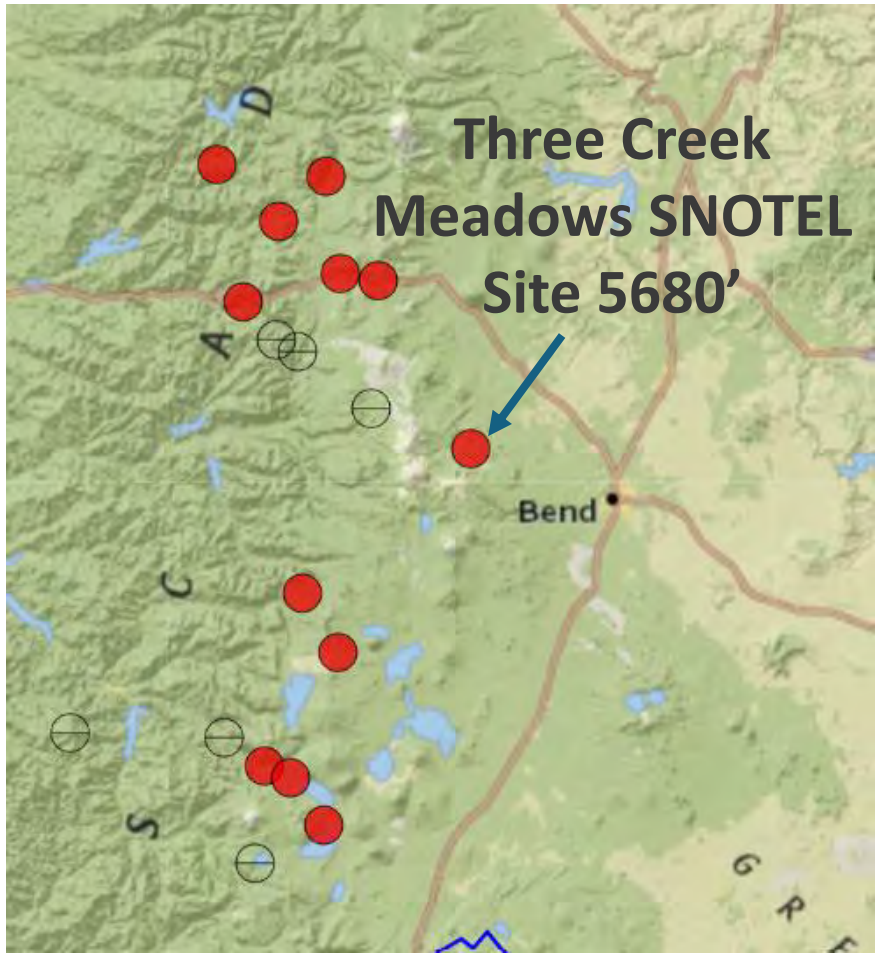
USDA Natural Resources Conservation Service
United States Department of Agriculture

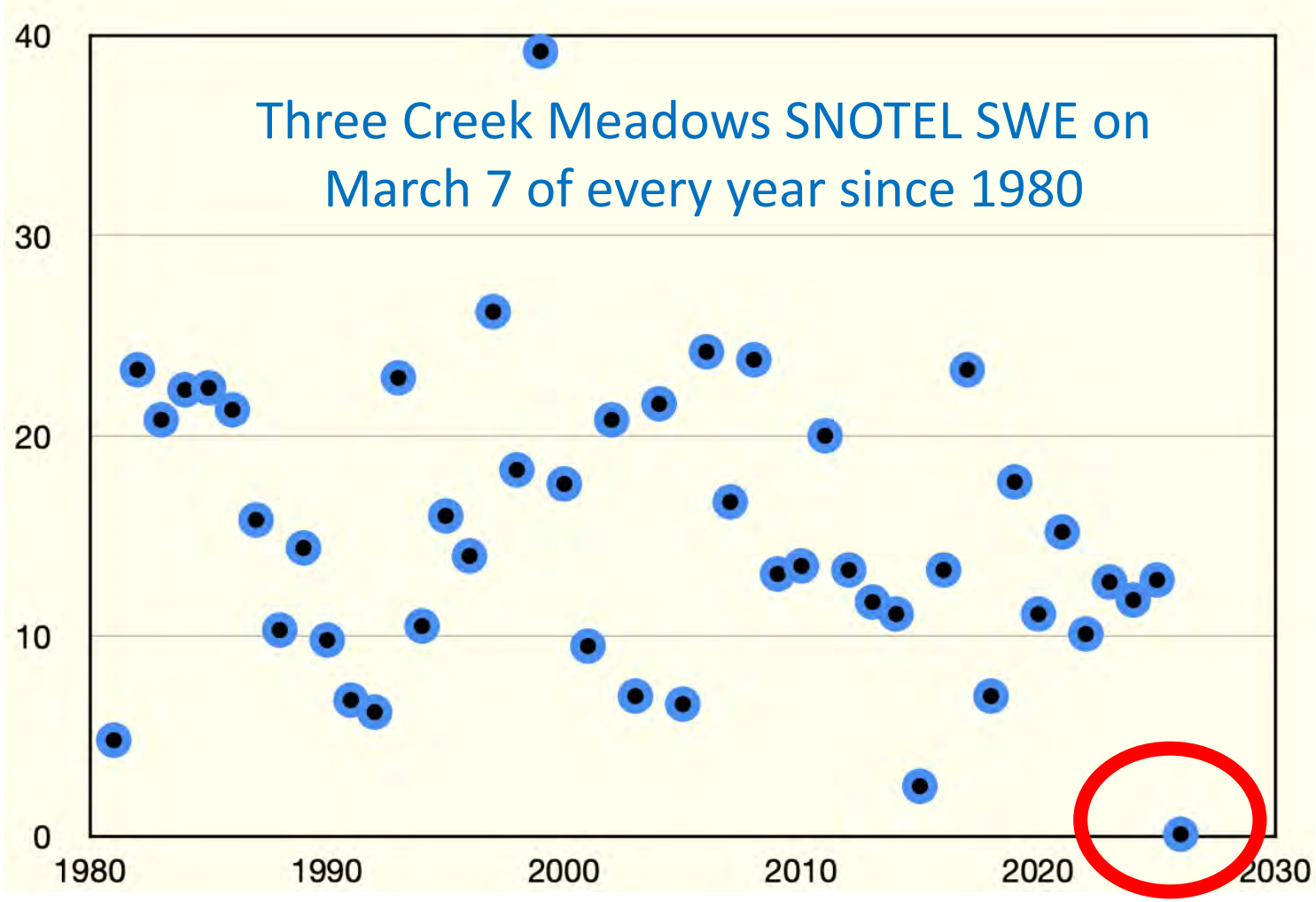
N

0 20 40 80 120 160 200 Miles

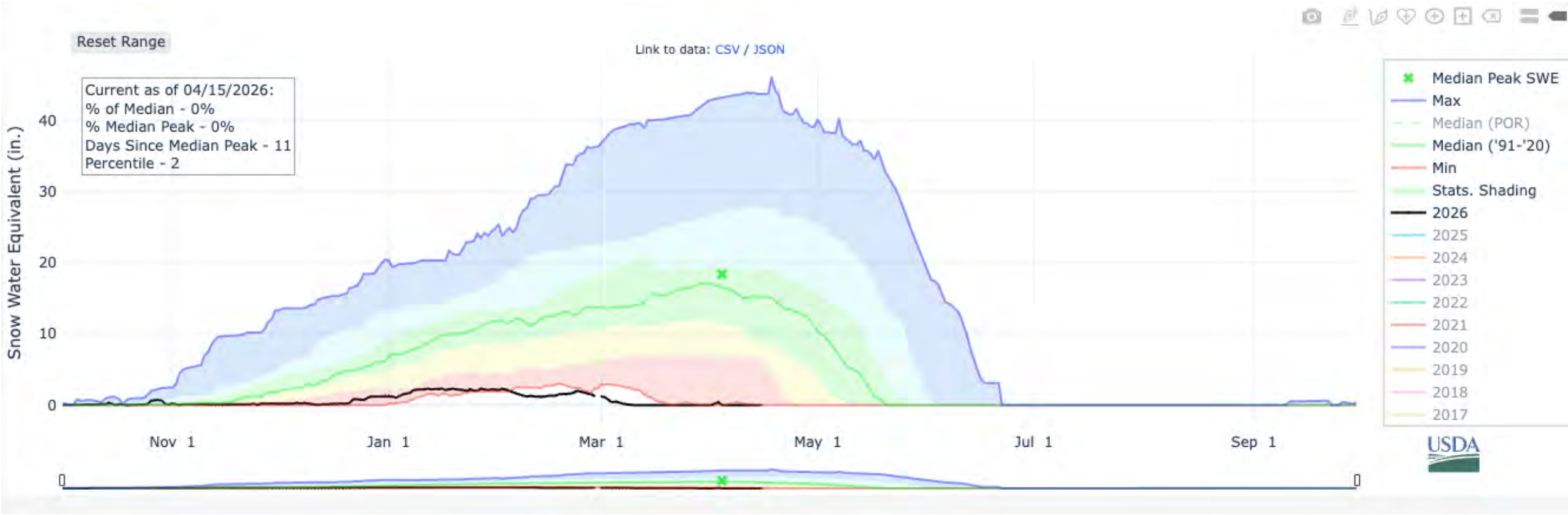
Created 4-15-2026

Three Creek Meadows SNOTEL Site Hit ZERO Snow on March 7!

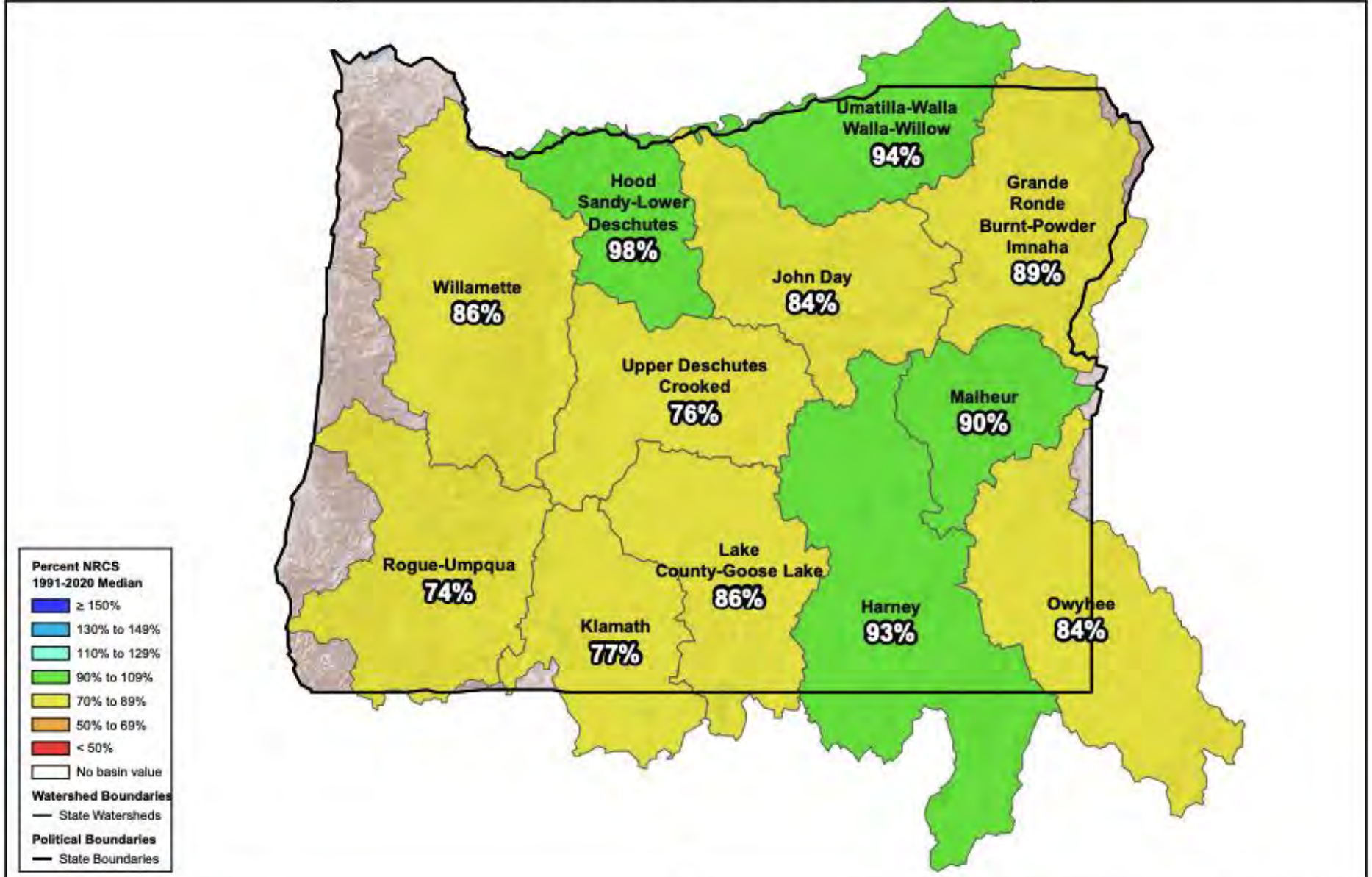




Three Creeks Meadow Snow Water Equivalent



Water Year to Date Precipitation	Oregon SNOTEL Percent NRCS 1991-2020 Median	October 1, 2025 - April 14, 2026



USDA Natural Resources Conservation Service
United States Department of Agriculture

N

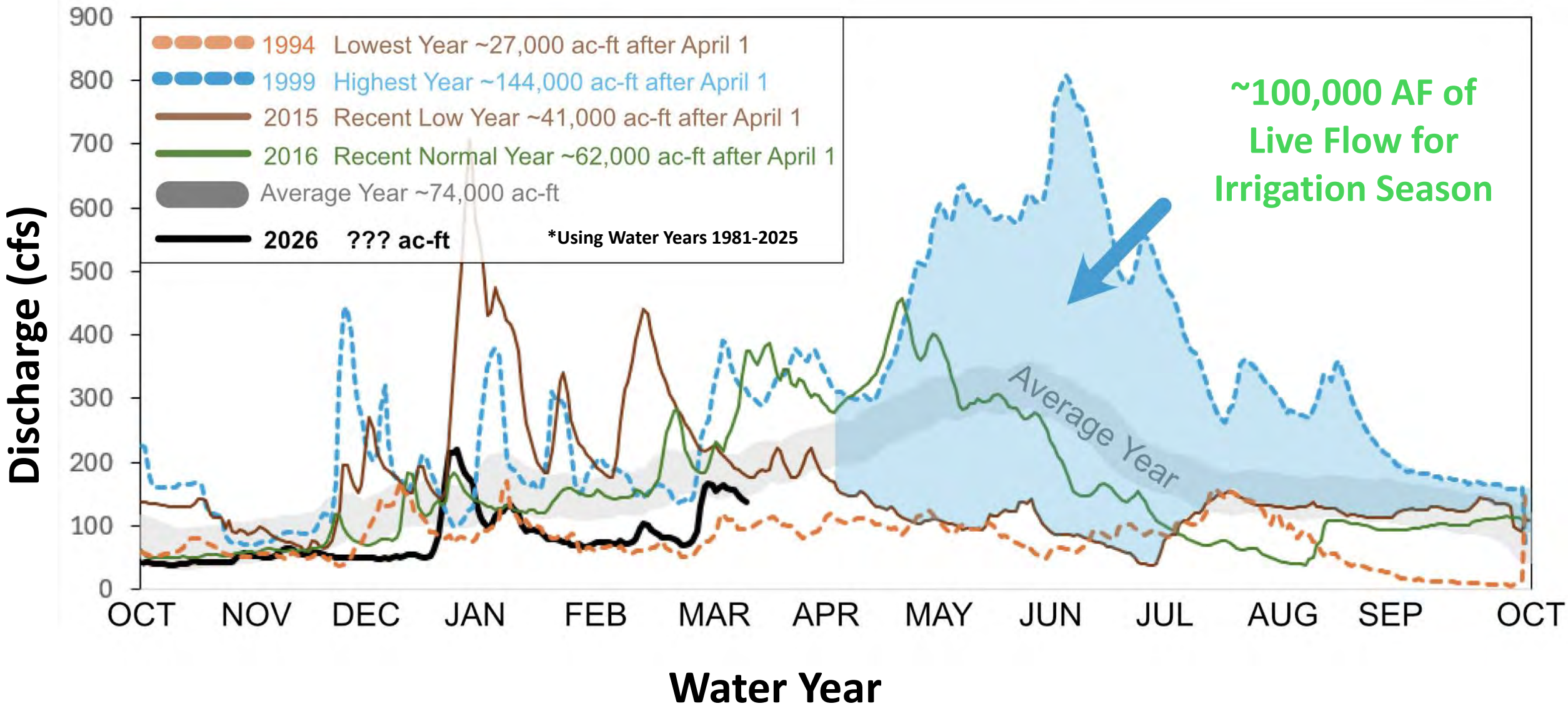
0 20 40 80 120 160 200 Miles

Created 4-15-2026

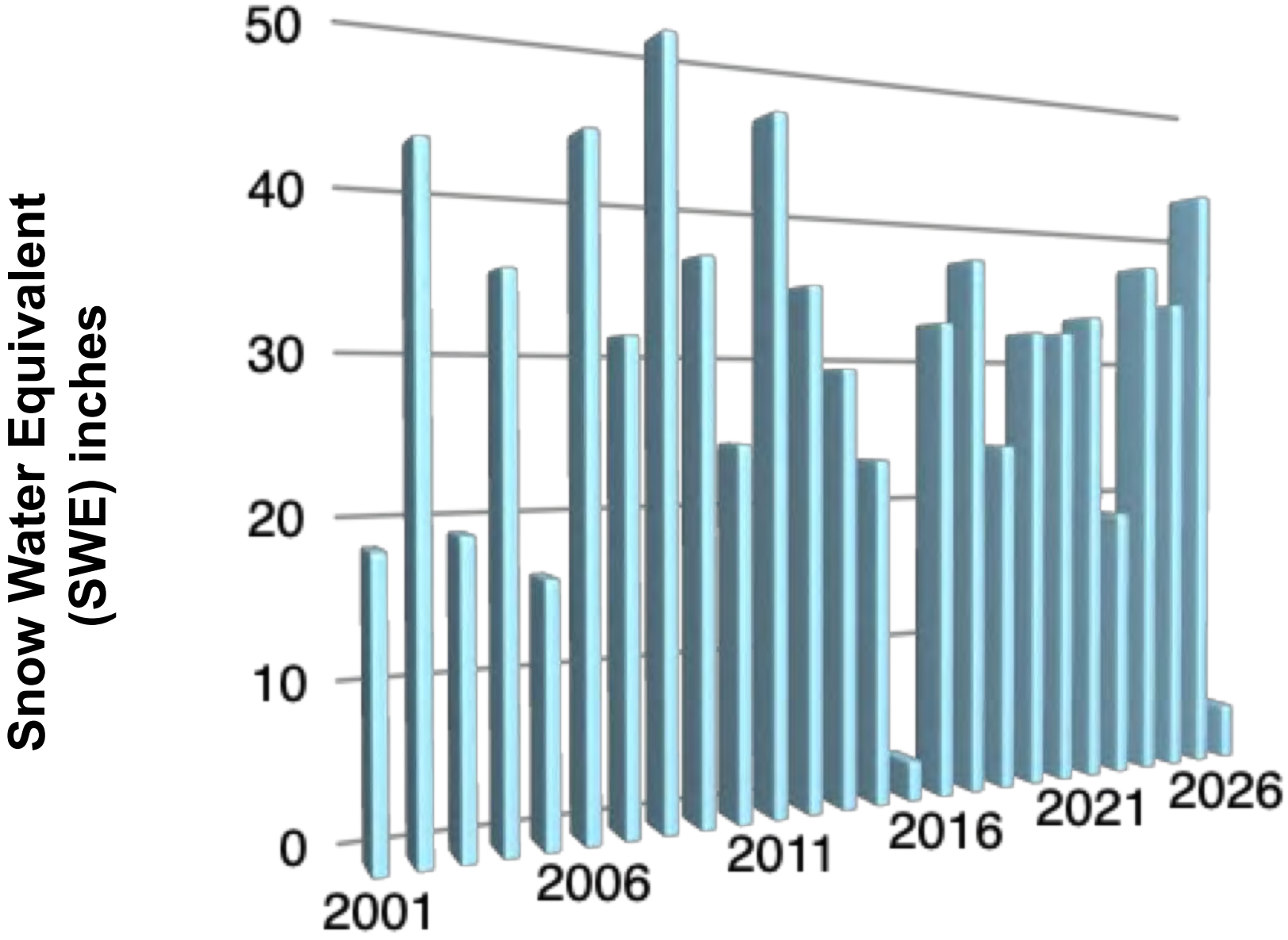
Live Flow

Live Flow = the natural flow of the river without the addition of storage/water being released from the reservoirs

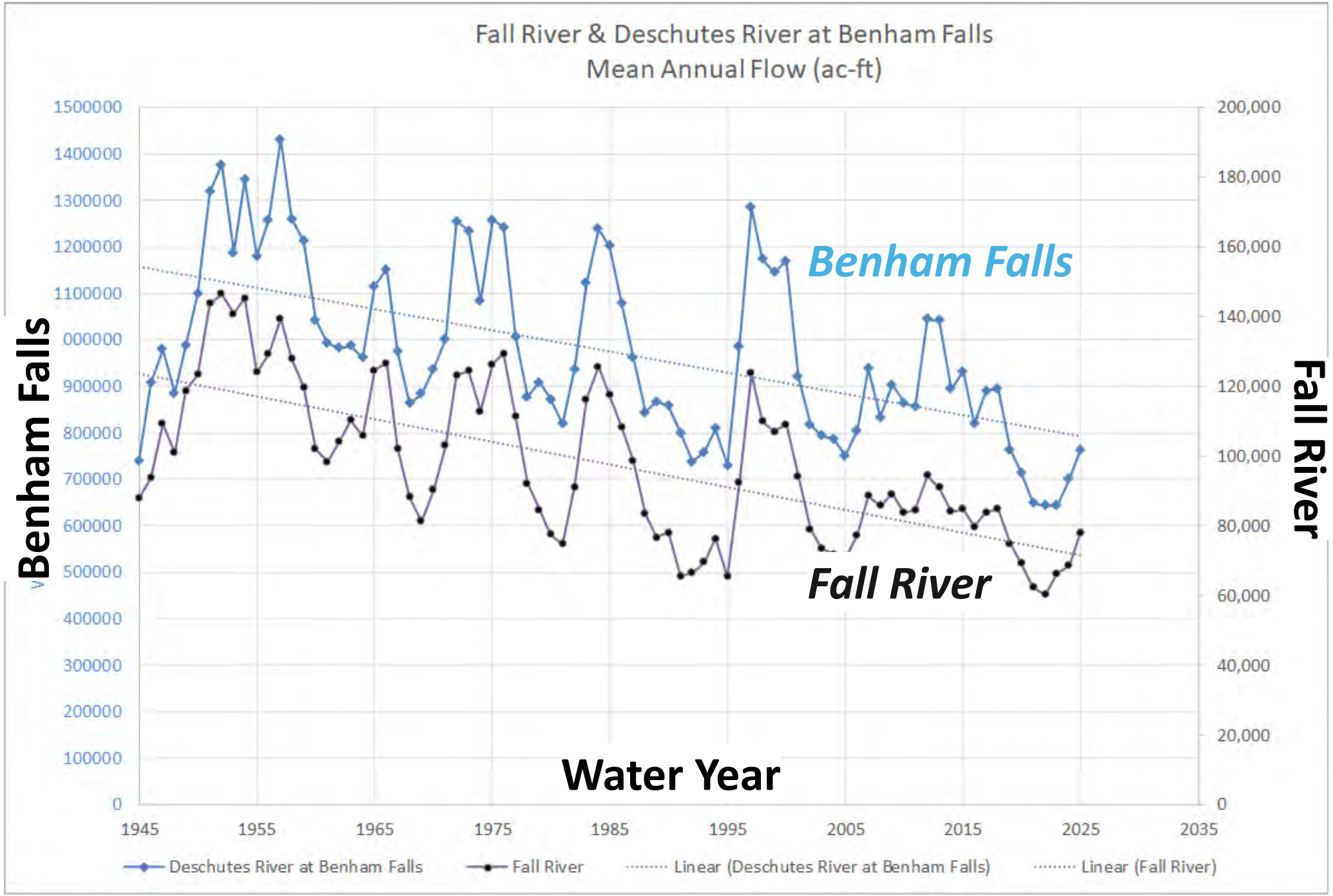
The Importance of Live Flow From The Little Deschutes River



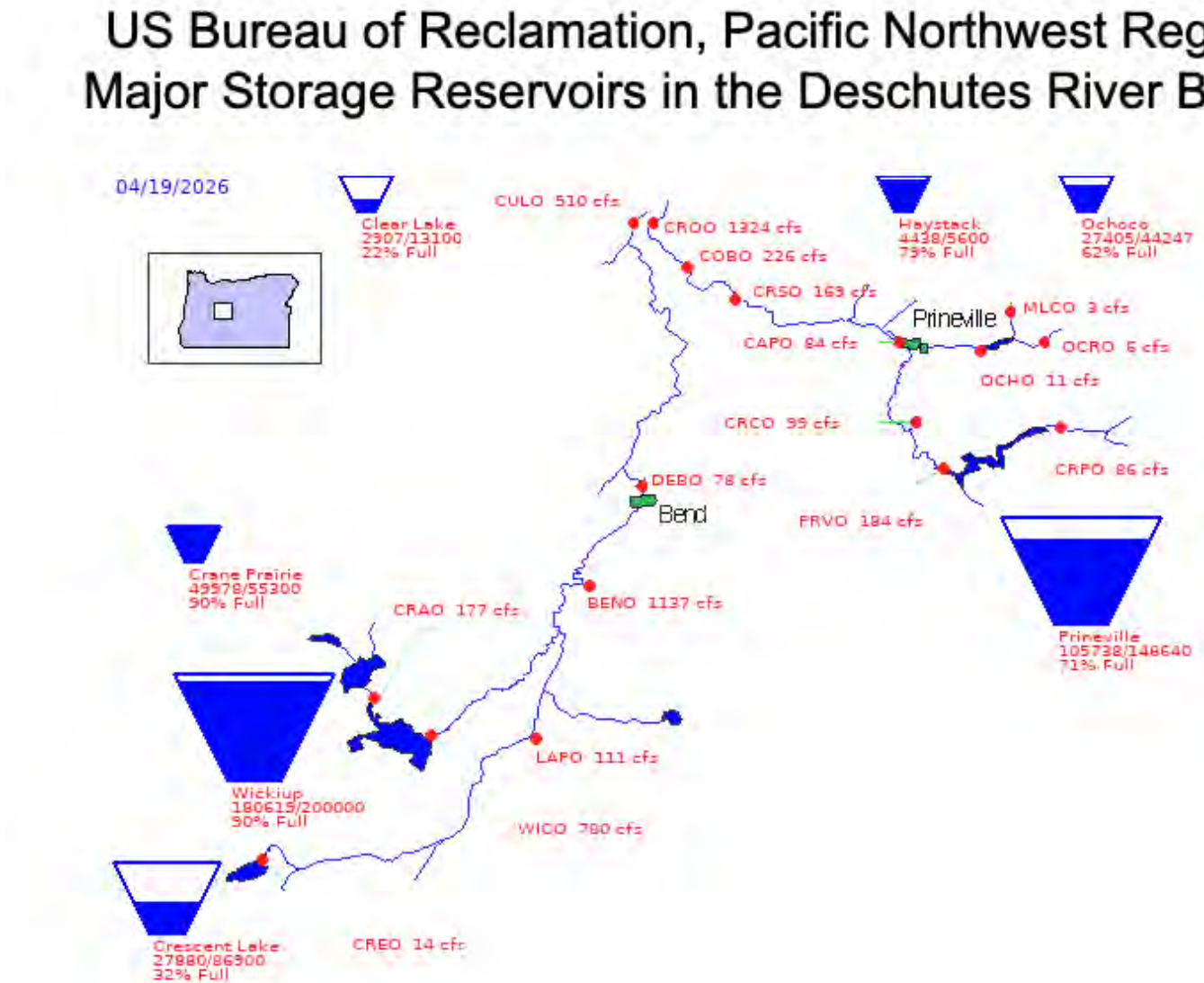
“If we get 30 inches of water in the snowpack at Cascade Summit by April 1, we will be alright” *-Awbrey Perry Deschutes Watermaster 1933-1960*



OREGON
WATER RESOURCES DEPARTMENT


Fall River & Deschutes River at Benham Falls
Mean Annual Flow (ac-ft)
Annual Volume AC-ft
Benham Falls
Fall River
Annual Volume AC-ft
Benham Falls
Fall River
Water Year
1500000
1400000
1300000
1200000
1100000
000000
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1945
1955
1965
1975
1985
1995
2005
2015
2025
2035
Deschutes River at Benham Falls
Fall River
Linear (Deschutes River at Benham Falls)
Linear (Fall River)

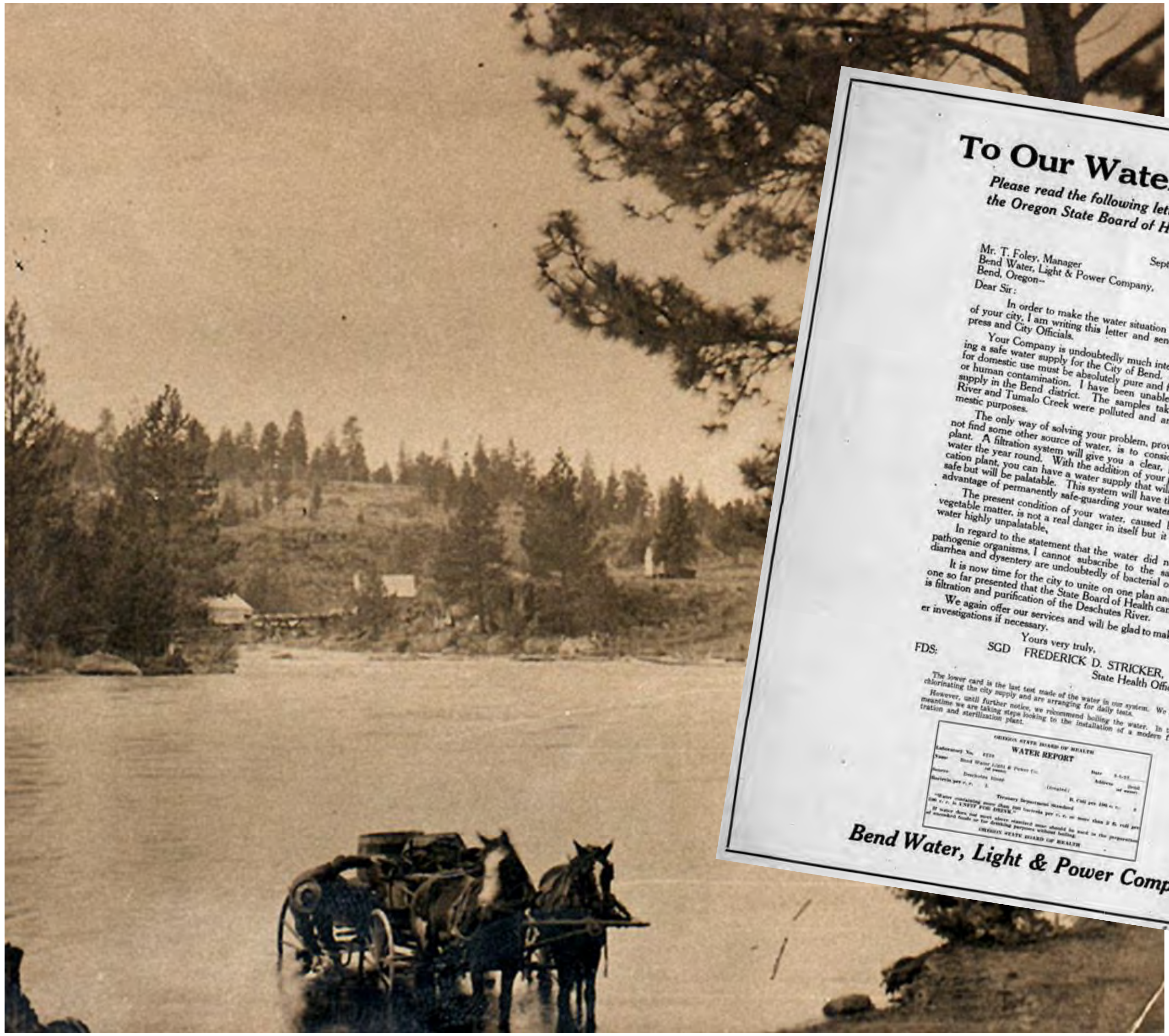
Tracking Water Across the Basin: The Storage Report



DEPARTMENTS • PUBLIC WORKS • ABOUT WATER SERVICES

I ♥ BEND WATER — CELEBRATING 100 YEARS

For a century, Bend has been sustained by clean, clear, mountain water. We're celebrating this remarkable milestone, and we want you to join us.



To Our Water Users--

Please read the following letter received from the Oregon State Board of Health today:

Mr. T. Foley, Manager — September 11, 1923.
Bend Water, Light & Power Company,
Bend, Oregon--

Dear Sir:

In order to make the water situation clear to the citizens of your city, I am writing this letter and sending copies to the press and City Officials.

Your Company is undoubtedly much interested in providing a safe water supply for the City of Bend. A water to be fit for domestic use must be absolutely pure and free from animal or human contamination. I have been unable to find such a supply in the Bend district. The samples taken from Spring River and Tumalo Creek were polluted and and unfit for domestic purposes.

The only way of solving your problem, providing you cannot find some other source of water, is to consider a filtration plant. A filtration system will give you a clear, pure drinking water the year round. With the addition of your present purification plant, you can have a water supply that will not only be safe but will be palatable. This system will have the additional advantage of permanently safe-guarding your water supply.

The present condition of your water, caused by decaying vegetable matter, is not a real danger in itself but it makes the water highly unpalatable,

In regard to the statement that the water did not contain pathogenie organisms, I cannot subscribe to the same. The diarrhea and dysentery are undoubtedly of bacterial origin.

It is now time for the city to unite on one plan and the only one so far presented that the State Board of Health can approve is filtration and purification of the Deschutes River.

We again offer our services and will be glad to make further investigations if necessary.

Yours very truly,

FDS: SGD FREDERICK D. STRICKER,
State Health Officer.

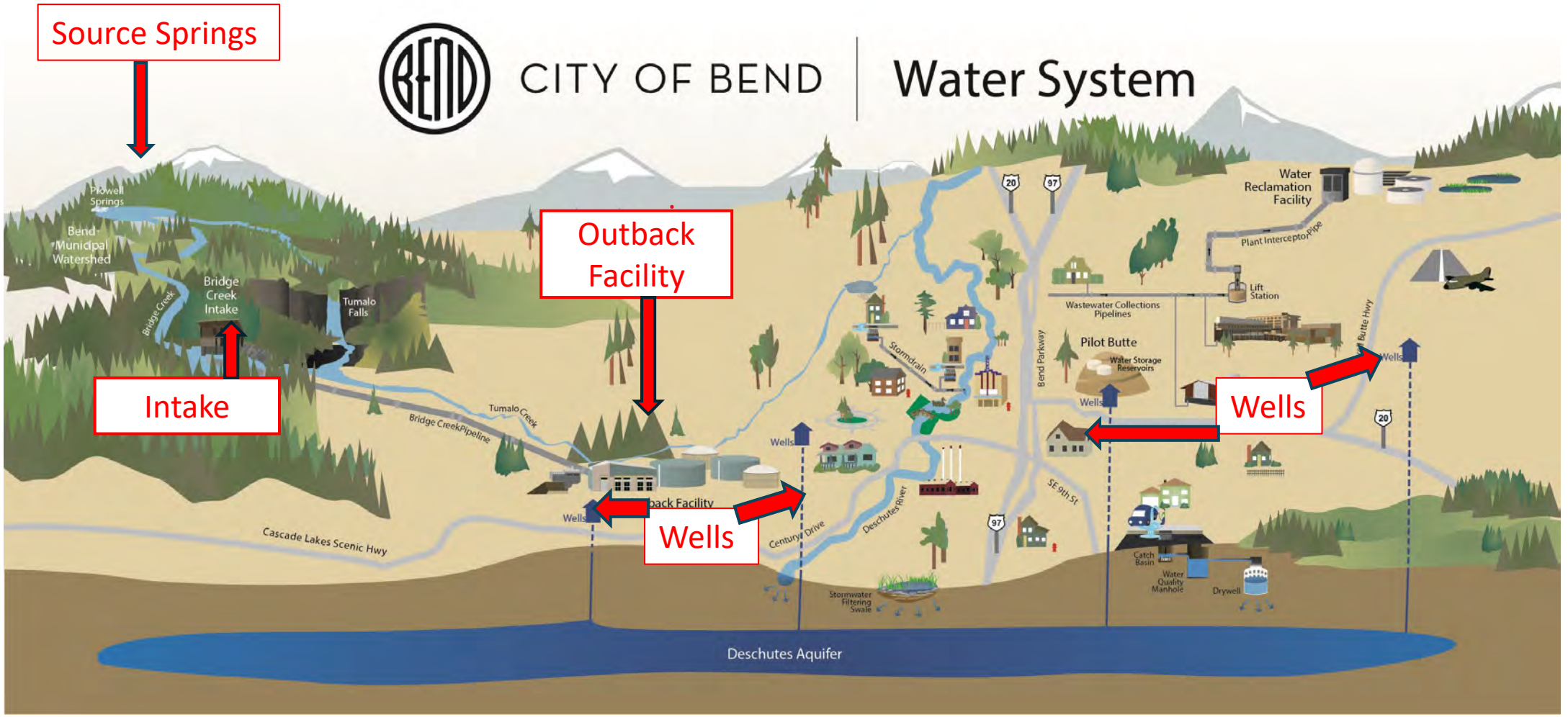
The lower card is the last test made of the water in our system. We are chlorinating the city supply and are arranging for daily tests.

However, until further notice, we recommend boiling the water. In the meantime we are taking steps looking to the installation of a modern filtration and sterilization plant.

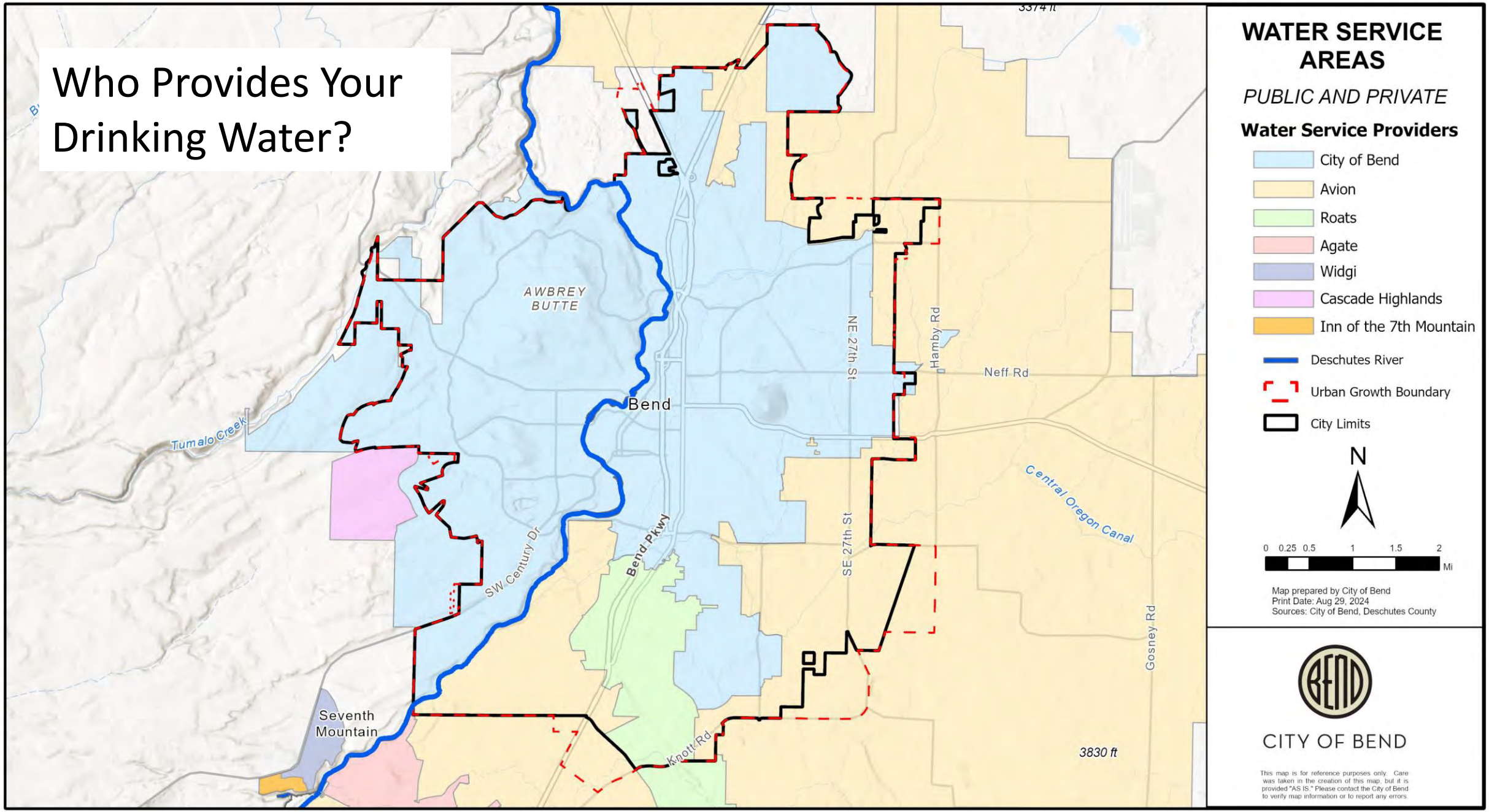
OREGON STATE BOARD OF HEALTH
WATER REPORT

Bend Water, Light & Power Company

Bend's Dual Source Drinking Water System



Who Provides Your Drinking Water?



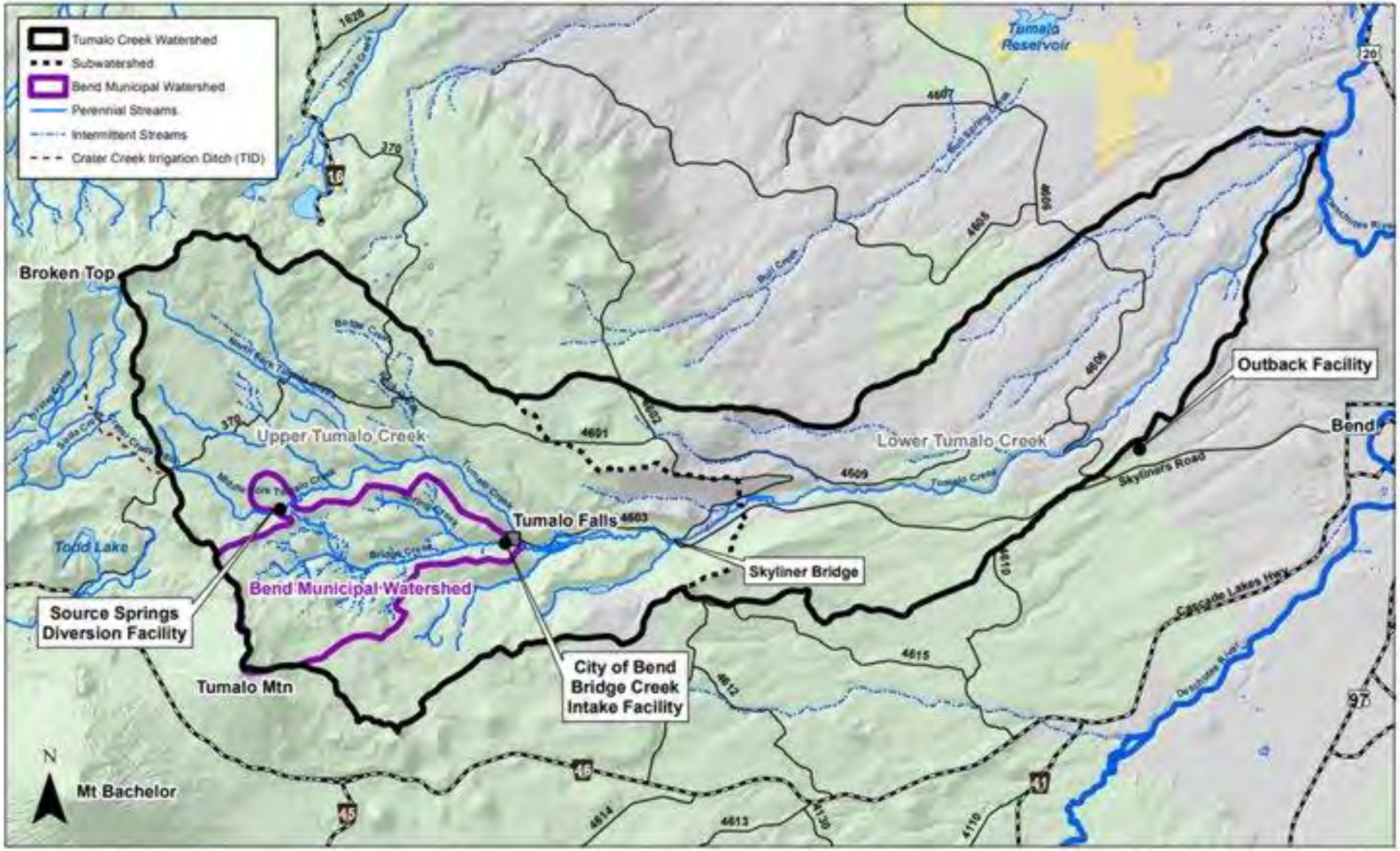
Bend Water Supplies – Surface Water

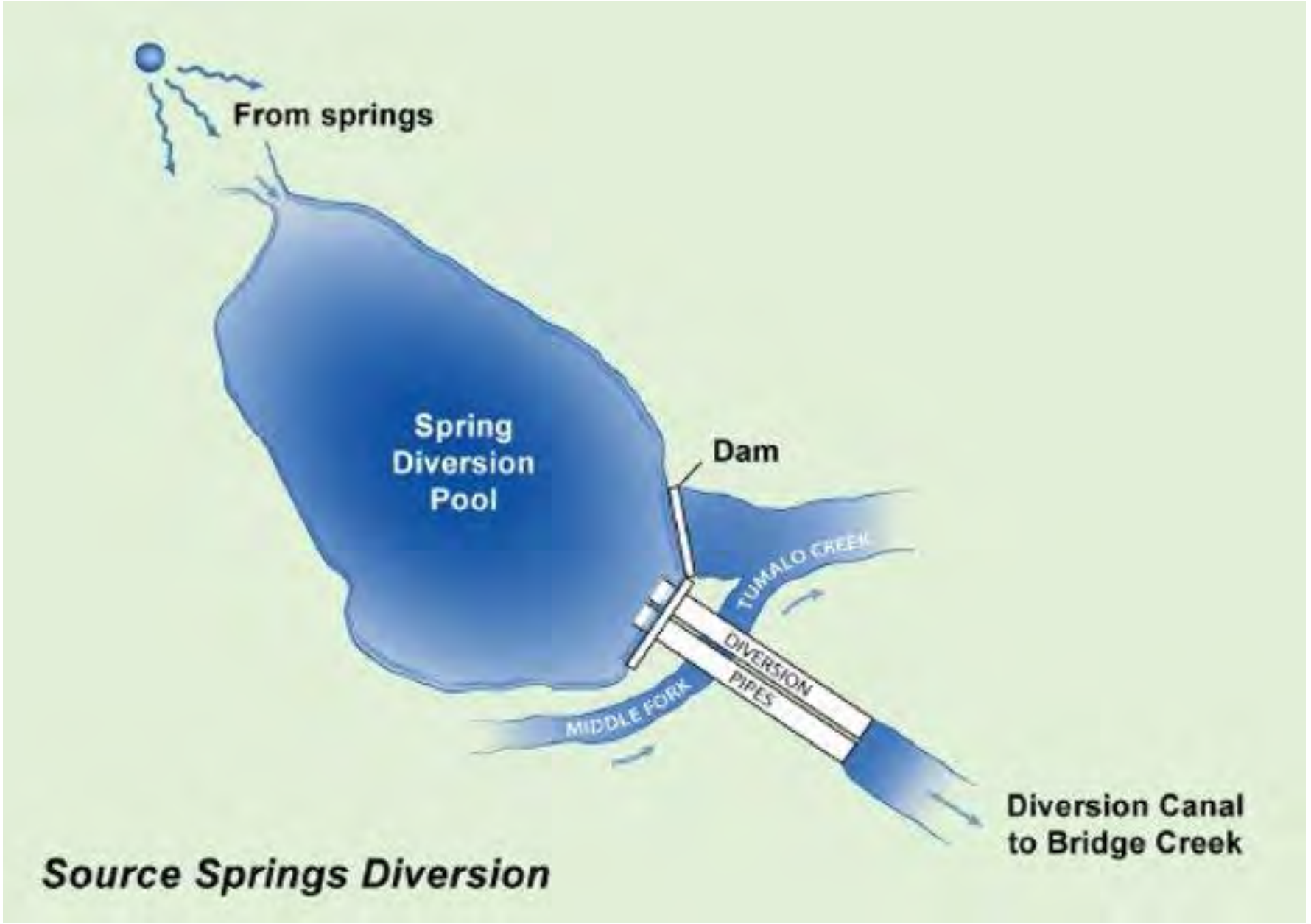
Bend Municipal Watershed

- Established in 1926
- Our primary source - approx 60% of water supply
- Six water rights, coordination with Tumalo Irrigation District
- Gravity fed, low carbon footprint
- Protected watershed in partnership with USFS
- Take no more than 18.2 cfs per code and USFS Special Use Permit, and only take what we use
- Issues: Fire, Climate Change

Bend Municipal Watershed - Map 1 Tumalo Creek Watershed

Version 3/7/2018





Source Springs Diversion


HEIDI LANSDOWNE
WATER INTAKE FACILITY

Benefits of Bend Water Project completed 2016:

- Better control of water intake = more water in Middle Tumalo Creek in shoulder seasons
- Better drinking water quality
- Increased reliability and operational days

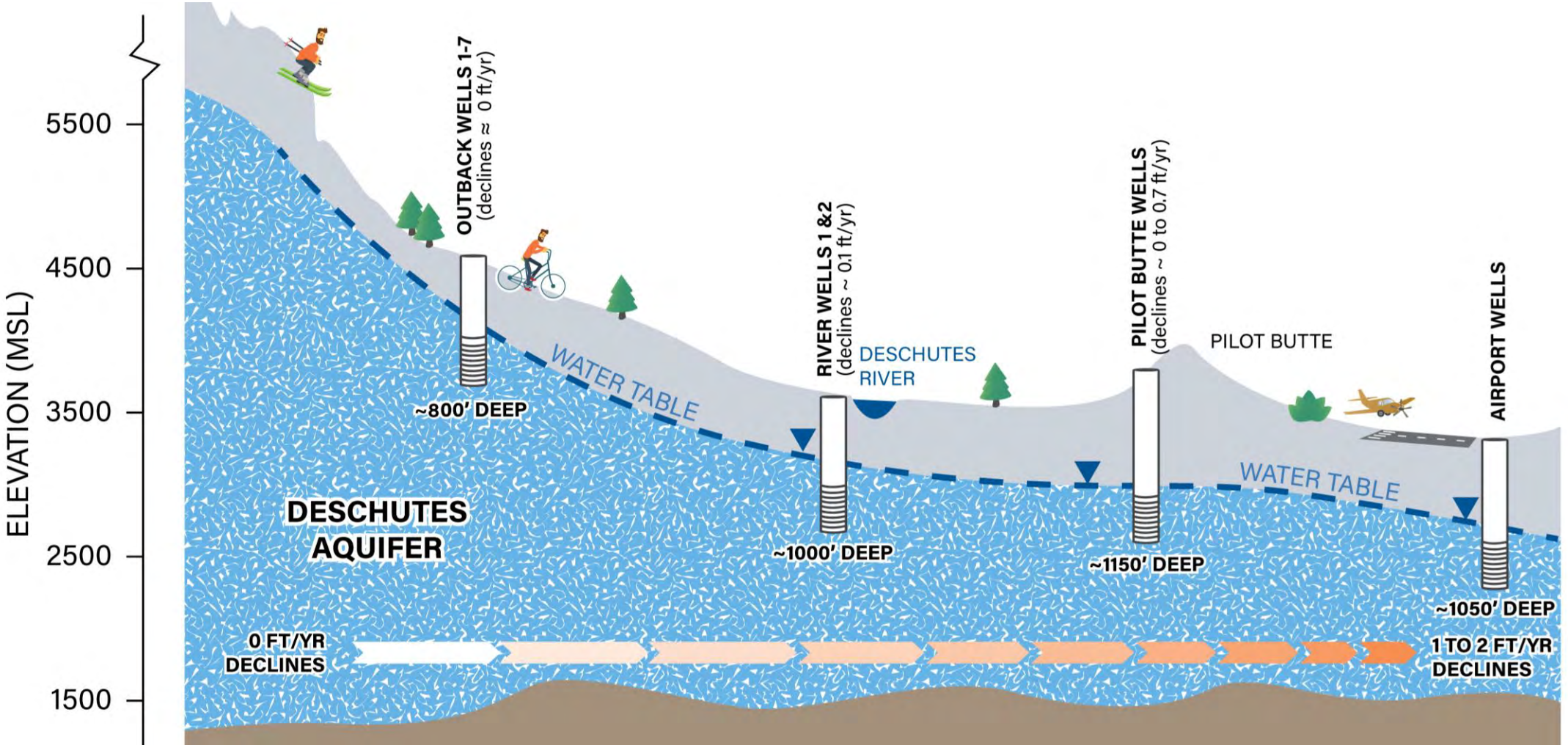
Watershed: Key Issues & Risk Management

- Wildfire & Fuels
- Water Quality, Turbidity
- Power Supply Resiliency
- Operational Space for Serving Future Water Needs

Bend Water Supplies – Groundwater

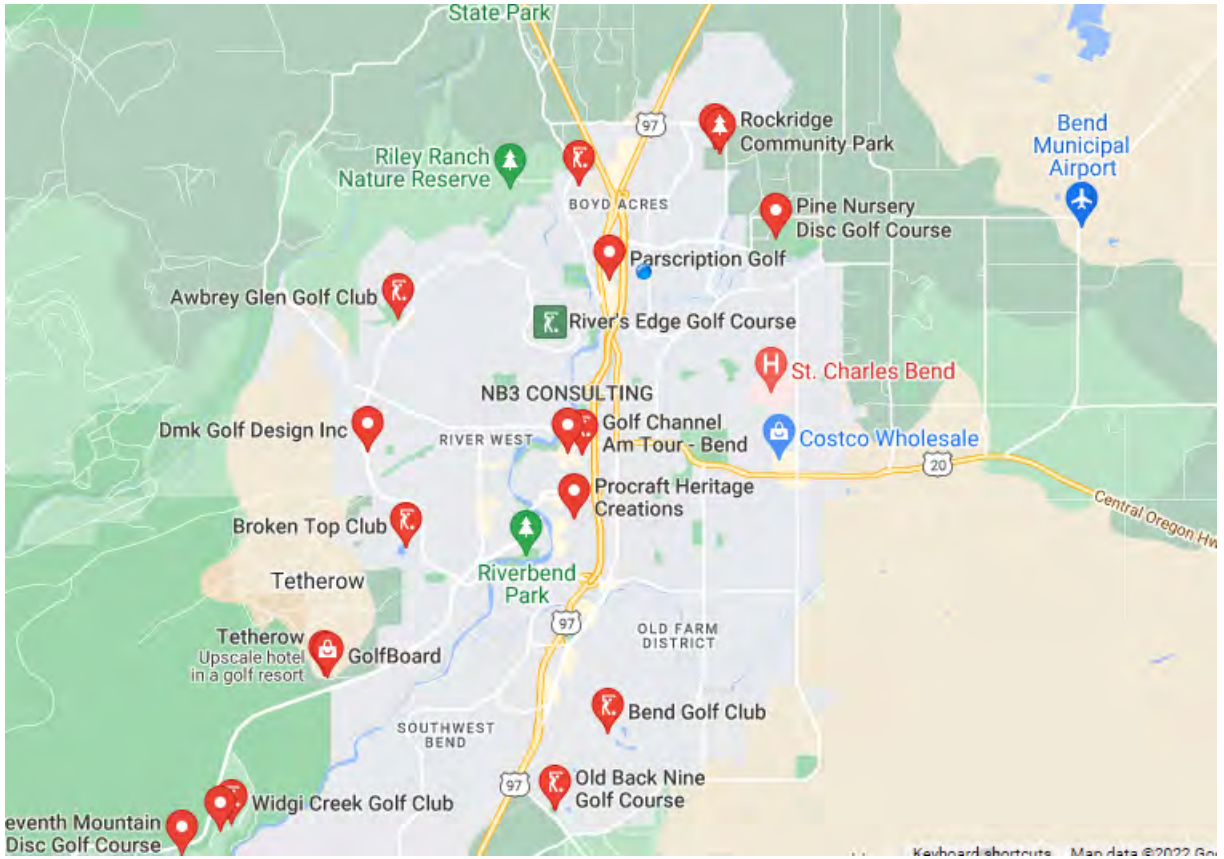
- 19 wells supply approximately 40% of our water
- 12 groundwater rights, plus one application under consideration
- Used when demand is high (summer) and as a backup
- Wells are deep in the thick, regional Deschutes Aquifer
- Initial wells installed in 1980s
- High energy use/carbon footprint - approximately 2x more expensive than surface water delivery
- Mitigation requirements
- Issues: Groundwater levels, ability to obtain more mitigation credits or water rights in the future

Bend's Groundwater Supply Wells



Q: How many golf courses in Bend are irrigated with city drinking water?

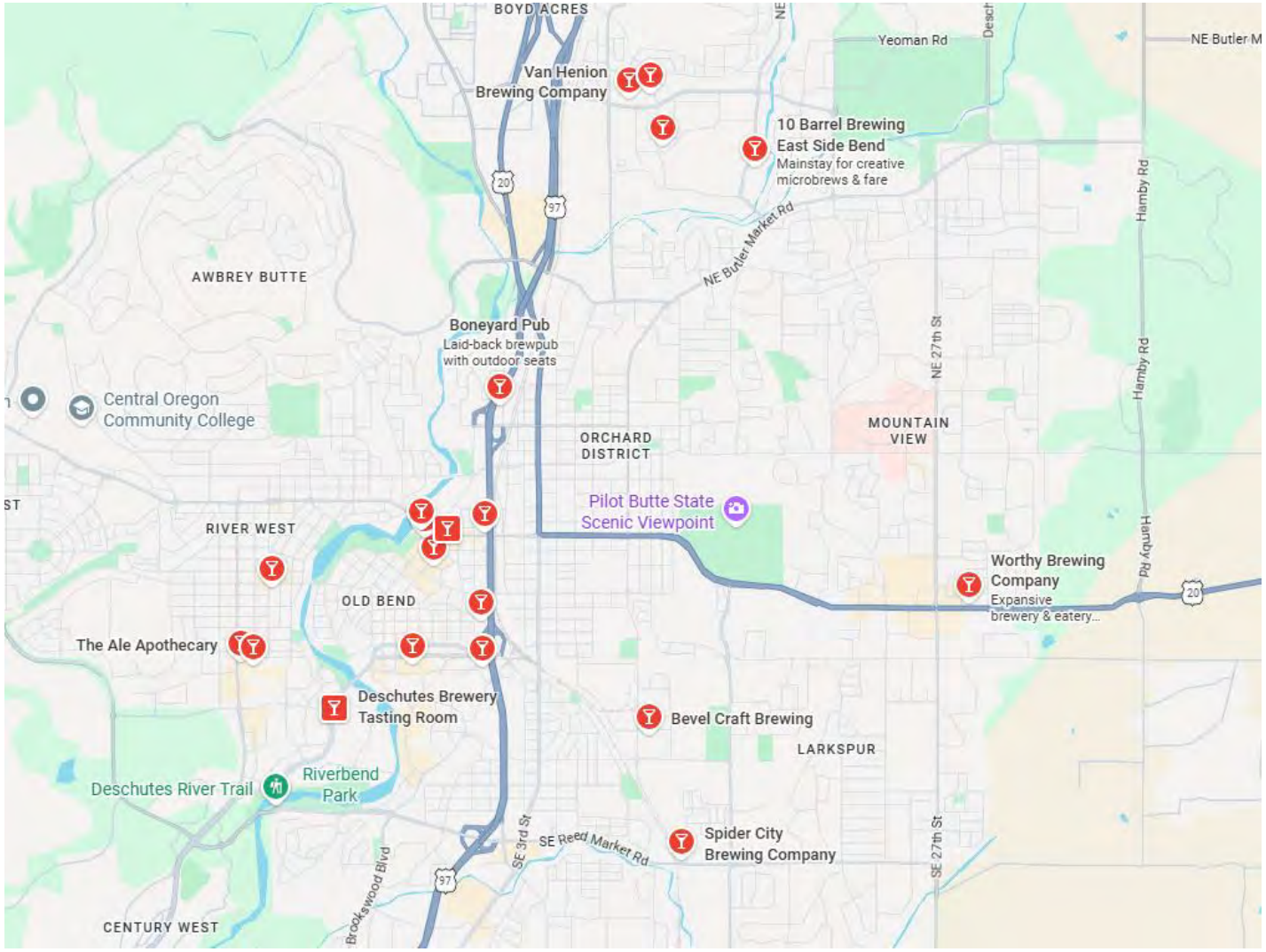
A: None, local golf courses have their own individual surface water or groundwater rights independent of the City of Bend.



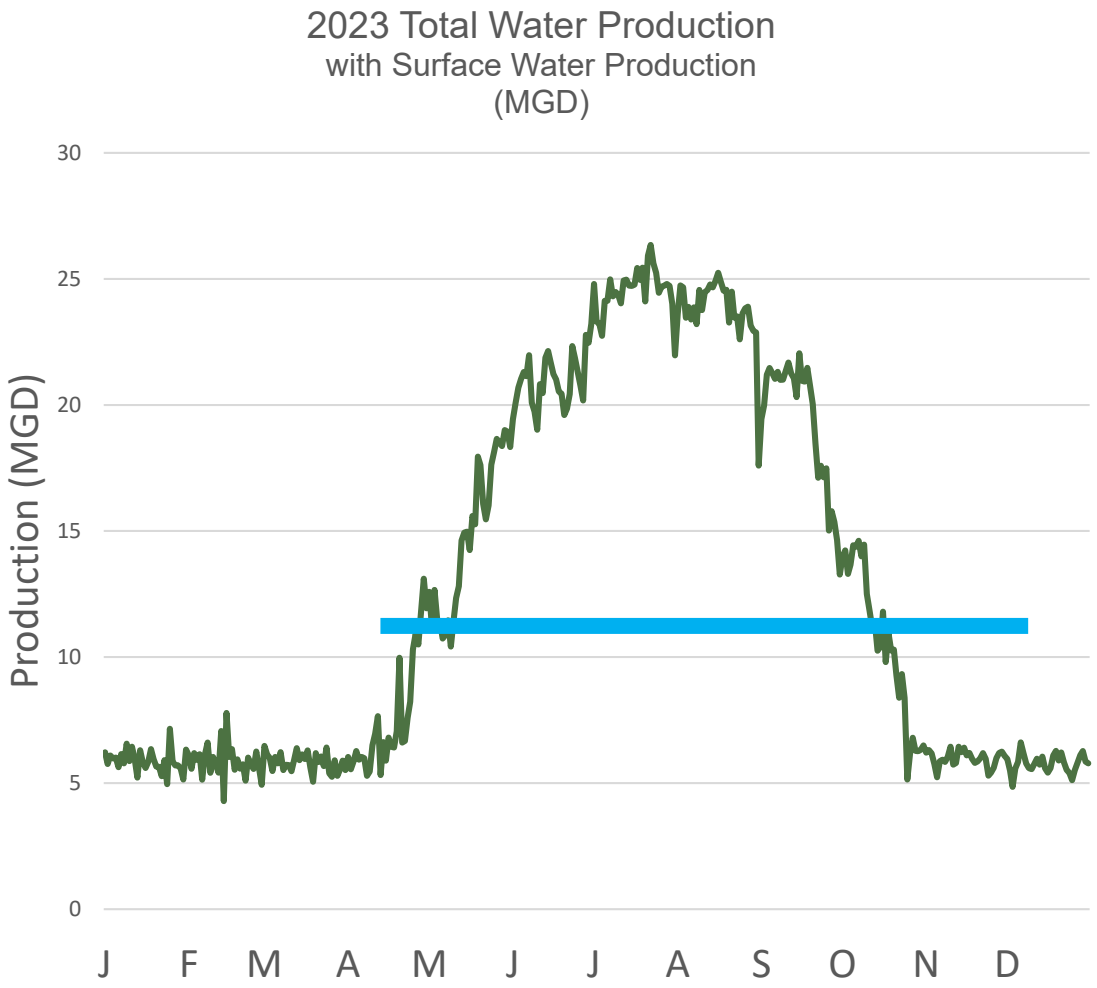
Source: Google Maps

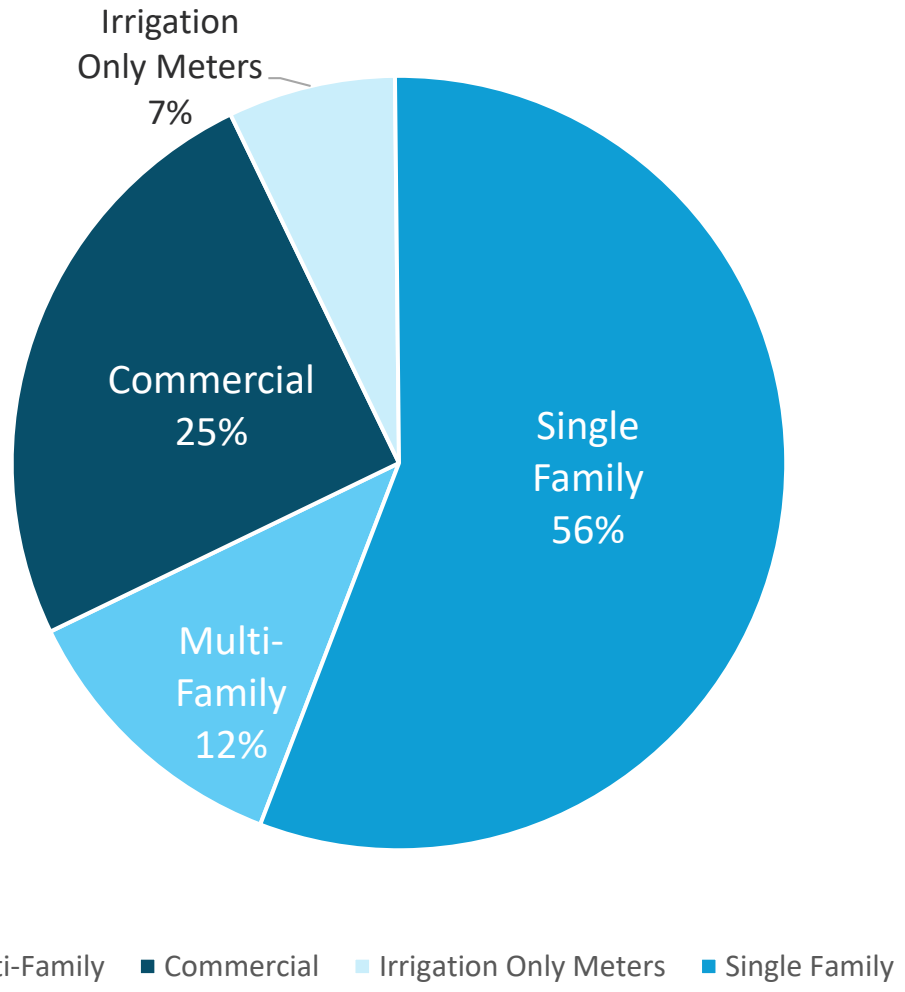
Q: Aren’t Bend Breweries a major water consumer ?

A: Collectively, Bend Breweries account for 2% of Bend’s water production. Landscape Irrigation accounts for 60%.

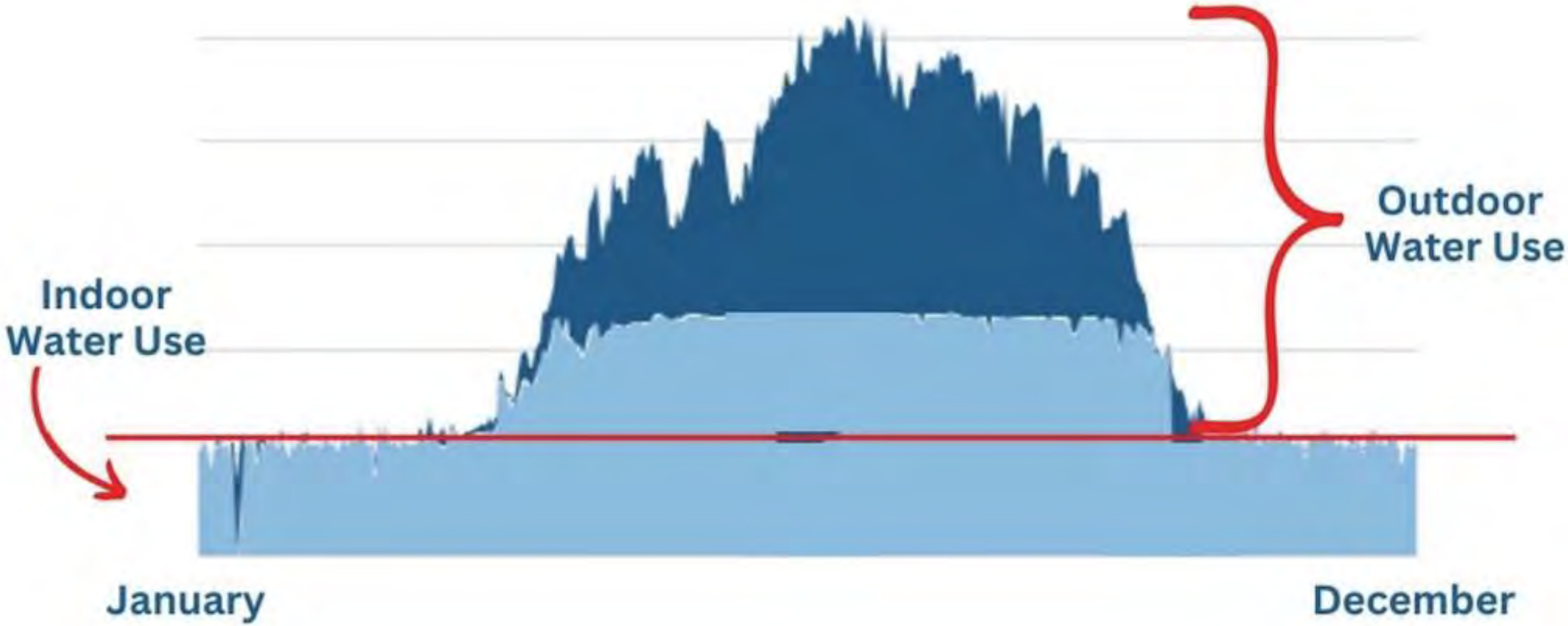


How Bend Uses Water

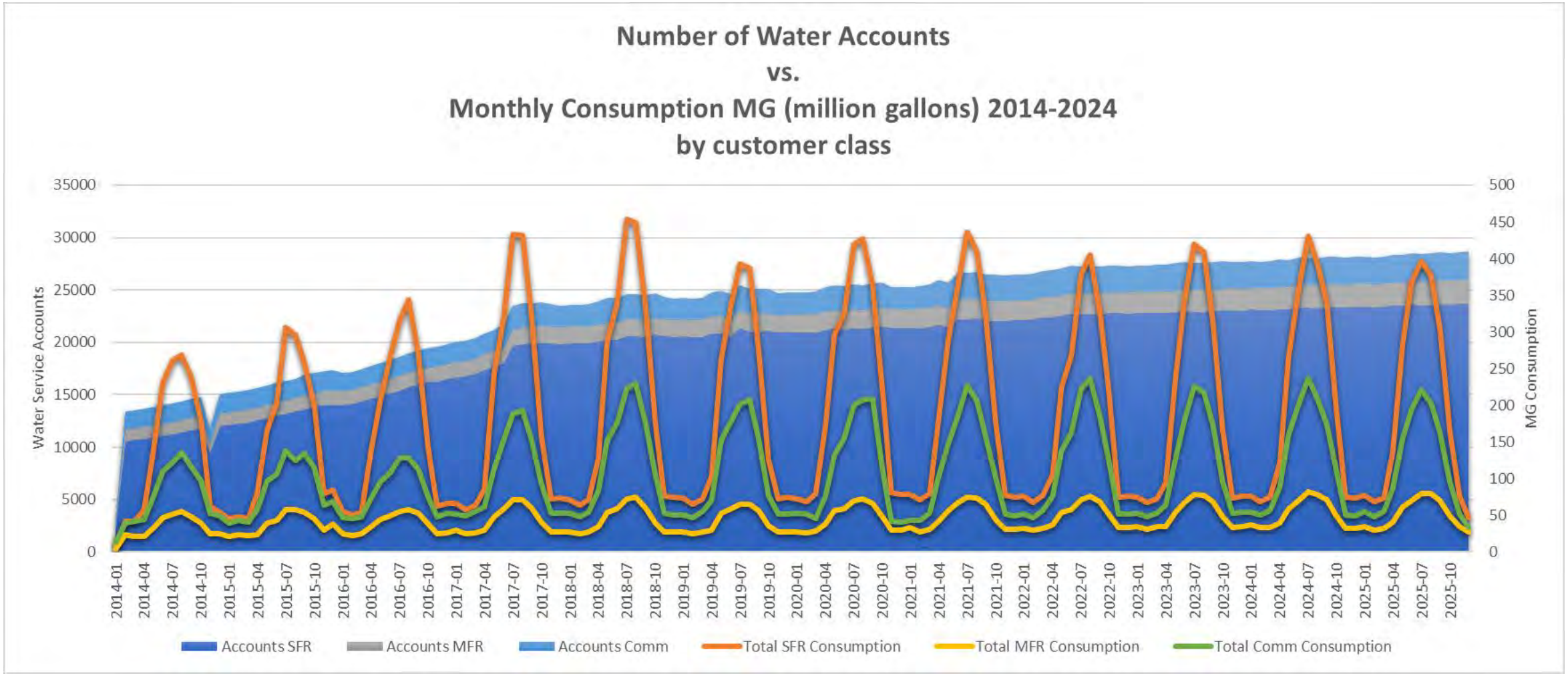




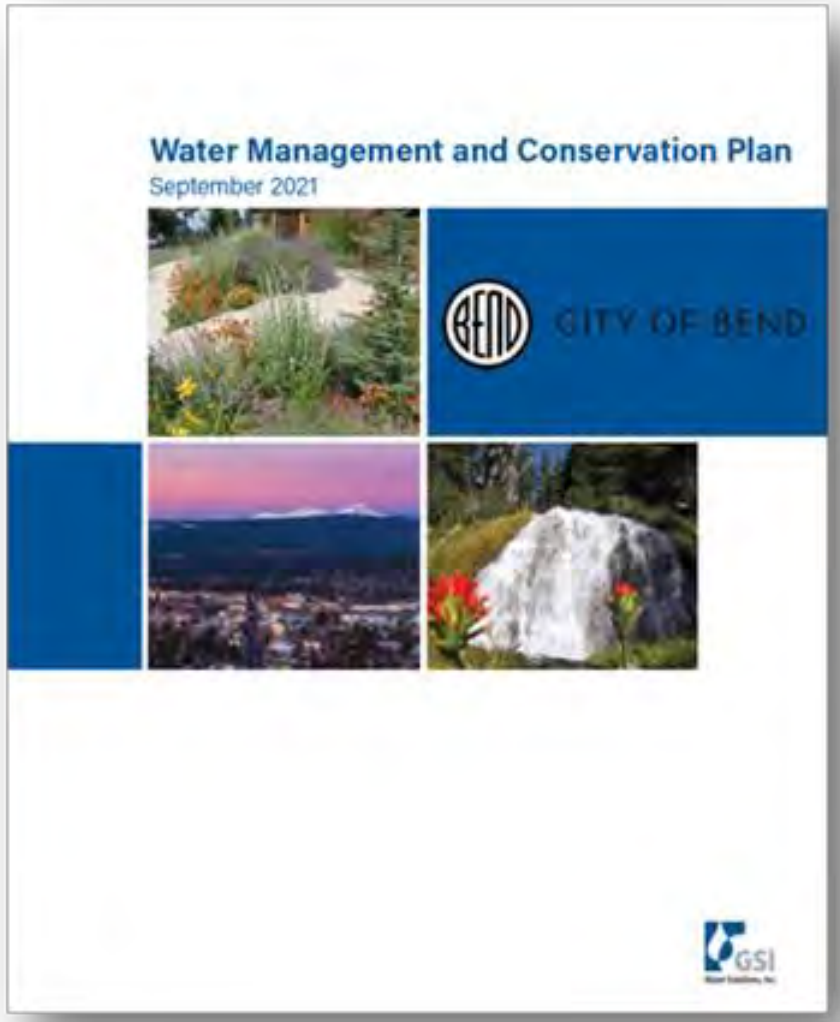
City of Bend Water Use



Water Use in City of Bend



Implementing Water Conservation Goals



- ✓ 7.9 billion gal/saved by 2040
- ✓ Gallons per capita per day (GPCD) reduction 169 to 152
- ✓ Roll out and increase participation in conservation measures, including:
  - Landscape Code
  - Rebates programs indoor/ outdoor all customer classes
  - Turf replacement
  - Public education
  - Code Enforcement
  - Water Conservation based rates

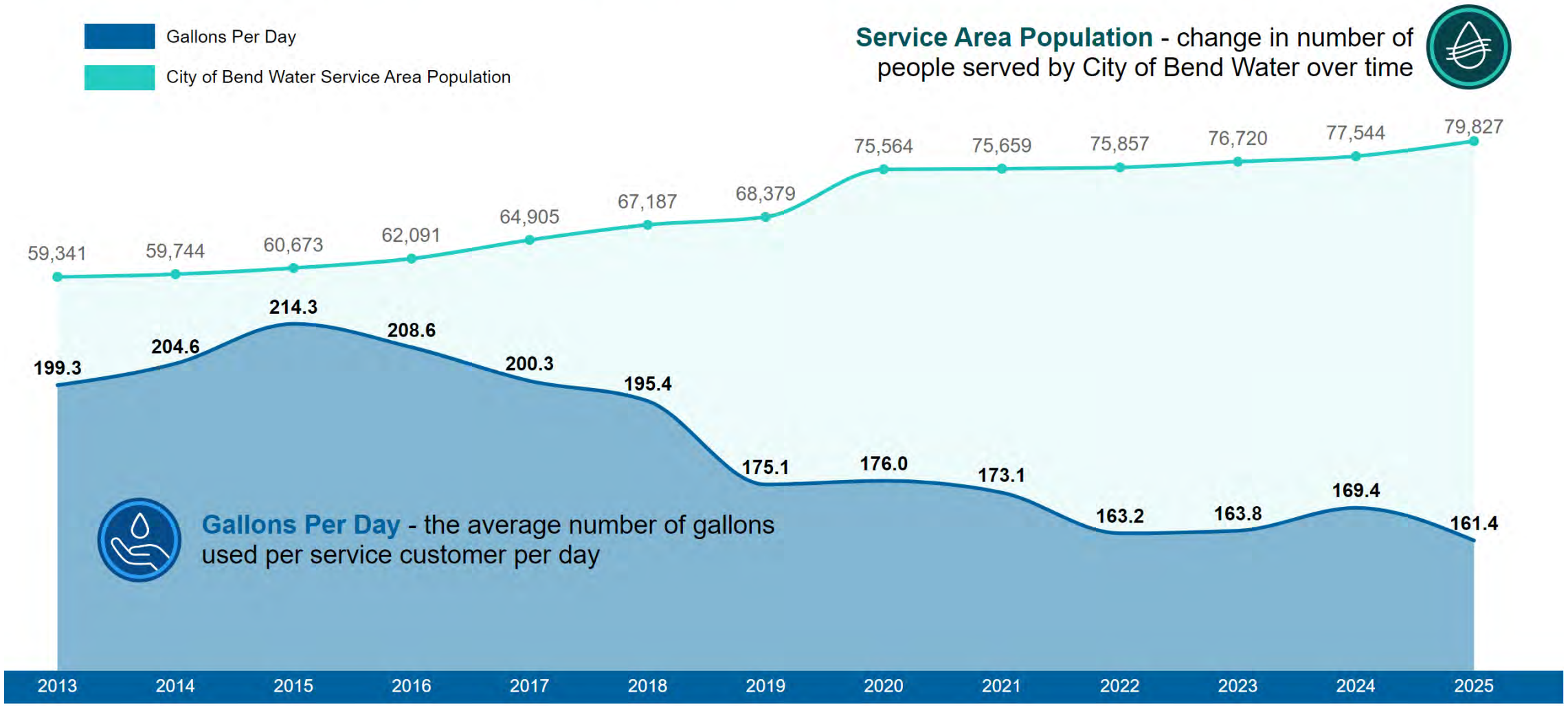
DEPARTMENTS • PUBLIC WORKS • WATER SERVICES

WATER CONSERVATION

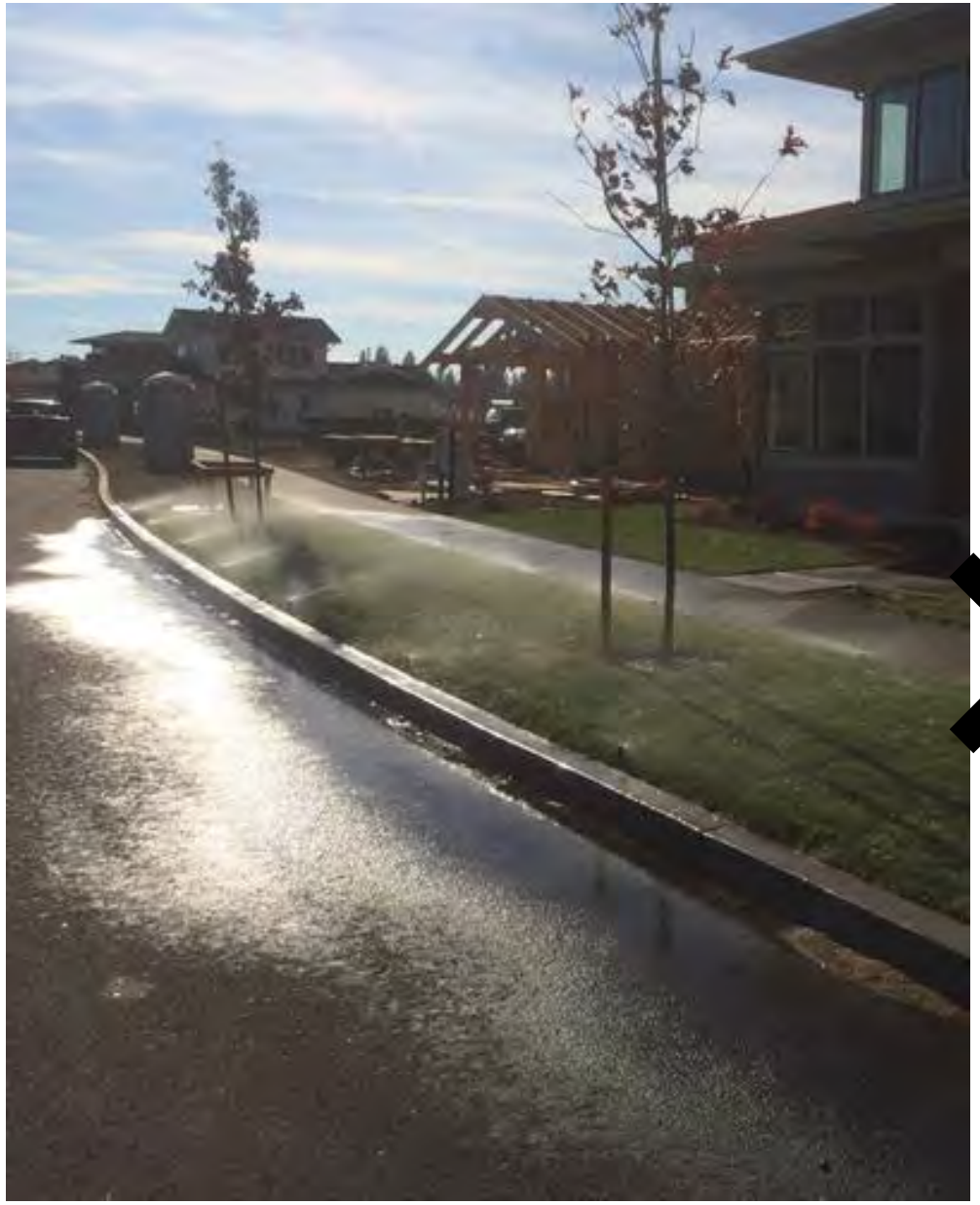
Bend has great drinking water, and we want the whole community to enjoy this clean water and healthy environment for years to come. Water conservation is essential—not just to protect this vital resource, but to preserve the healthy environment we all value.

https://bendoregon.gov/departments/public-works/water-services/water-conservation/

City of Bend Water: Gallons Per Capita Per Day (GPCD)



Excludes Avion and Roats customer usage



Can we be Waterwise *and* Firewise?

Myth: You can't have a landscape that reduces wildfire risk *and* conserves water

Fact: You ***can*** incorporate both in your landscape! Many plant options are naturally fire-resistant and thrive with minimal supplemental water. Find them in the OSU Fire-Resistant Plant Guide and OSU Waterwise Gardening in Central Oregon.

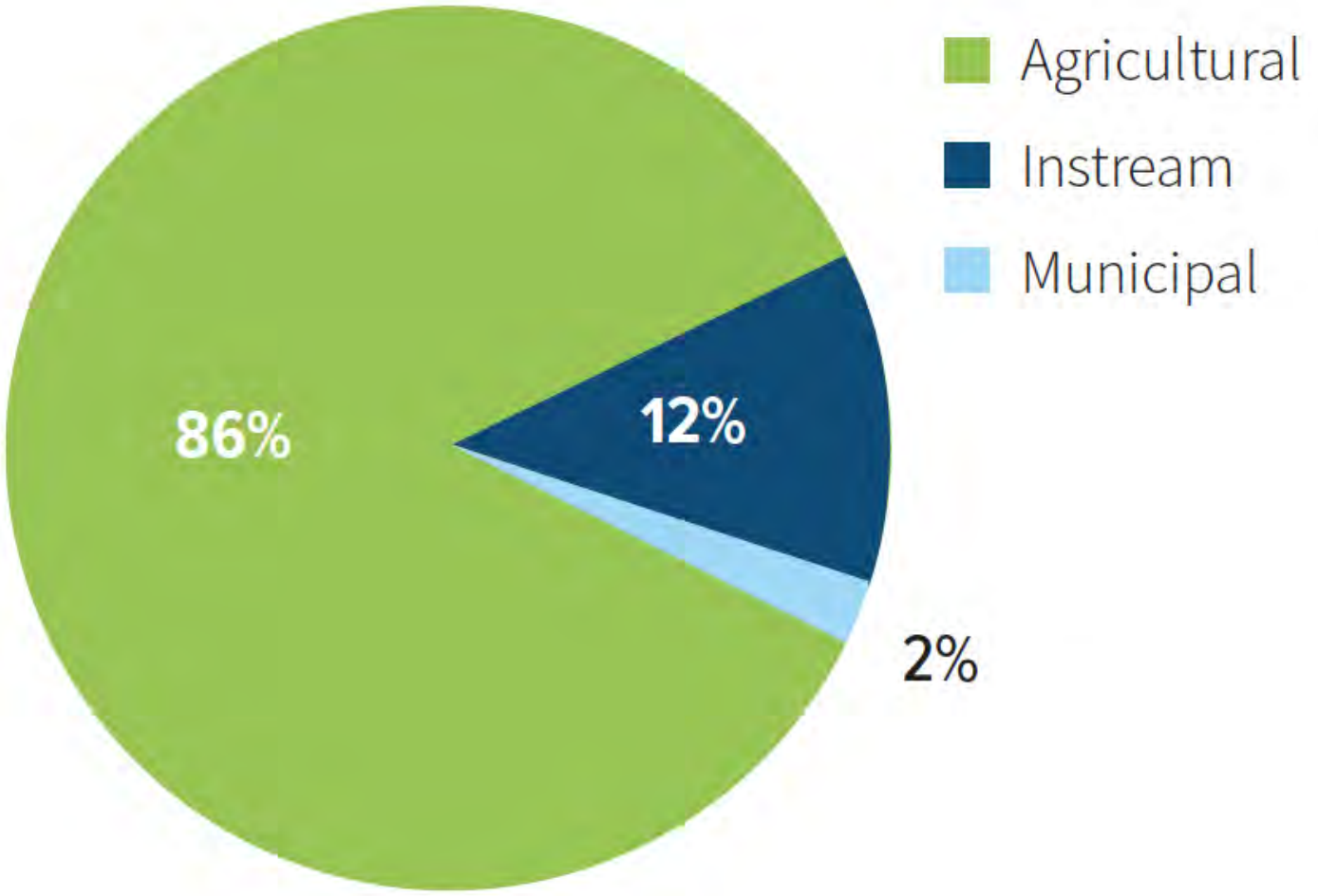
Can we be Waterwise *and* Firewise?

- **Myth:** City of Bend's water system can stop a wildfire

Fact: It can't!

- Our system is built for routine fire events inside the City, not large wildfires
- Building infrastructure oversized for wildfire would be extremely costly and impractical
- The best defense is creating defensible space practices around your home
- Conserving water helps, too — when we use less, more water stays in our urban reservoirs to maintain the pressure firefighters rely on in an emergency

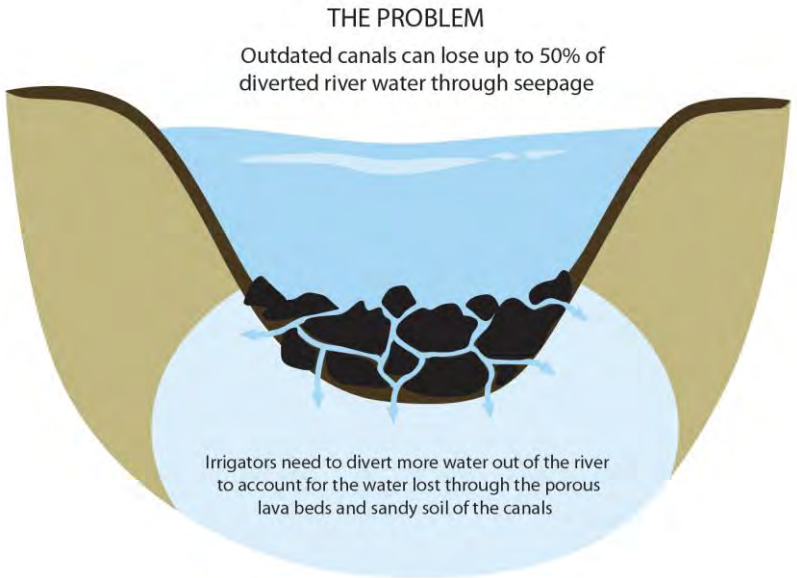
Current Water Rights Distribution in the Deschutes Basin



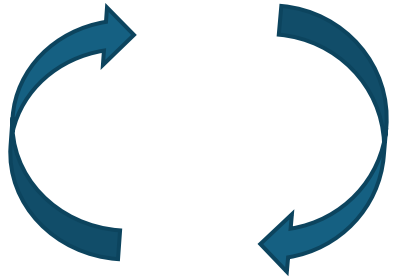
Irrigation Modernization

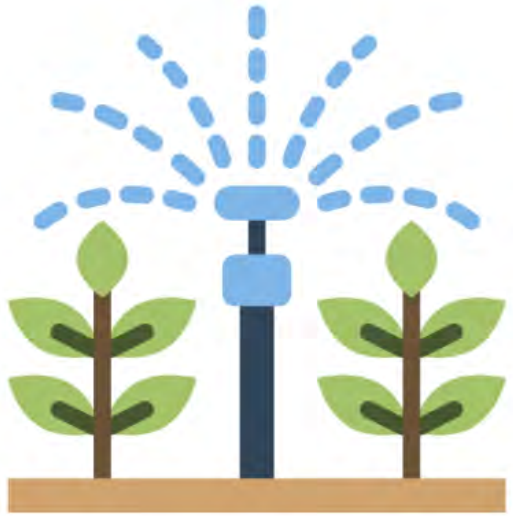
Why Pipe?

- 700 miles of canals in Central Oregon
- Leaking ~50% of their water
- Divert twice as much as is needed on the farm



Piping Leaky Canals Facilitates On-Farm Improvements and Water Marketing





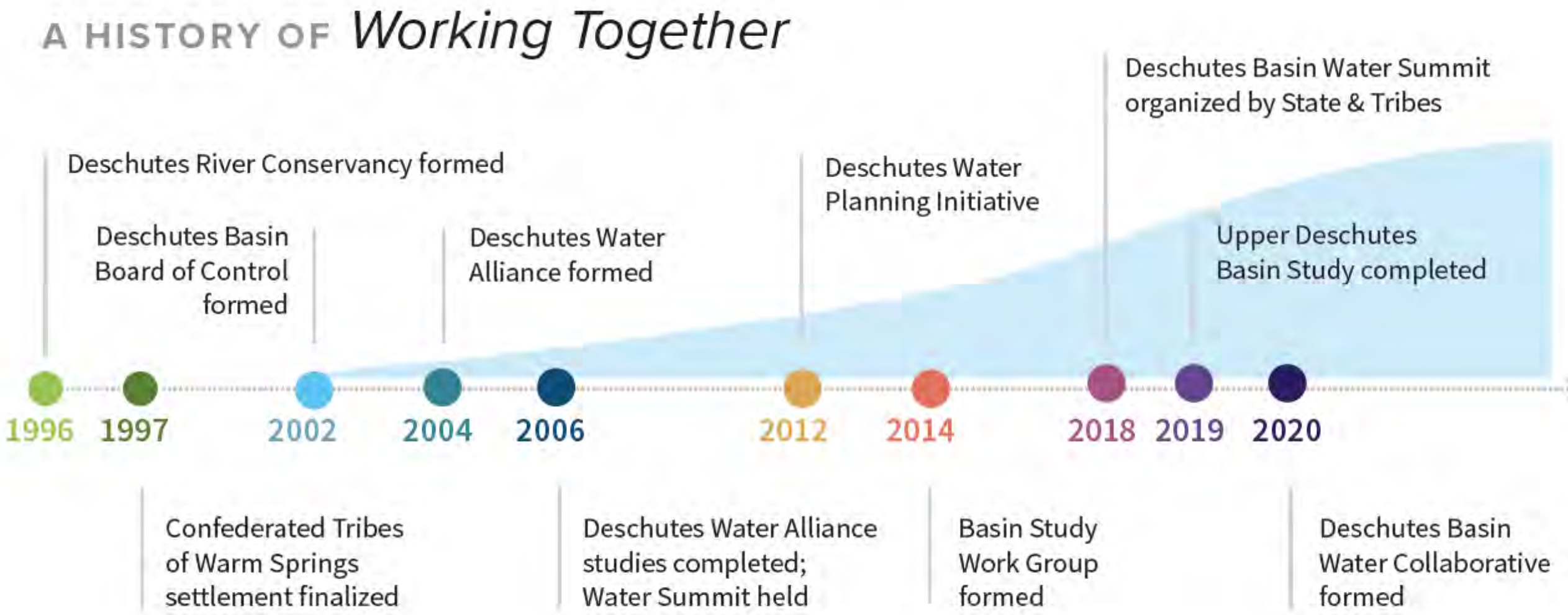
Market-Based Transactions

Instream Leasing, Acquisitions & Water Banking

*Accountability & Transparency

Local. Voluntary. Flexible.

Collaborative Basin Planning



Collaborative Basin Planning

Deschutes Basin
WATER COLLABORATIVE
Water for Rivers, Agriculture and Communities

Go Native! Lawns Suck….Water

DESCHUTES RIVER CONSERVANCY

INSTREAM COLLECTIVE

RESTORING FLOWS TO OUR RIVERS

Support Healthy Rivers & Thriving Communities

Join with other river stewards to support healthy streamflow in the Deschutes Basin through our monthly membership program

GIVE BACK TO THE RIVER

SCAN