Dan Huls

Huls Dairy

-

Corvallis Canal & Water

-

Humble Drain

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Teller Wildlife Refuge

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Bitterroot Water Forum

Ag advisor-

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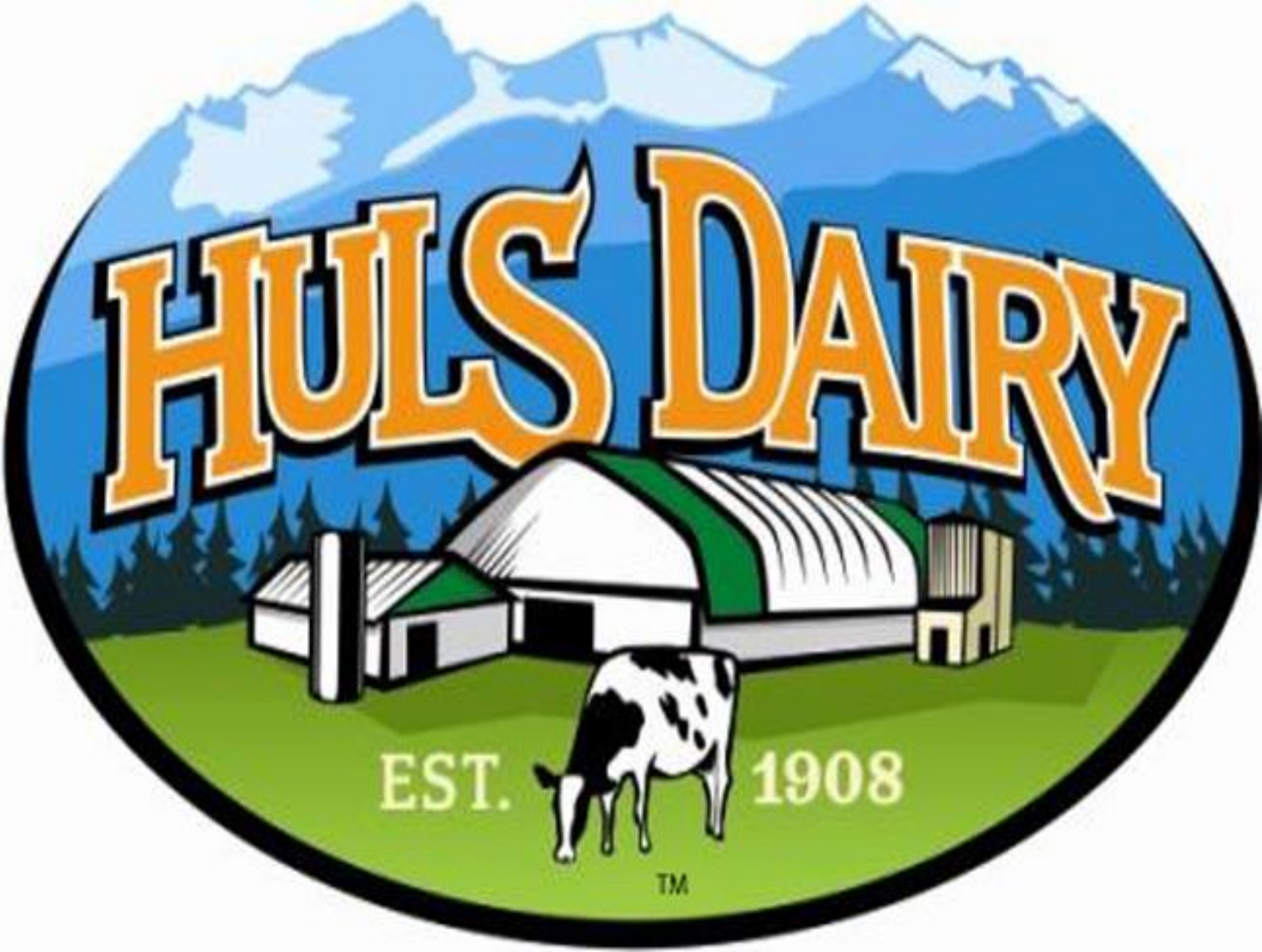
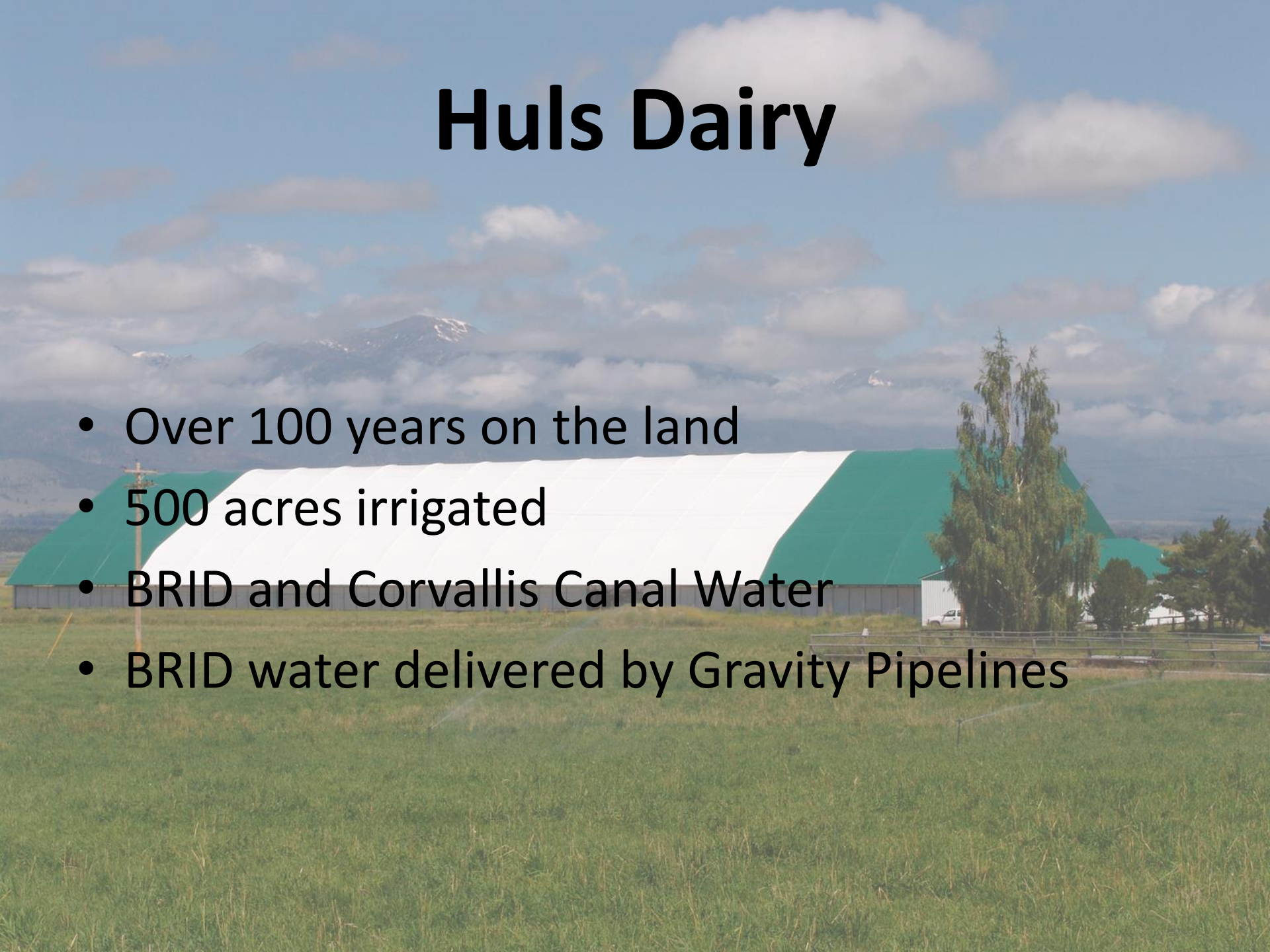
County RTF&R Board


HULS DAIRY
EST. 1908
TM

Huls Dairy



- Over 100 years on the land
- 500 acres irrigated
- BRID and Corvallis Canal Water
- BRID water delivered by Gravity Pipelines

Gravity Flow

- **Mountain view…** Developed by 12 Farmers in 1970…. Irrigating 1200 acres… Buried Concrete Asbestos Pipe for mainline.
- Currently serving 83 land owners and growing
- **Coyote Creek …** Developed by 6 Farmers in 1980… Irrigating 500 acres…. Buried Plastic & Steel mainline.
- Currently serving 50 land owners and growing

- **Corvallis Canal**
- Pumped sprinkler irrigation
- 1 Center pivot
- Wheel lines
- Hand lines…..

Corvallis Canal & Water Co

- **Director**
- 1st water right out of Bitter Root River…. 1871
- 5000 Miners inches….. 5000 acres….
- 165 irrigators served
- From river behind sewer plant in Hamilton to Wood Lane North of Corvallis

Humble Drain

Commissioner

Constructed in 1942 by court order

Land owners Voted to be included in district

$17,000 to construct in 1942.

To drain about 1,500 acres of farm land being flooded by water from Flood irrigation on east bench north of Corvallis…About 4.5 miles…East of Railroad tracks… Quast Lane to Wood lane.

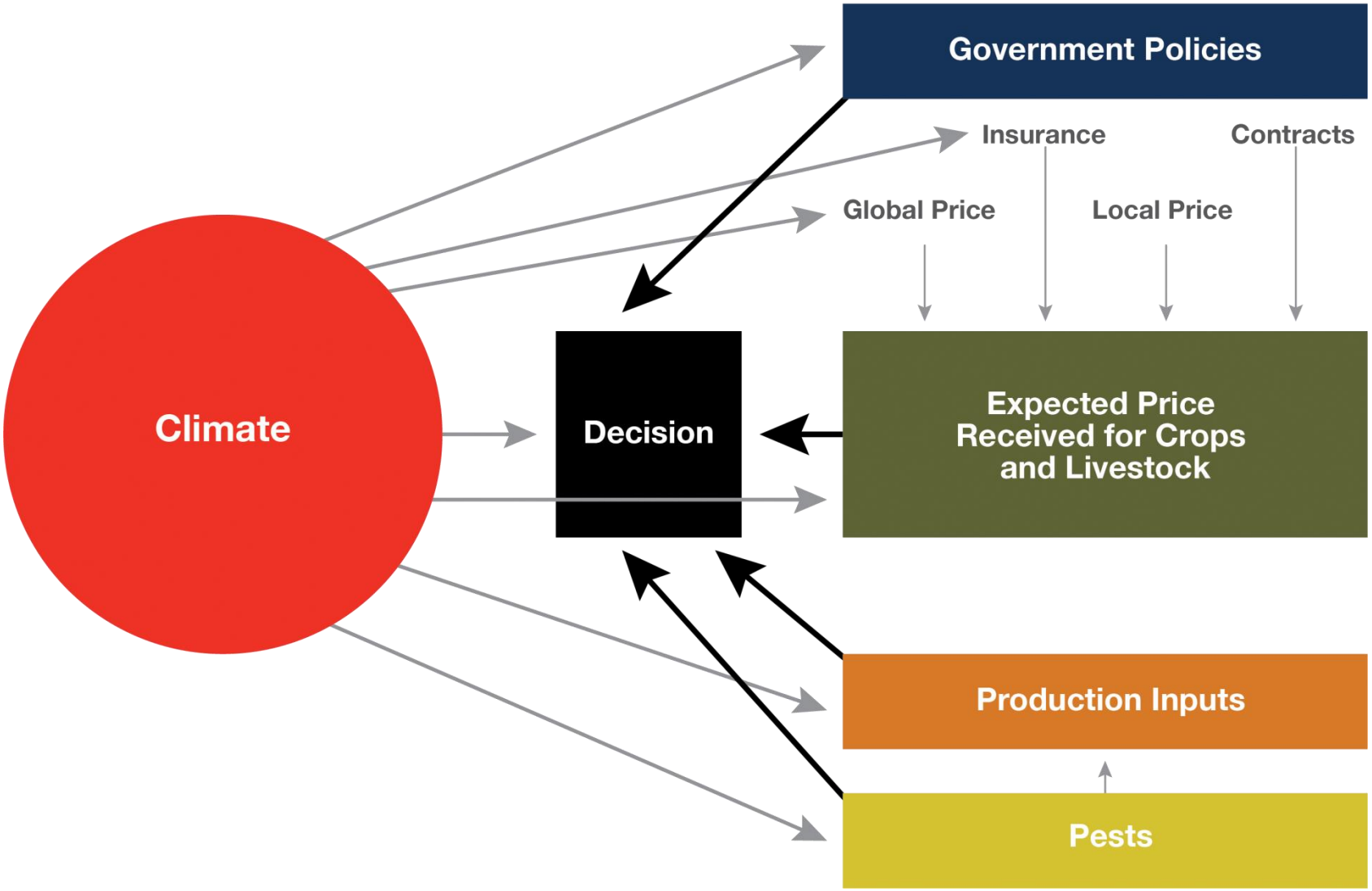
Collect waste water from canals and seepage water from Big Ditch.

AGRICULTURE AND CLIMATE CHANGE IN THE BITTER ROOT VALLEY

Agriculture has always faced variability and occasional extreme events.

Agriculture risk assessment now must include the understanding of climate change and the future climate trends that are of great importance for the sustainability of agriculture.

Factors That Drive Agricultural Decisions in Montana



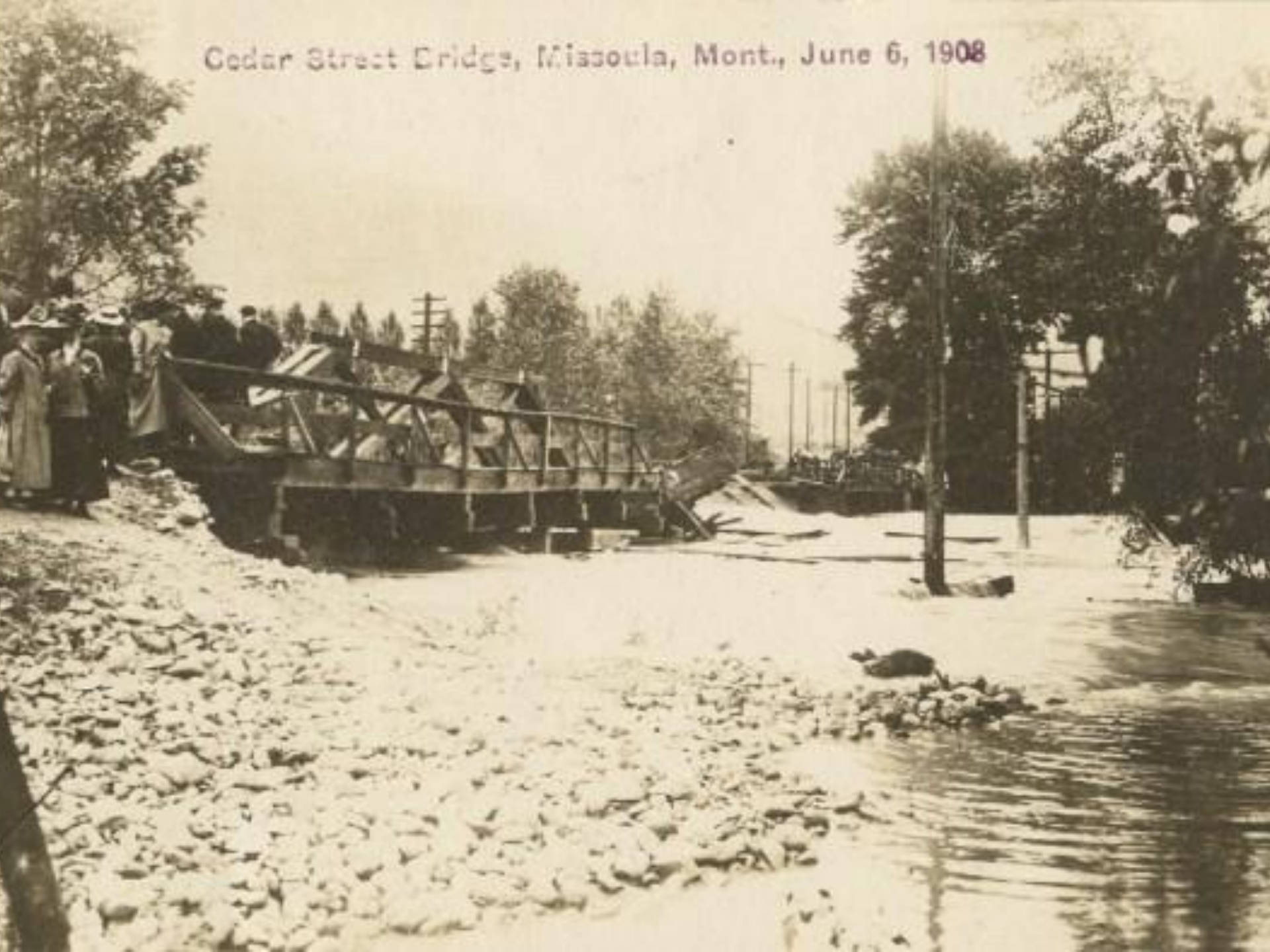
Weather Anomalies
Clark Fork floods of 1908
Estimated flow of 48,000 cubic feet per second

Daily discharge, cubic feet per second -- statistics for May 29 based on 89 years of record more

Min (1941)	25th percen-tile	Median	Mean	Most Recent Instantaneous Value May 29	75th percen-tile	Max (1948)
5920	12900	17800	19600	21500	26400	51200

Rain for 33 consecutive days

Bitter Root Trestle, Missoula, Mont., June 8, 1908


Cedar Street Bridge, Missoula, Mont., June 6, 1908

The Great **Fire of 1910** (also commonly referred to as the Big Blowup, the Big Burn, or the Devil's Broom **fire**) was a wildfire in the western United States that burned three million acres (4,700 sq mi; 12,100 km^2) in North Idaho and Western Montana, with extensions into Eastern Washington and Southeast British Columbia, ..

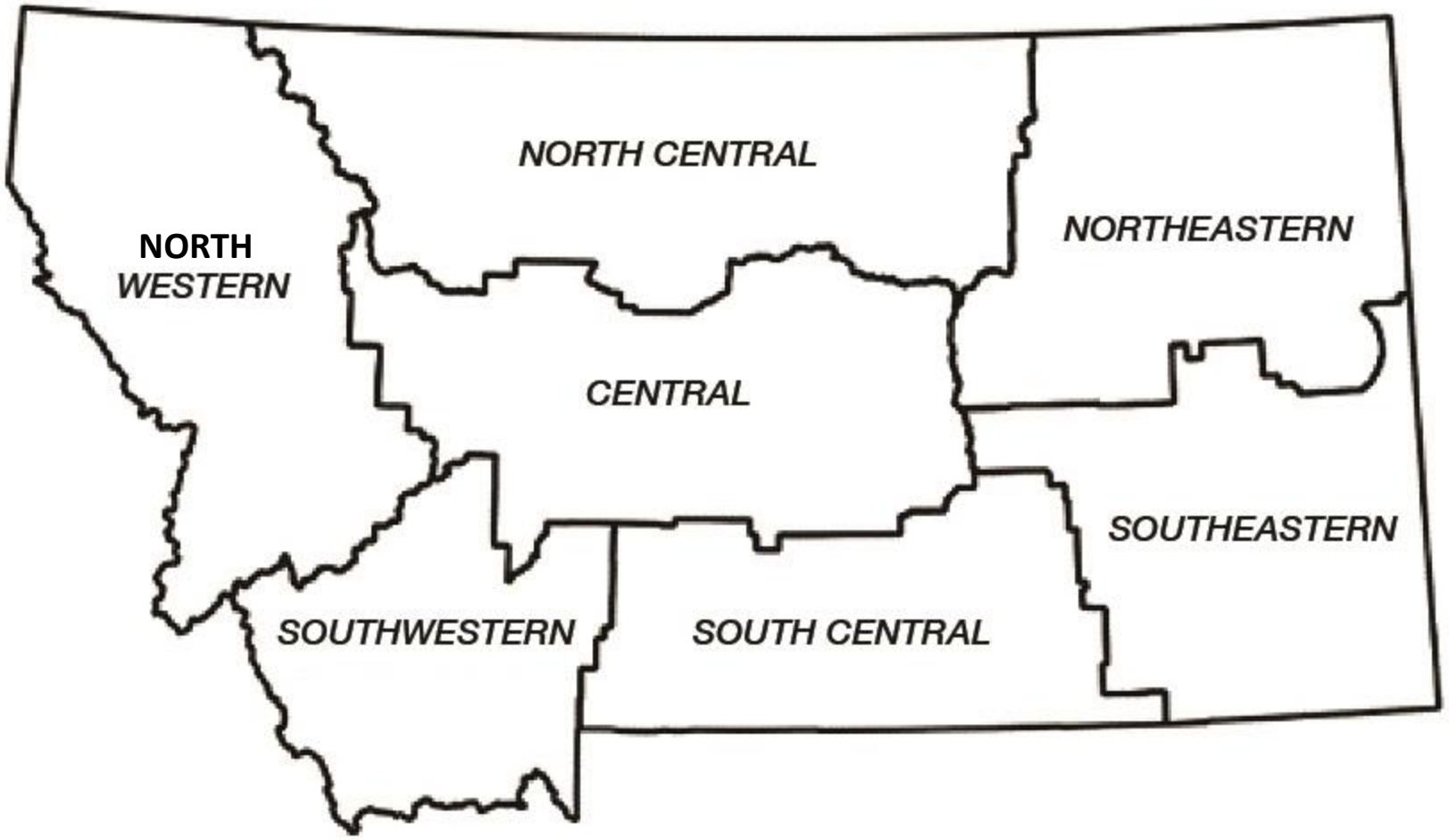

Fire of 1910

Aquatic Invasive Species
Zebra mussels

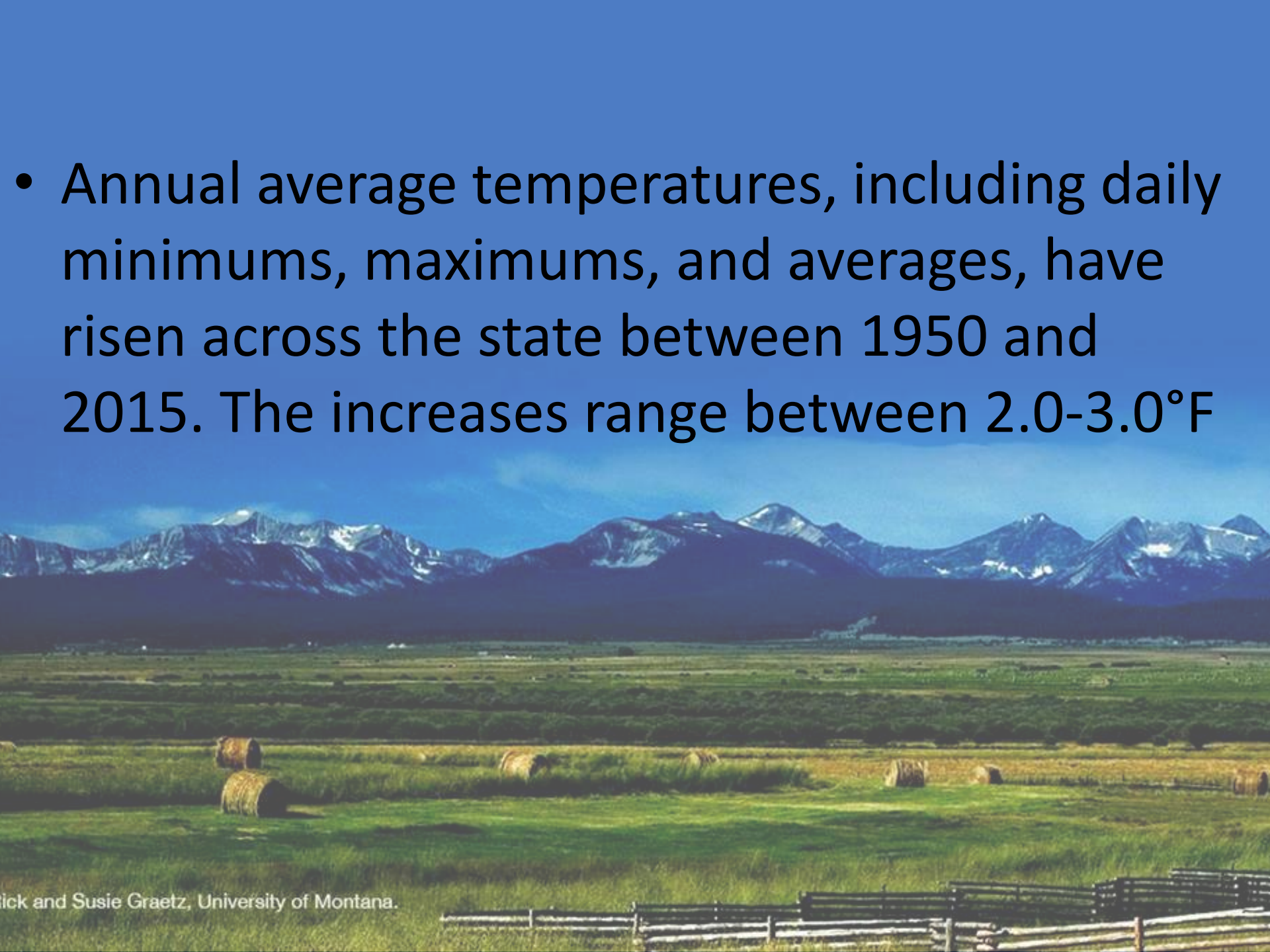
2017 MONTANA CLIMATE ASSESSMENT

Stakeholder driven, science informed

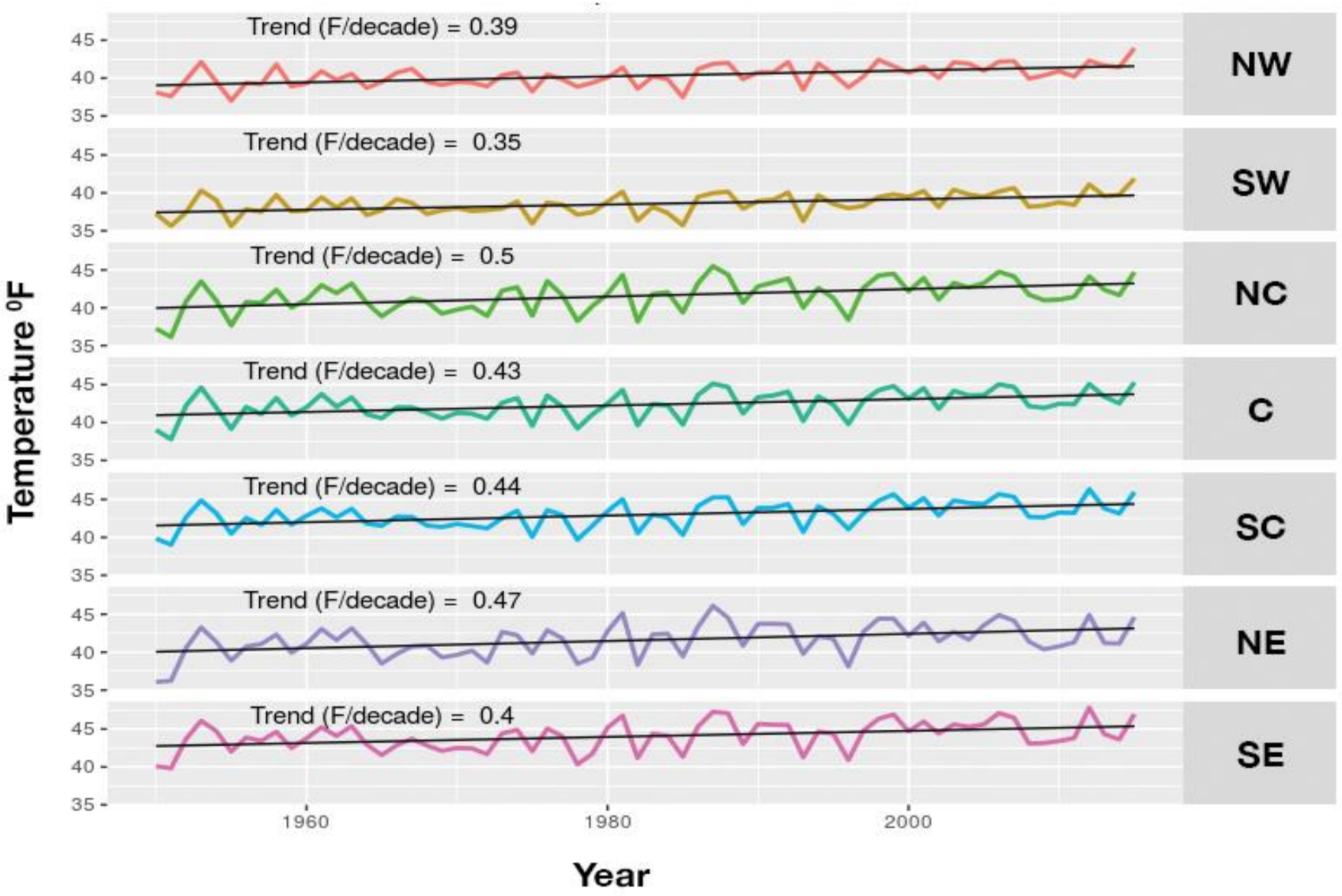
Montana Climate Divisions



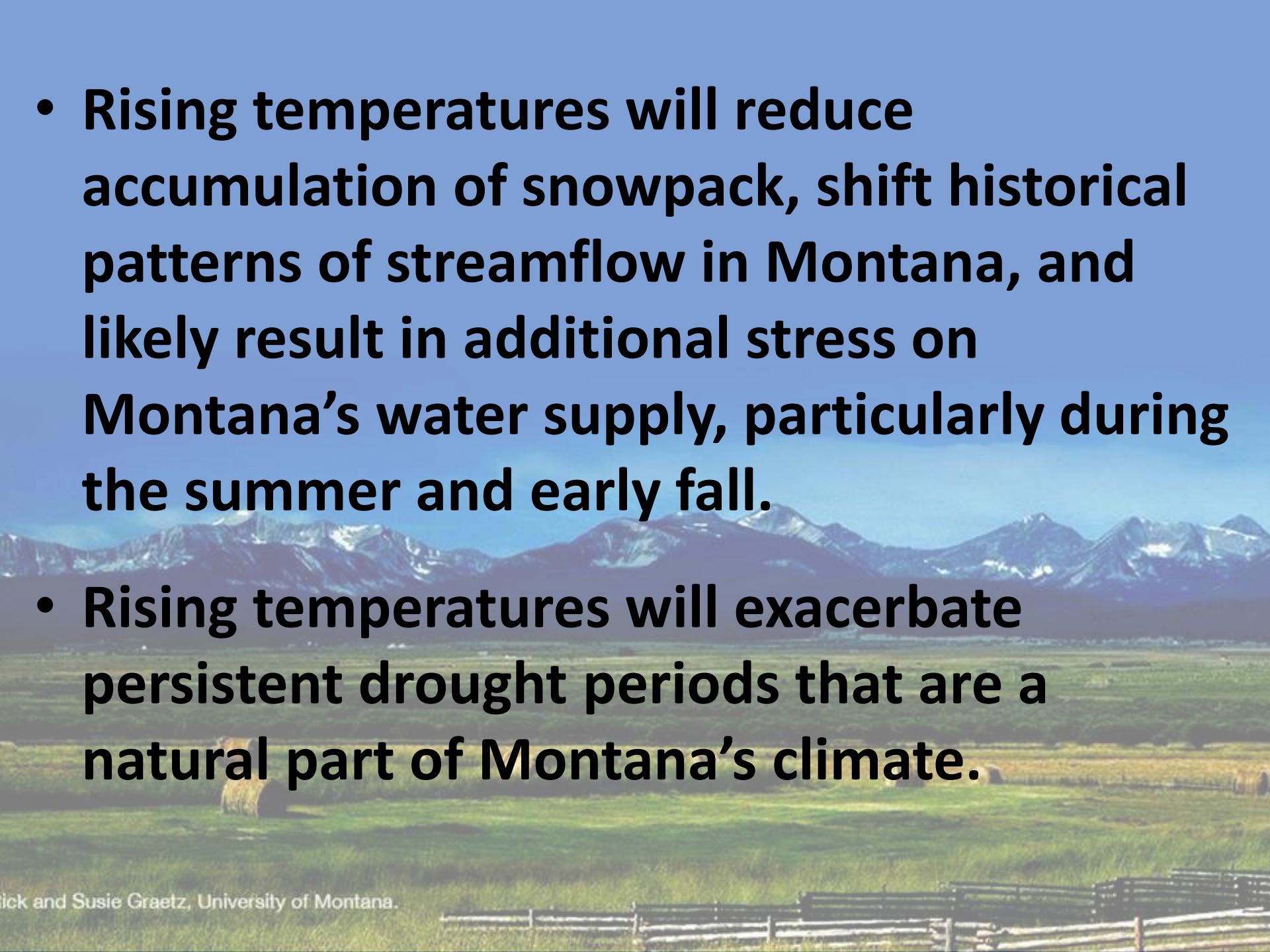
- Annual average temperatures, including daily minimums, maximums, and averages, have risen across the state between 1950 and 2015. The increases range between 2.0-3.0°F



MT Climate Division Temperature Trends from 1950–2015



- **Rising temperatures will reduce accumulation of snowpack, shift historical patterns of streamflow in Montana, and likely result in additional stress on Montana's water supply, particularly during the summer and early fall.**
- **Rising temperatures will exacerbate persistent drought periods that are a natural part of Montana's climate.**



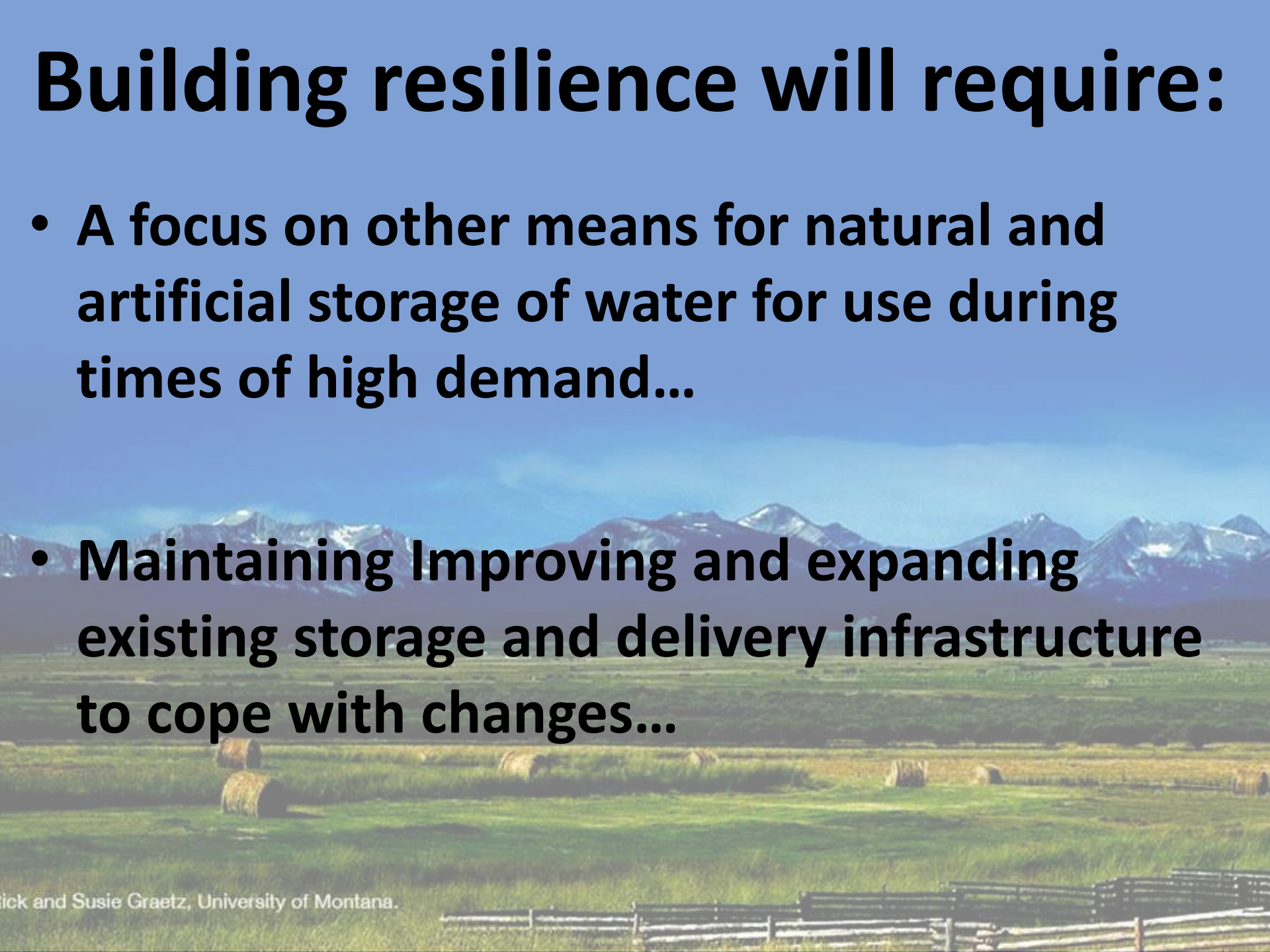
Building resilience will require:

- A water use system that is flexible and able to adapt to changes in timing of water supply;
- Cooperation between legislators, planners, scientists, managers and water users
- Explicitly addressing the issue of water use and demand in conjunction with best data on climate and water supply

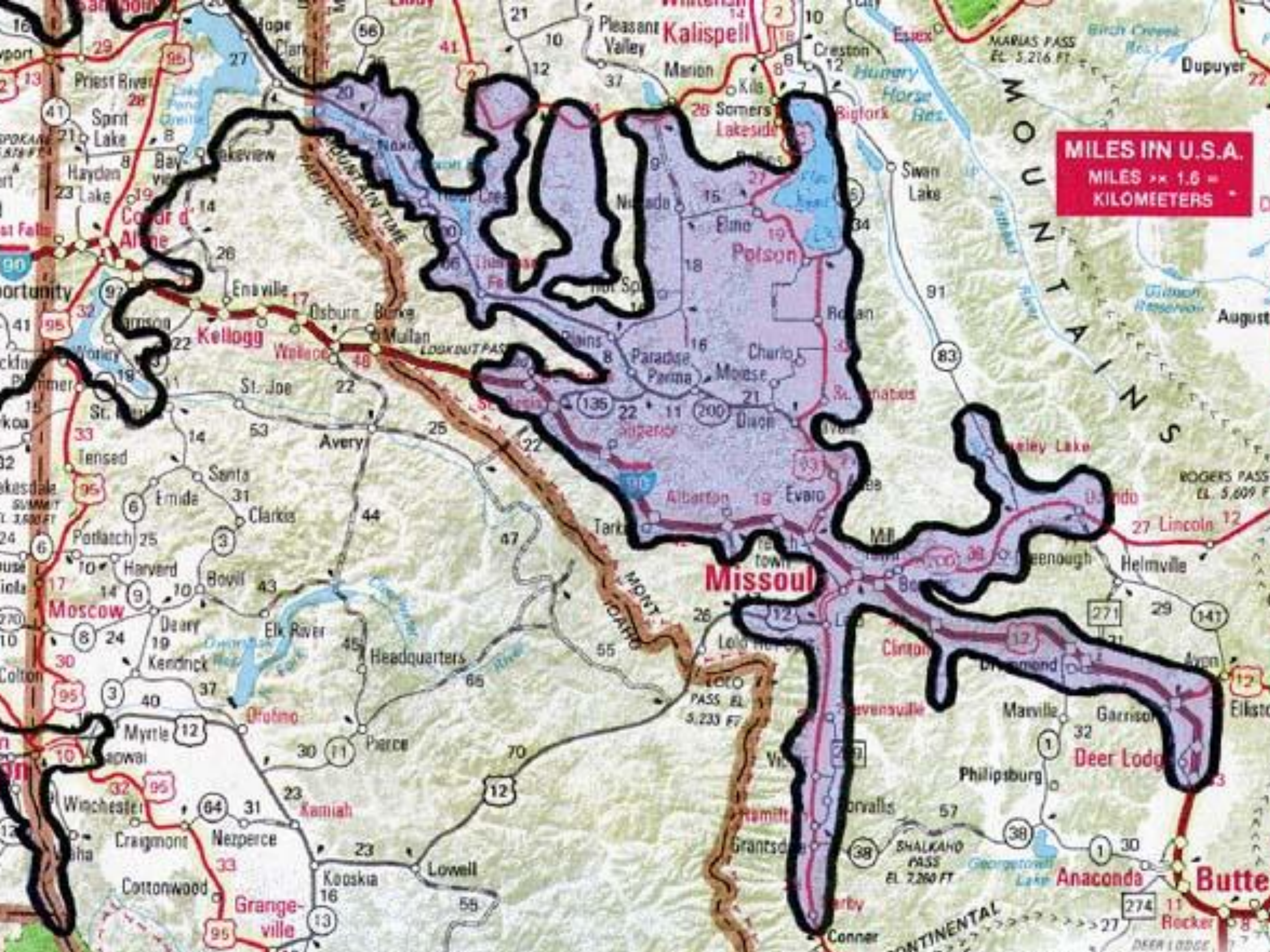
Building resilience will require:

- A focus on other means for natural and artificial storage of water for use during times of high demand…

- Maintaining Improving and expanding existing storage and delivery infrastructure to cope with changes…



Glacial Lake Missoula



MILES IN U.S.A.
MILES × 1.6 = KILOMETERS
MOUNTAINS
Kalispell
Pleasant Valley
Marion
Creston
Kila
Somers
Lakeside
Bigfork
Hungry Horse Res.
Swan Lake
MARIAS PASS EL. 5,216 FT
Dupuyer
Polson
Elmo
Ronan
Charlo
Moiese
Paradise
Plains
St. Ignatius
Dixon
Superior
Alberton
Evaro
Missoula
Bonner
Greenough
Helmville
Lincoln
ROGERS PASS EL. 5,609 FT
Clinton
Drummond
Garrison
Avon
Elliston
Deer Lodge
Maxville
Philipsburg
Anaconda
Butte
Georgetown Lake
SKALKAHO PASS EL. 7,260 FT
Corvallis
Hamilton
Grantsdale
Darby
Conner
Stevensville
Lolo
LOLO PASS EL. 5,233 FT
CONTINENTAL
Hope
Priest River
Spirit Lake
Hayden Lake
Coeur d'Alene
Opportunity
Enaville
Kellogg
Wallace
Osburn
Mullan
LOOKOUT PASS
St. Joe
Avery
Tensed
Santa
Emida
Clarkia
Potlatch
Harvard
Bovill
Moscow
Deary
Elk River
Kendrick
Headquarters
Orofino
Myrtle
Pierce
Lapwai
Winchester
Kamiah
Craigmont
Nezperce
Lowell
Kooskia
Cottonwood
Grangeville
MOUNTAIN TIME
PACIFIC TIME
MONTANA
IDAHO

Mission Valley strandlines noted by T.C Chamberlin in 1886.

Glacial Lake Missoula Erratic

WATER….. Essential to life

- Water resource management is Essential…..
- Water infrastructure in the Bitterroot is Essential
- IRRIGATION is Essential…Essential to agriculture…
- Working Farms & Ranches
- Essential To provide Benefits beyond Agriculture….
  Aquafer recharge…. Domestic Wells….
  Flood control…. Wildlife Habitat
- Recreation… Hunting, Fishing, Camping, Boating,
- **Rich History In The Bitterroot**

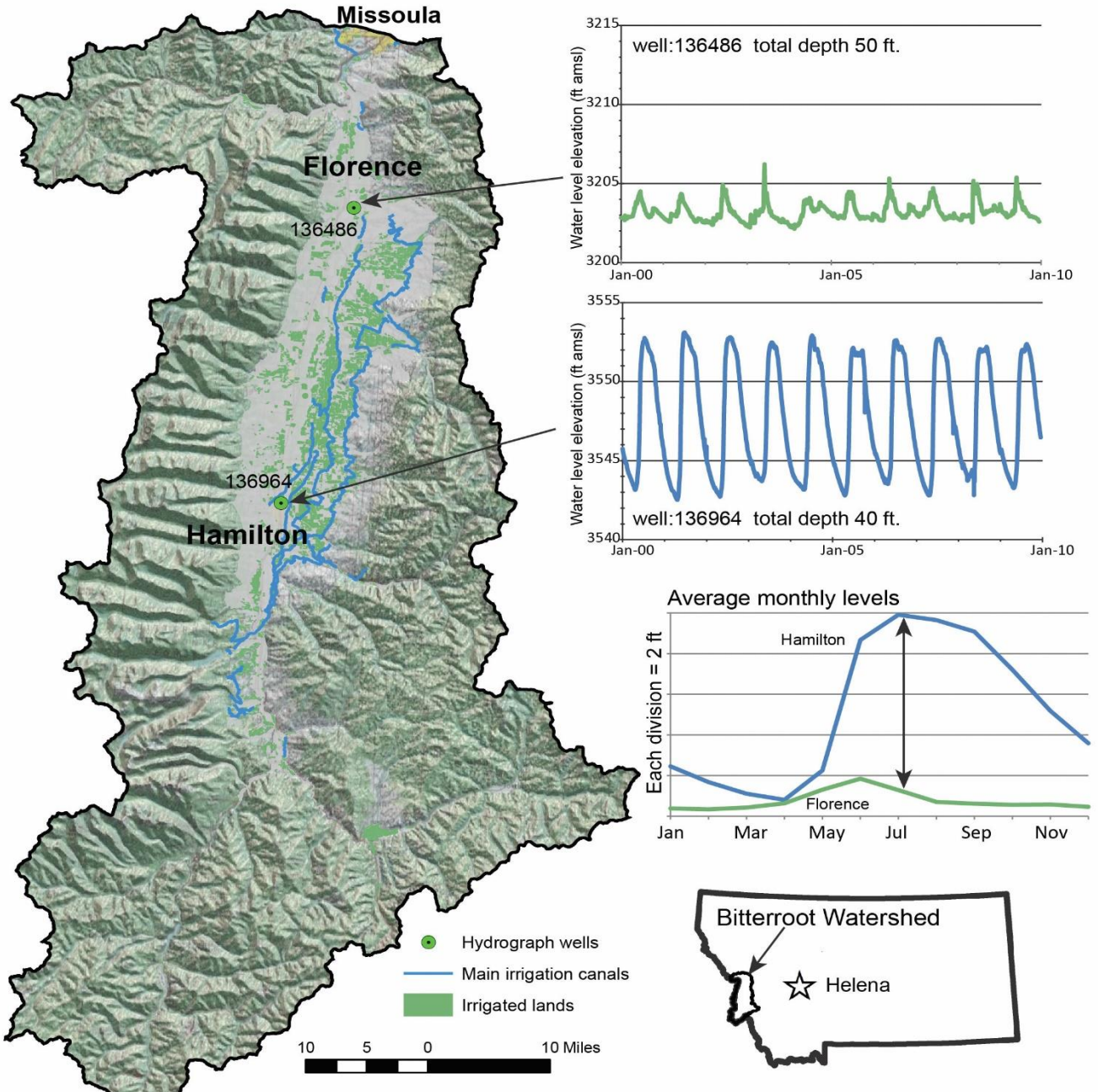
Montana Water Law…..

- The Popham and Holloran family's live in the Corvallis area about 5 miles north east of town
- Popham vs Holloran established the standard in Montana state water law….
- 1st in Time….1st in Right….. Around 1900

Infrastructure Overview

- 30 Water Delivery organizations
- 65,250 Irrigated acres
- 4,950 Irrigators
- Delivered through 250 miles of main canals
- From 28 Mountain Lakes… 19 in wilderness…. Storing a total of 86,800 Acre Ft.
- Delivered by Creeks & Streams the Bitter Root River & a system of Ditches & Canals

Ground water recharge



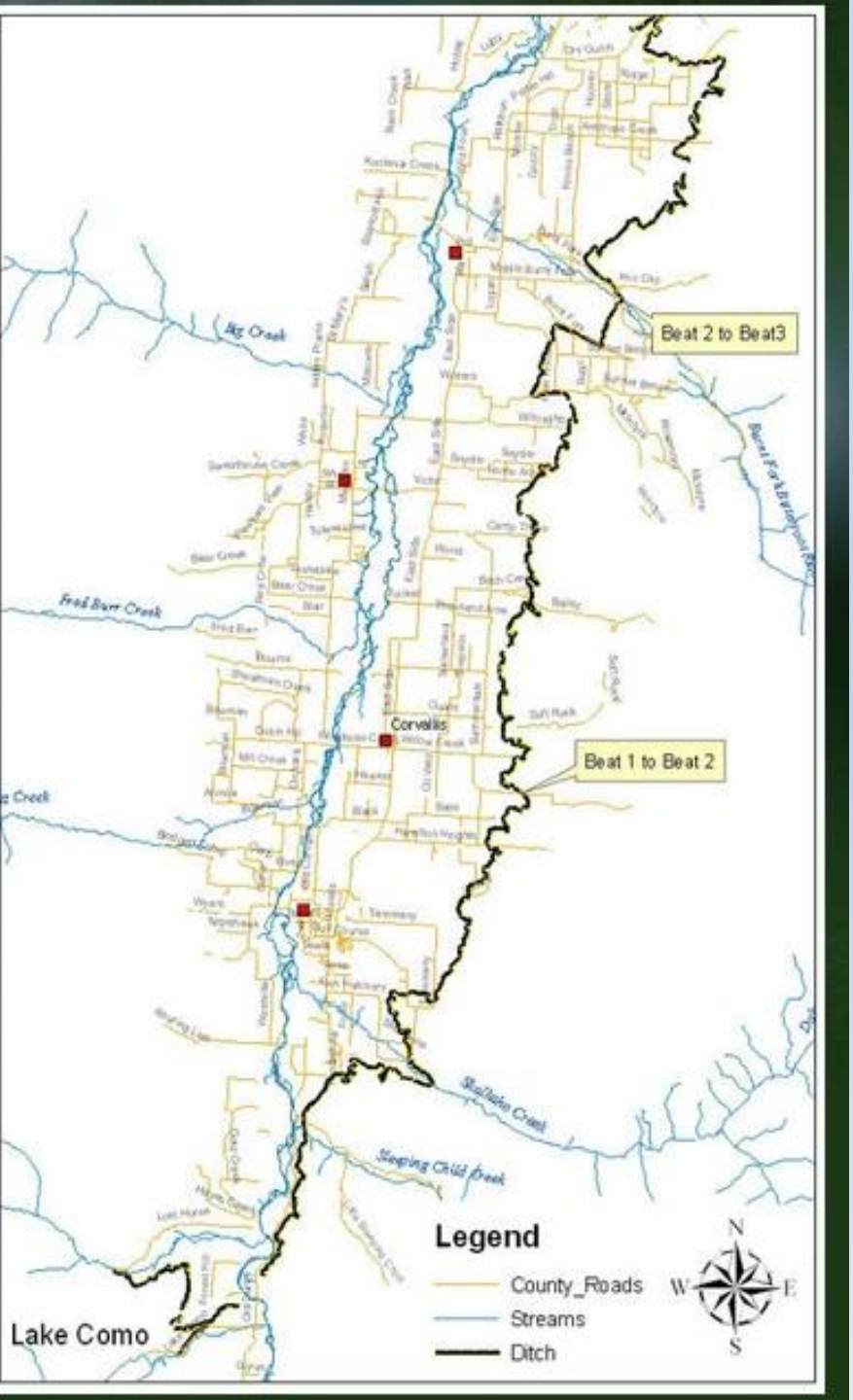
BRID

- Water is stored in Lake Como on Rock Creek.
- Lake Como holds 38,500 acre-feet of water.
- BRID services 16,665 acres along a 72 mile stretch from Lake Como to the Eagle Watch area southeast of Florence.
- The Big Ditch services 1,400 water users.

Infrastructure
Developed in early 1900'S

Ongoing Maintenance

Pipe Replacement



Como Dam

Current Rehabilitation Project

1,300,000 Cost to

Replace two discharge control valves

Loan of 300,000 @ 0% from Ravalli County

125,000 Grant from the State of Montana

Bureau of Reclamation grant – in progress

Daly Ditches

- Manages 10 main canals
- 75 miles of canal… 150 miles of Lateral ditches
- North of Darby to north of Corvallis
- Water from Bitterroot River.. Dam lake.. Skalkaho Creek.. And others
- Serving 15,000 acres
- 2000 water users

Corvallis Canal & Water Co

- **Director**
- 1st water right out of Bitter Root River…. 1871
- 5000 Miners inches….. 5000 acres….
- 165 irrigators served
- From river behind sewer plant in Hamilton to Wood Lane North of Corvallis


KUBOTA
CC&W
Head Gate repair
June 2017


Next project for
Corvallis Canal &
Water Co

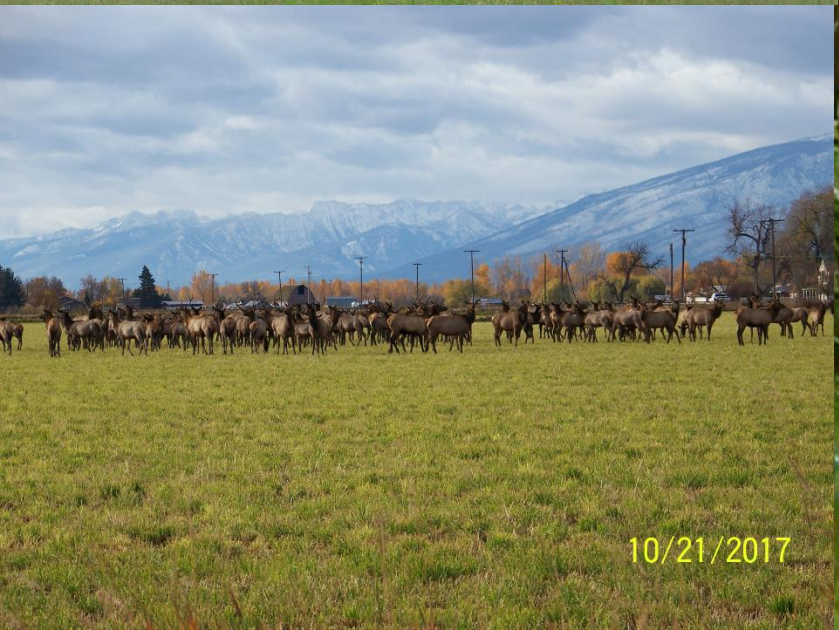

Separate Corvallis Canal from Willow Creek/Drain


A system like this, but likely not wood, will be implemented

Recreation

Wildlife

Wildlife



Resource Management Needs

- Upgrade existing infrastructure.
- Increase Storage where feasible.
- Ensure Wilderness Dam maintenance.
- Control excess runoff.
- Employ technology for maximum efficiency.
- Educate…. Educate…. Educate…. To ensure conservation and the best use of

OUR MOST PRECIOUS RESOURCE

WATER

Mankind

Despite all our achievements we owe our very existence to the

Fact

that there is

Six Inches of Top Soil

and that it

RAINS