



Upper Grande Ronde River Basin

An Introduction to Water Resources

Presented by
Oregon Water Resources Department
February 22, 2017

10/29/2008

The Water Setting

1. Physical description
2. Water use and control
3. Groundwater resources

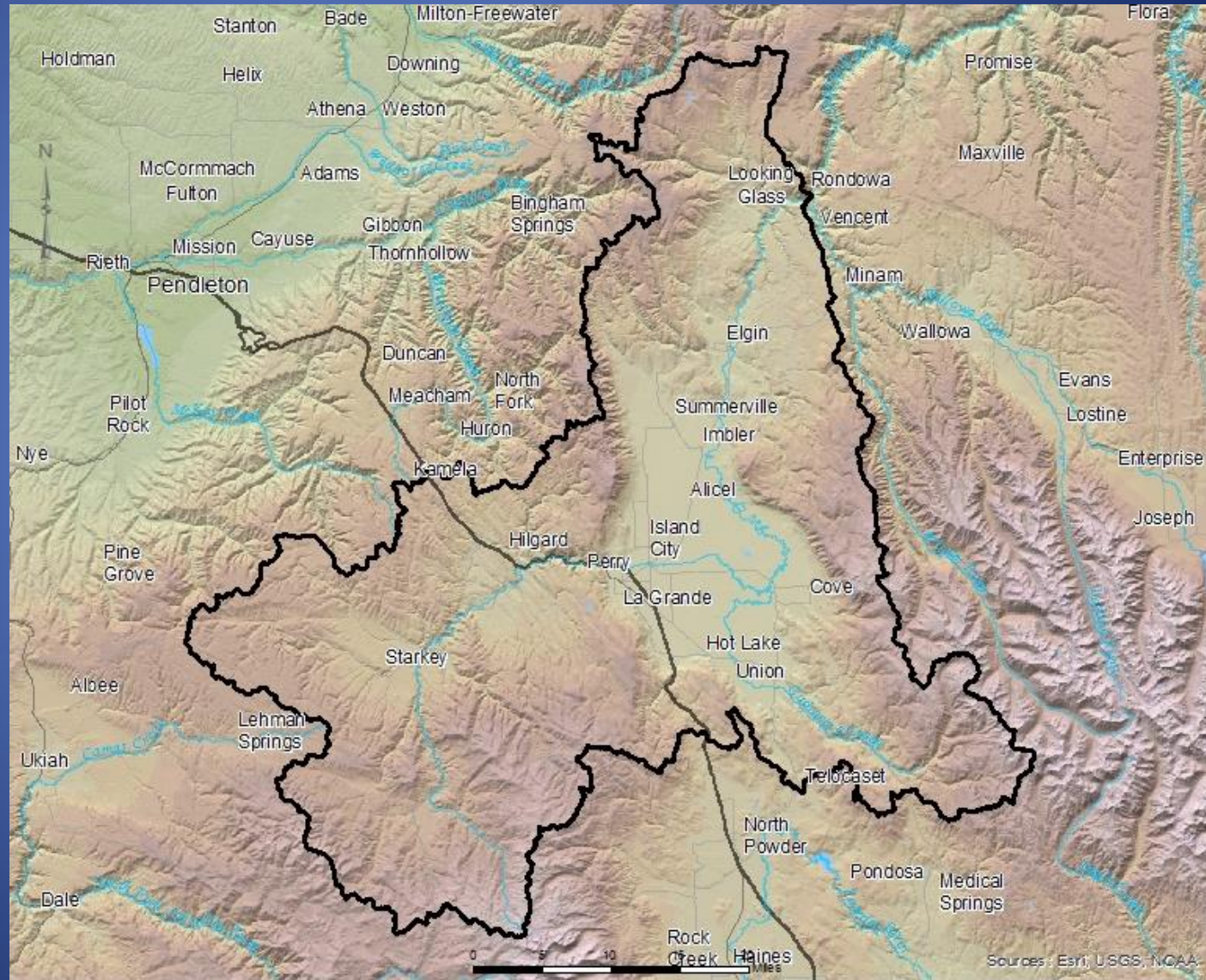
Physical Description - Topography

**Study Area:
1640 sq. miles**

**Mean Elevation:
4,170 feet**

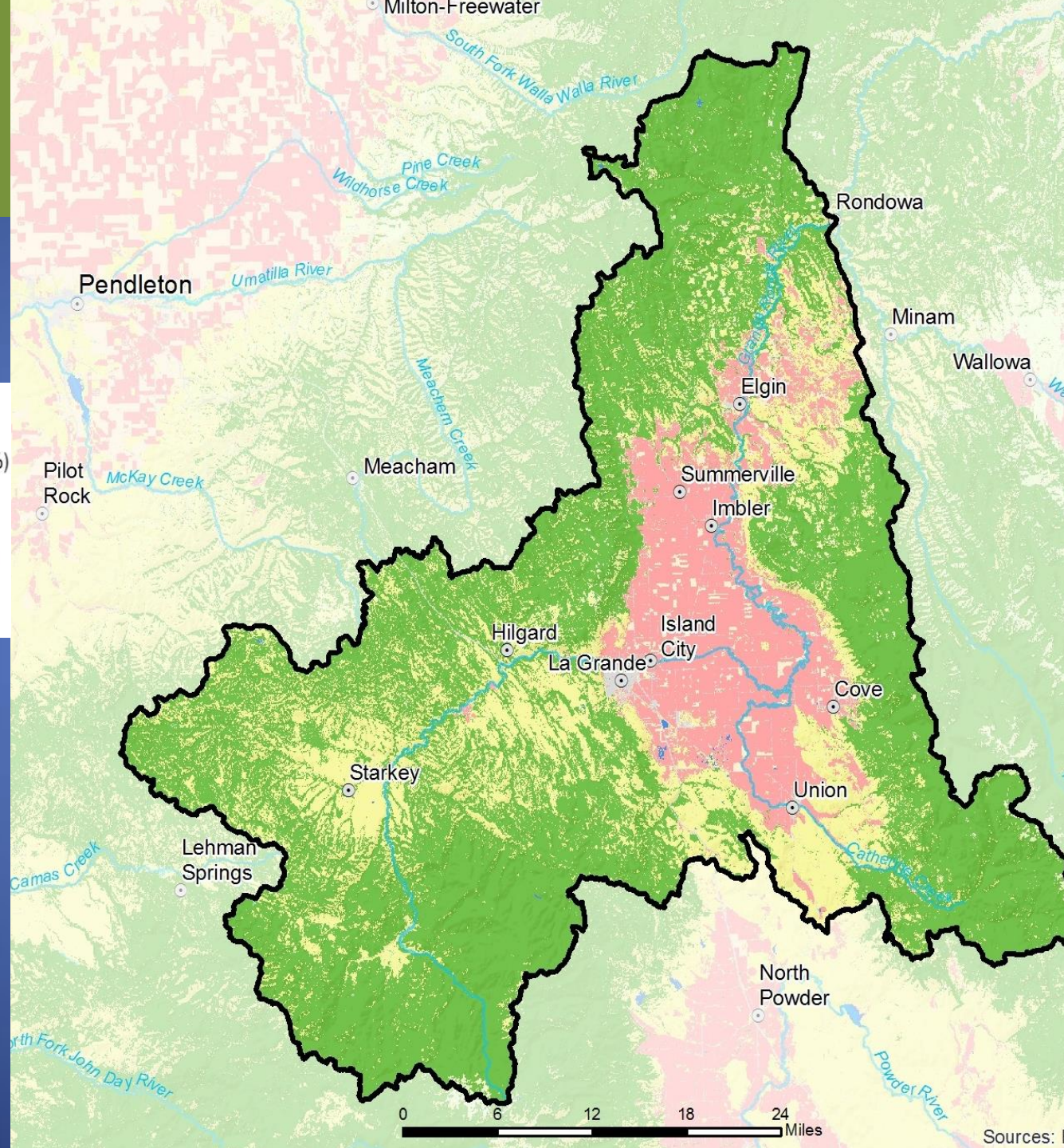
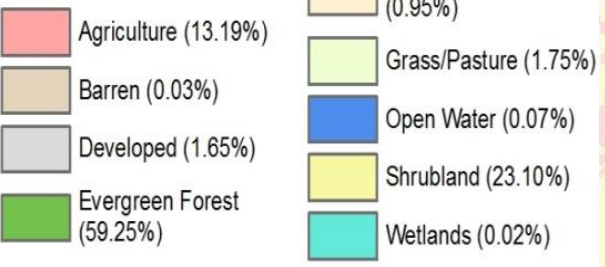
**Maximum relief:
6,350 feet**

**Mean slope:
10.5 degrees**



Land Cover

USDA Cropland Data (2014)



Sources:

Climate

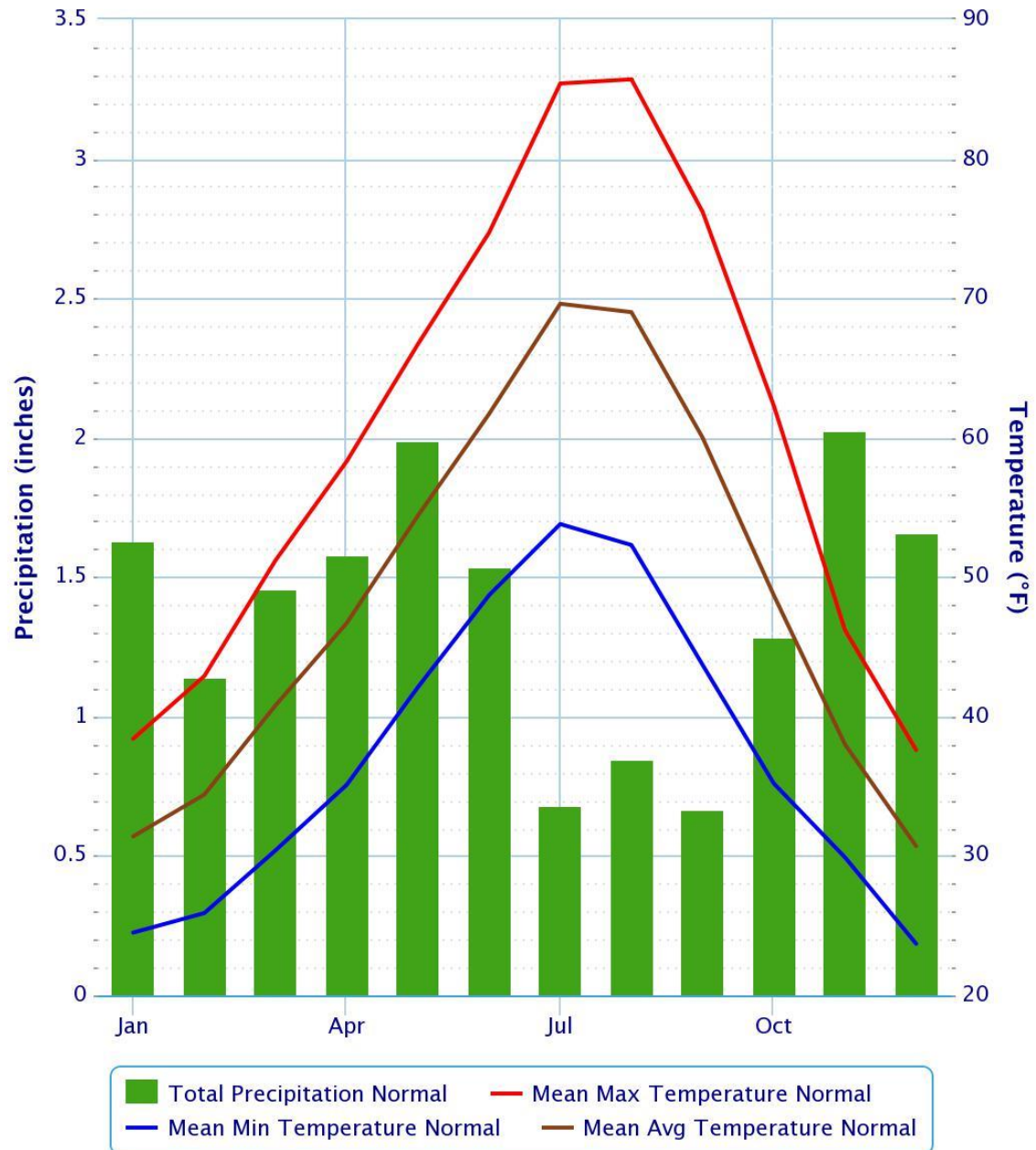
Mean annual precip.
28.25 inches

July – Sept driest

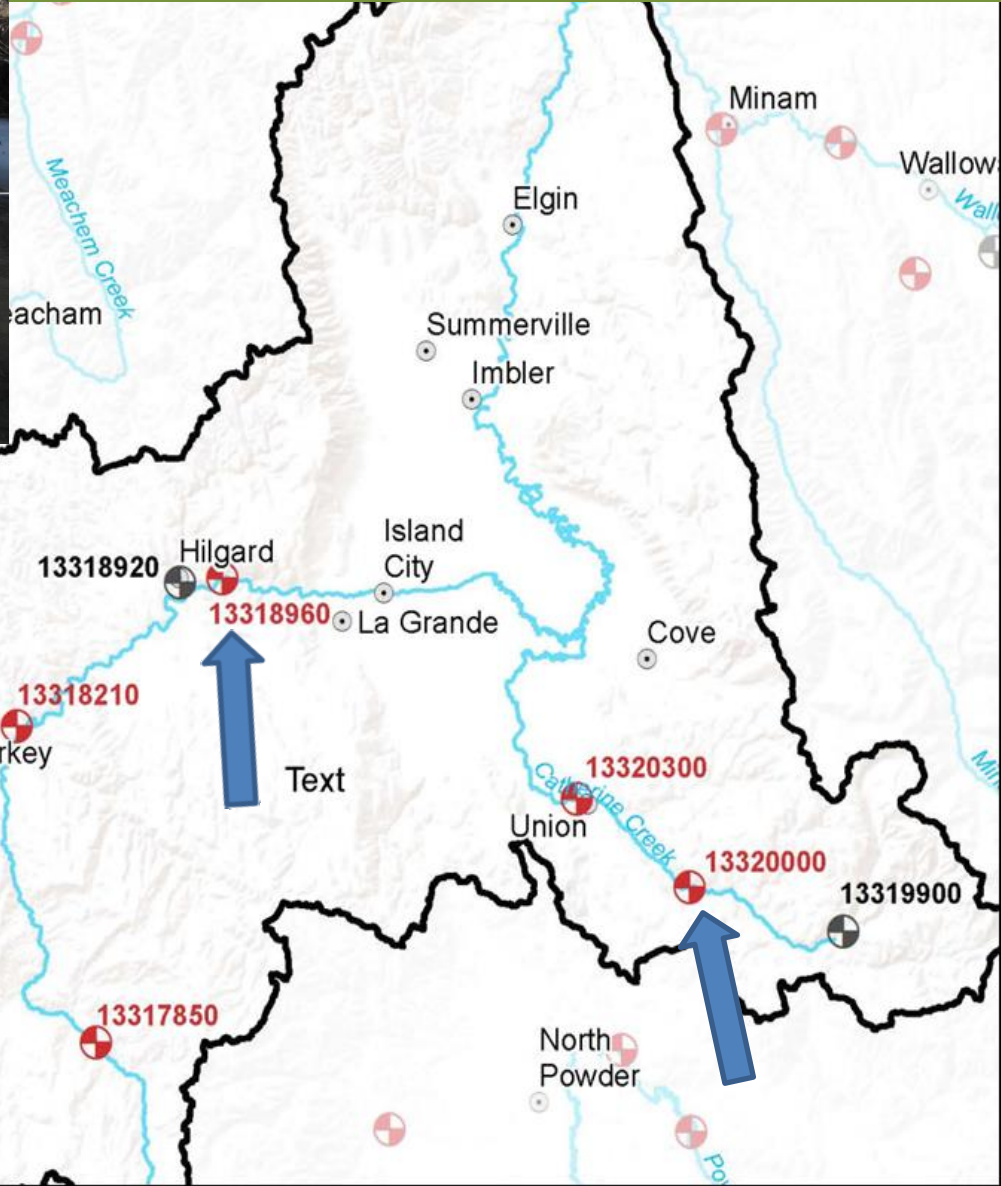
Large % of precip.
falls as snow

Monthly Climate Normals (1981–2010) – LA GRANDE, OR



Click and drag to zoom to a shorter time interval



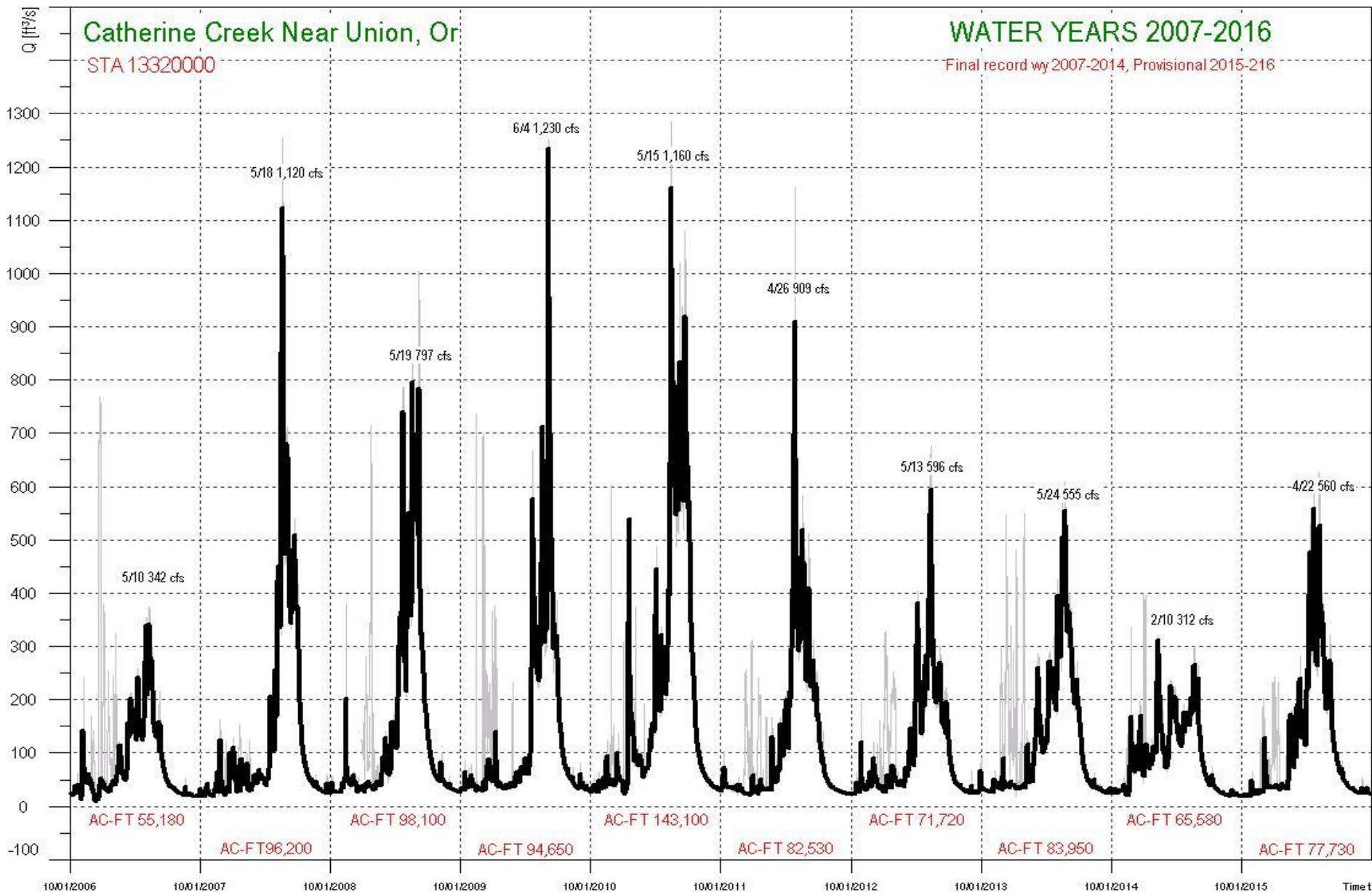
WRD Stream Gaging Stations



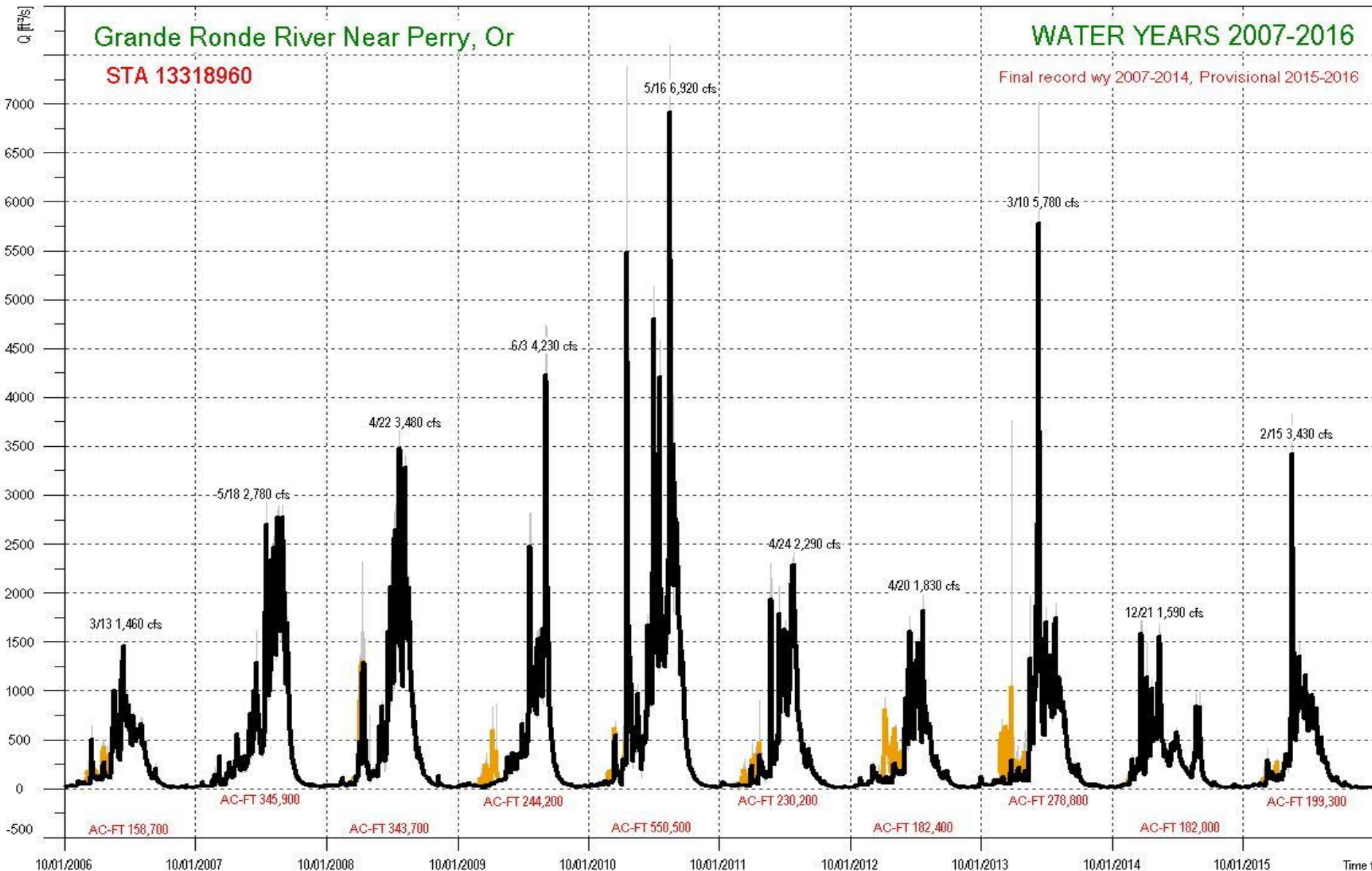
Active Gaging Stations

-  Stream gage and Station number
-  Near real-time gage and Station number

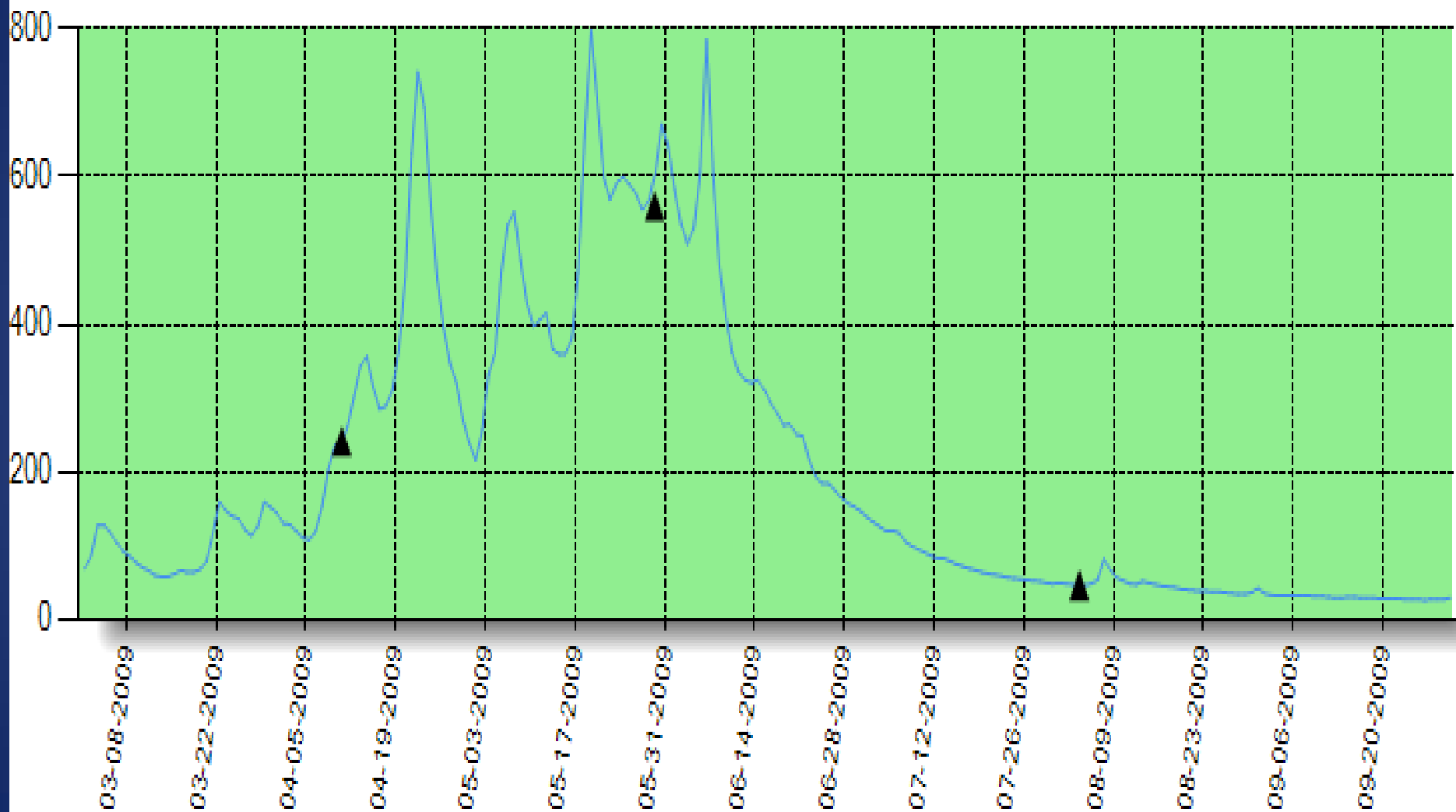
Hydrology: Catherine Creek



Hydrology: Grande Ronde



2009 Peak Flow Period



Catherine Creek above Union from March 1 through August 15.

Water Use and Control



Grande Ronde Basin Program

DIVISION 508

GRANDE RONDE BASIN PROGRAM

690-508-0000

General Classifications

(1) Stored water may be used for any beneficial purpose.

(2) The storage of up to 900 acre-feet of water for domestic or livestock purposes authorized under water rights with priority dates after November 6, 1992, shall be exempt from regulation for storage of water reserved under OAR 690-508-0110 through 0120.

690-508-0010

Upper Grande Ronde Subbasin

(1) Classifications:

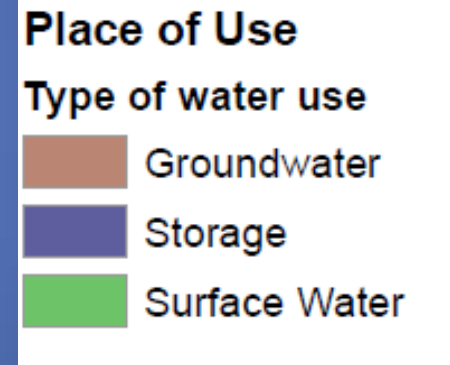
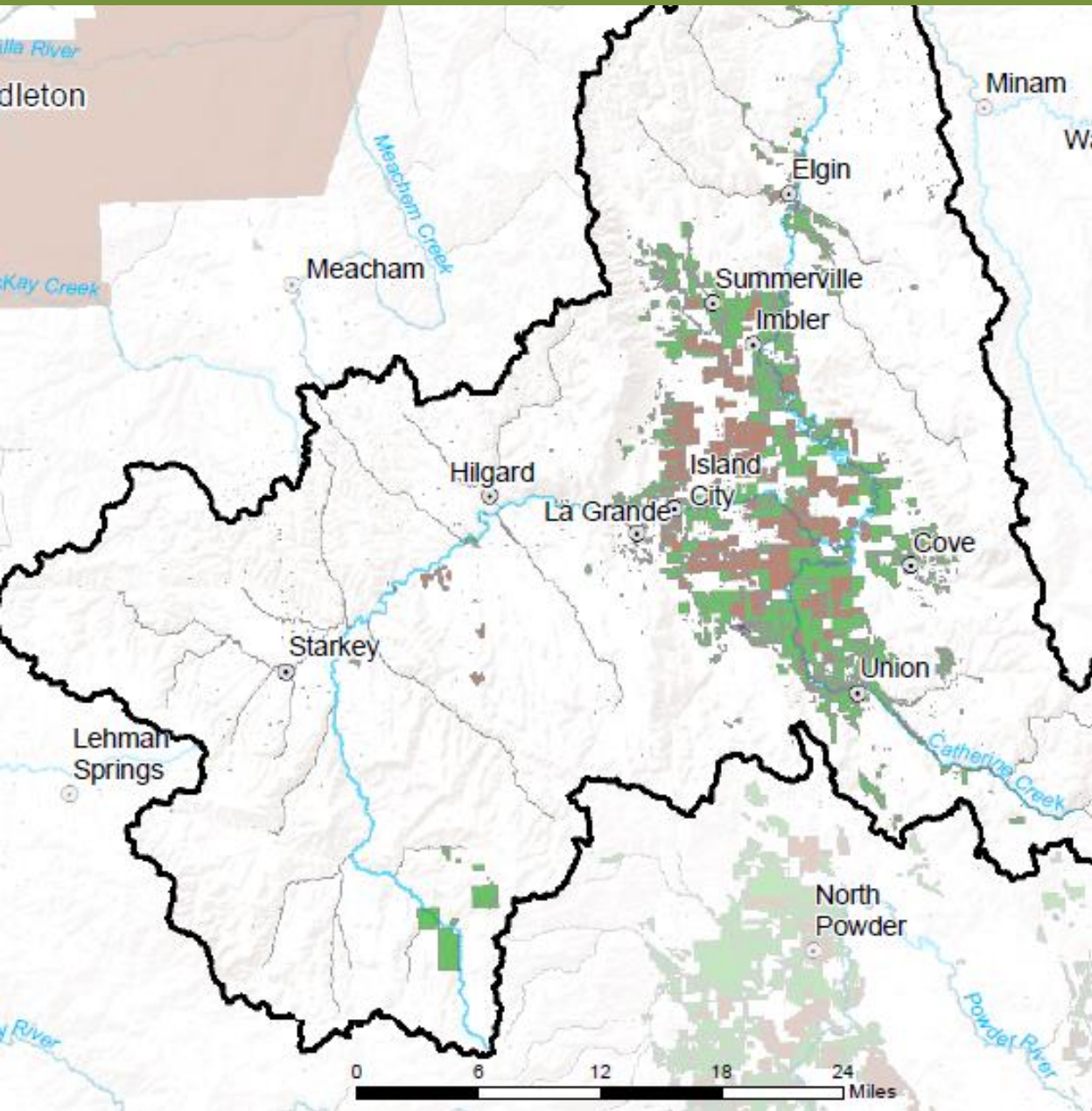
(a) The maximum economic development of this state and the attainment of the highest and best use of the waters of the Upper Grande Ronde for the benefit of the state as a whole, will be furthered through utilization of the aforementioned waters only for domestic, livestock, municipal, irrigation, flow augmentation, commercial, agriculture, power development, industrial, mining, recreation, wildlife, and fish life uses and the waters of the Upper Grande Ronde Basin are hereby so classified.

Surface Water Appropriation

Water Rights by Decade



Primary Water Rights by Type



Dams and Reservoirs

State Dams

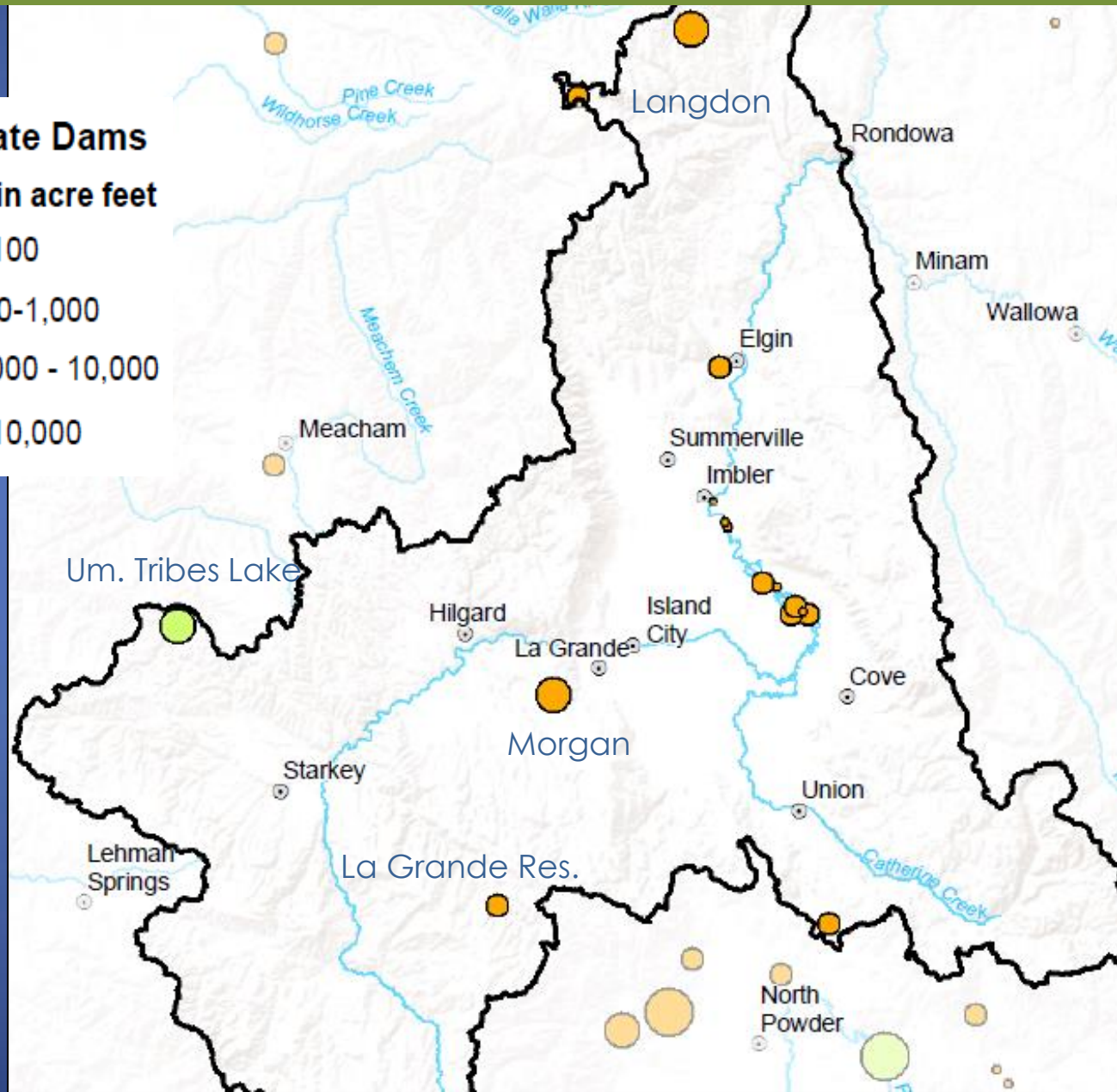
Storage in acre feet

- < 100
- 100-1,000
- 1,000 - 10,000
- > 10,000

Non-State Dams

Storage in acre feet

- < 100
- 100-1,000
- 1,000 - 10,000
- > 10,000




Dams and Storage Uses

Dam	River	Use	Owner
Arnoldus Loop	Grande Ronde	irrigation	Private
Beaver Creek	Beaver Creek	municipal	City of La Grande
Elgin Mill Trmt Lagoon #1	Waste Water	industrial	Boise Cascade
Elgin Mill Trmt Lagoon #2	Waste Water	industrial	Boise Cascade
Elmer Reservoir 1	Grande Ronde	irrigation	Private
Elmer Reservoir 2	Grande Ronde	irrigation	Private
Elmer Reservoir 3	Grande Ronde	irrigation	Private
Elmer Stoplog Dam	Grande Ronde	irrigation	Private
Fleet Reservoir 2	Grande Ronde	irrigation	Private
Fleets Loop	Grande Ronde	irrigation	Private
Howell	Grande Ronde	irrigation	Private
Indian Lake Dam		exempt	CTUIR
Jubilee Lake Dam	Mottet Creek	recreation	ODFW
Langdon Lake Dam	Lookingglass	recreation	Langdon Lake Association
Morgan Lake Dam	Sheep Creek	recreation	City of La Grande
Pyles Canyon 2	Pyles Creek	irrigation	Private
Ruckmans Reservoir	Grande Ronde	Irrigation	Private

Municipal Water

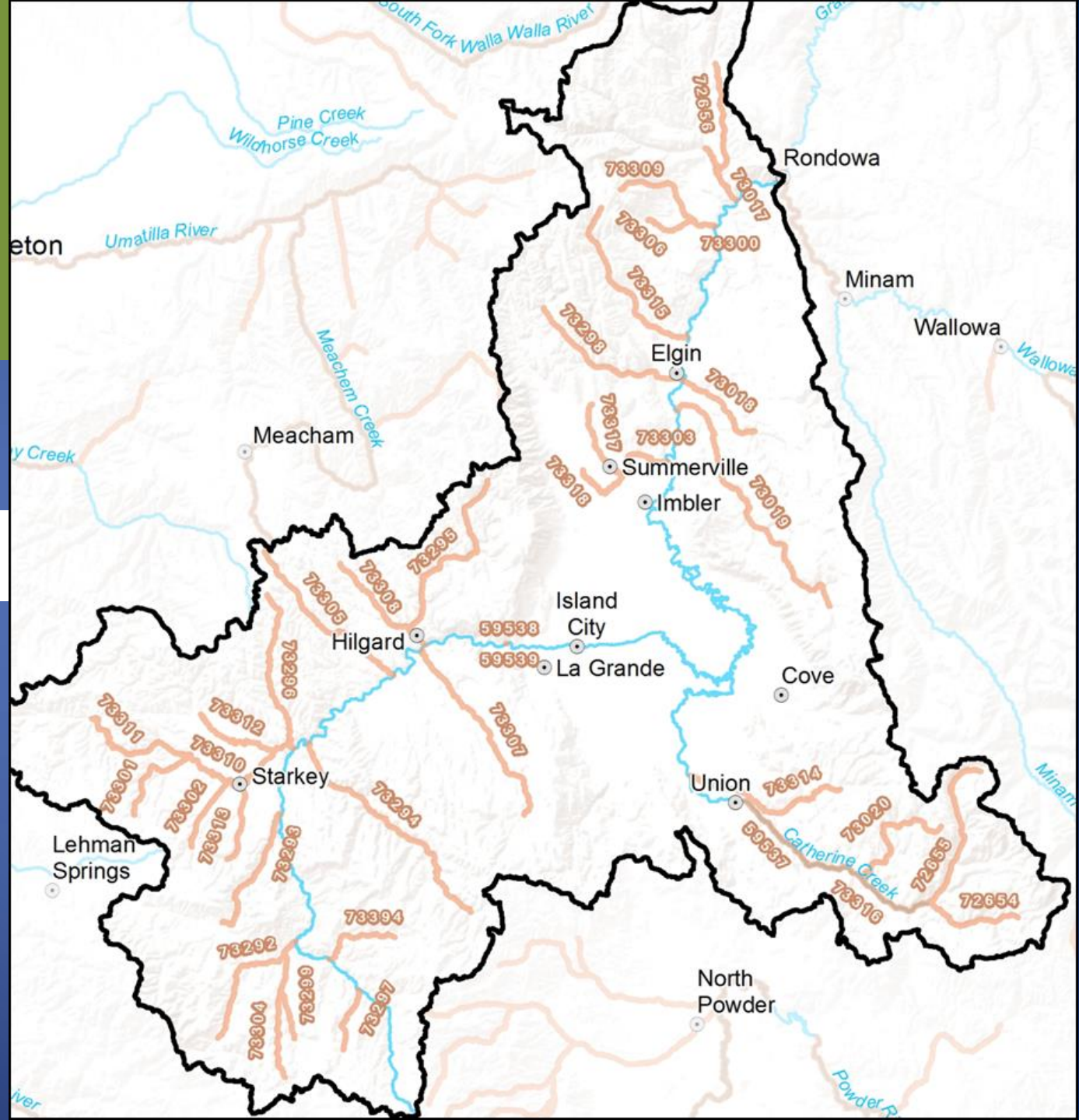
City	Date	Surface Water	Ground Water Alluvial	Ground Water Basalt
La Grande	1892	0.75		
	1909	7		
	1961			1.11
	1968		3.33	
	1969			1.33
510 Ac-Ft	1977		3.34	
	1984			4.46
	1992			5.8
	1998		4.46	
	2001		0.07	
Sum =		7.75	11.2	12.7
Island City	1977		1	
	1993		2.67	
	2000		0.31	
Sum =		0	3.98	0
Union	1874	0.85		
	1893	3		
	1963			0.45
	1983			4.01
	1989			5.57
Sum =		3.85		10.03
Cove	1914	0.1		
	1981			1.11
	2001			1.67
Sum =		0.1		2.78
Elgin	1917	0.75	(irrigation)	
	1949			5
	1967			3.3
Sum =		0.75		8.3
Imbler	1988		Muni	1.11
	1988		Fire Protection	4.46
Sum =				5.57

Instream Water Rights

 Instream water rights

1955 Minimum
Perennial
Streamflow Act

1987 Instream
Water Rights Act



Reservations of Water

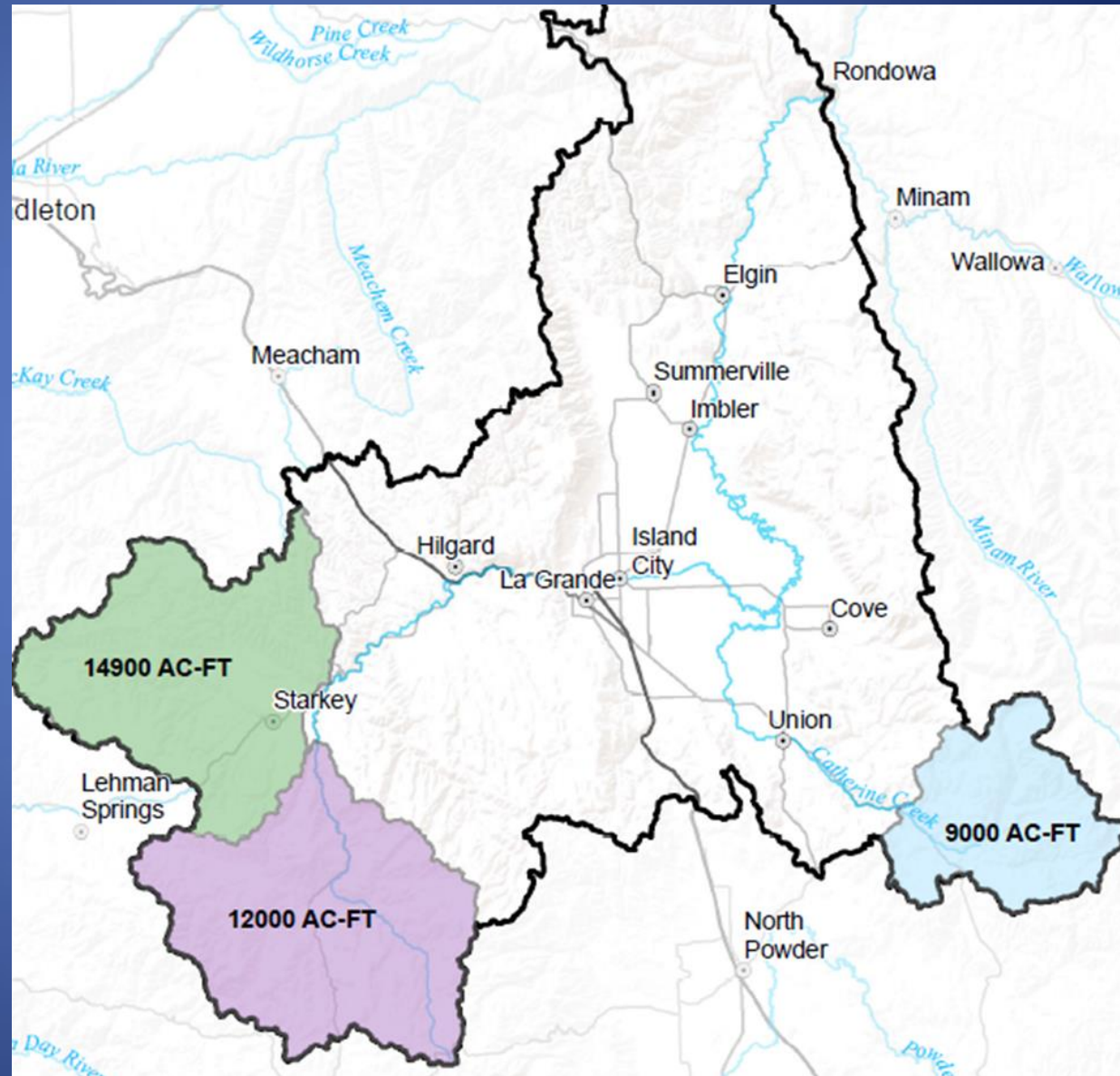
1987 Senate Bill 140

For future economic development through multipurpose storage

Grande Ronde
(Nov. 6, 1992)

ODA-requested

Division 79 Rules



Scenic Waterway

Grande Ronde State Scenic Waterway Designated 1988

– Confluence with Wallowa River to WA state line

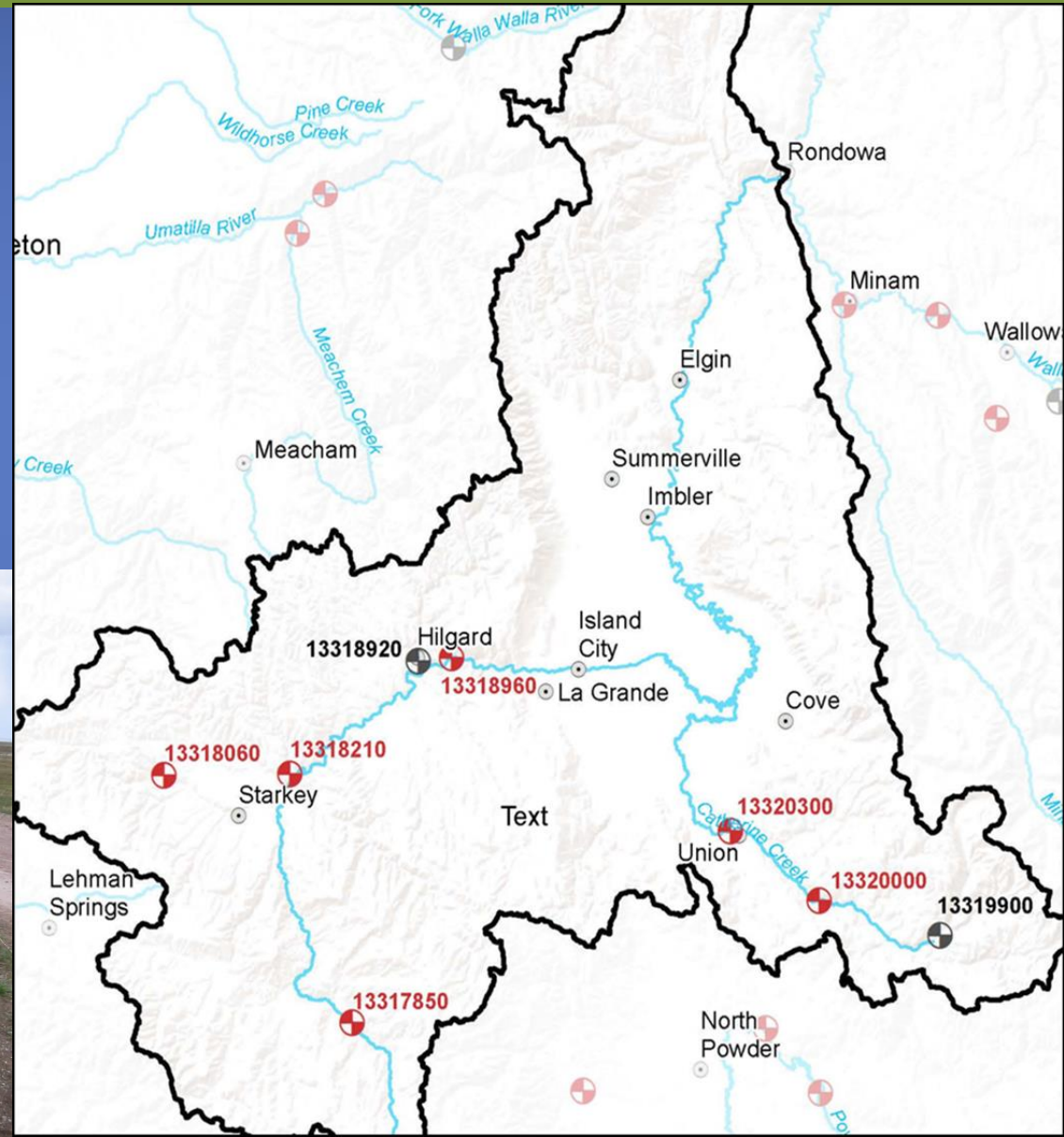
<u>Month</u>	<u>Flow CFS</u>
January	800
February	800
March	2000
April	5000
May	5000
June	5000
July	1500
August	800
September	800
October	800
November	1200
December	800



Water Right Regulation

Watermasters respond to calls from water users and determine who in times of water shortage has the right to use water.

Each summer as streamflows drop, they regulate junior users to provide water to more senior users.



Determining Water Availability

- Statistical summary of water available for appropriation by month
- Based on streamflow records from 1958-1987

The formula: $NS - ED = AW$

Natural Streamflow

– **Expected Demands:**

reservations for storage

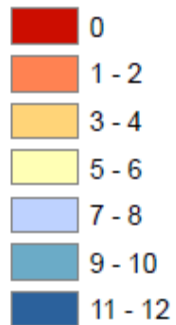
instream rights and scenic flows

out of stream rights

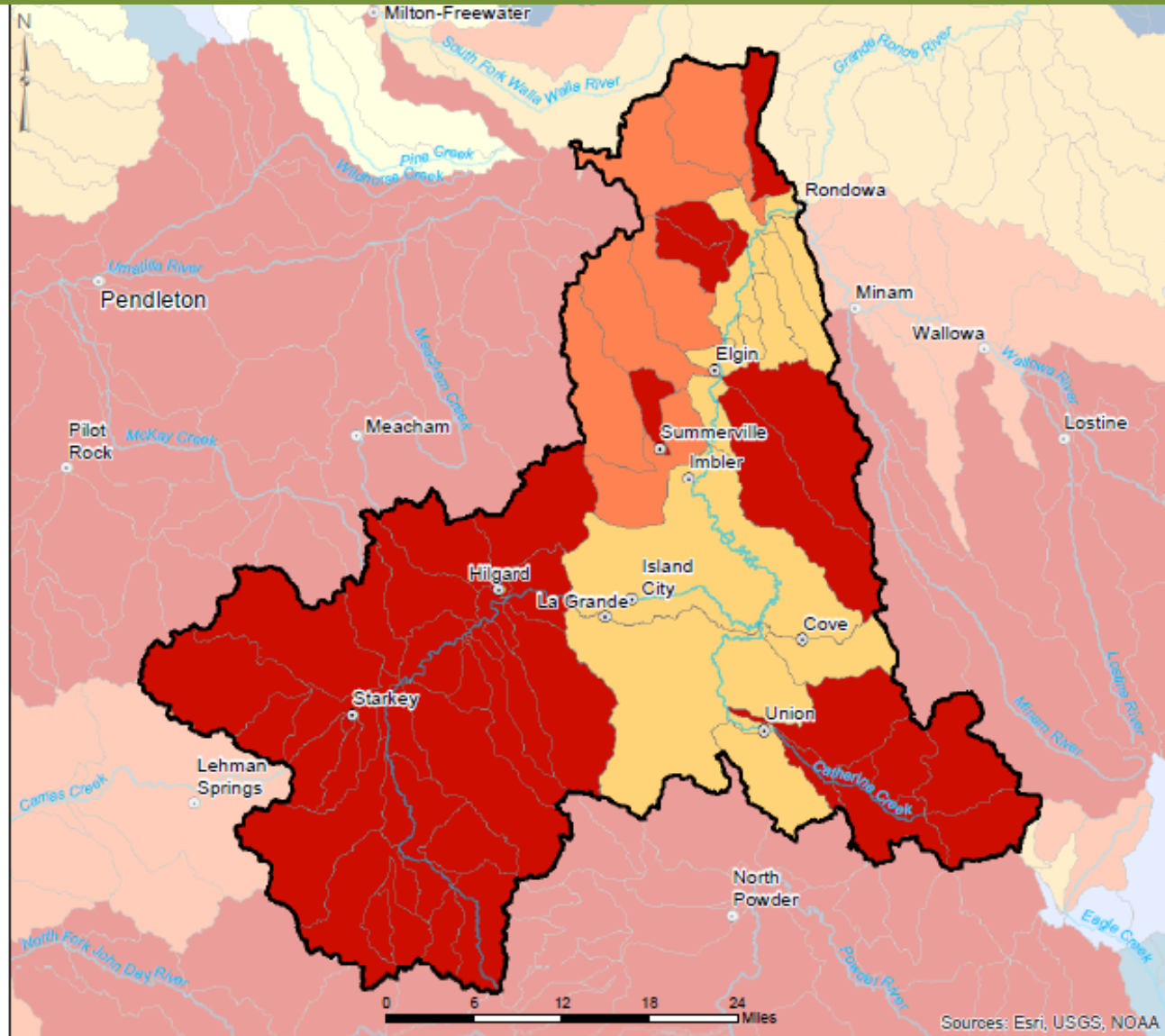
= Available Water

Water Availability – 80%

Number of Months Water is Available

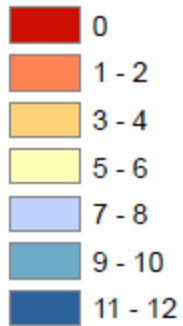


Map produced by:
Oregon Water Resources Department
725 Summer St. NE Suite A
Salem, OR 97301

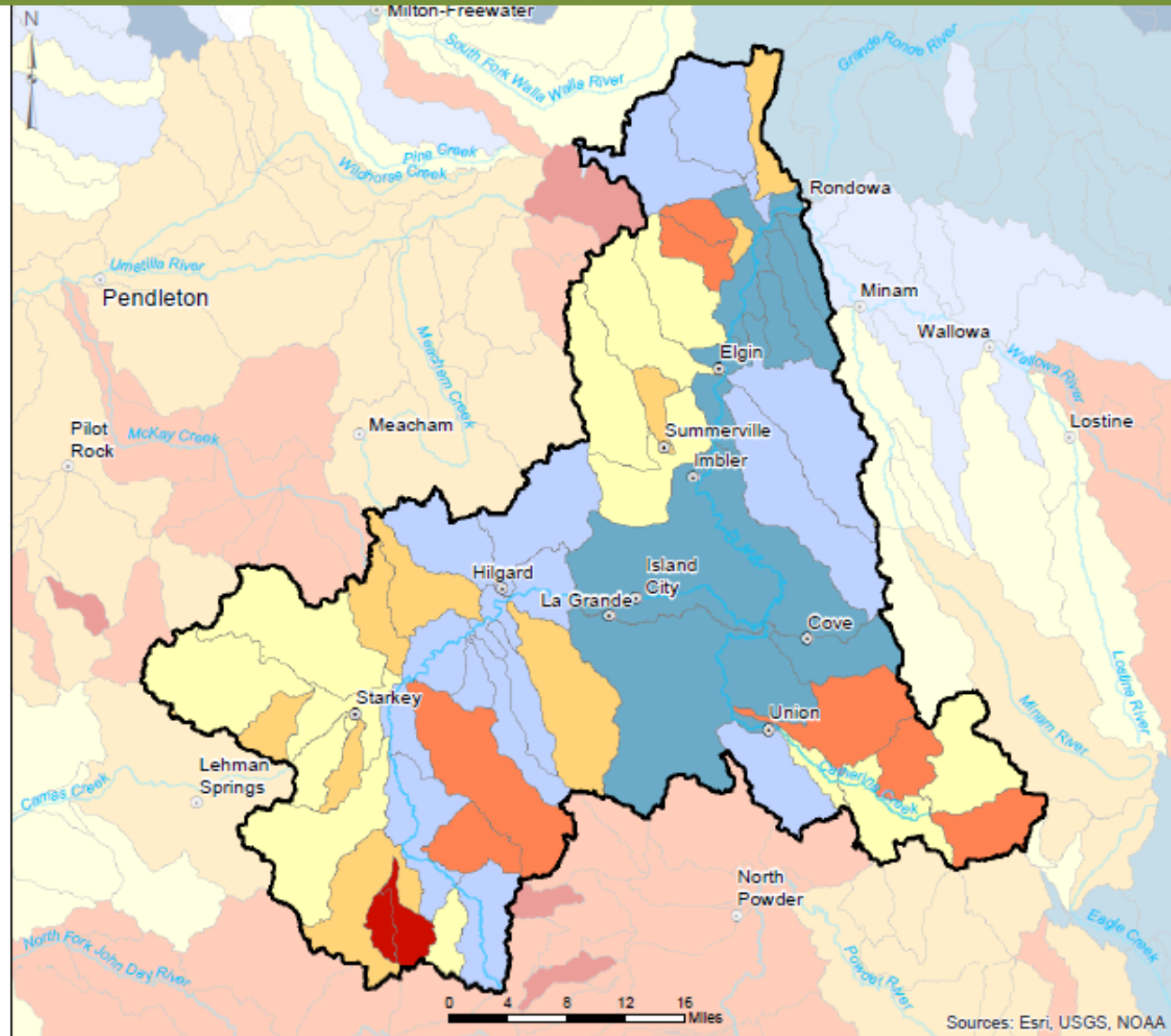


Water Availability – 50%

Number of Months Water is Available



Map produced by:
Oregon Water Resources Department
725 Summer St. NE Suite A
Salem, OR 97301



Questions?

On which topics do you want more information?

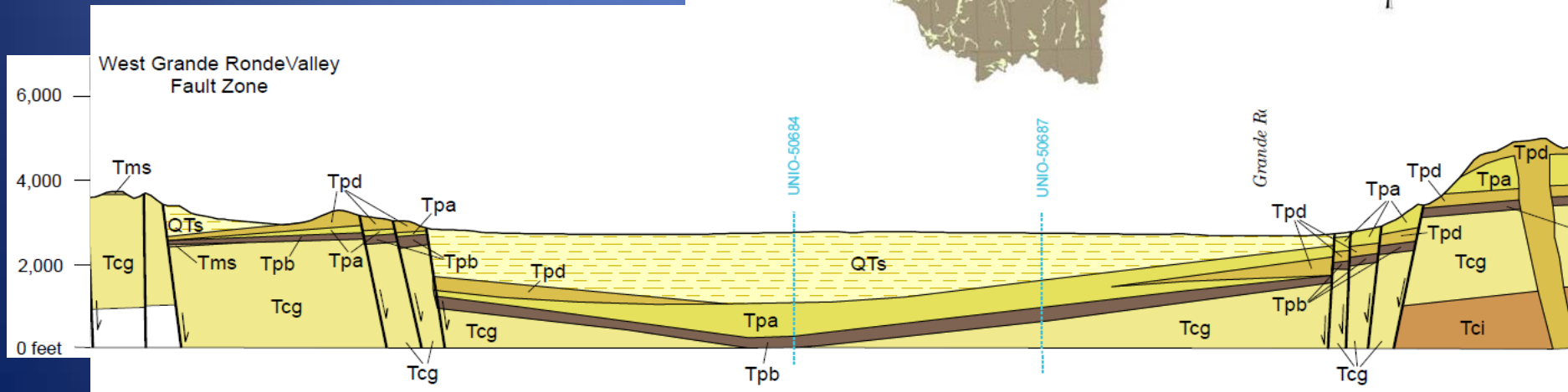
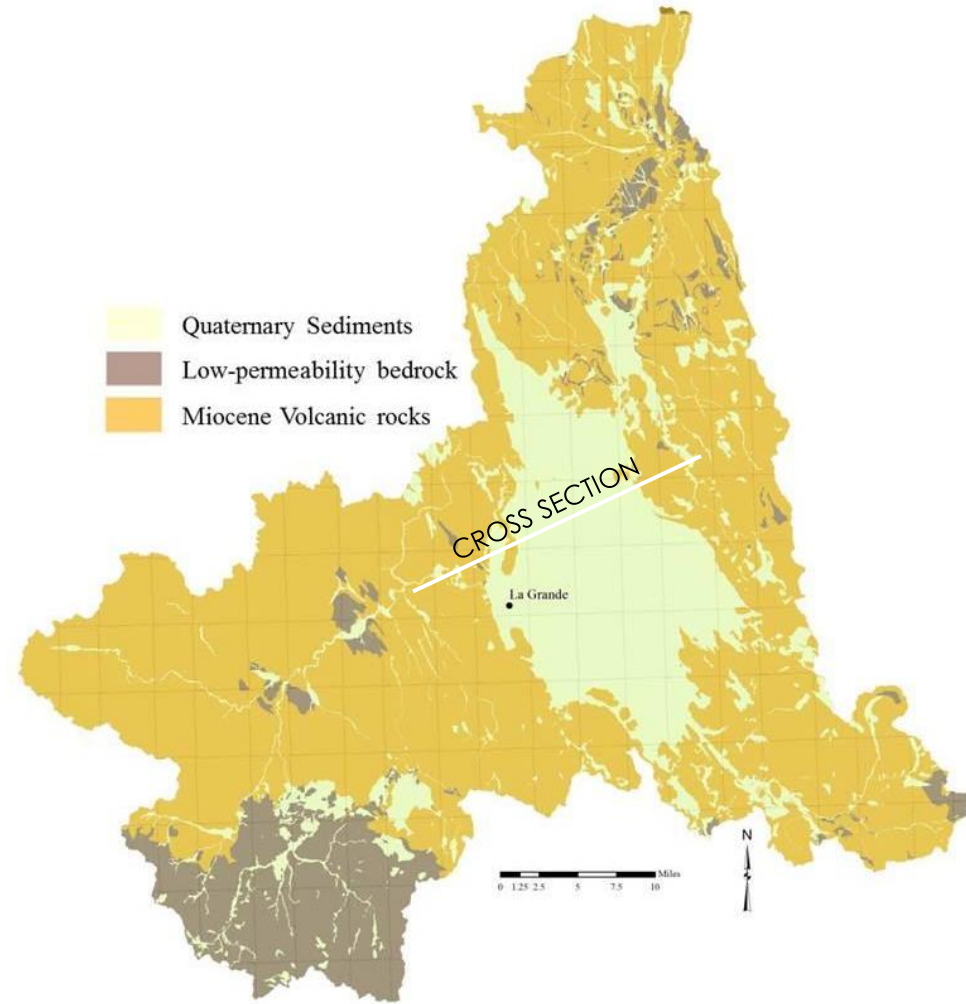
Does anything stand out having seen this information?

Groundwater Resources



Aquifers

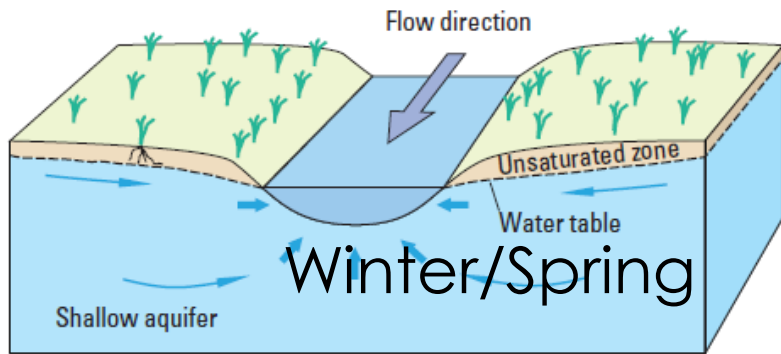
- Valley-fill sediments
 - Unconfined to poorly confined
 - Moderate to low yields
 - Hydraulically connected to streams
 - As thick as 2,500' in Valley
- Volcanic aquifers
 - Confined to unconfined
 - Very high to moderate yields
 - Low storage
- Low-permeability bedrock
 - Low to very low yields
 - Older units, low permeability



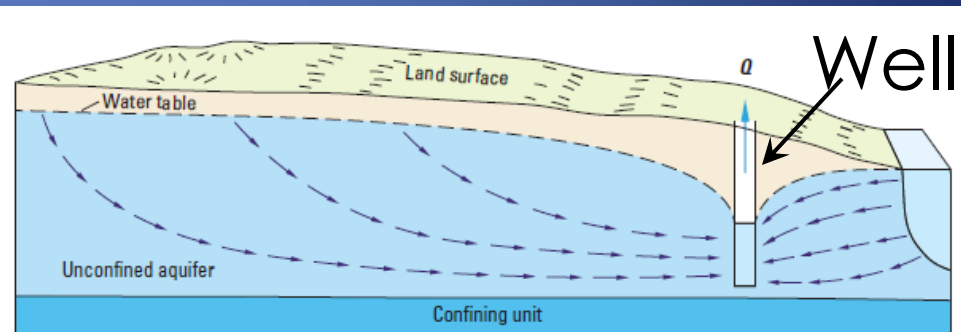
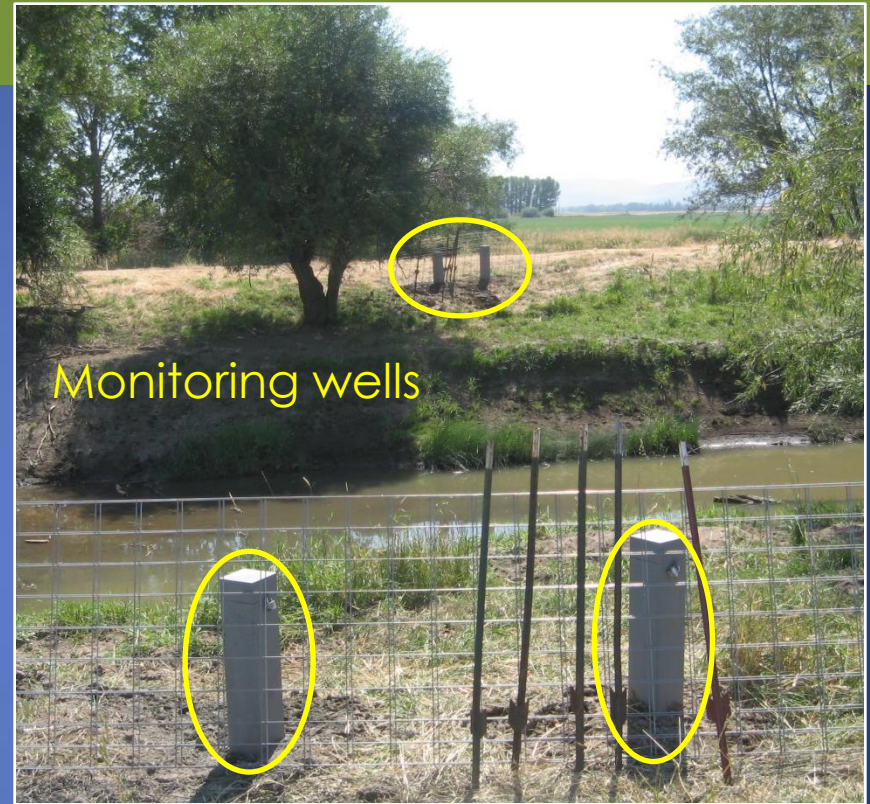
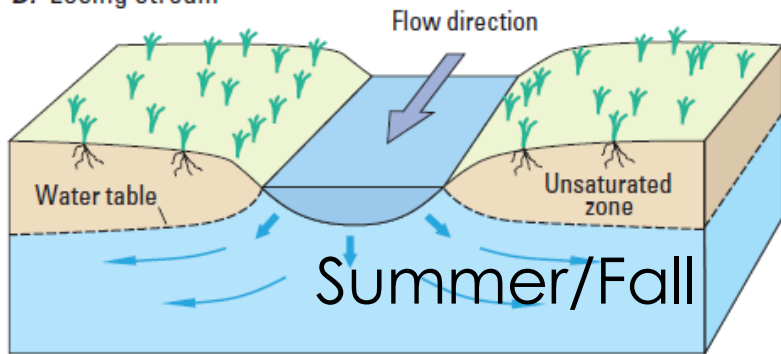
Geology of the Upper Grande Ronde River Basin, Union County, Oregon (Ferns and others, 2010)

Groundwater/Surface Water Interaction

A. Gaining stream



B. Losing stream

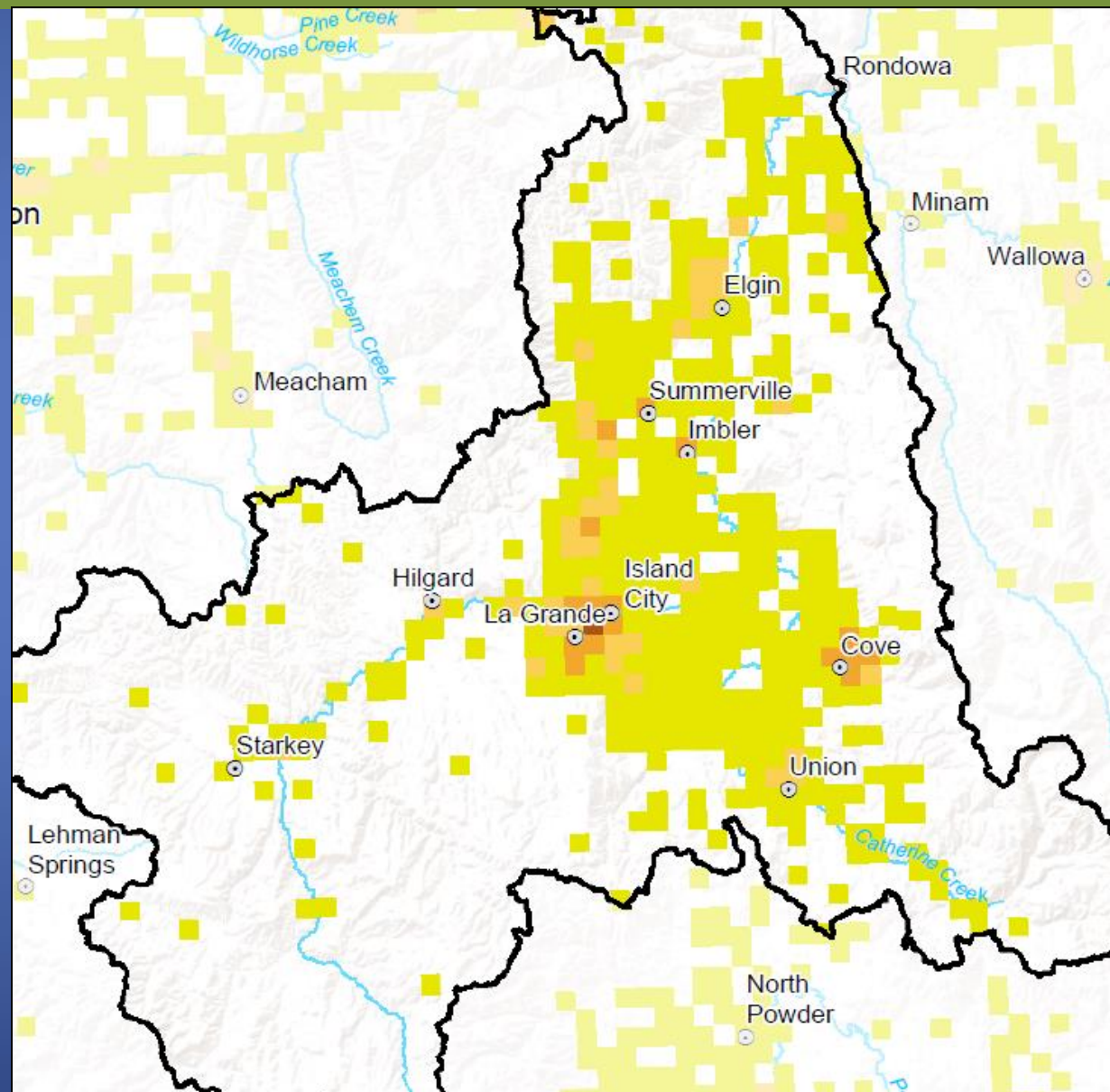
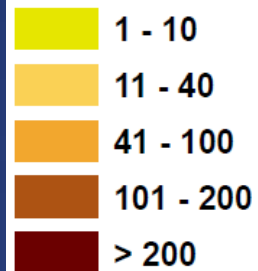


- Water table fluctuations influence streamflow
- Streams can gain/lose flow seasonally
- Water table responds to local pumping

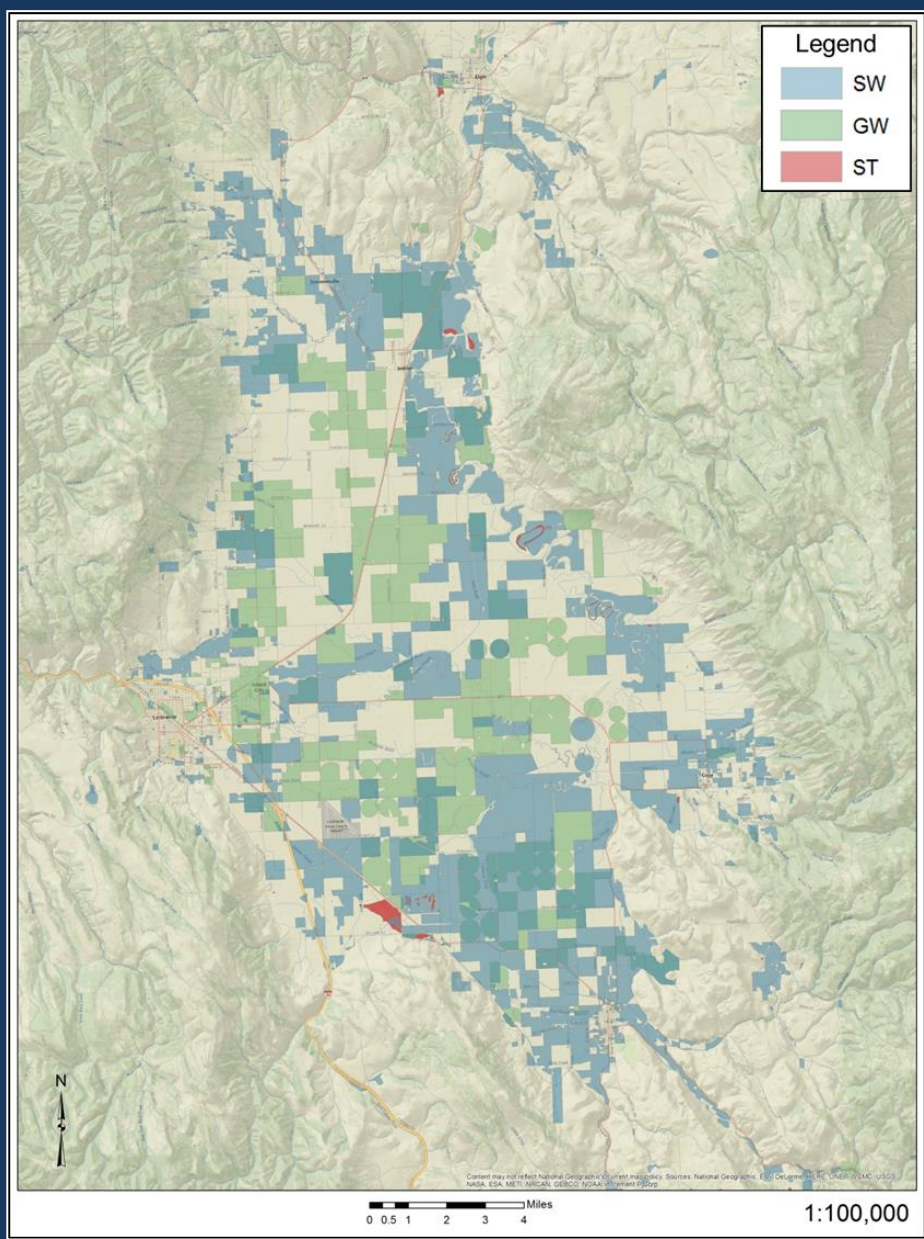
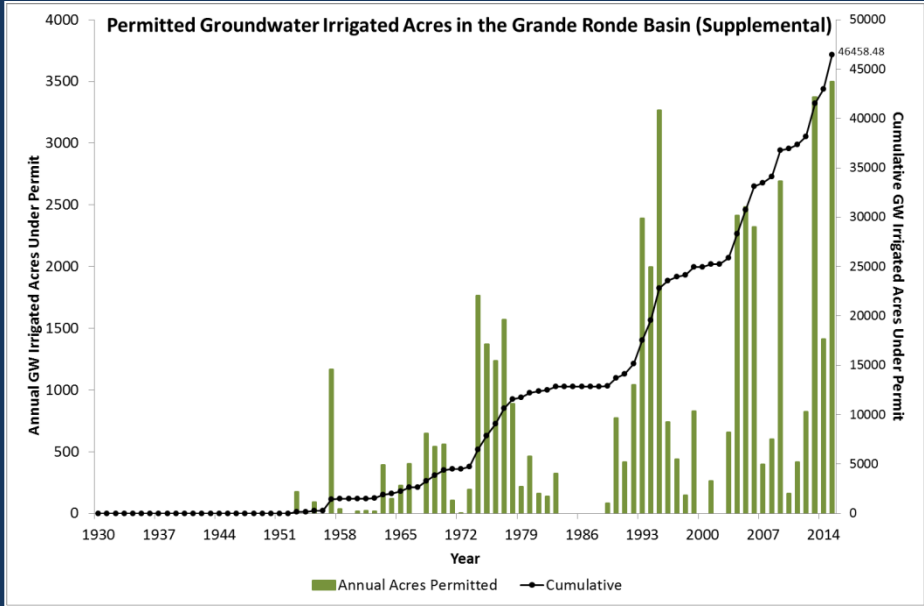
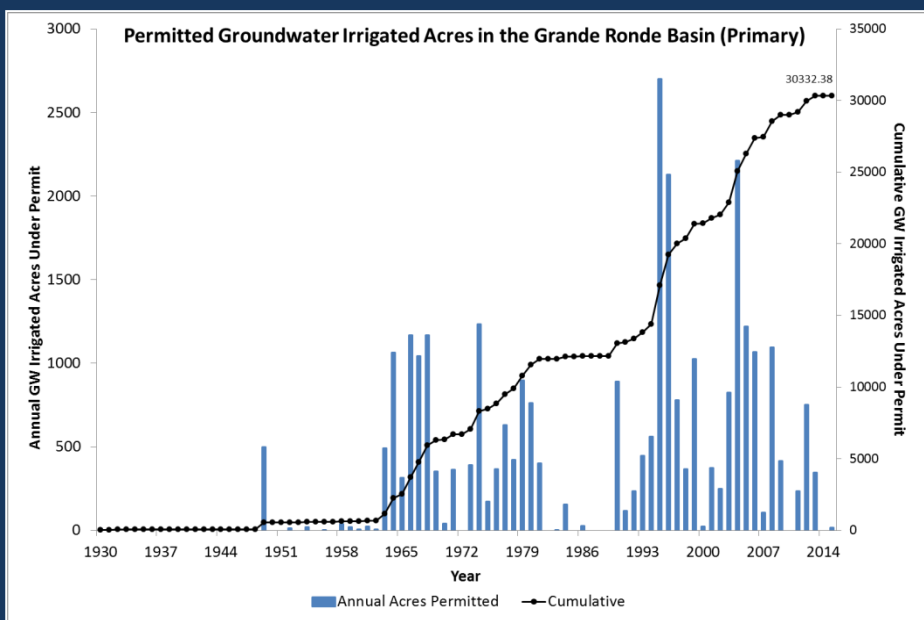
Groundwater Well Density

Well Density

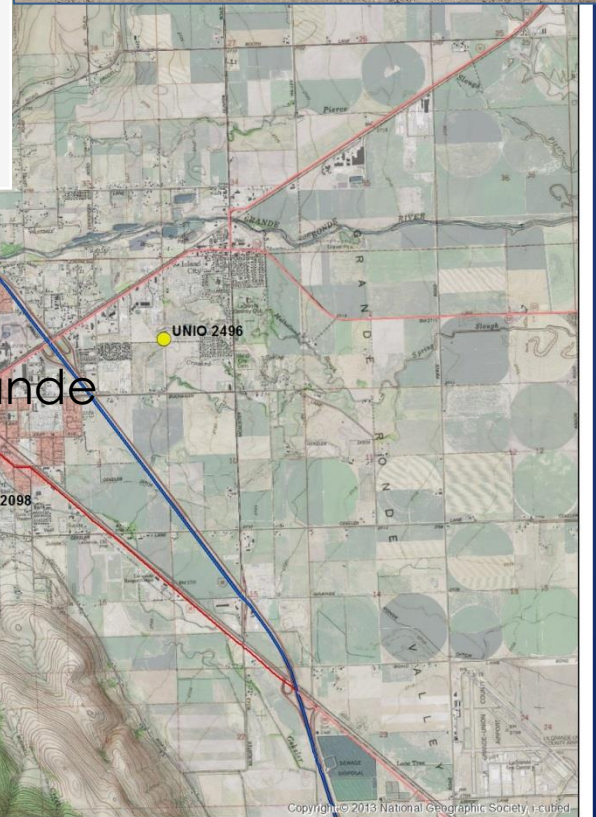
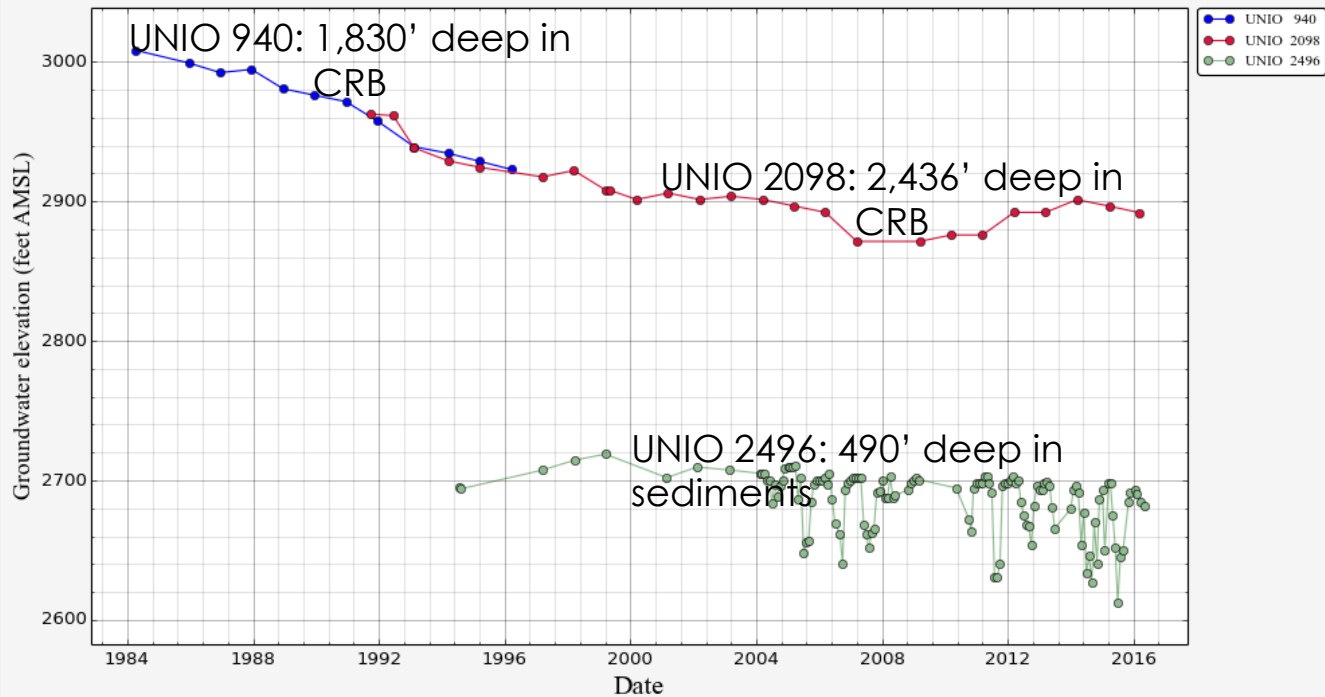
Number of Wells by PLS Section



Groundwater Rights



Observation Well Data



Summary of Wells by Use:

- Domestic - 2663
- Irrigation - 328
- Industrial - 45
- Livestock - 36
- Community - 28

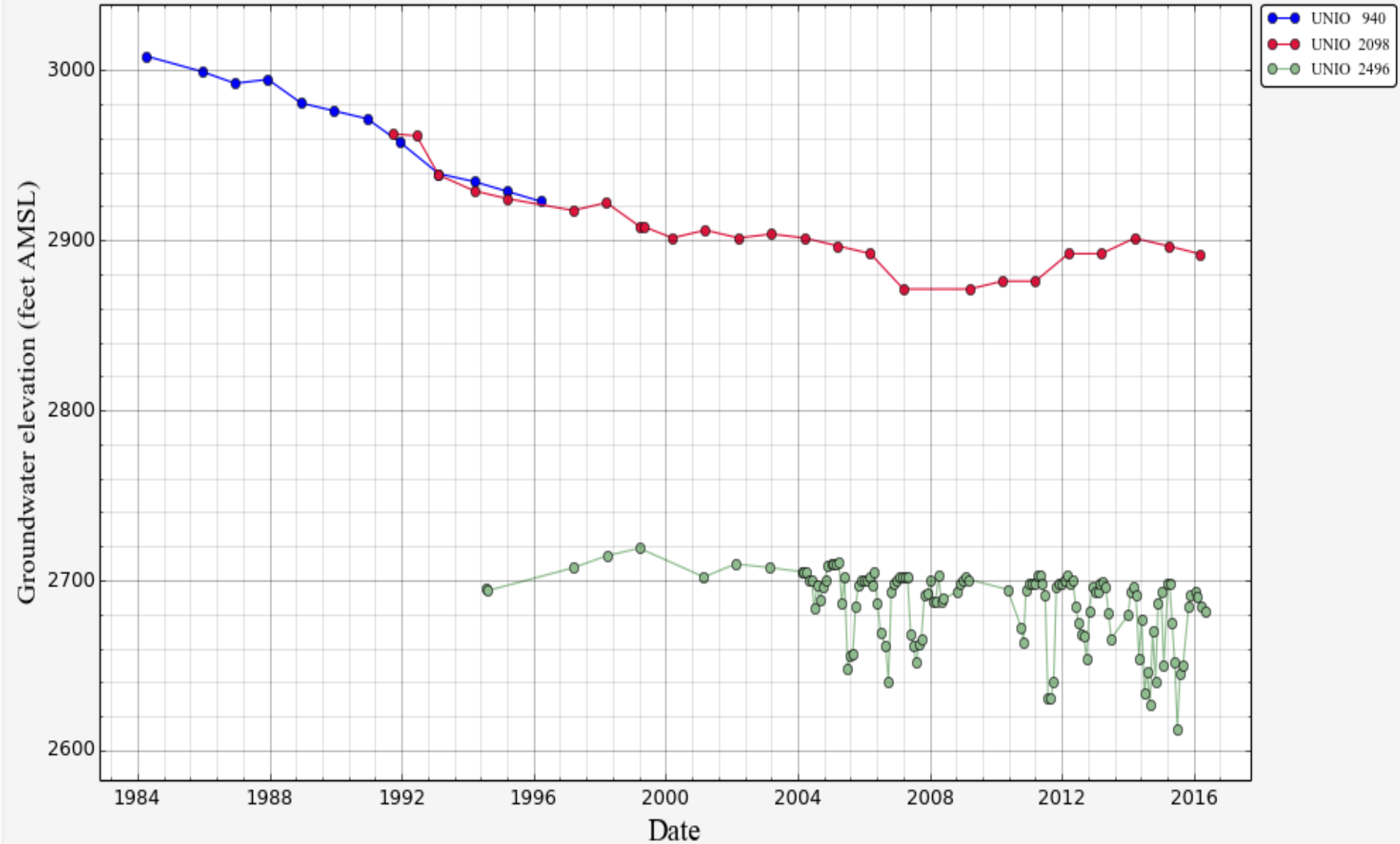


0 0.25 0.5 1 1.5 2 Miles

1:48,000

Observation Well Data

Observation Well Data



Previous Groundwater Studies

Hampton, E.R. and Brown, S.G., Geology and Ground-Water Resources of the Upper Grande Ronde River Basin, Union County, Oregon: USGS Water Supply Paper 1597, **1964**.

La Marche, J., Wozniak, K.C., Hattan, S., and Hackett, J.A., Groundwater and Surface Water Interactions in the Catherine Creek Watershed, Oregon – Results and Analysis from the 2011 Seepage Run: Water Resources Department Open File Report SW 2012-001, **2012**.

Ferns, M.L., McConnell, V.S., Madin, I.P., and Johnson, J.A., Geology of the Upper Grande Ronde River Basin, Union County, Oregon, DOGAMI Bulletin 107, **2010**.

Conclusions from Current Info

- Further development of the unconfined sedimentary aquifer in the Grande Ronde Basin is inhibited by hydraulic connection to surface waters above a Scenic Waterway.
- Development of confined volcanic aquifers is possible, but at considerable expense and risk.

Questions?

Presenter contact information

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