

# The State of the Well in Oregon



John Day River

Karl C. Wozniak, Hydrogeologist  
Oregon Water Resources Department  
December 11, 2008

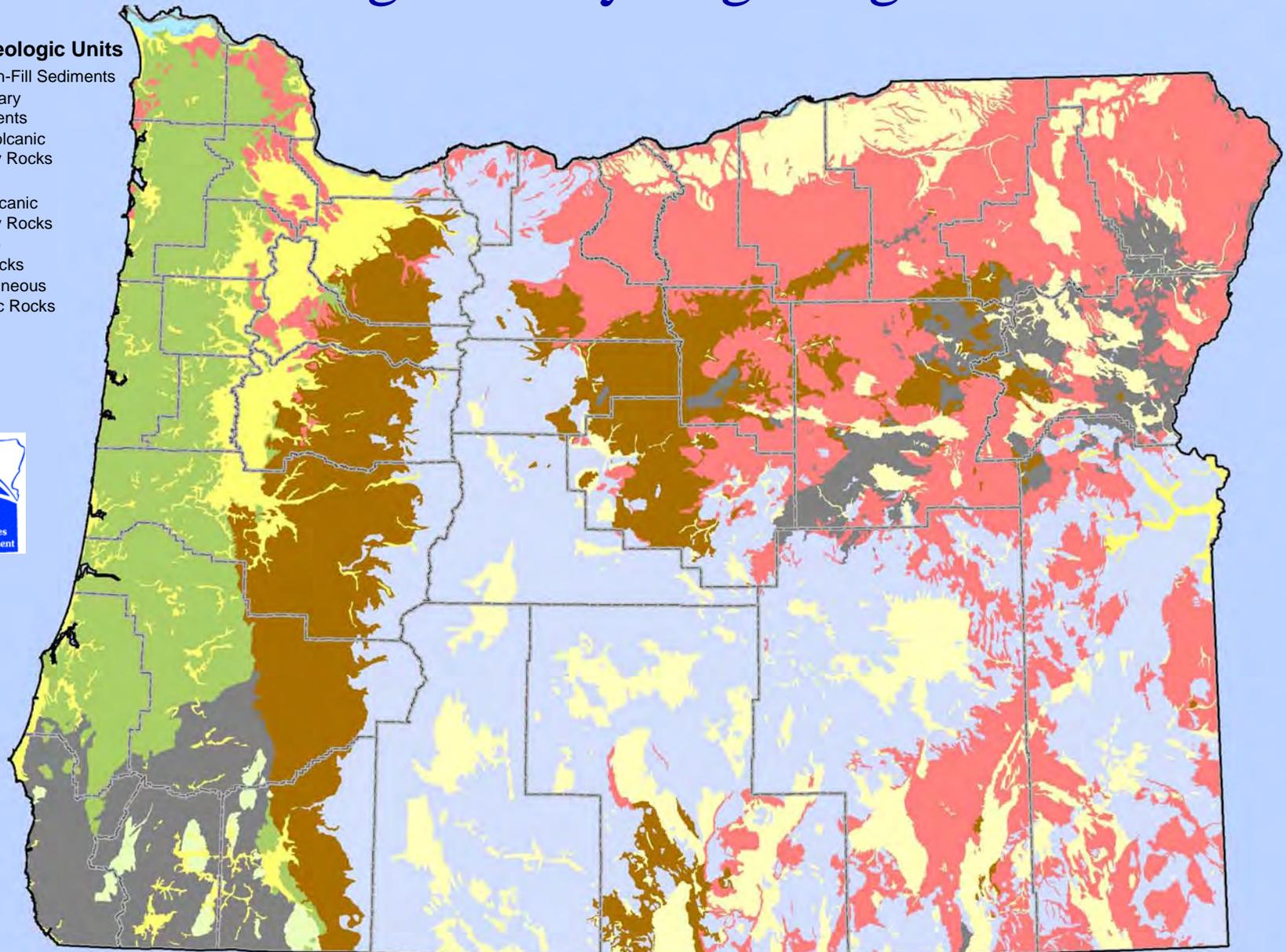


# Regional Hydrogeologic Units

Counties

## Regional Hydrogeologic Units

- Quaternary Basin-Fill Sediments
- Tertiary-Quaternary Basin-Fill Sediments
- Post-Miocene Volcanic and Sedimentary Rocks
- Miocene Basalts
- Pre-Miocene Volcanic and Sedimentary Rocks
- Eocene-Miocene Coast Range Rocks
- Pre-Oligocene Igneous and Metamorphic Rocks
- Granitic Rocks



Oregon Water Resources Department December 2008

0 25 50 100 Miles

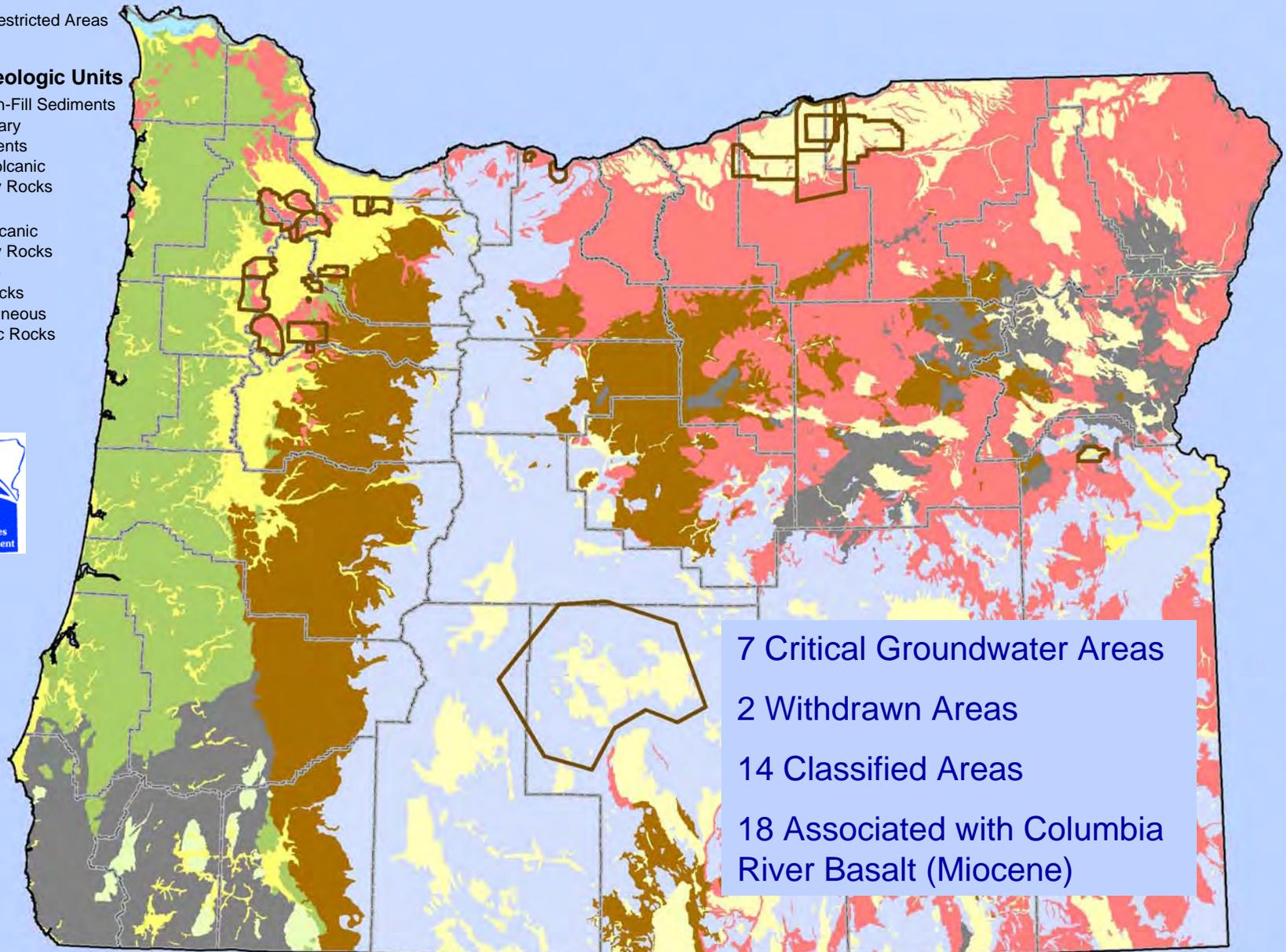


# Groundwater Restricted Areas

- Ground Water Restricted Areas
- Counties

## Regional Hydrogeologic Units

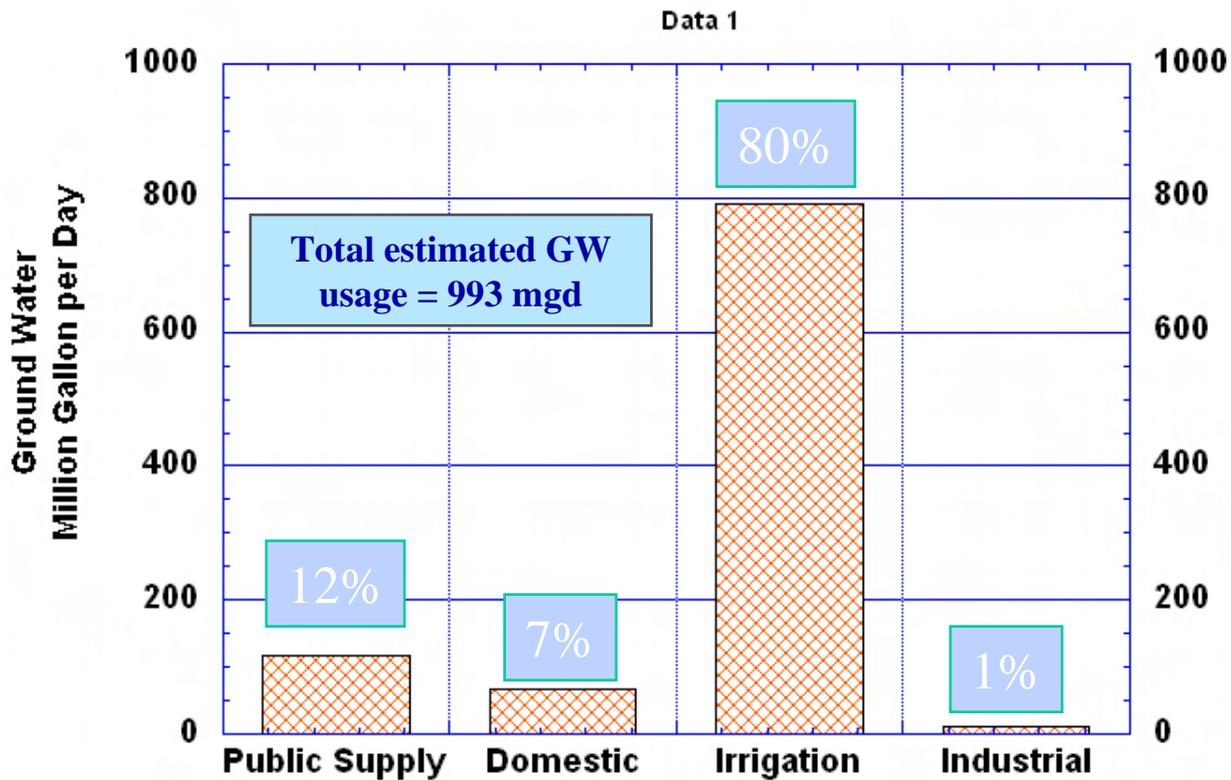
- Quaternary Basin-Fill Sediments
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- Eocene-Miocene Coast Range Rocks
- Pre-Oligocene Igneous and Metamorphic Rocks
- Granitic Rocks



7 Critical Groundwater Areas  
2 Withdrawn Areas  
14 Classified Areas  
18 Associated with Columbia River Basalt (Miocene)



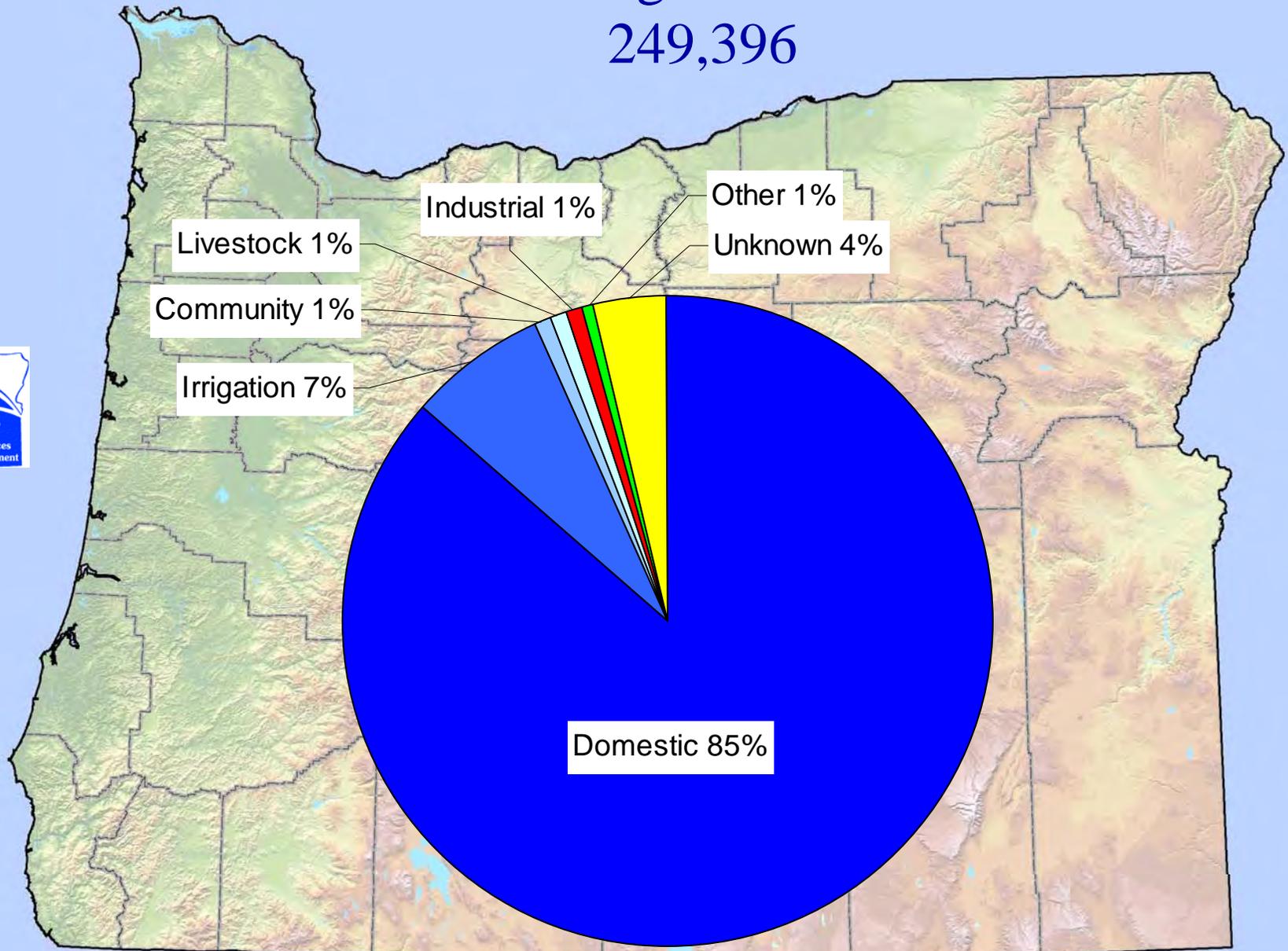
# Groundwater Usage in Oregon



Source: Estimated Use of Water in the United States in 2000,  
U.S. Geological Survey Circular 1268

# Water Well Logs – December 2008

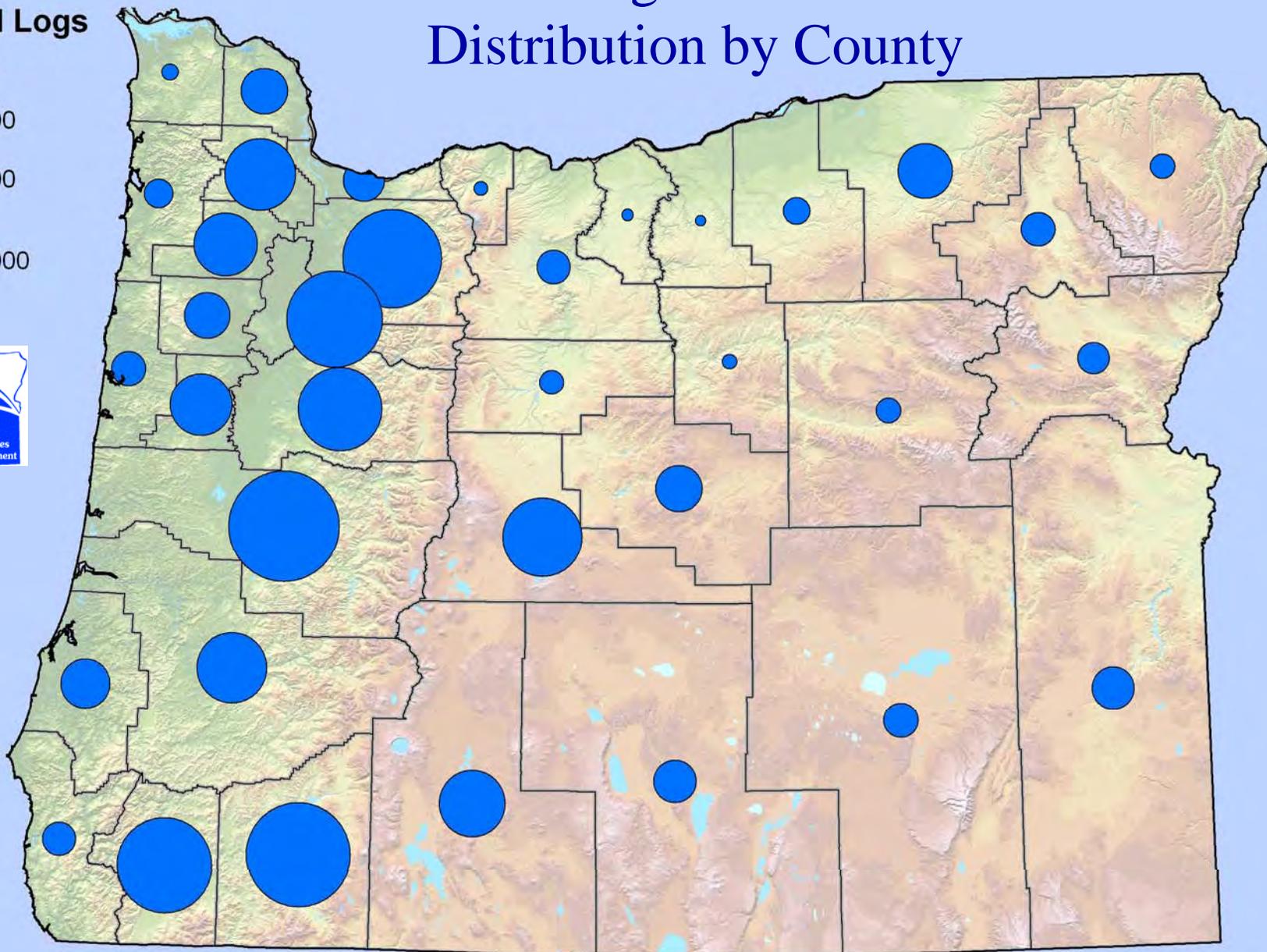
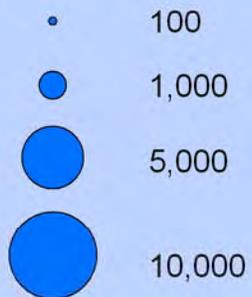
249,396



# Water Well Logs – December 2008

## Distribution by County

### Water Well Logs

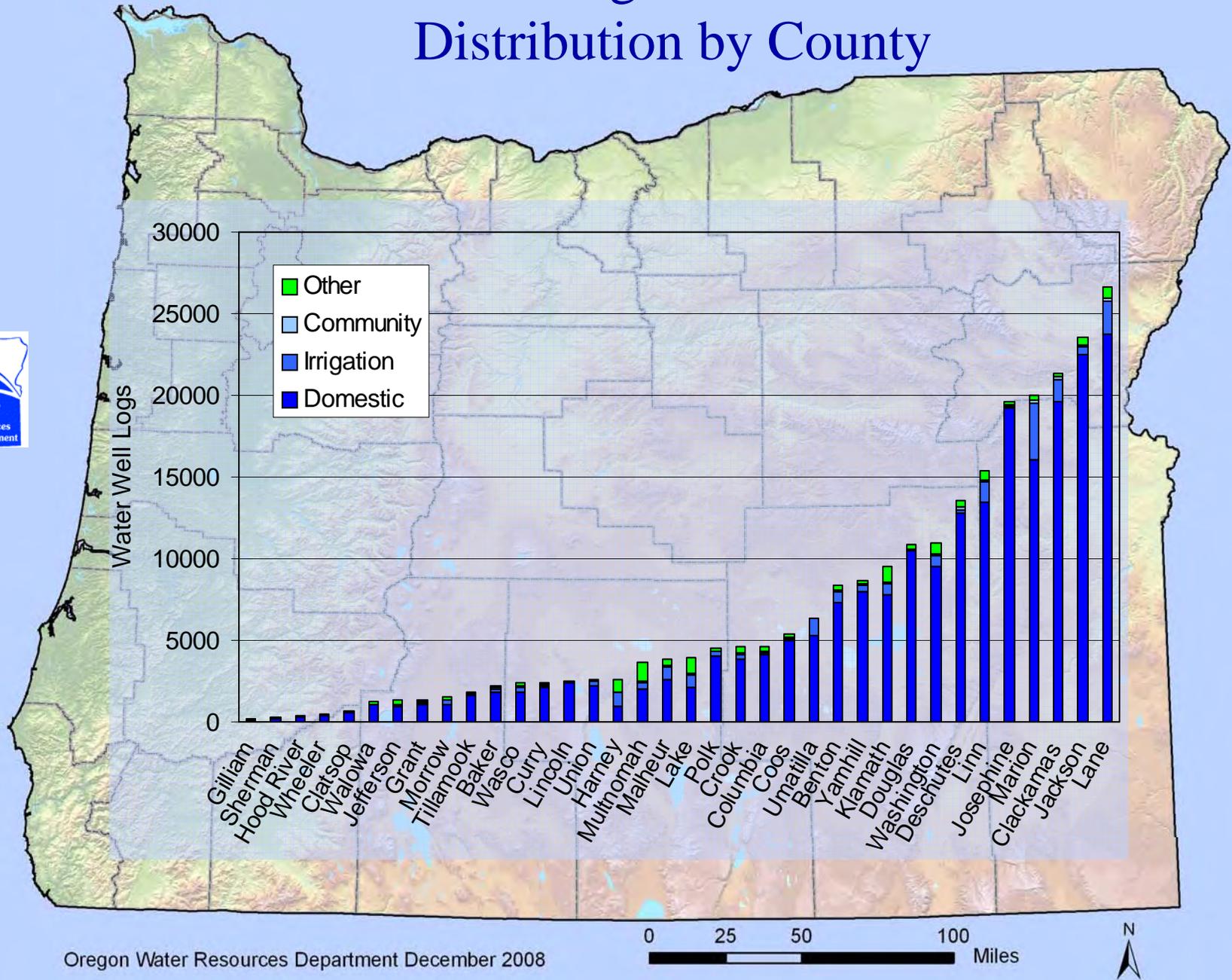


Oregon Water Resources Department December 2008



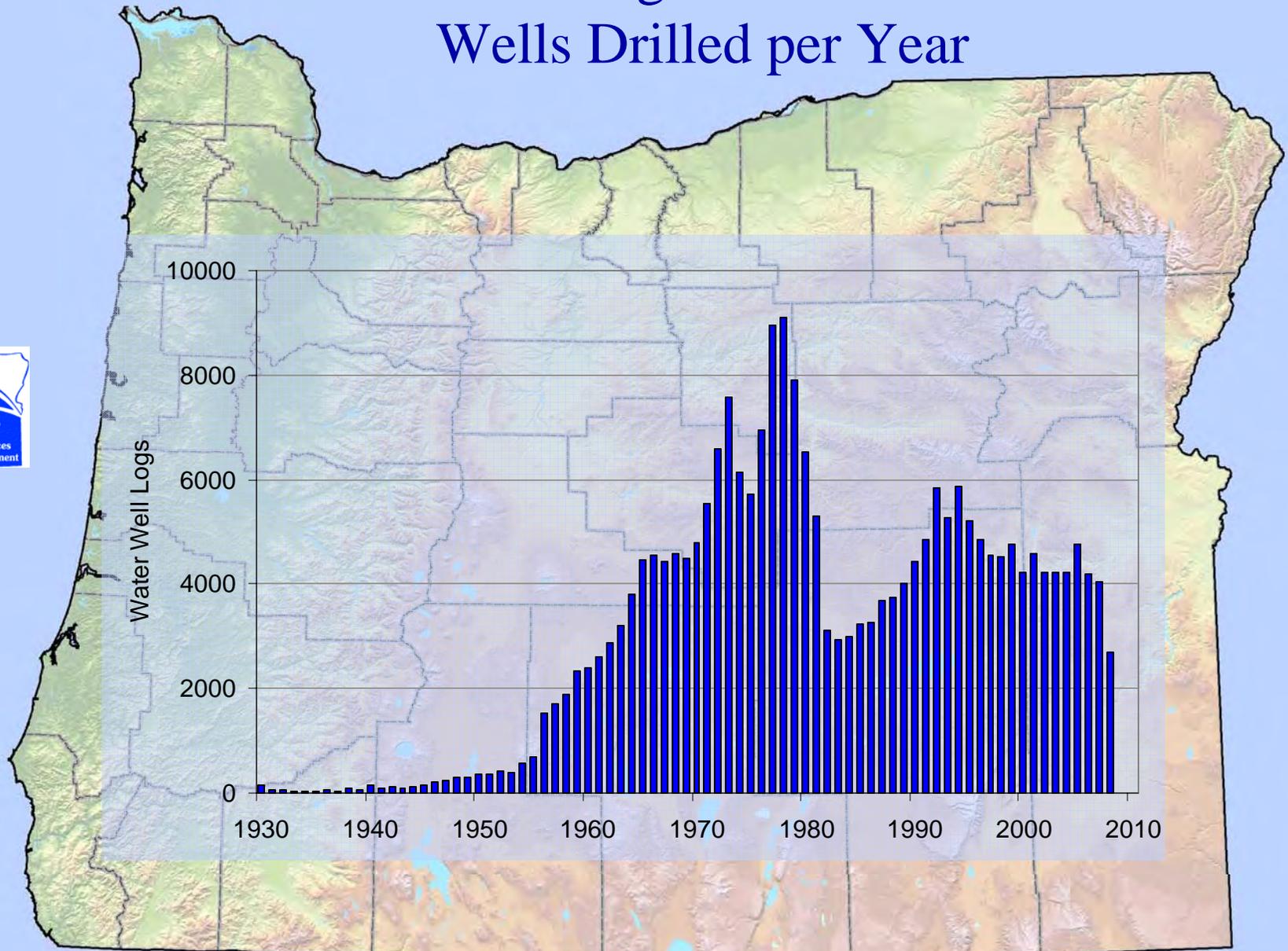
# Water Well Logs – December 2008

## Distribution by County



# Water Well Logs – December 2008

## Wells Drilled per Year



Oregon Water Resources Department December 2008

0 25 50 100 Miles



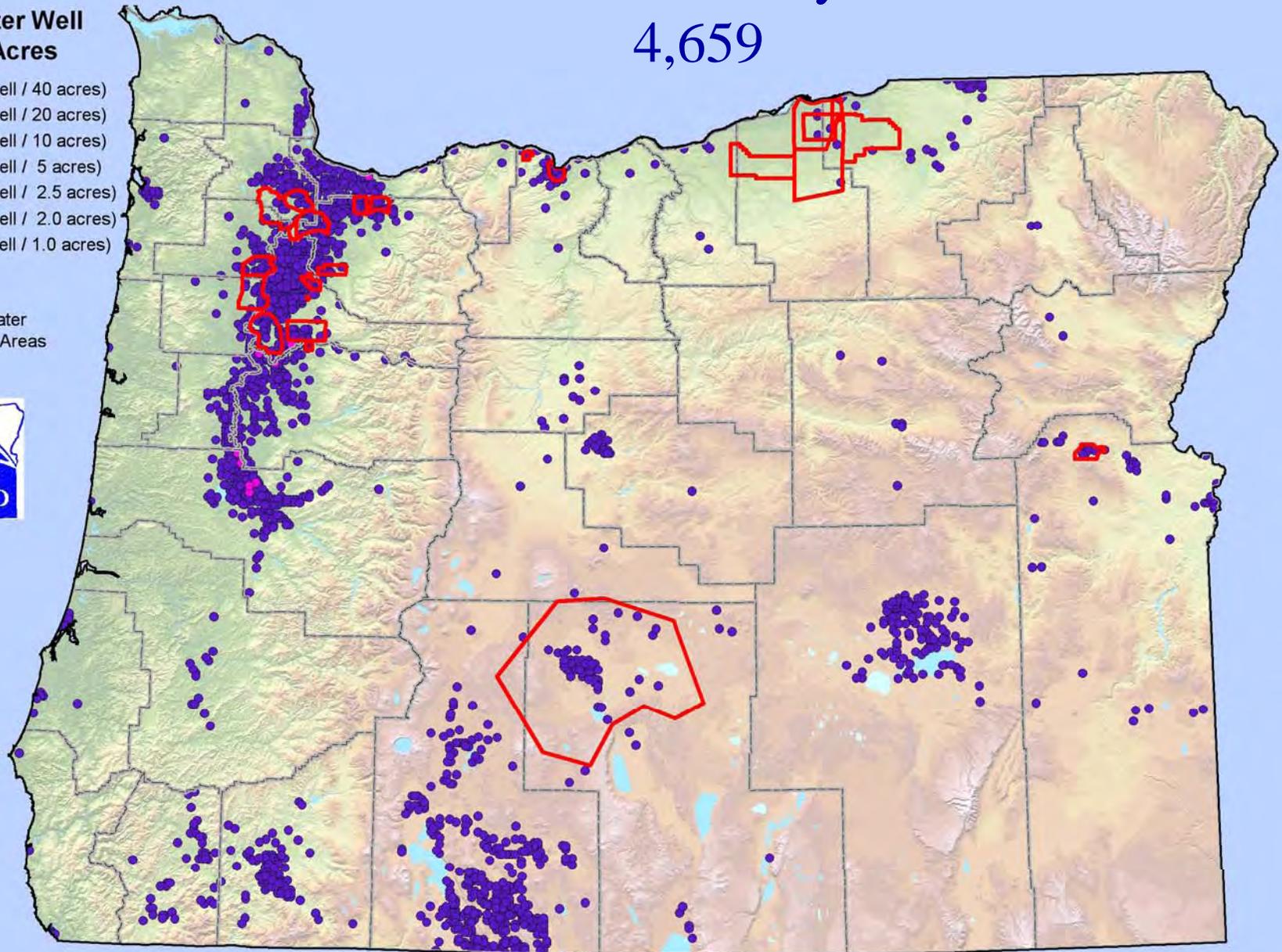
# Water Well Density – 1955

4,659

## Density of Water Well Logs per 640 Acres

- 1 - 16 ( $\leq 1$  well / 40 acres)
- 17 - 32 ( $\leq 1$  well / 20 acres)
- 33 - 64 ( $\leq 1$  well / 10 acres)
- 65 - 128 ( $\leq 1$  well / 5 acres)
- 129 - 256 ( $\leq 1$  well / 2.5 acres)
- 257 - 320 ( $\leq 1$  well / 2.0 acres)
- >320 ( $\leq 1$  well / 1.0 acres)

- Counties
- Ground Water Restricted Areas



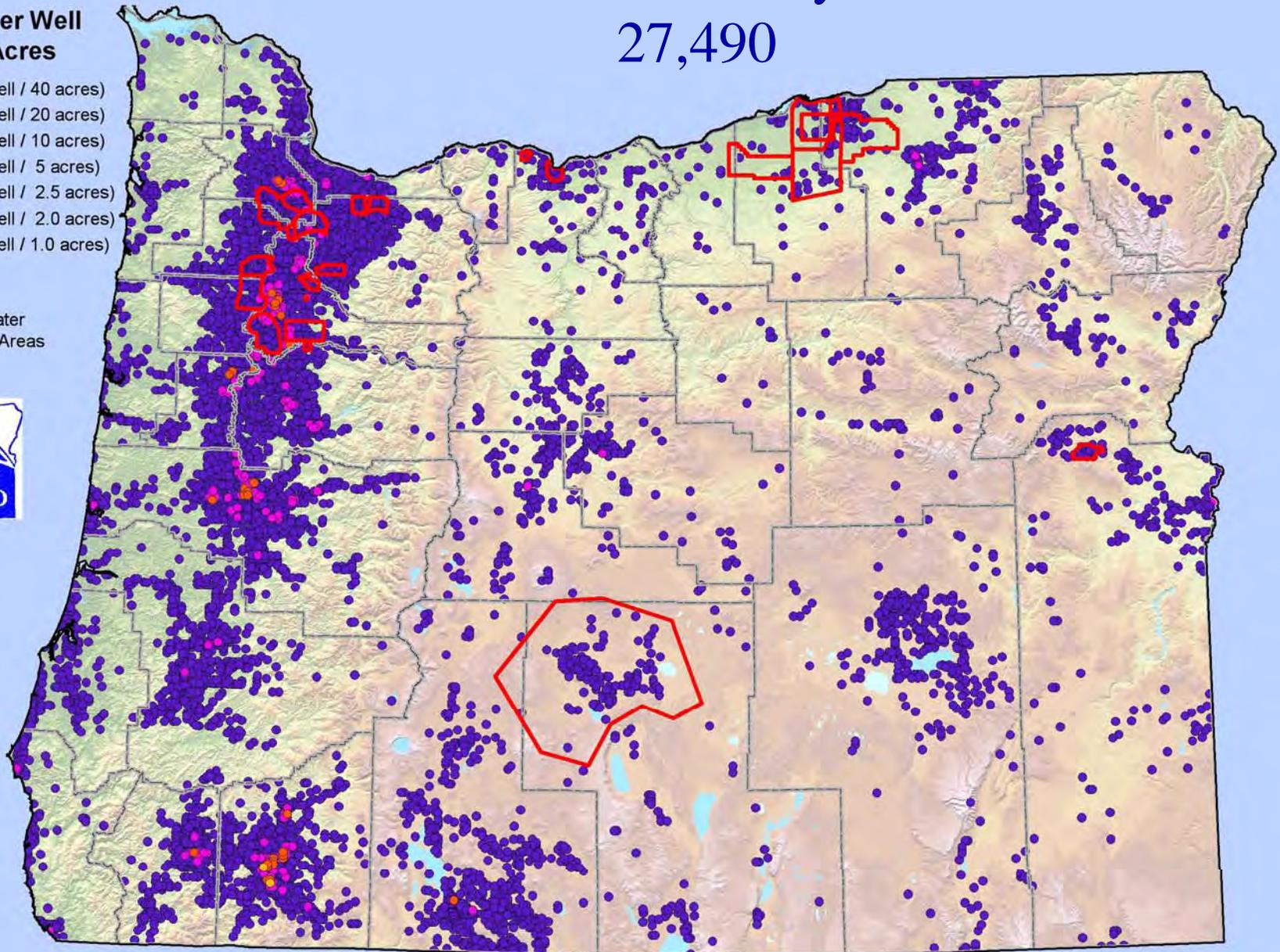
# Water Well Density – 1965

27,490

## Density of Water Well Logs per 640 Acres

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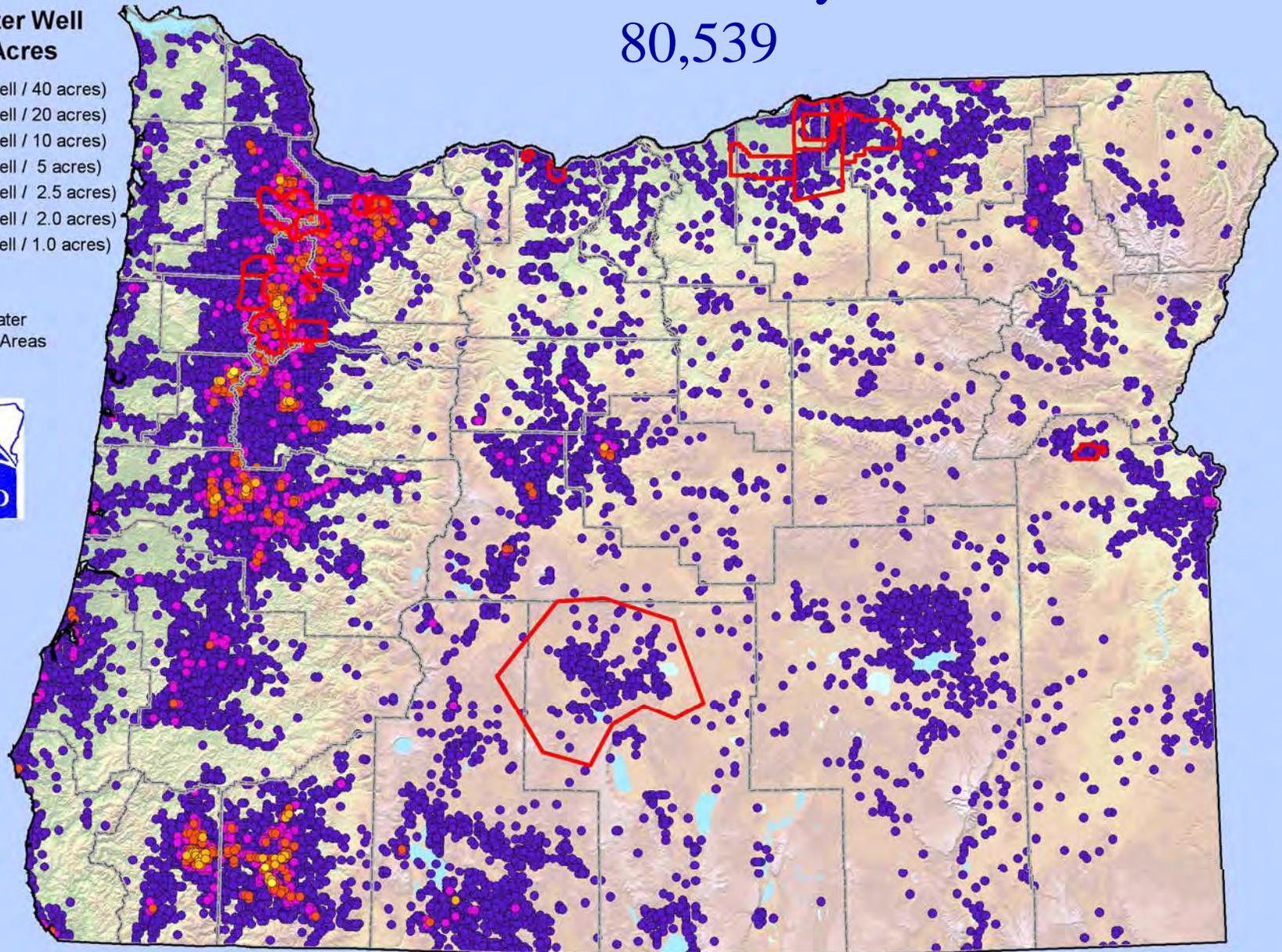
# Water Well Density – 1975

80,539

## Density of Water Well Logs per 640 Acres

- 1 - 16 ( $\leq 1$  well / 40 acres)
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- Counties
- Ground Water Restricted Areas



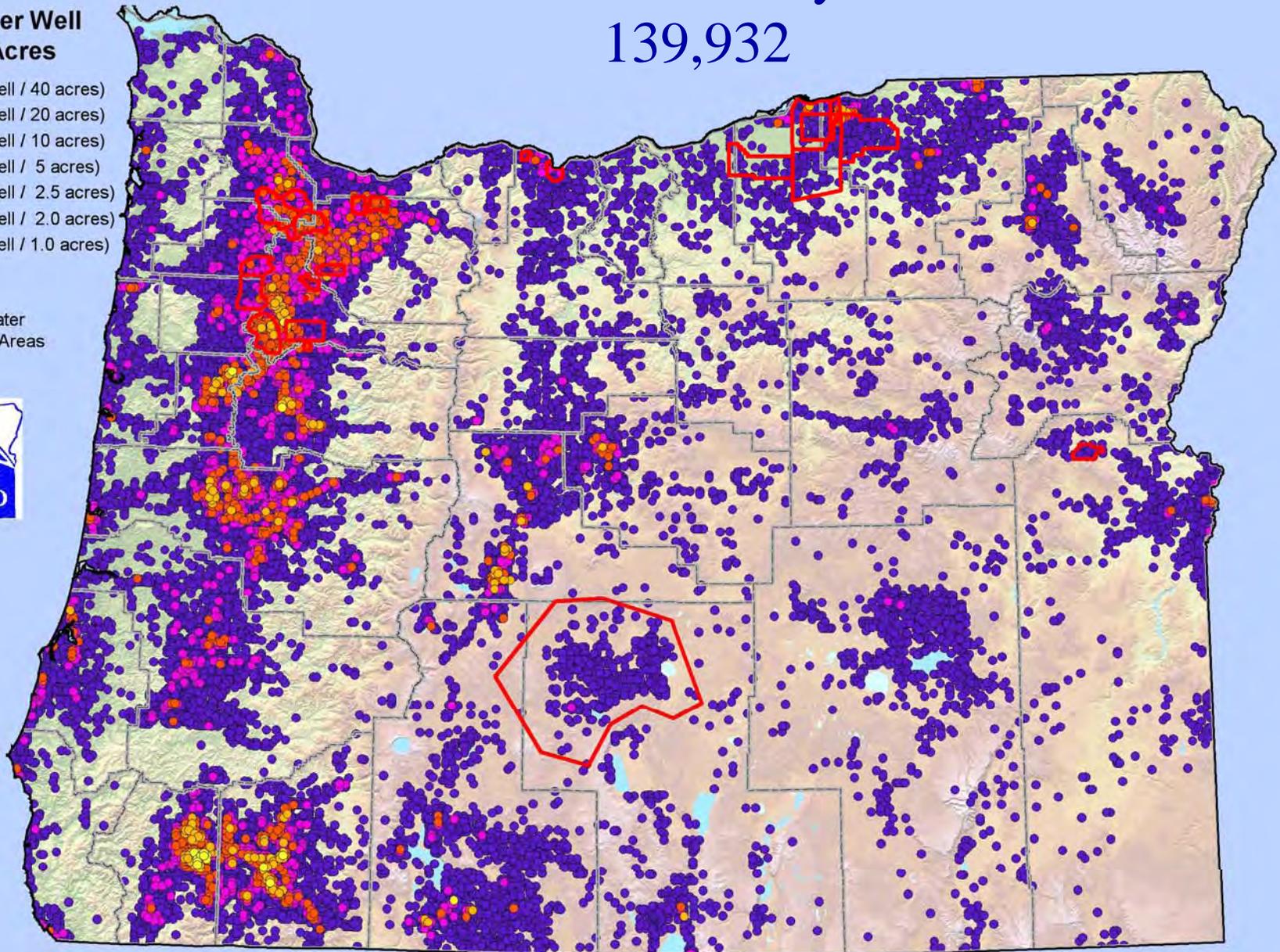
# Water Well Density – 1985

139,932

## Density of Water Well Logs per 640 Acres

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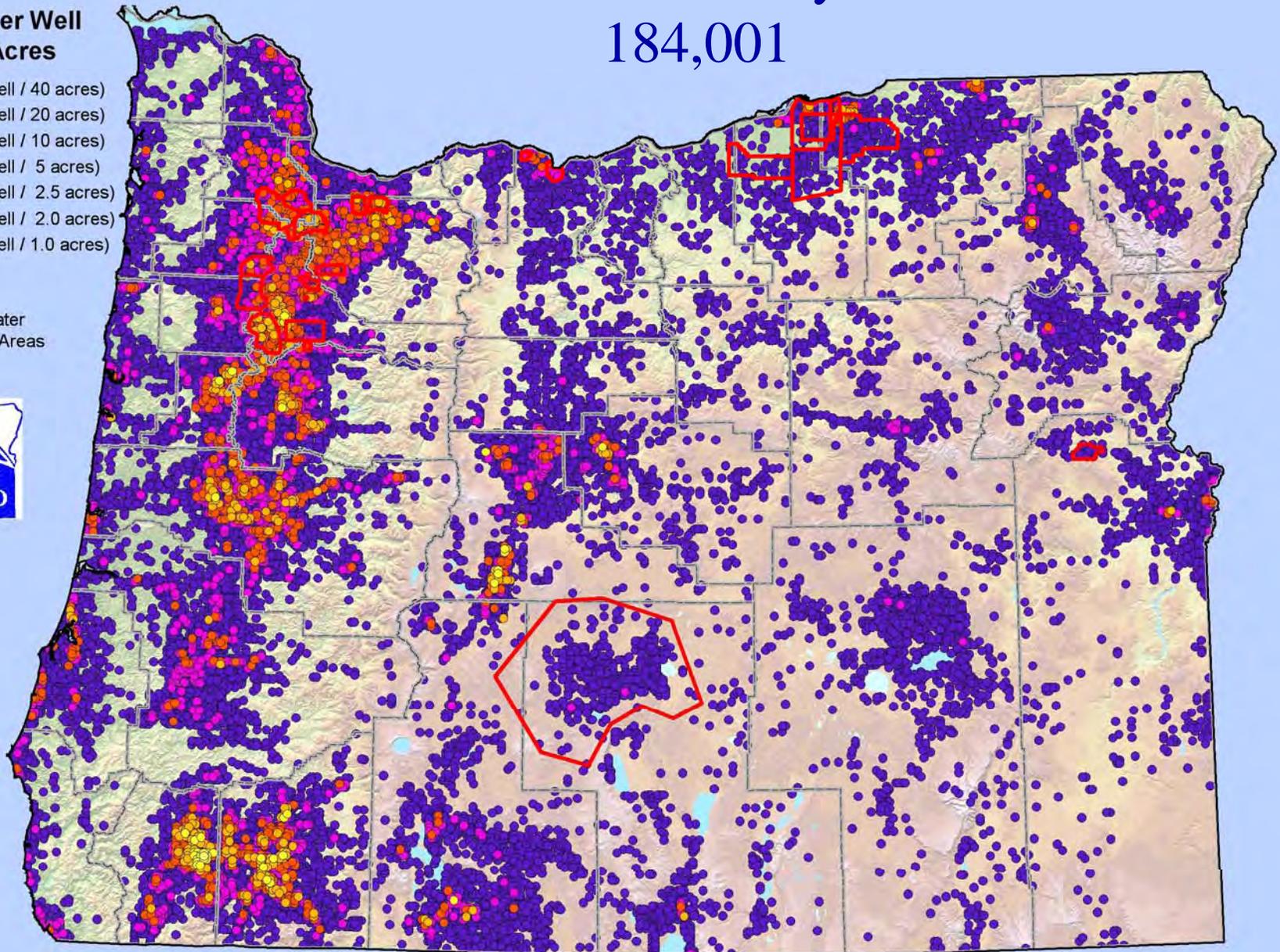
# Water Well Density – 1995

184,001

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- Counties
- Ground Water Restricted Areas



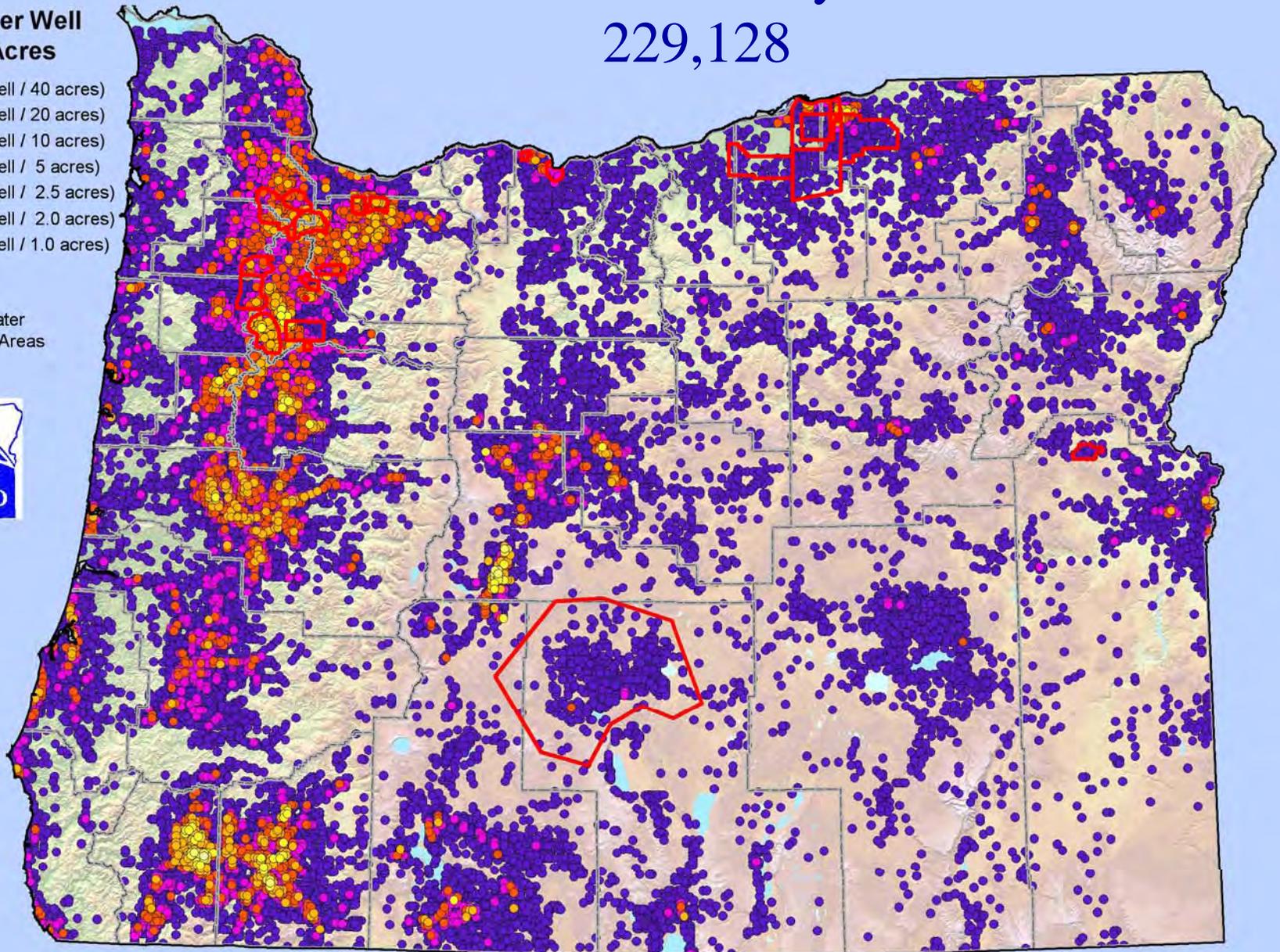
# Water Well Density – 2005

229,128

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- Counties
- Ground Water Restricted Areas



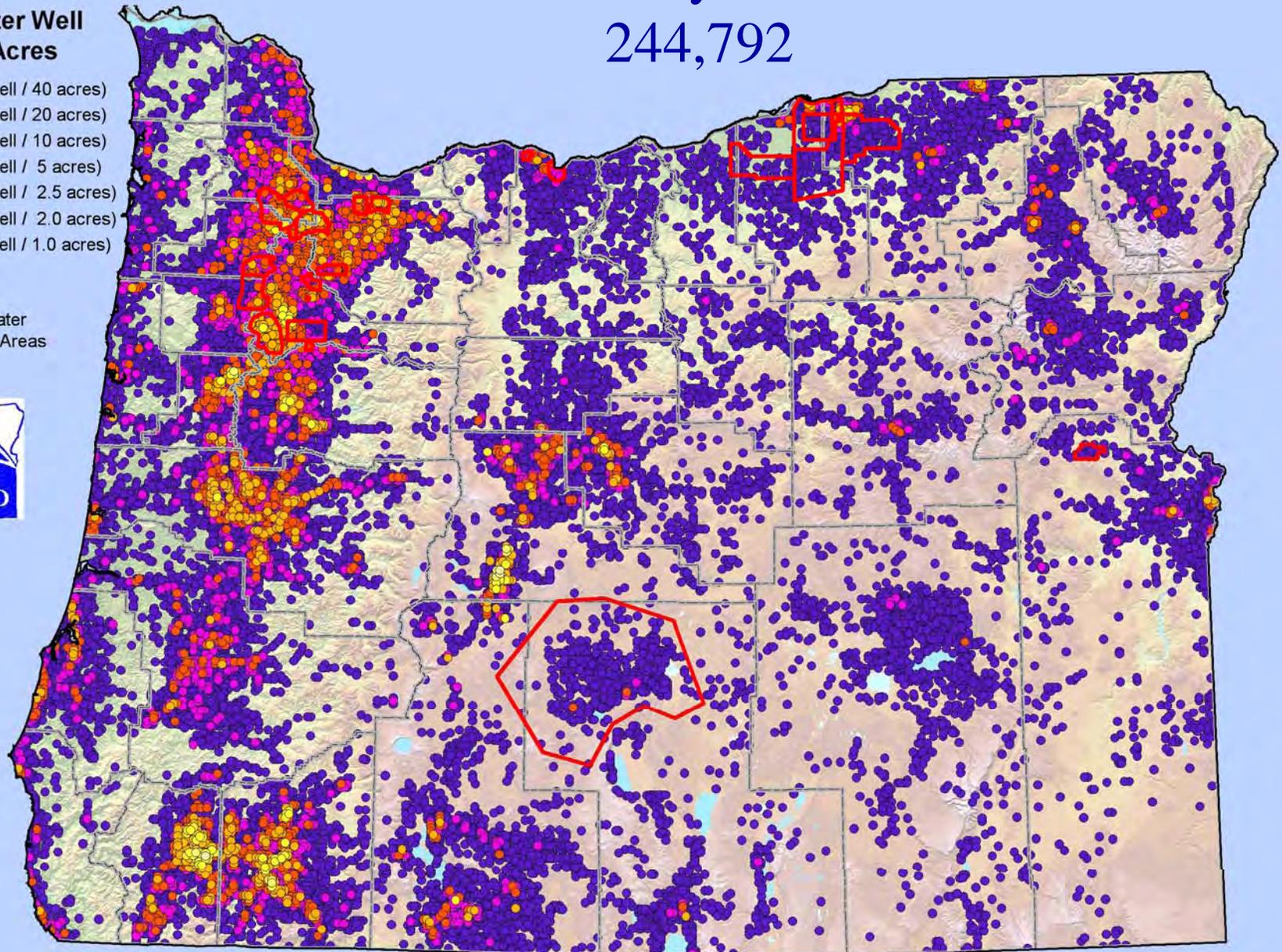
# Water Well Density – December 2008

244,792

## Density of Water Well Logs per 640 Acres

- 1 - 16 ( $\leq 1$  well / 40 acres)
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- Counties
- Ground Water Restricted Areas



Oregon Water Resources Department December 2008

0 25 50 100 Miles



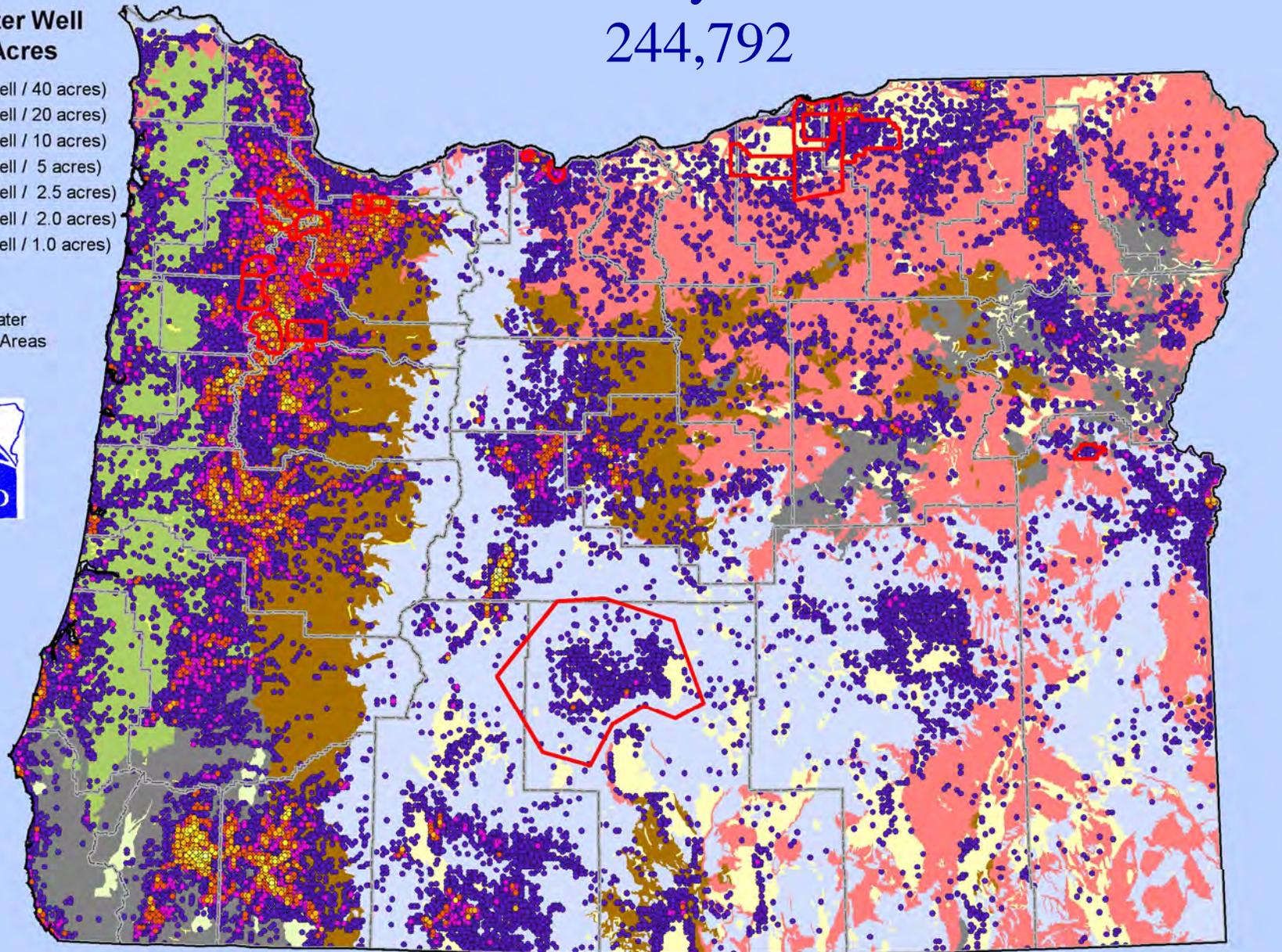
# Water Well Density – December 2008

244,792

## Density of Water Well Logs per 640 Acres

- 1 - 16 (<= 1 well / 40 acres)
- 17 - 32 (<= 1 well / 20 acres)
- 33 - 64 (<= 1 well / 10 acres)
- 65 - 128 (<= 1 well / 5 acres)
- 129 - 256 (<= 1 well / 2.5 acres)
- 257 - 320 (<= 1 well / 2.0 acres)
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- Counties
- Ground Water Restricted Areas



Oregon Water Resources Department December 2008

0 25 50 100 Miles



# Wells and Water Rights

- Permitted Wells
  - Large volume uses
  - Typically irrigation, public supply, or industrial wells
- Exempt Wells
  - Small volume uses
  - Exempt from the requirement to file for a water right

# ORS 537.545 Exempt Uses

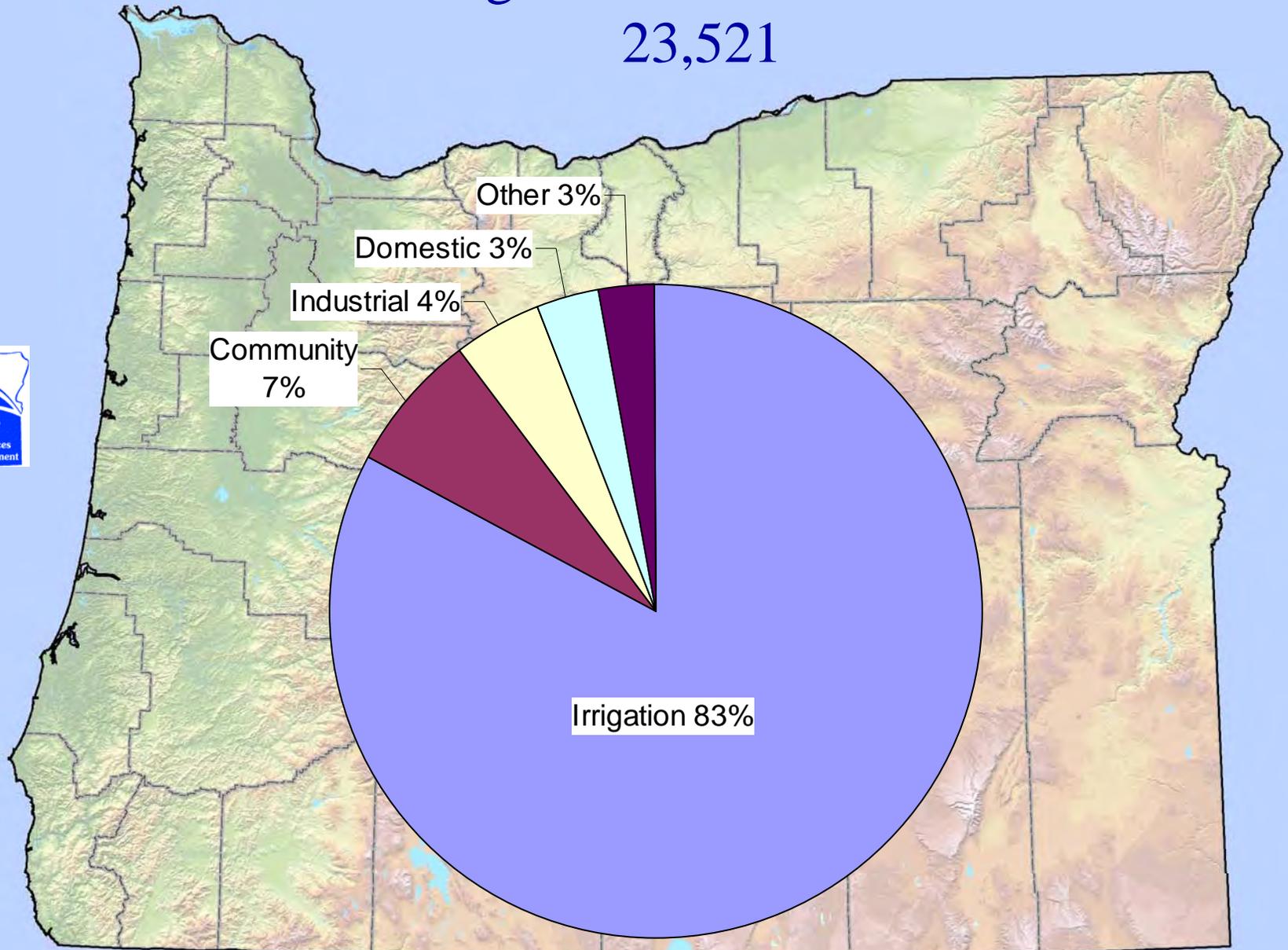
- Stock watering
- Lawns and non-commercial garden up to 1/2 acre
- School lawns, grounds and fields up to 10 acres in critical ground water areas
- Single or group domestic purposes not exceeding 15,000 gal/day
- Down-hole heat exchanges
- Industrial or commercial uses not to exceed 5,000 gal/day
- Effluent from permitted industrial or confined animal feeding purposes and re-used as irrigation

# ORS 537.545 Exempt Uses

- No application required
- No permit, certificate issued
- They constitute a water right with priority date
- Regulation is generally consistent with other water rights
- No oversight to evaluate water availability prior to use (except when we work with county planners)

# Water Right Wells - December 2008

## 23,521

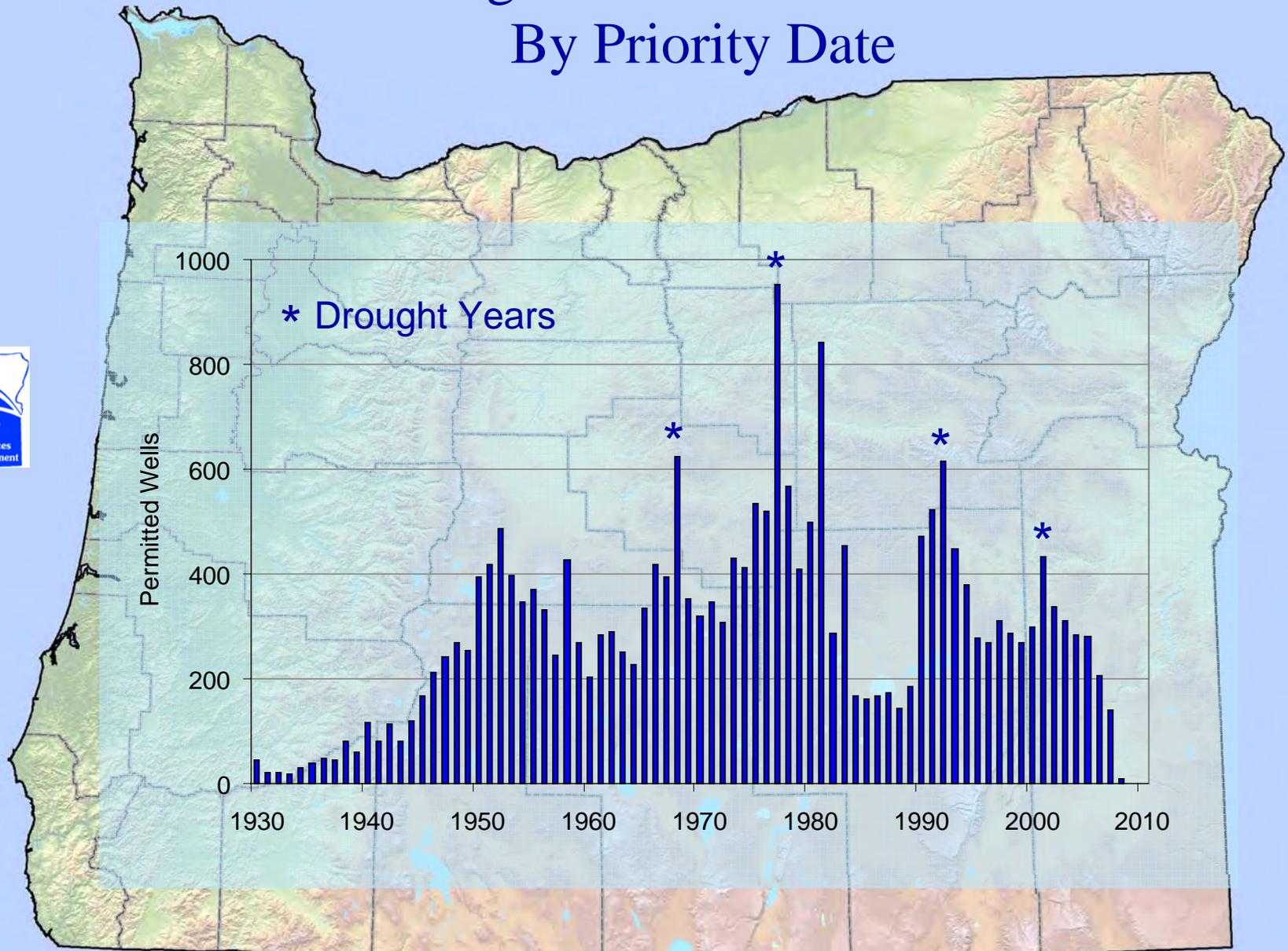


Oregon Water Resources Department December 2008

0 25 50 100 Miles

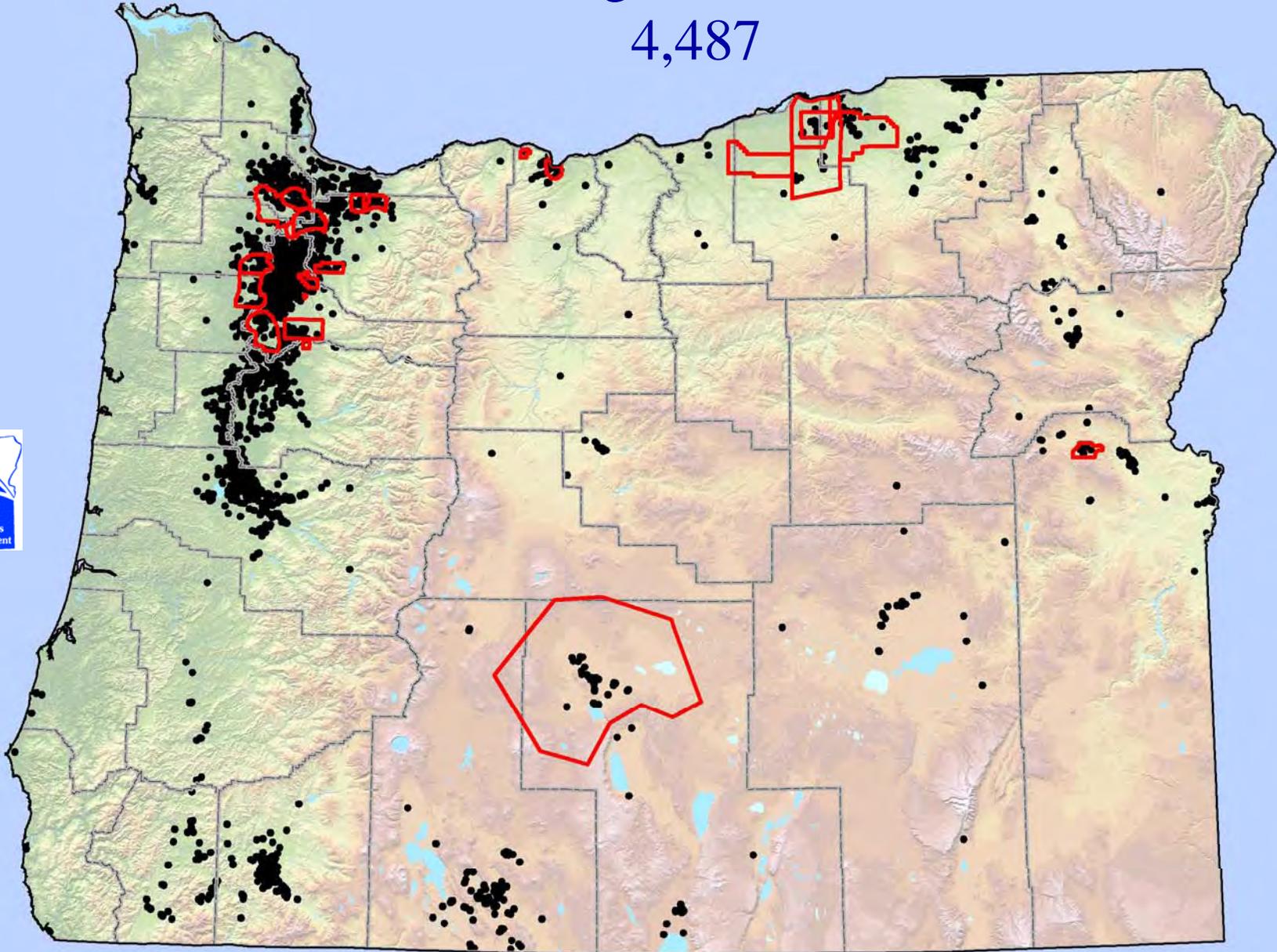


# Water Right Wells - December 2008 By Priority Date



# Water Right Wells – 1955

4,487

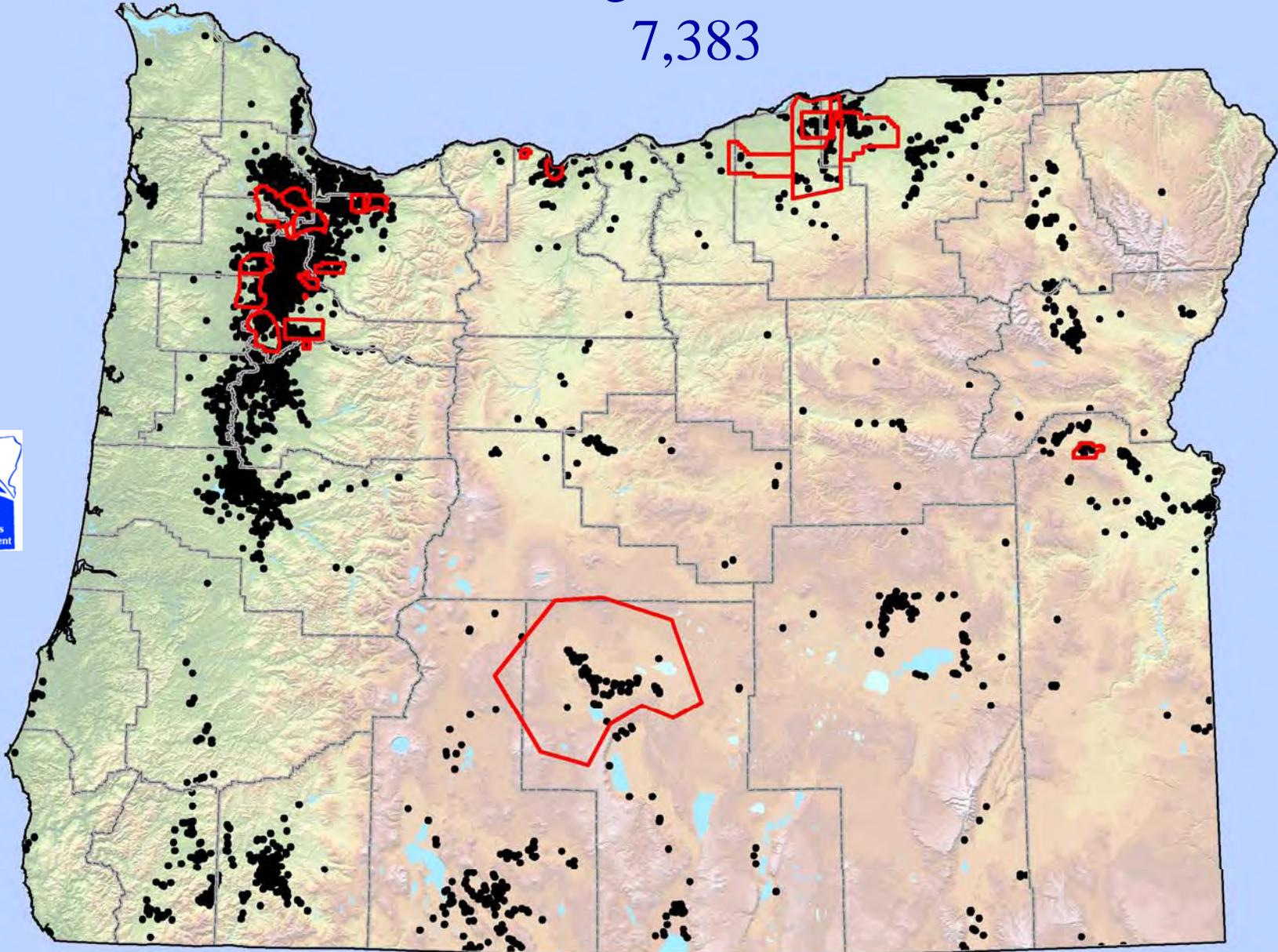


Oregon Water Resources Department December 2008

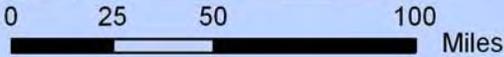


# Water Right Wells – 1965

7,383

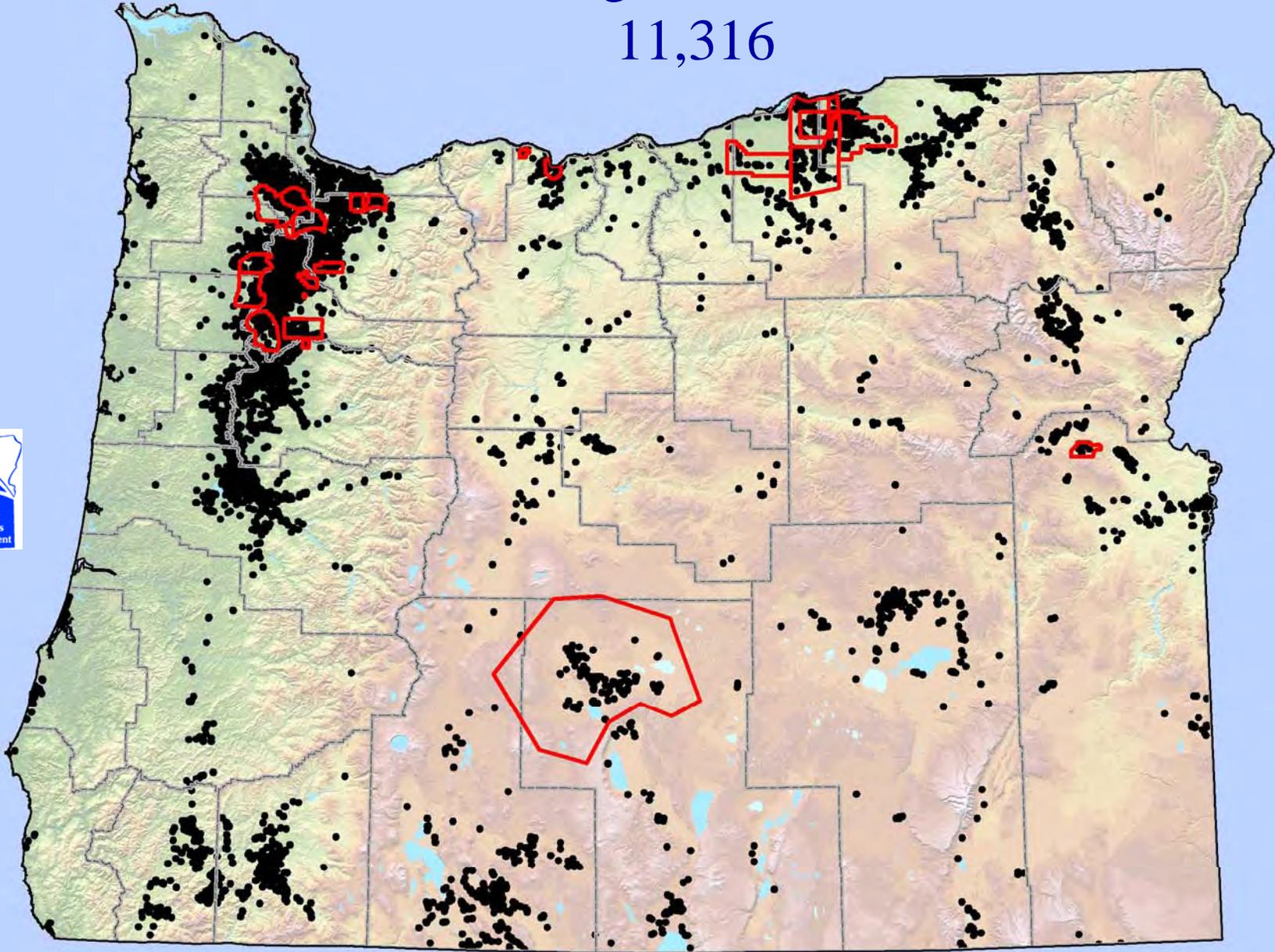


Oregon Water Resources Department December 2008

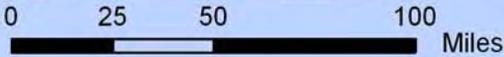


# Water Right Wells – 1975

11,316

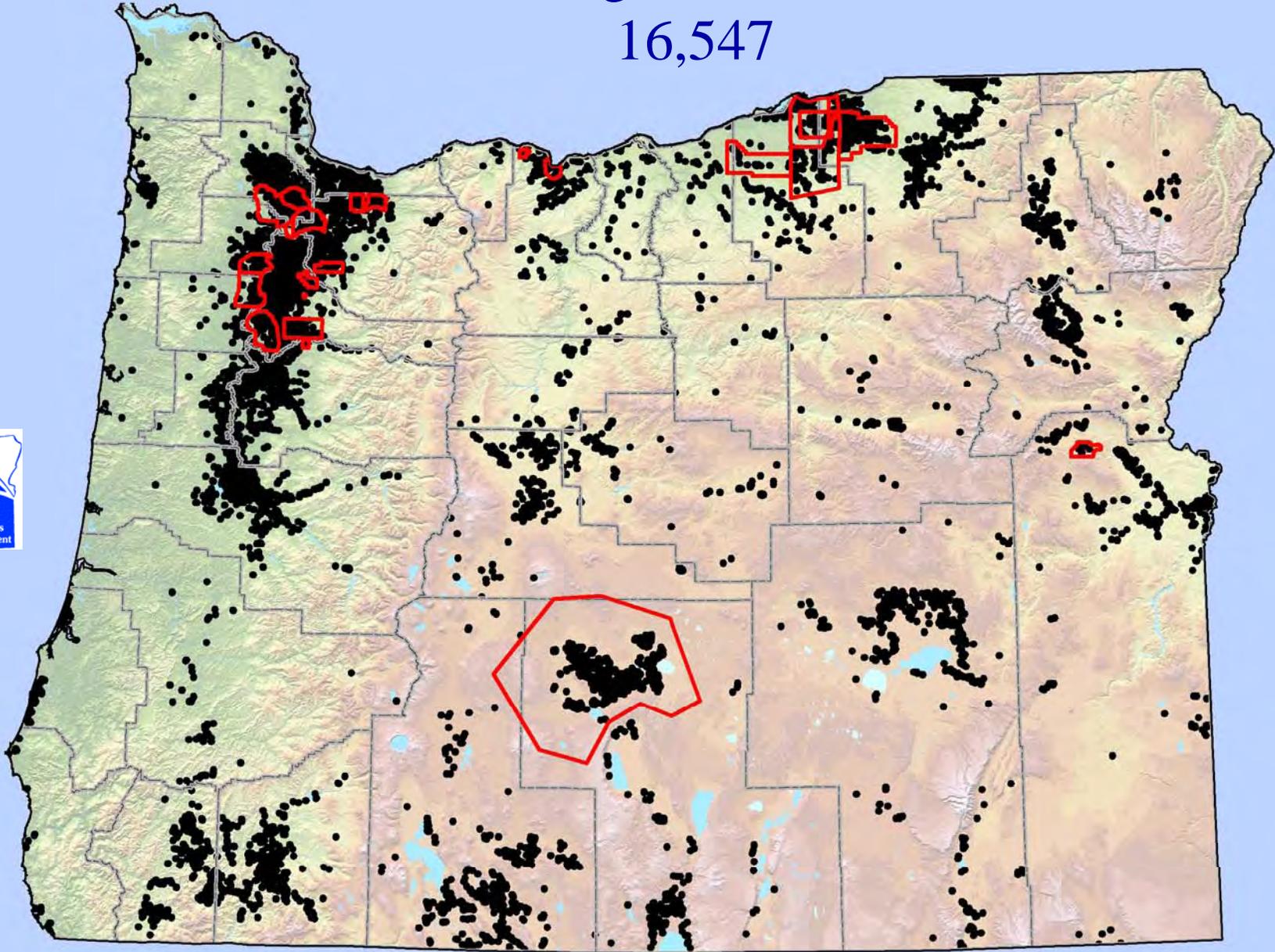


Oregon Water Resources Department December 2008



# Water Right Wells – 1985

16,547

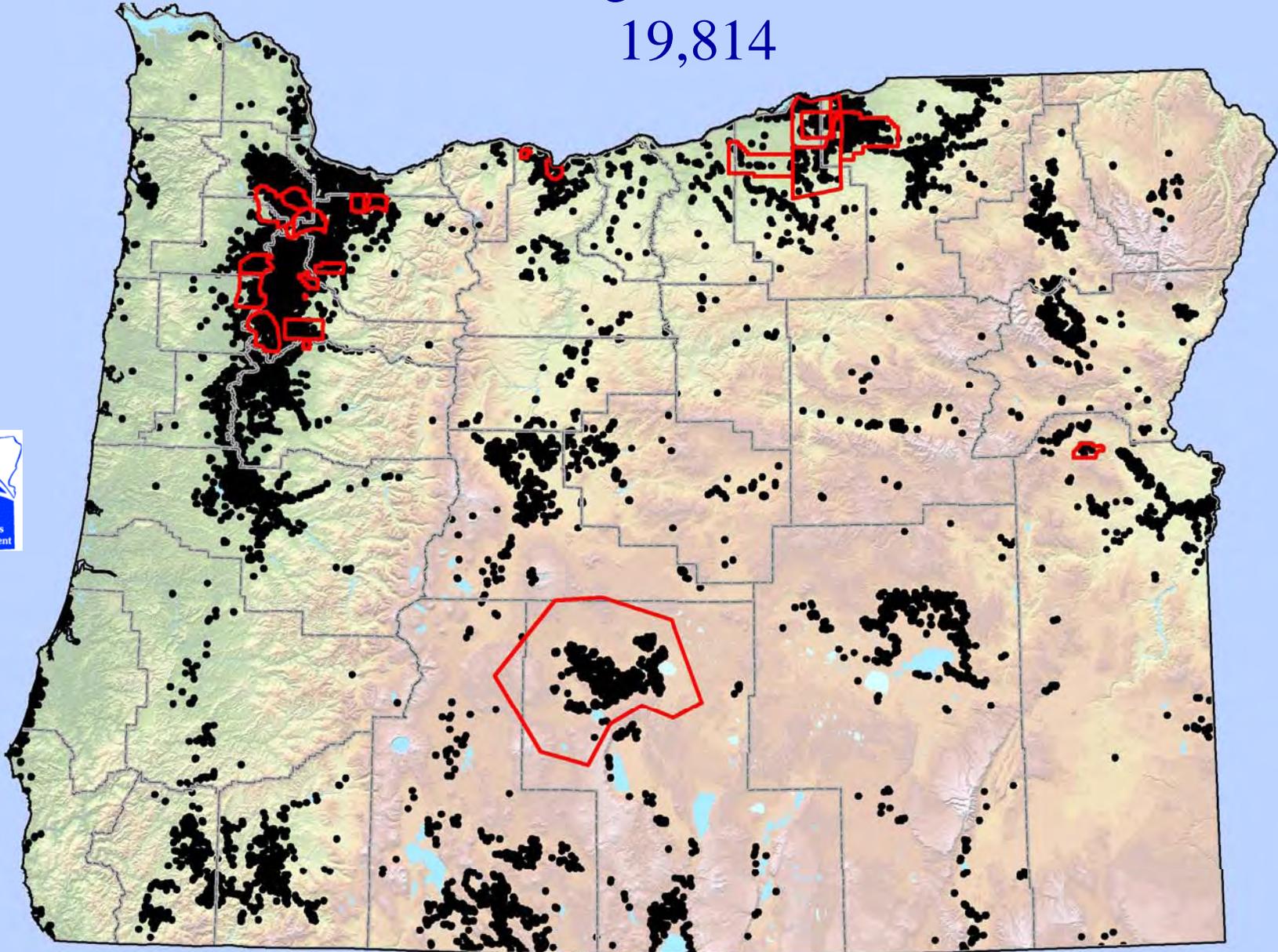


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# Water Right Wells – 1995

19,814

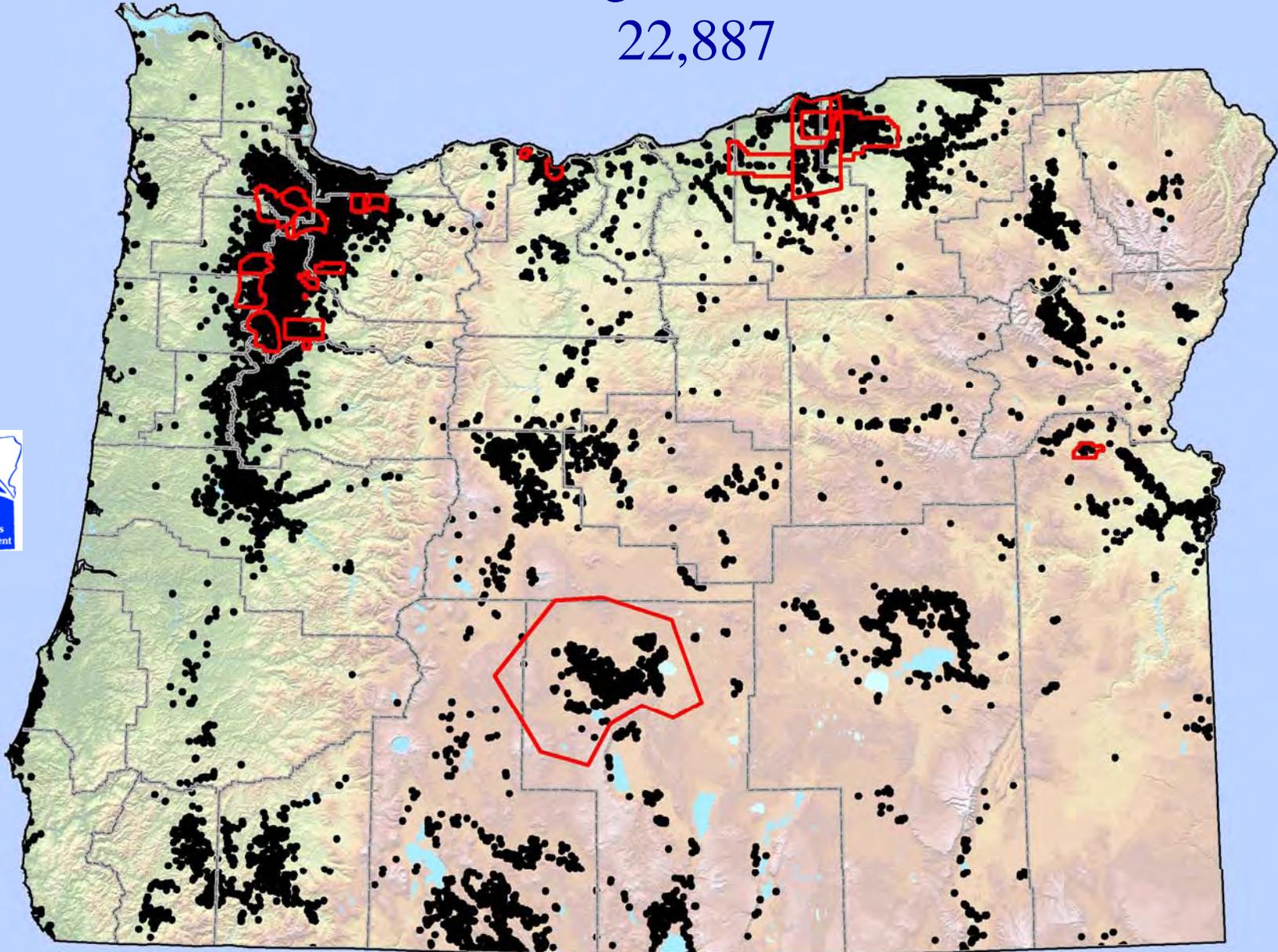


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# Water Right Wells – 2005

22,887

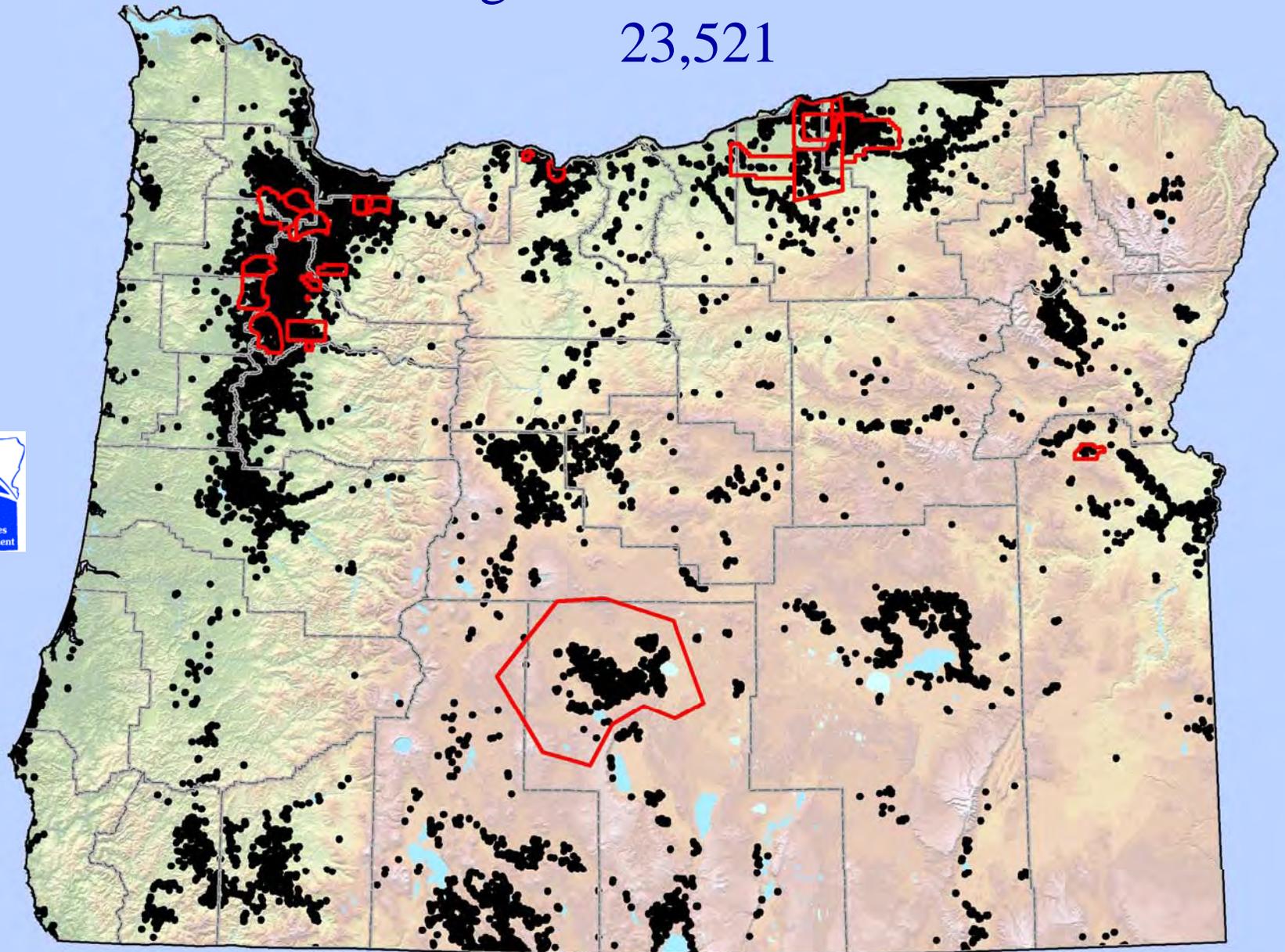


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# Water Right Wells – December 2008

23,521



Oregon Water Resources Department December 2008

0 25 50 100 Miles



# Water Right Wells – December 2008

## 23,521

 Ground Water Restricted areas

 Counties

### Regional Hydrogeologic Units

 Quaternary Basin-Fill Sediments

 Tertiary-Quaternary Basin-Fill Sediments

 Post-Miocene Volcanic and Sedimentary Rocks

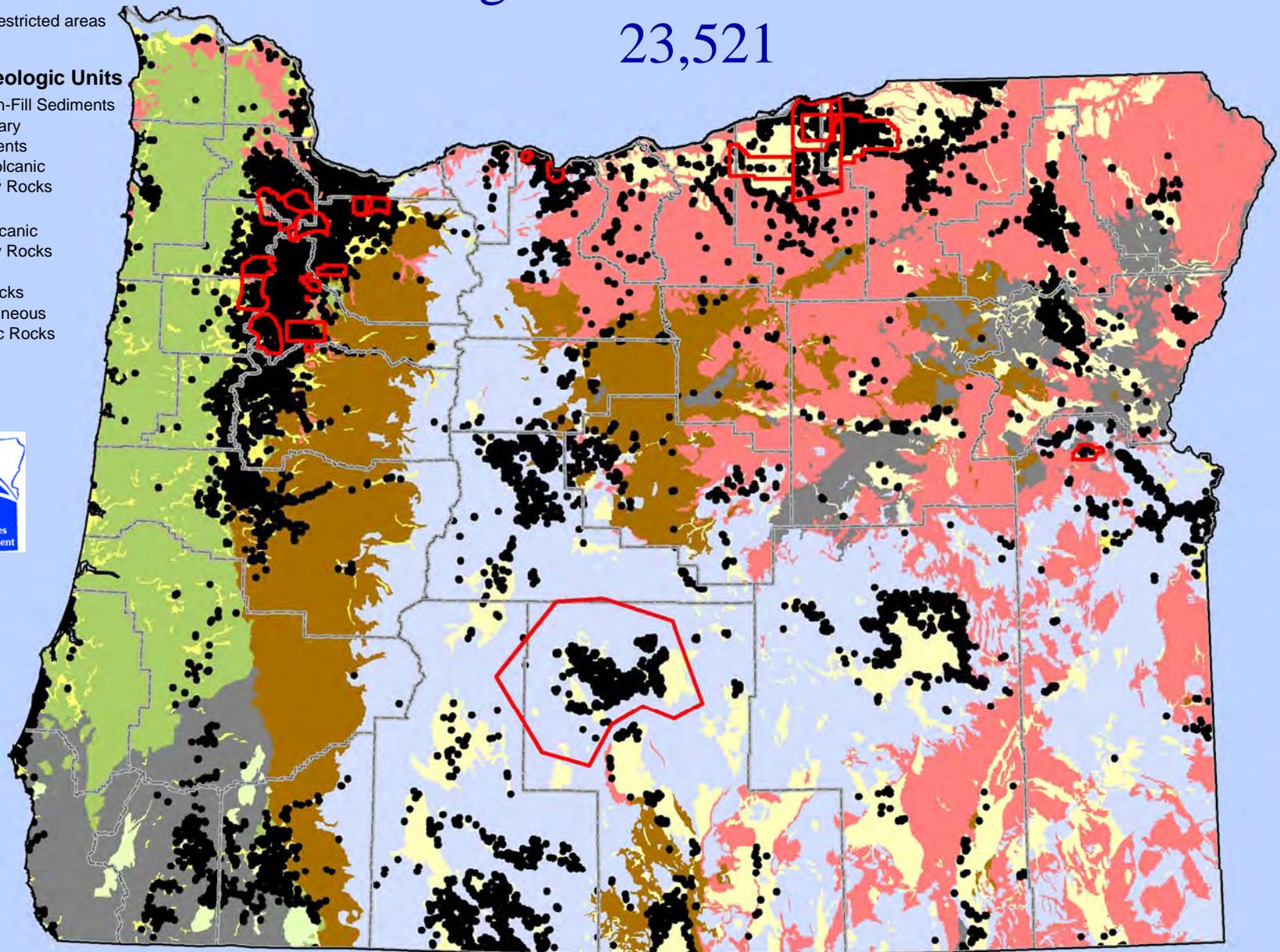
 Miocene Basalts

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 Pre-Oligocene Igneous and Metamorphic Rocks

 Granitic Rocks



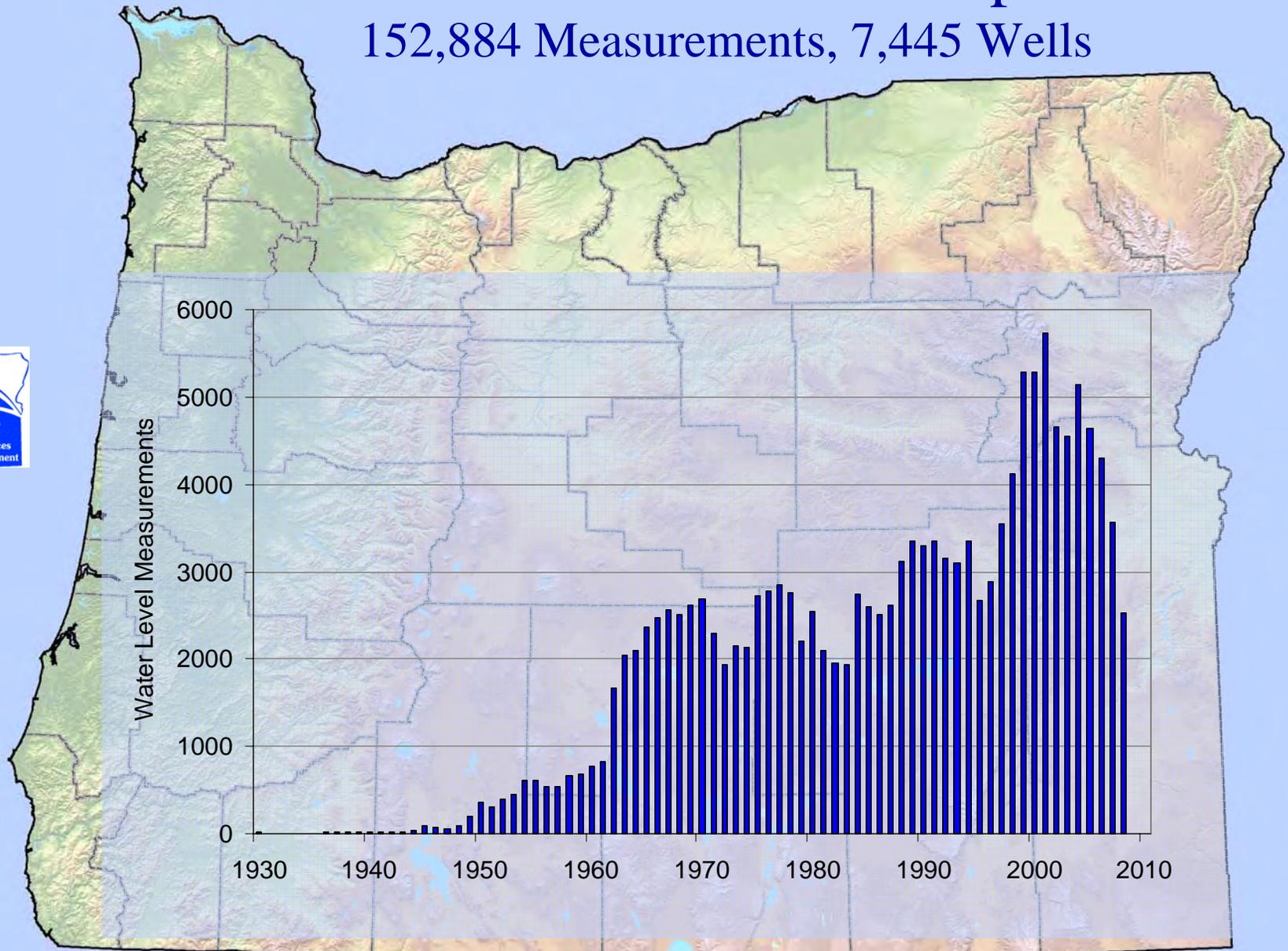
Oregon Water Resources Department December 2008

0 25 50 100 Miles



# Water-Level Measurements per Year

152,884 Measurements, 7,445 Wells



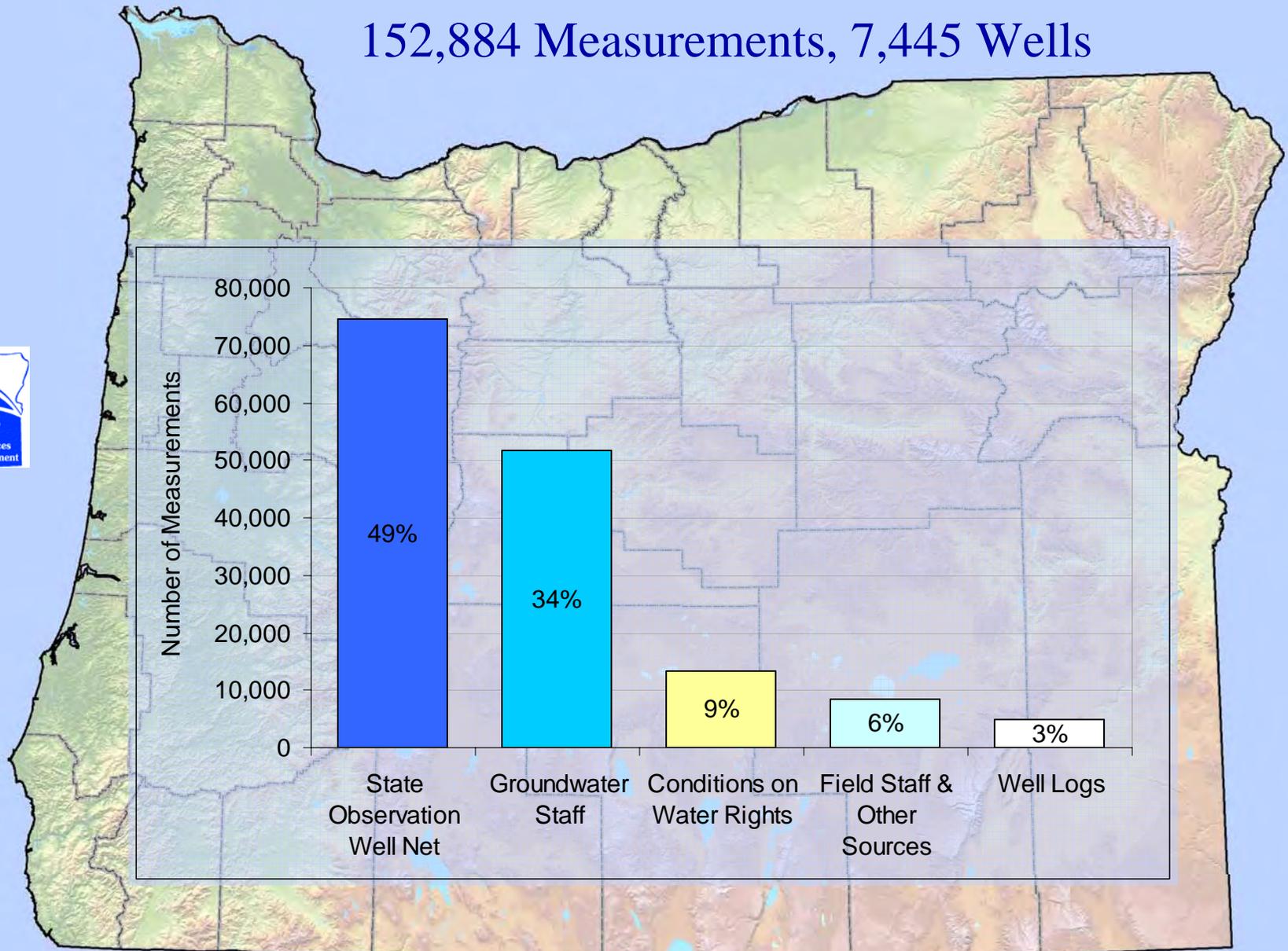
Oregon Water Resources Department December 2008

0 25 50 100 Miles



# Water-Level Measurements

152,884 Measurements, 7,445 Wells



Oregon Water Resources Department December 2008

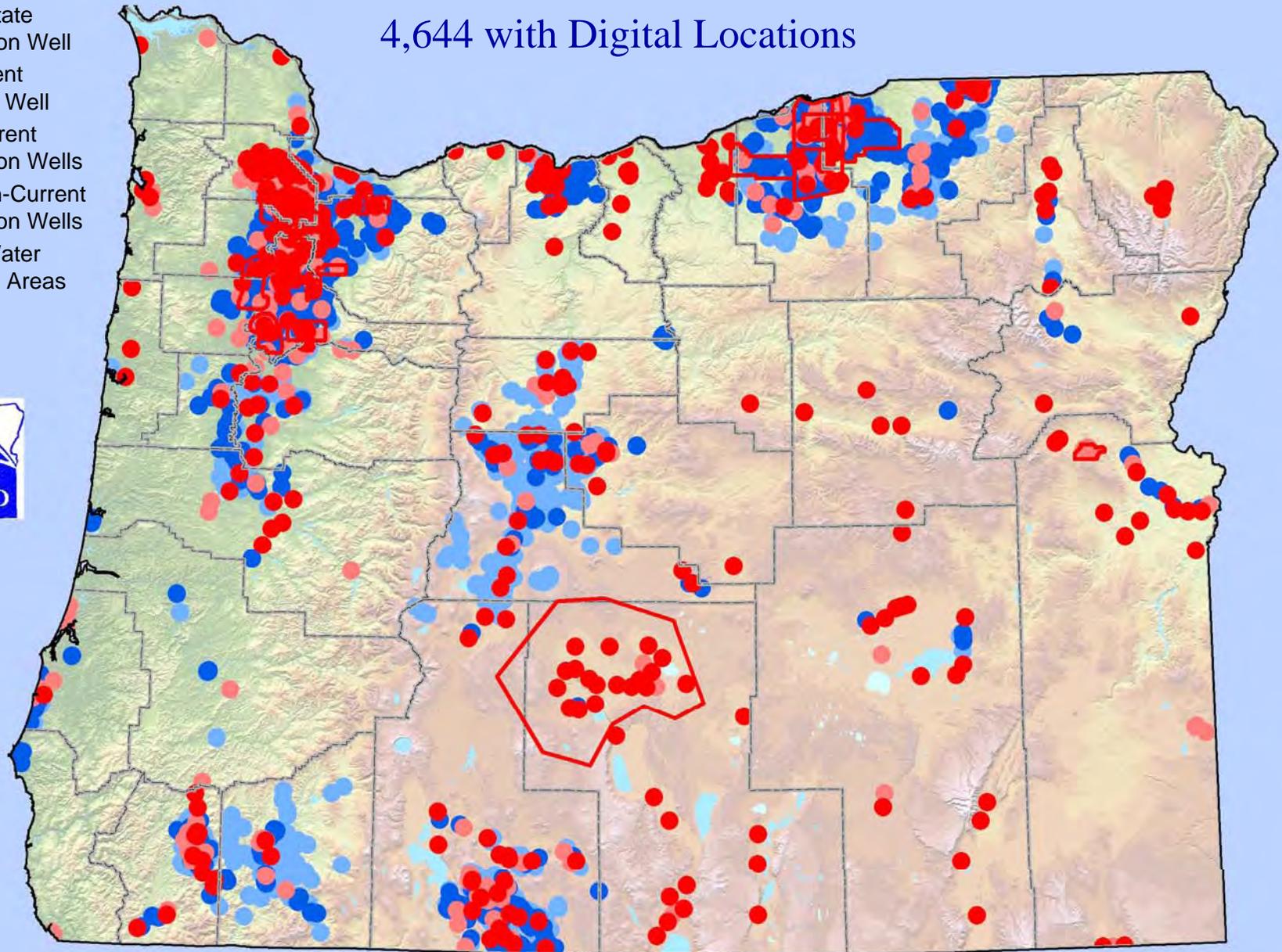
0 25 50 100 Miles



# Observation Wells

4,644 with Digital Locations

-  Current State Observation Well
-  Non-Current State Obs Well
-  Other Current Observation Wells
-  Other Non-Current Observation Wells
-  Ground Water Restricted Areas
-  Counties



Oregon Water Resources Department December 2008

0 25 50 100 Miles



# DESC 3016

## Decadal Climate Cycles

Well Location

15.00S10.00E8ACD

Oregon Water Resources Department Well Log ID

DESC 3016

Oregon Water Resources Department State Observation Well Number

116

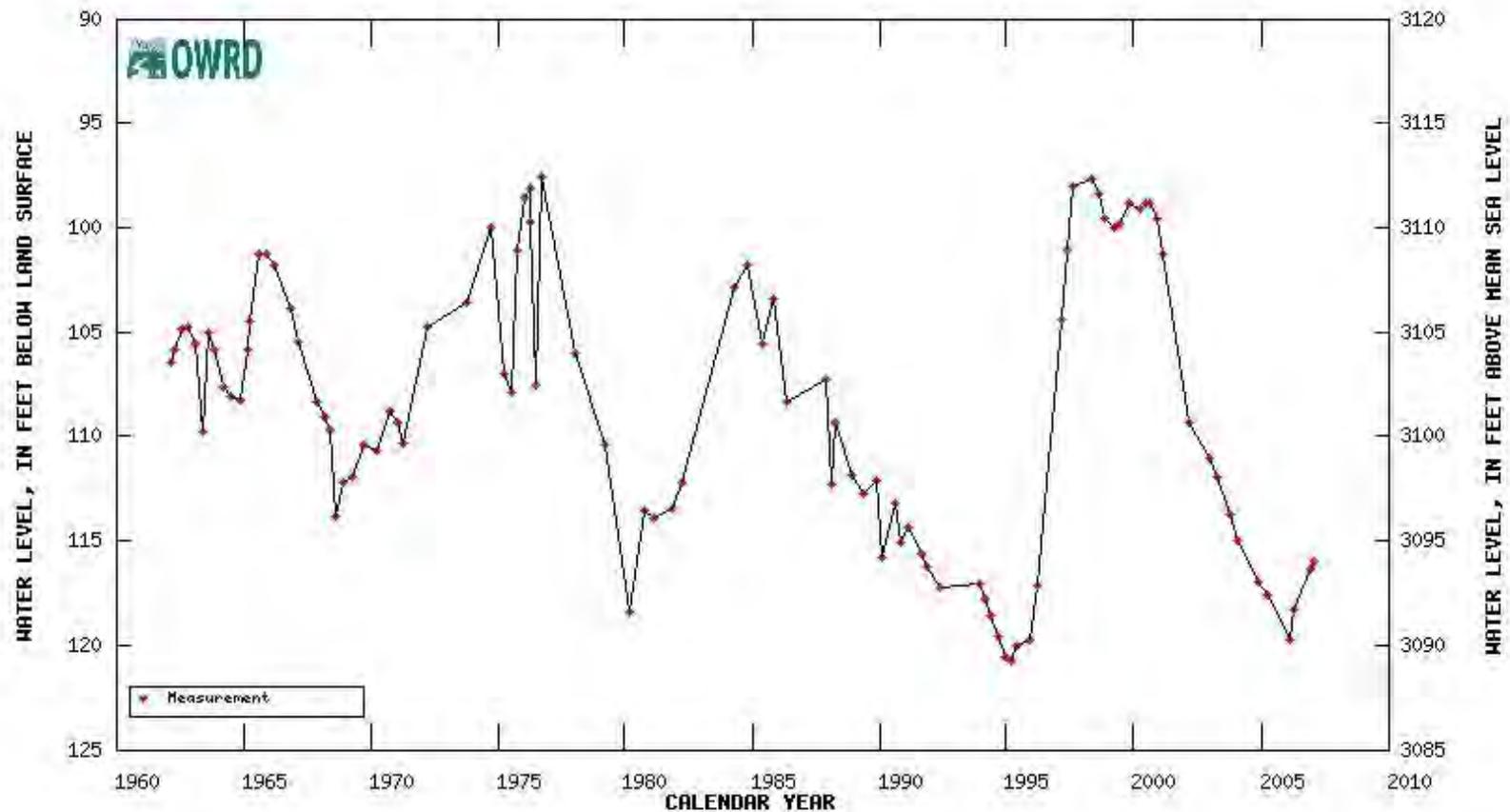
Well depth, in feet below land surface

Land surface elevation, in feet above mean sea level

3210

Primary use of well

not determined



# LAKE 113

## Decadal Climate Cycles & Well Withdrawals

Well Location

25.00S14.00E15BCC

Oregon Water Resources Department Well Log ID

LAKE 113

Oregon Water Resources Department State Observation Well Number

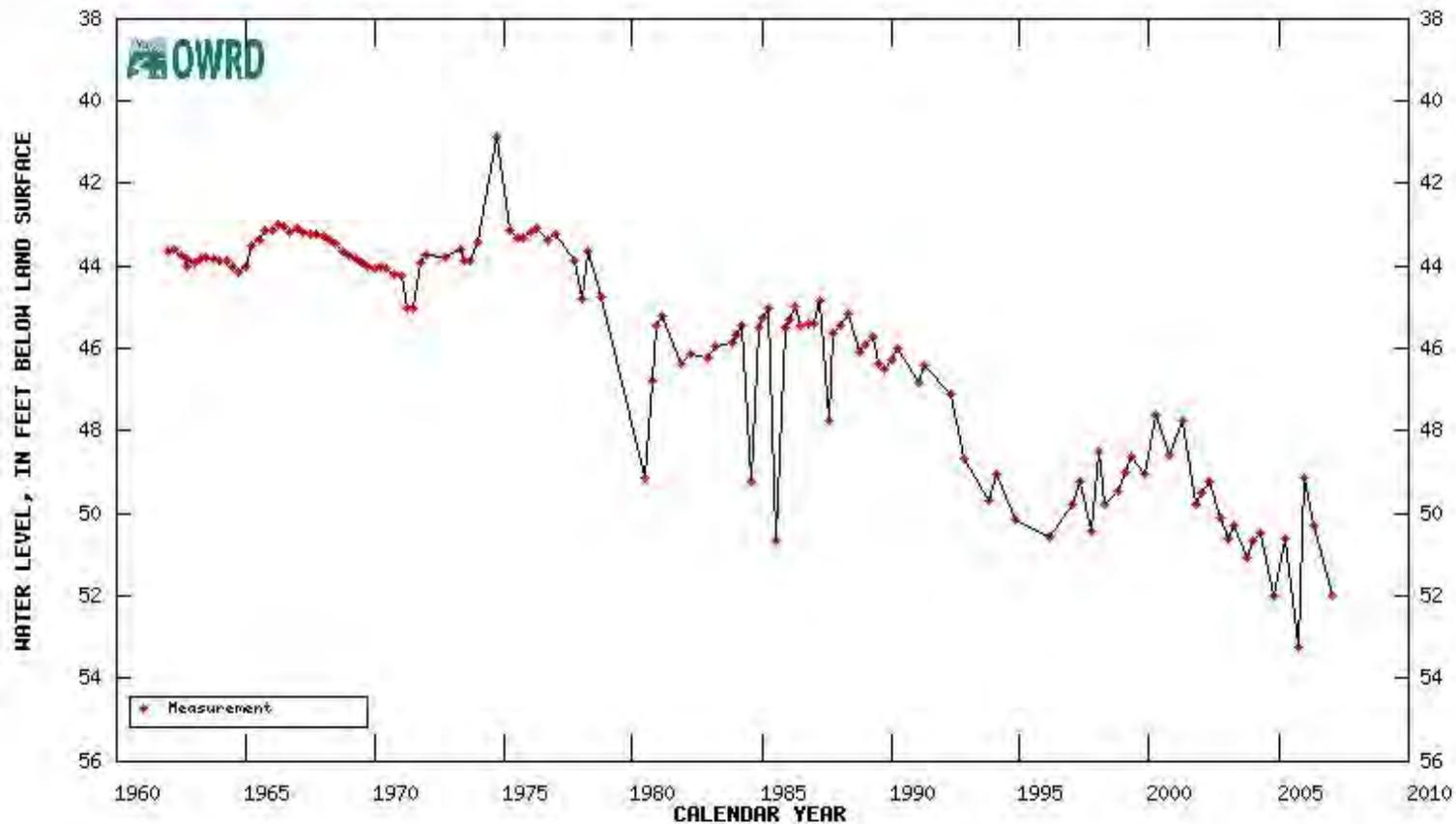
340

Well depth, in feet below land surface

Land surface elevation, in feet above mean sea level

Primary use of well

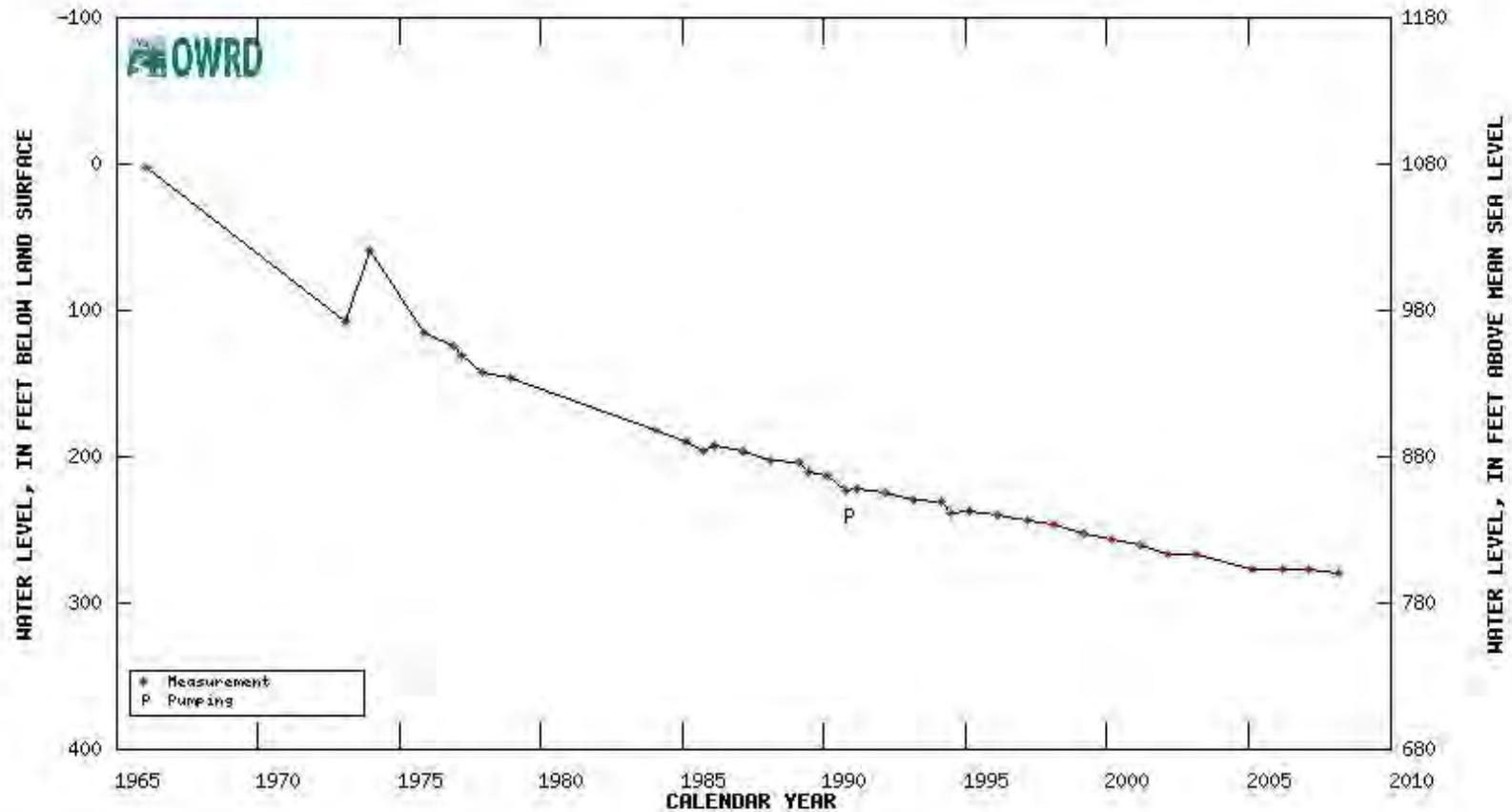
not determined



# MORR 454

## Excessive Well Withdrawals

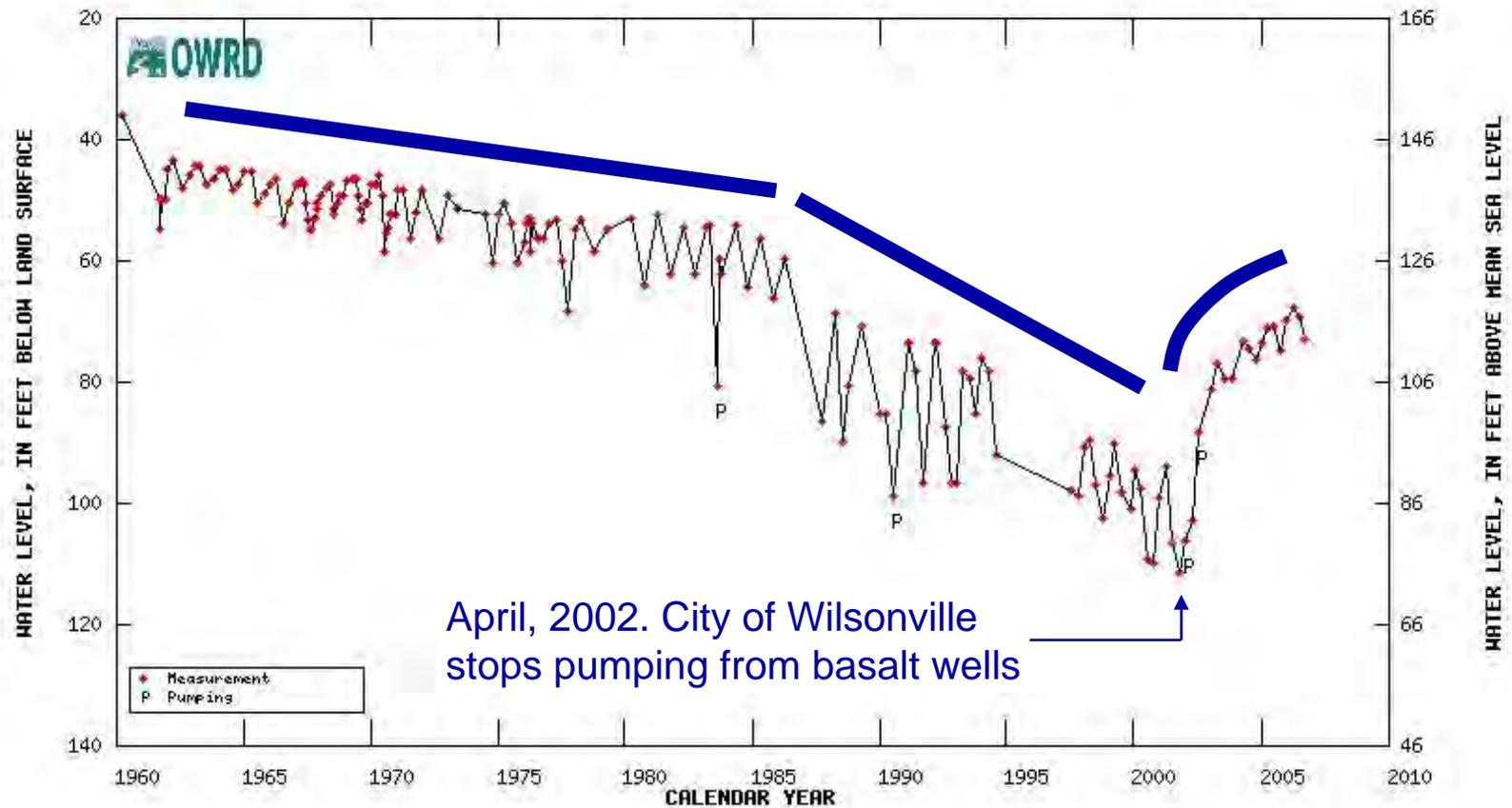
Well Location	1.00N27.00E30BB
Oregon Water Resources Department Well Log ID	MORR 454
Oregon Water Resources Department State Observation Well Number	----
Well depth, in feet below land surface	684
Land surface elevation, in feet above mean sea level	1080
Primary use of well	IRRIGATION



# CLAC 8231

## Changing Trends Over Time

Well Location	3.00S1.00W16DDD
Oregon Water Resources Department Well Log ID	CLAC 8231
Oregon Water Resources Department State Observation Well Number	40
Well depth, in feet below land surface	1000
Land surface elevation, in feet above mean sea level	186
Primary use of well	PUBLIC SUPPLY



# MARI 308

## Annual vs Seasonal Trends

Well Location

Oregon Water Resources Department Well Log ID

Oregon Water Resources Department State Observation Well Number

Well depth, in feet below land surface

Land surface elevation, in feet above mean sea level

Primary use of well

4.00S1.00W5CDC

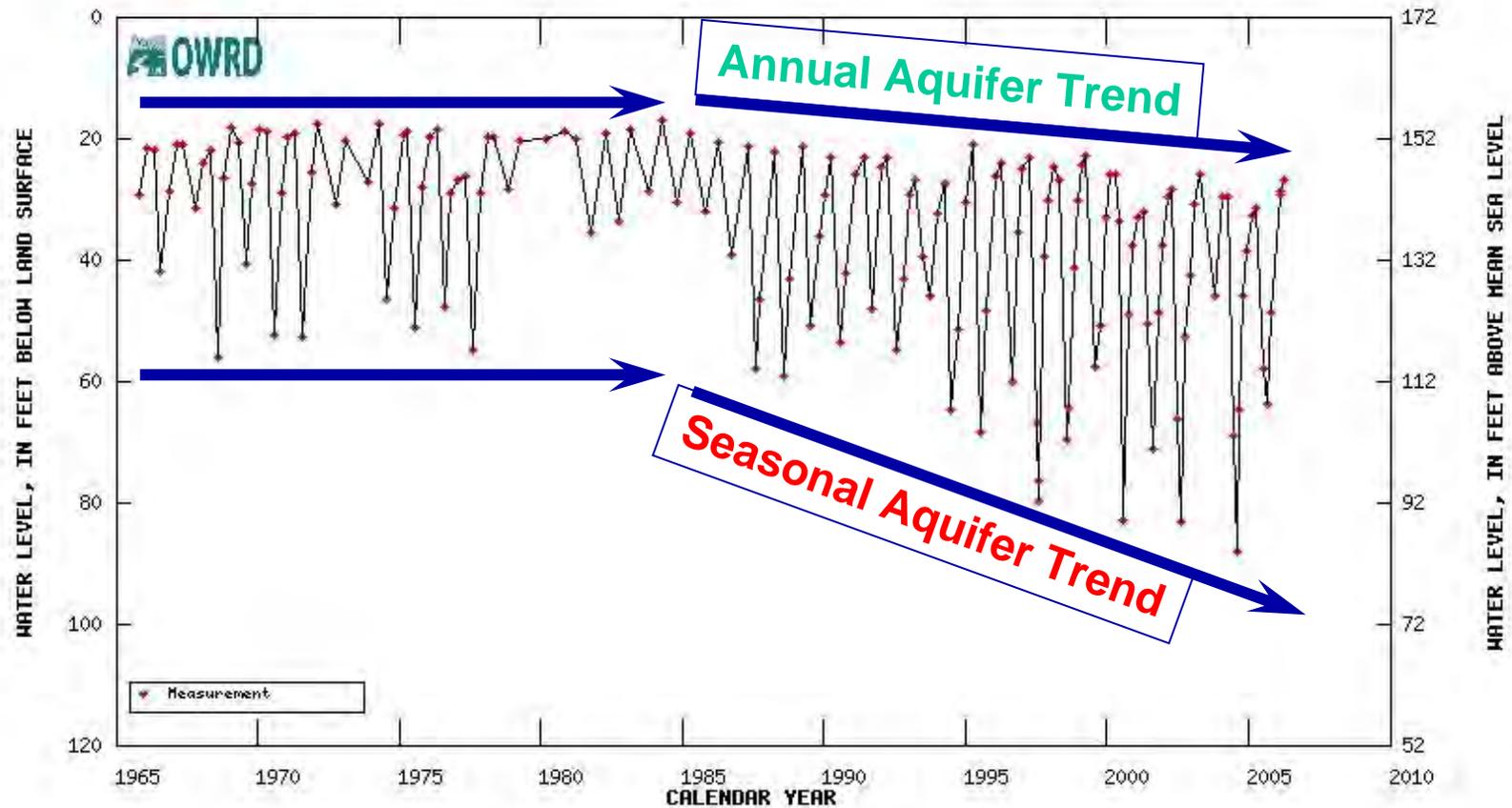
MARI 308

605

120

172

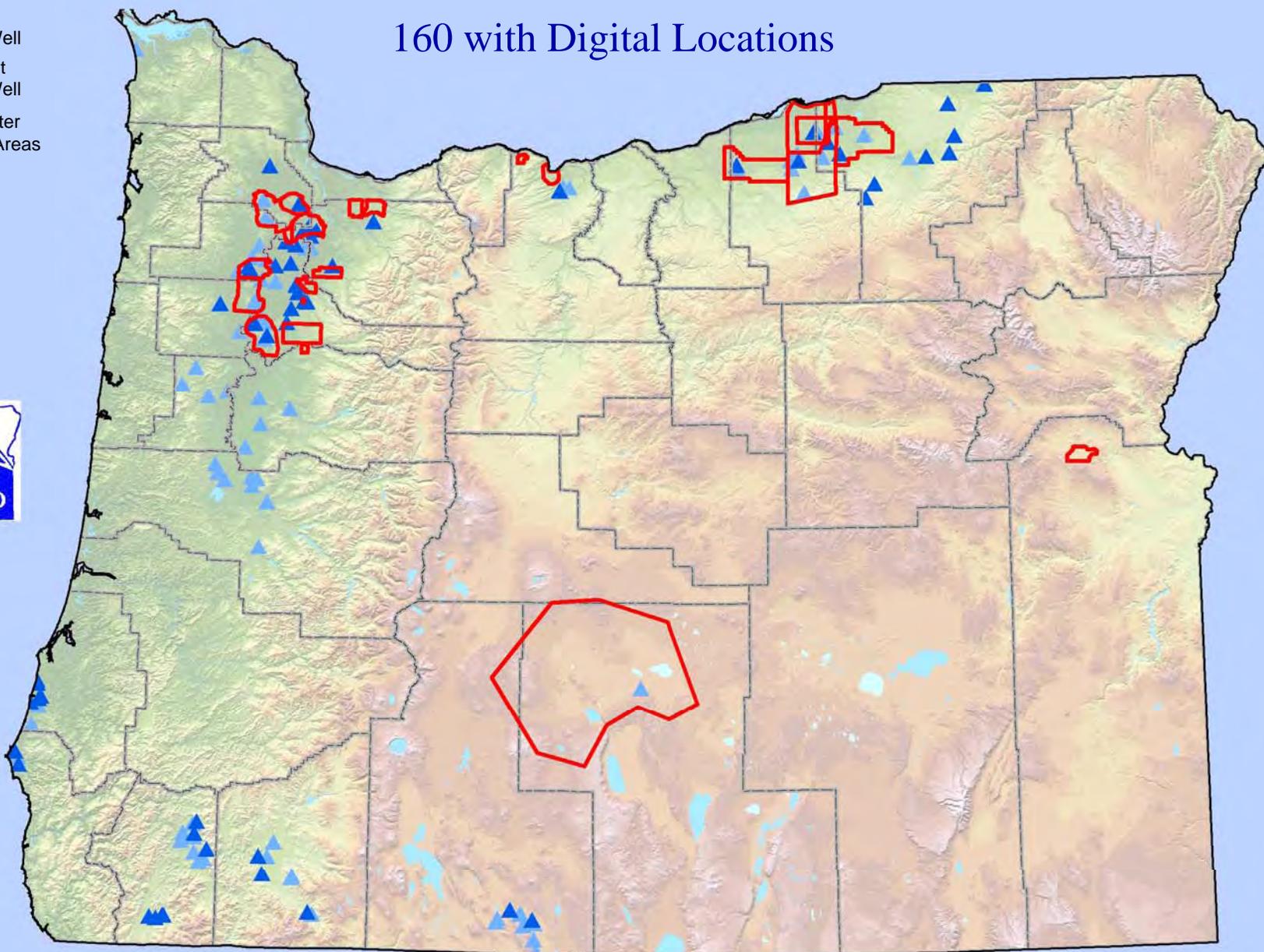
UNUSED



# Recorder Wells

160 with Digital Locations

- # Current Recorder Well
- # Non-Current Recorder Well
- Ground Water Restricted Areas
- Counties

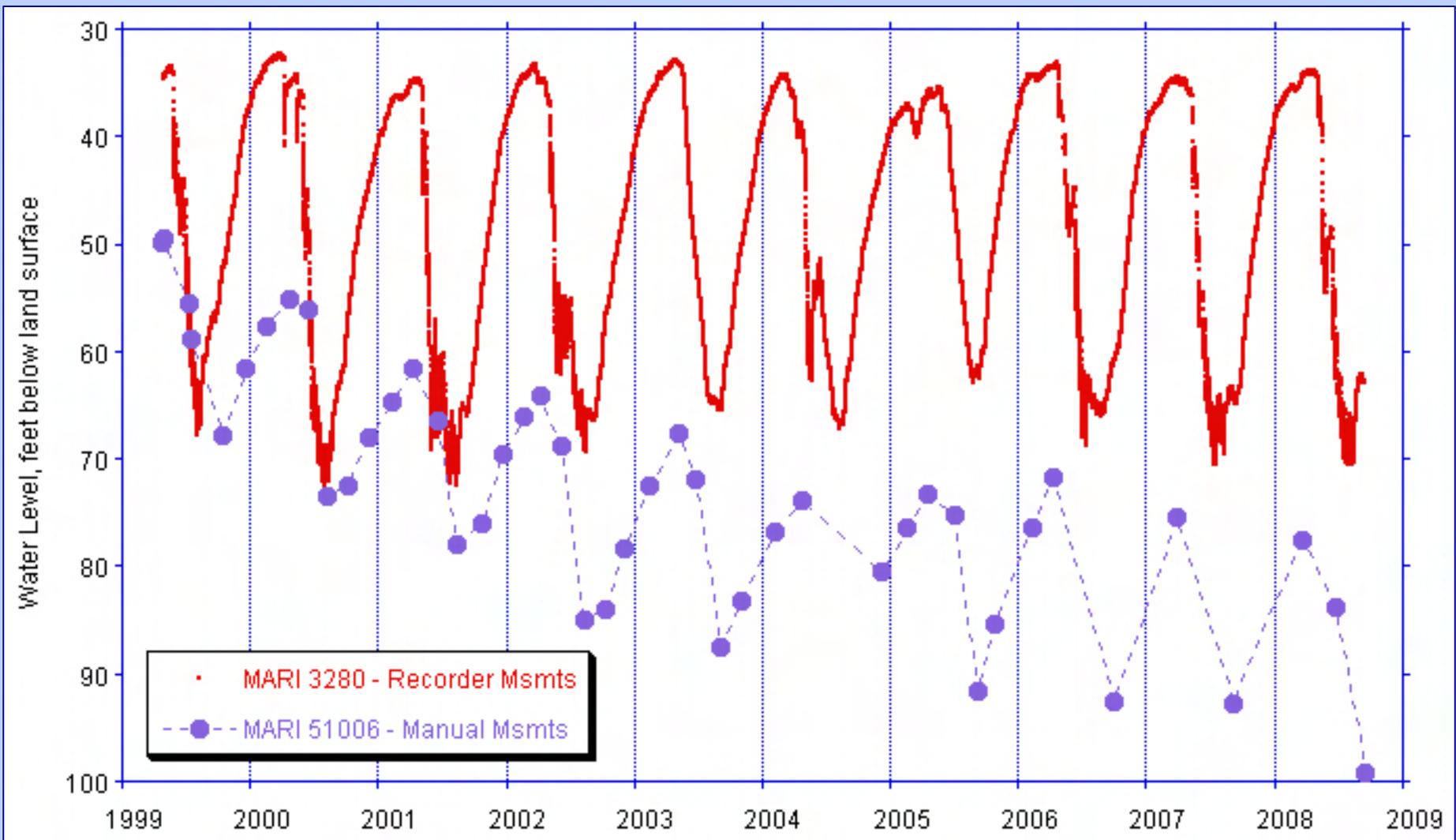


Oregon Water Resources Department December 2008



# MARI 3280 – Basin-Fill Sediments

## MARI 51006 – Columbia River Basalt



# Where to Find our Data

Oregon Water Resources Web Site

([wrd.state.or.us](http://wrd.state.or.us)) under Ground Water

- Online hydrographs
- Digital water-level tables
- Well location tables
- Groundwater reports
- Links to USGS groundwater studies and reports

