Harney Basin Groundwater Overview

June 18, 2015

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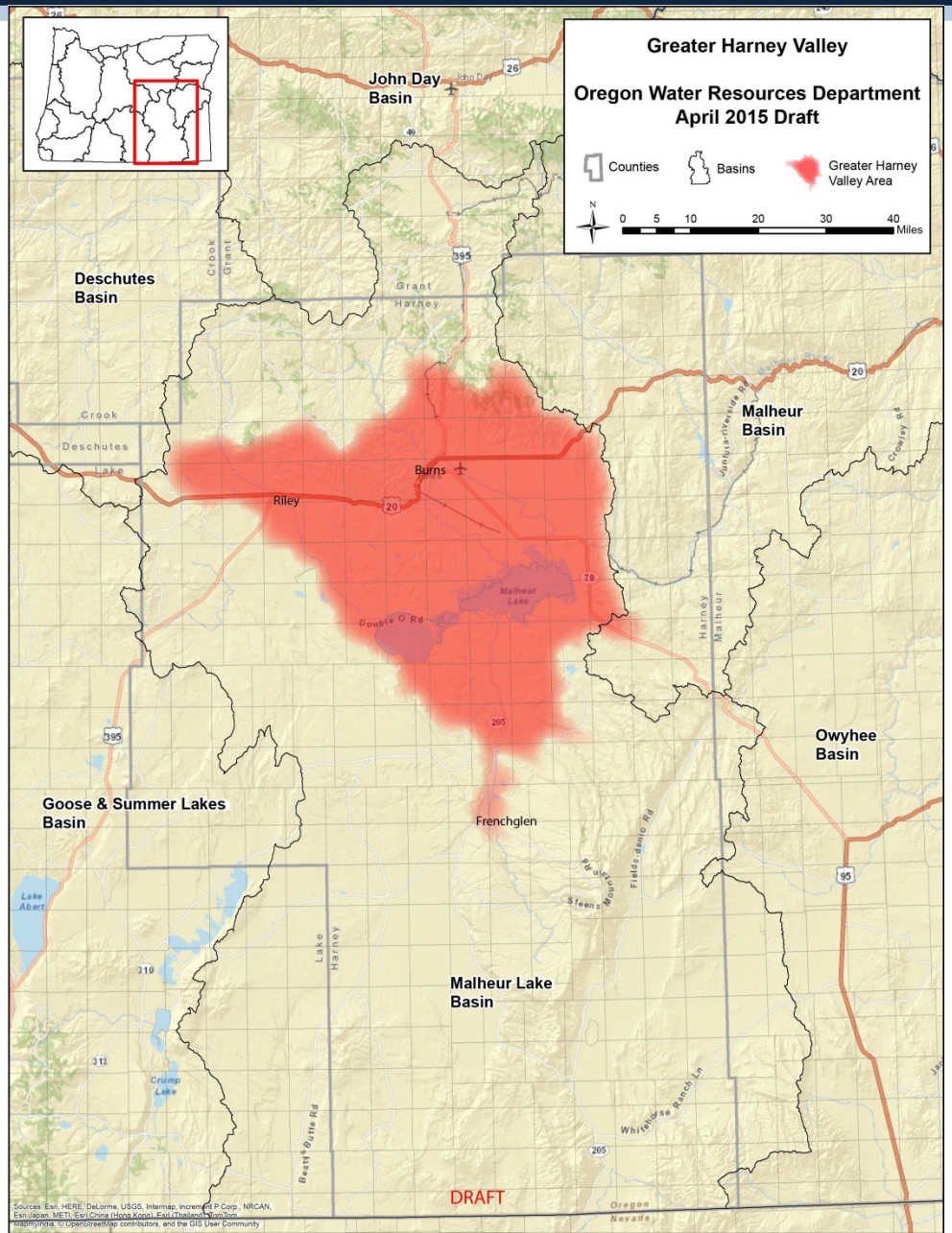
Oregon Water Resources Department

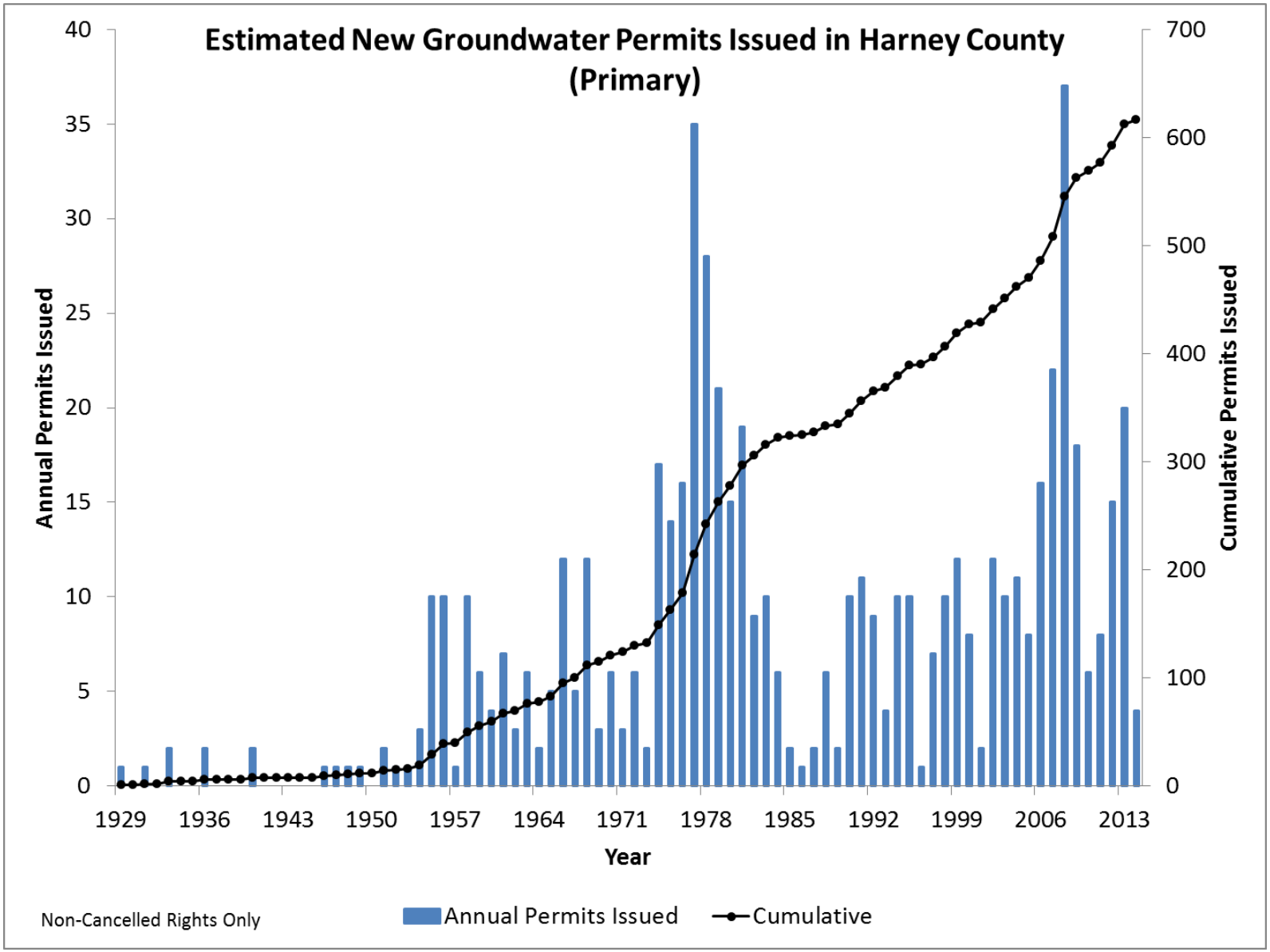
Why the need for the overview?

- Significant groundwater development
- Groundwater levels are declining; discuss data
- Recent applications protested → closer look at data
- Next steps

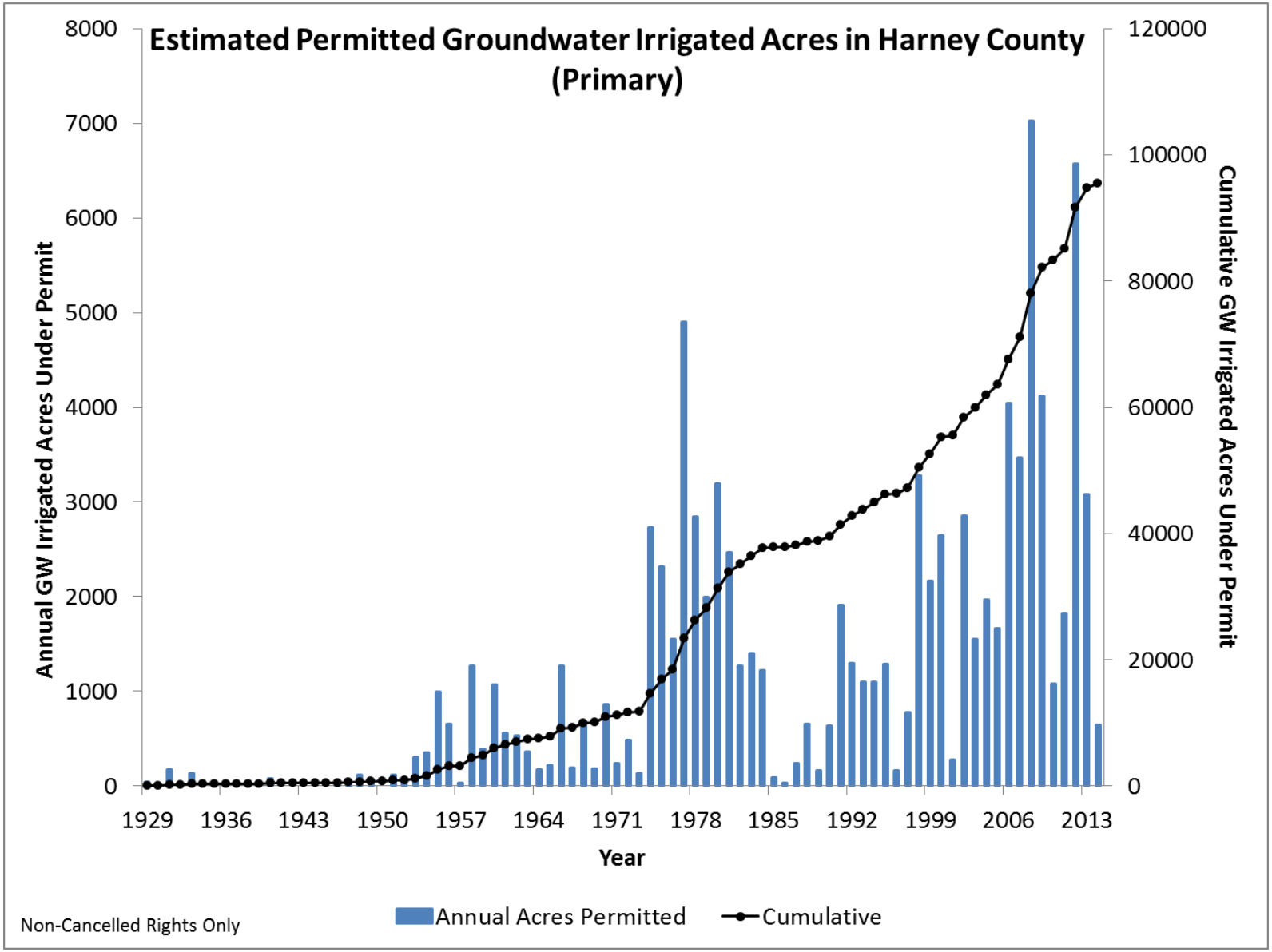
Greater Harney Valley Area



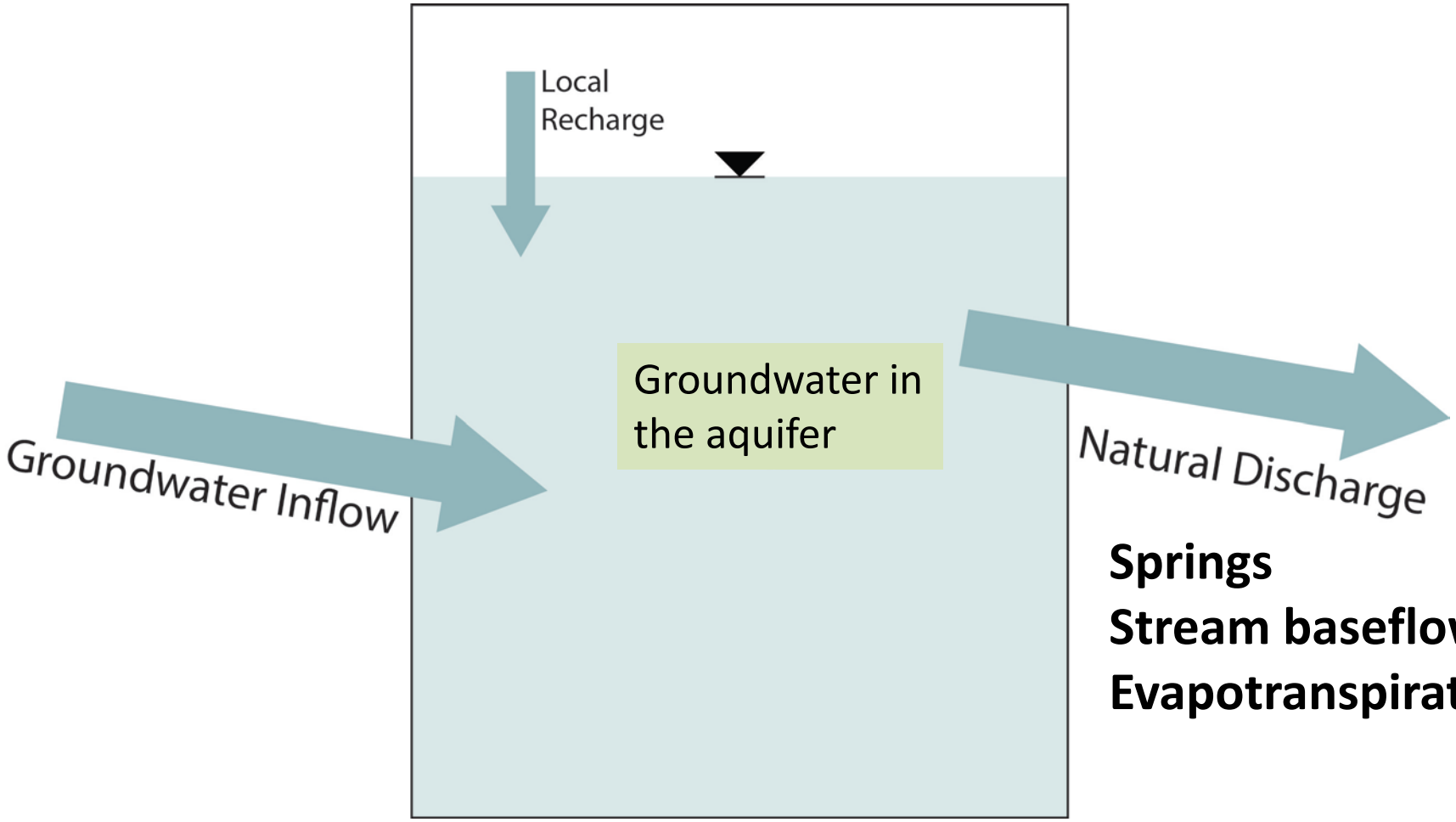
Groundwater Permits



Permitted Irrigated Acres

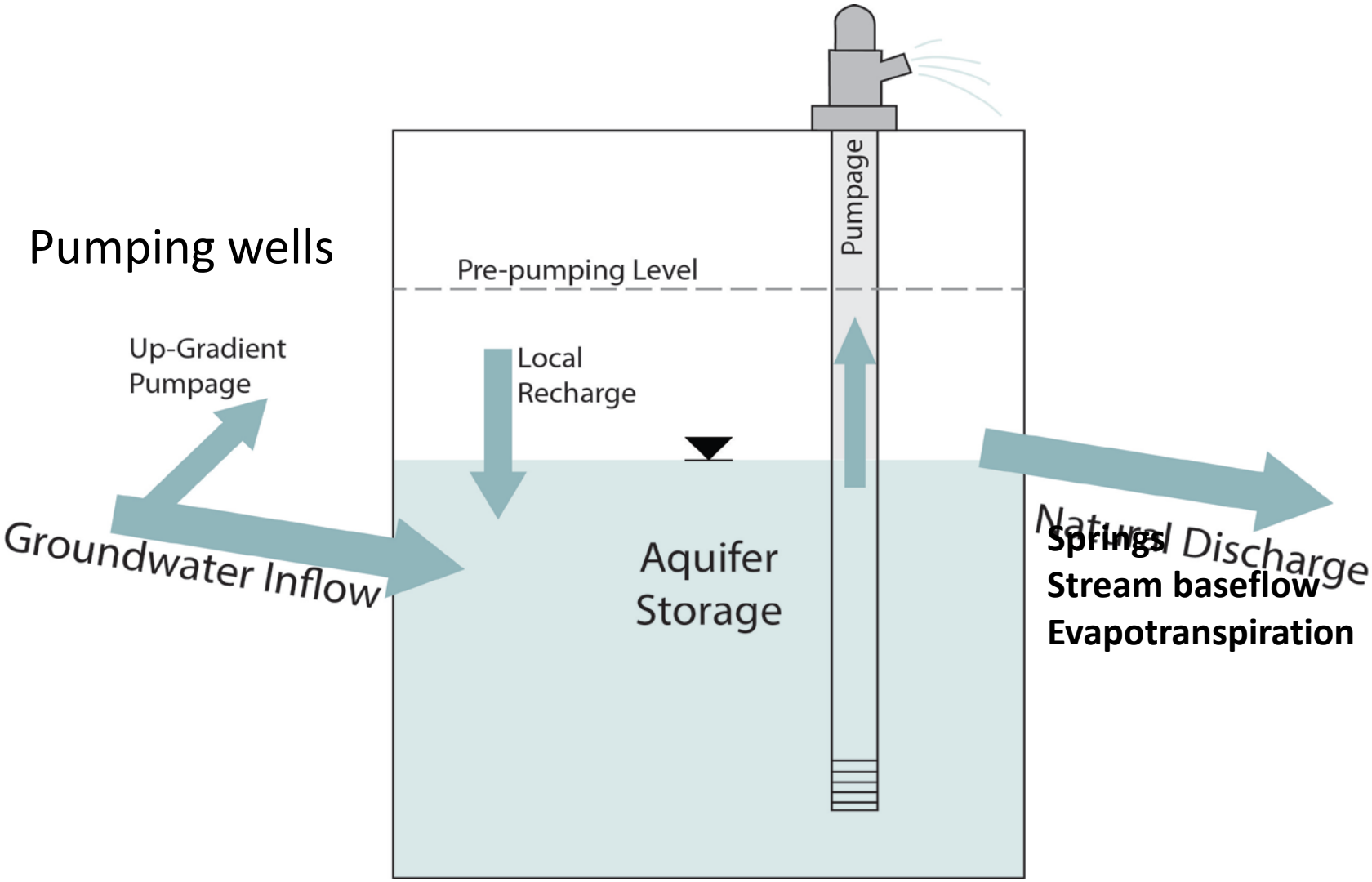


Aquifer system before pumping wells:

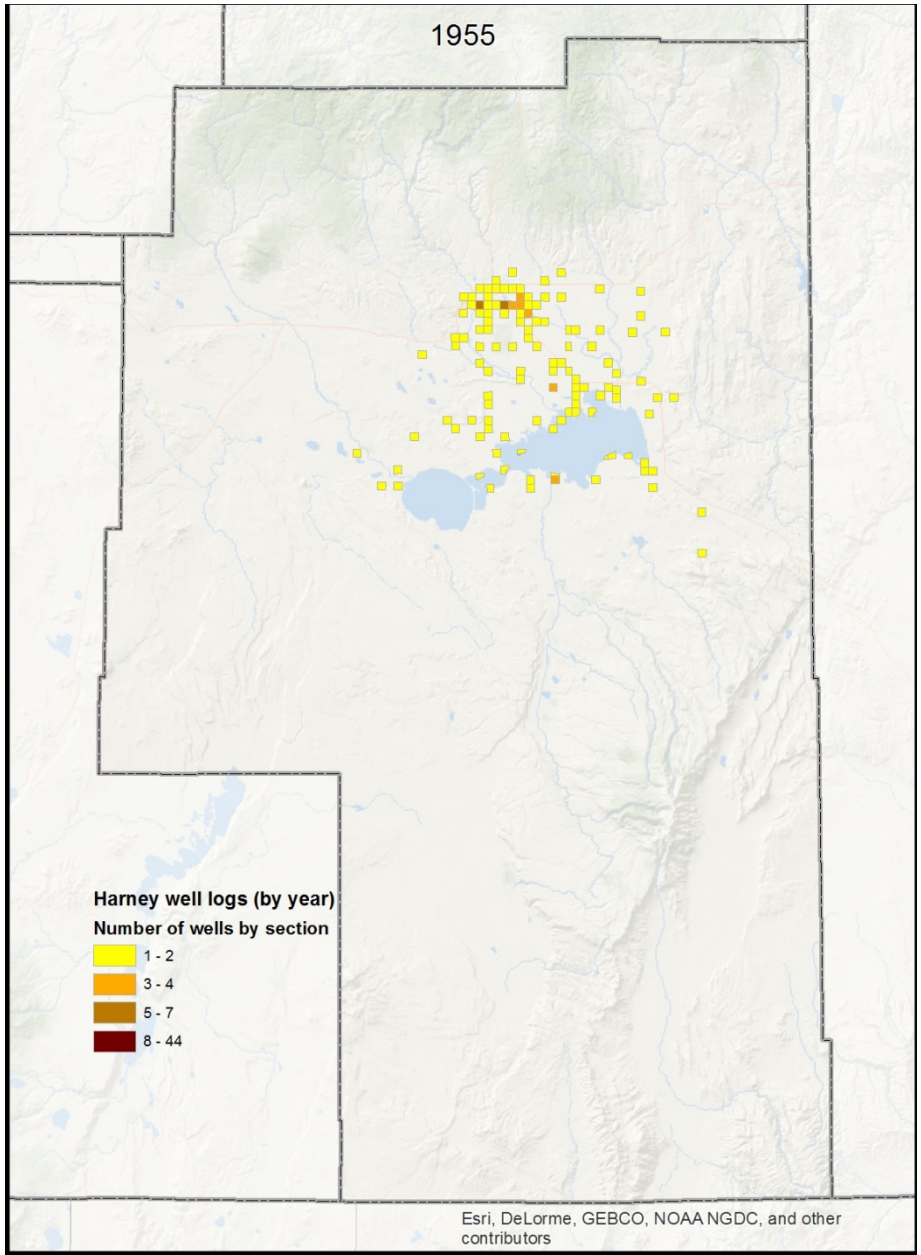


Springs
Stream baseflow
Evapotranspiration

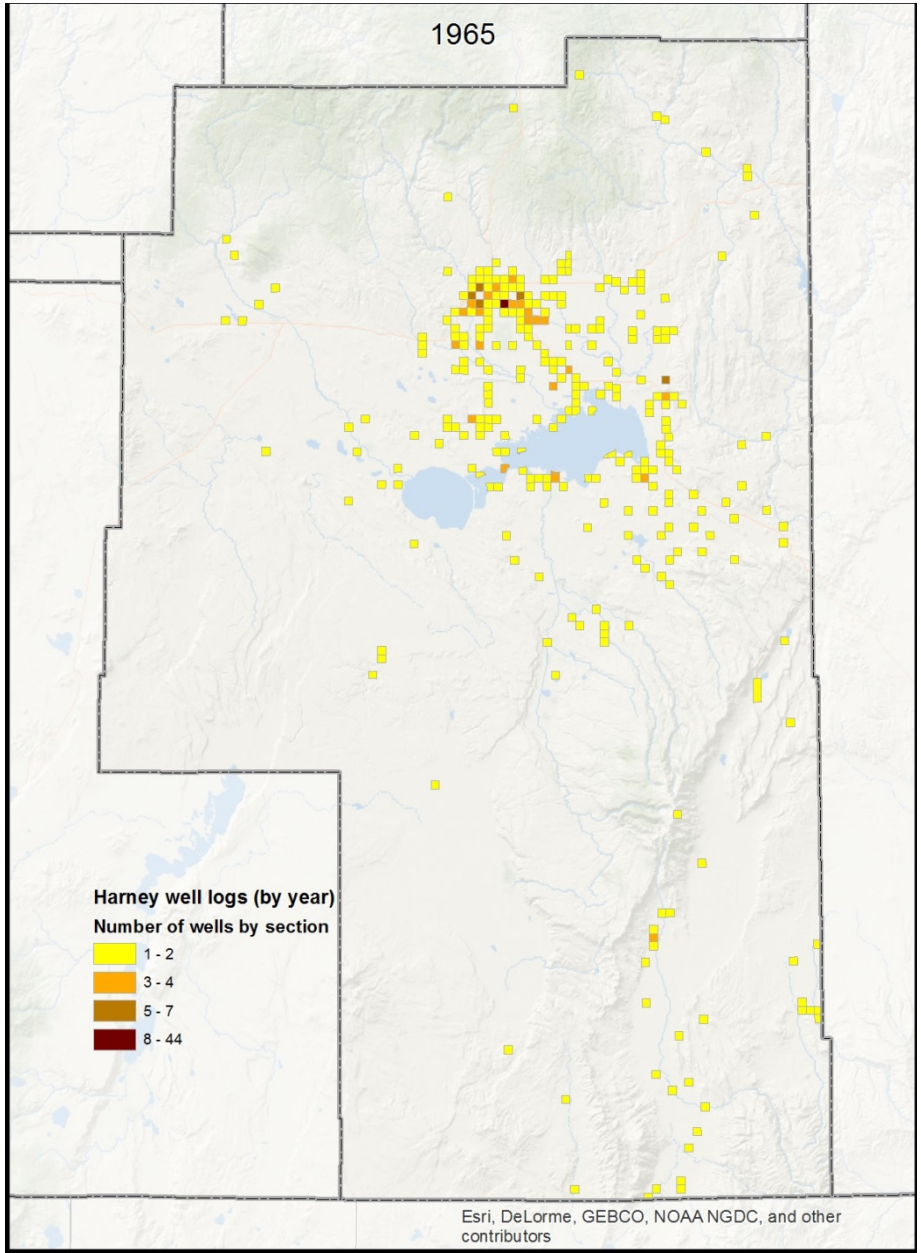
Aquifer system with pumping wells:



1955


1955
Harney well logs (by year)
Number of wells by section
1 - 2
3 - 4
5 - 7
8 - 44
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

1965


1965
Harney well logs (by year)
Number of wells by section
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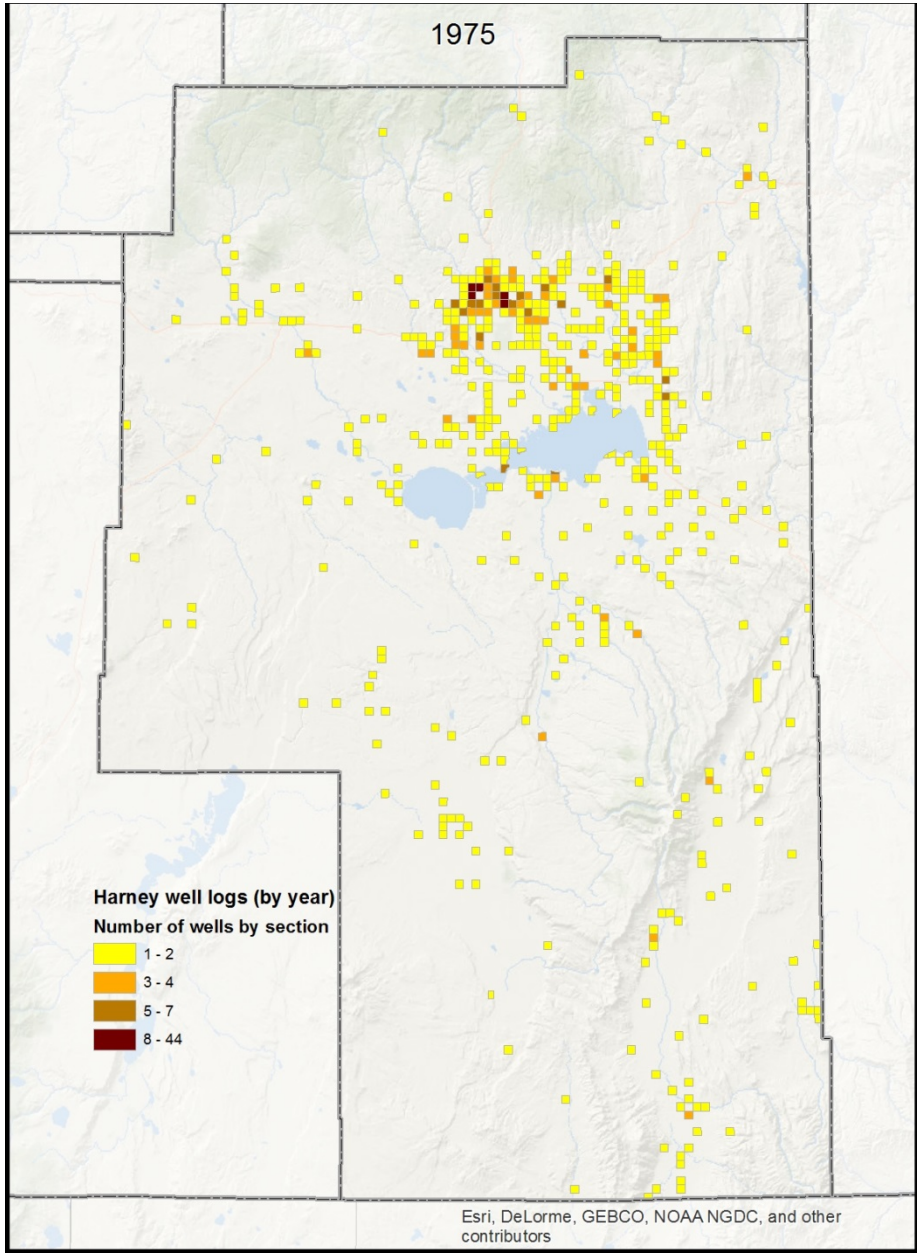
5 - 7
8 - 44
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

1975


1975
Harney well logs (by year)
Number of wells by section
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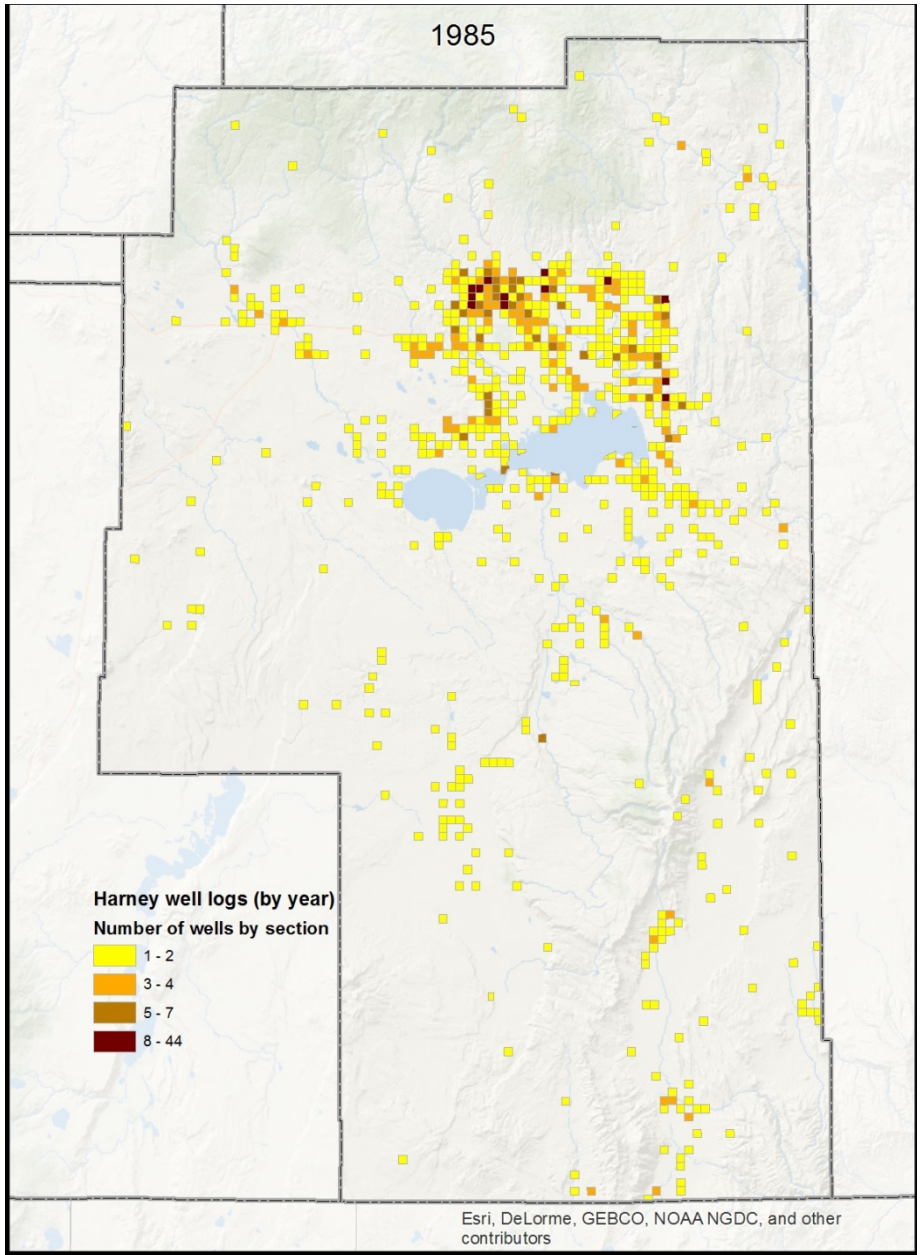
8 - 44
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

1985


1985
Harney well logs (by year)
Number of wells by section
1 - 2
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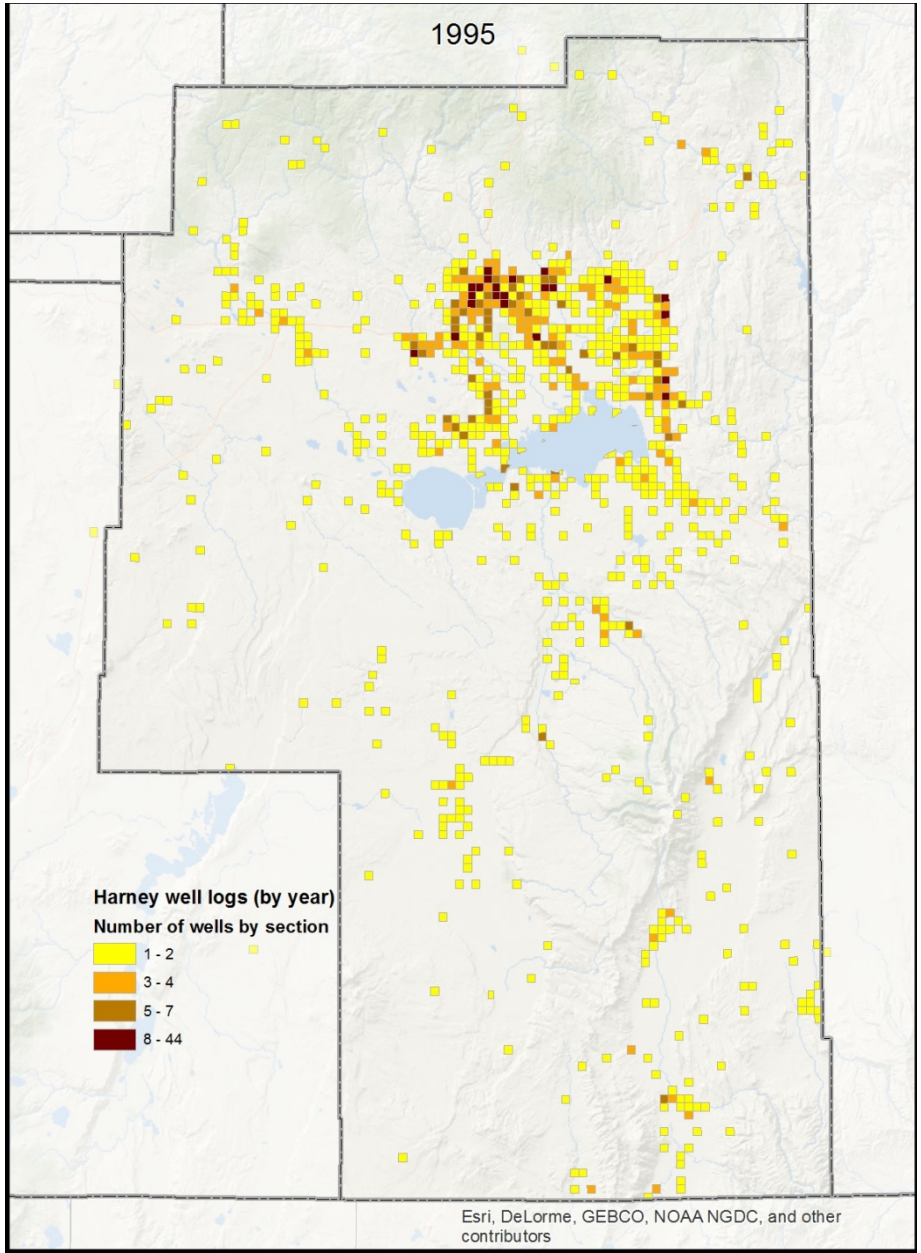
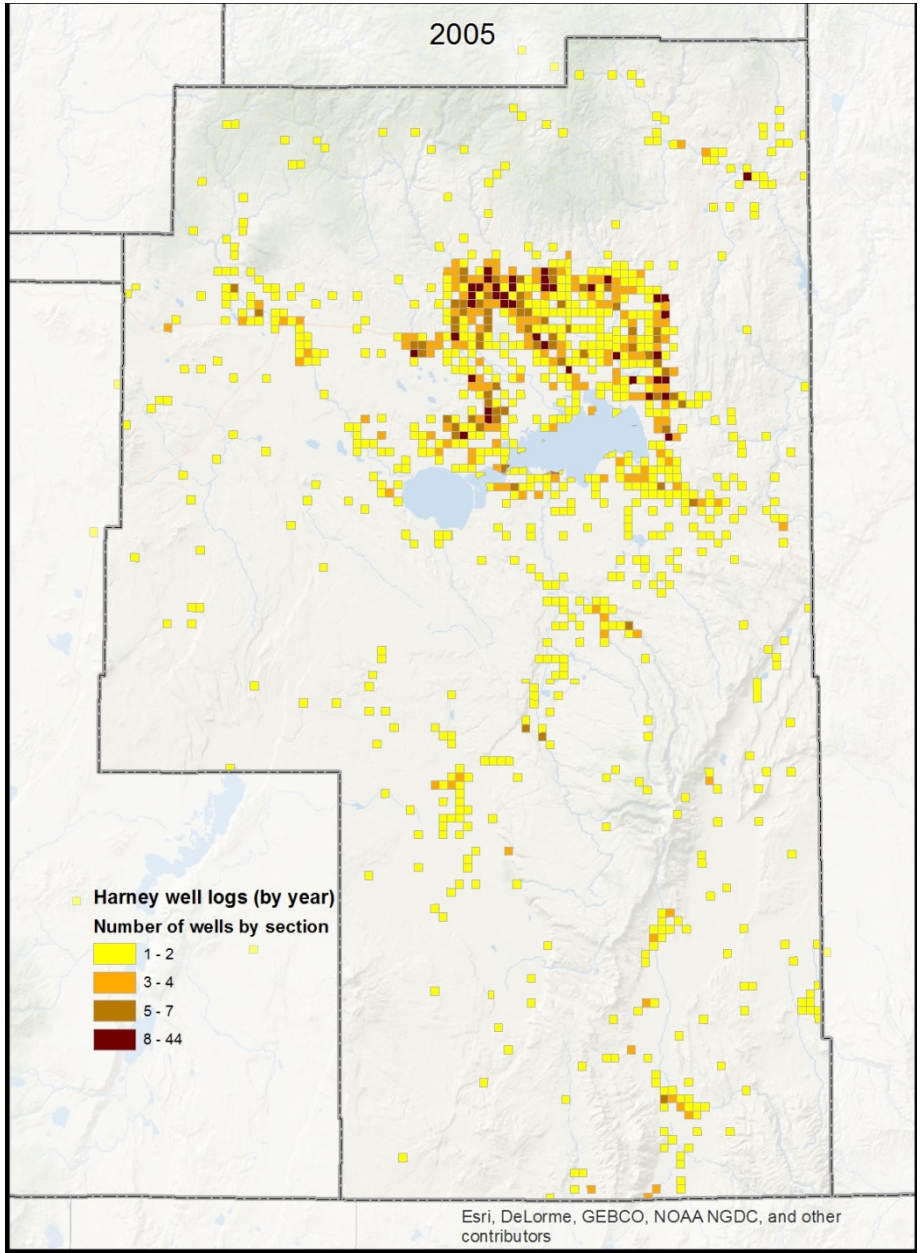
5 - 7
8 - 44
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

1995


1995
Harney well logs (by year)
Number of wells by section
1 - 2
3 - 4
5 - 7
8 - 44
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

2005


2005
Harney well logs (by year)
Number of wells by section
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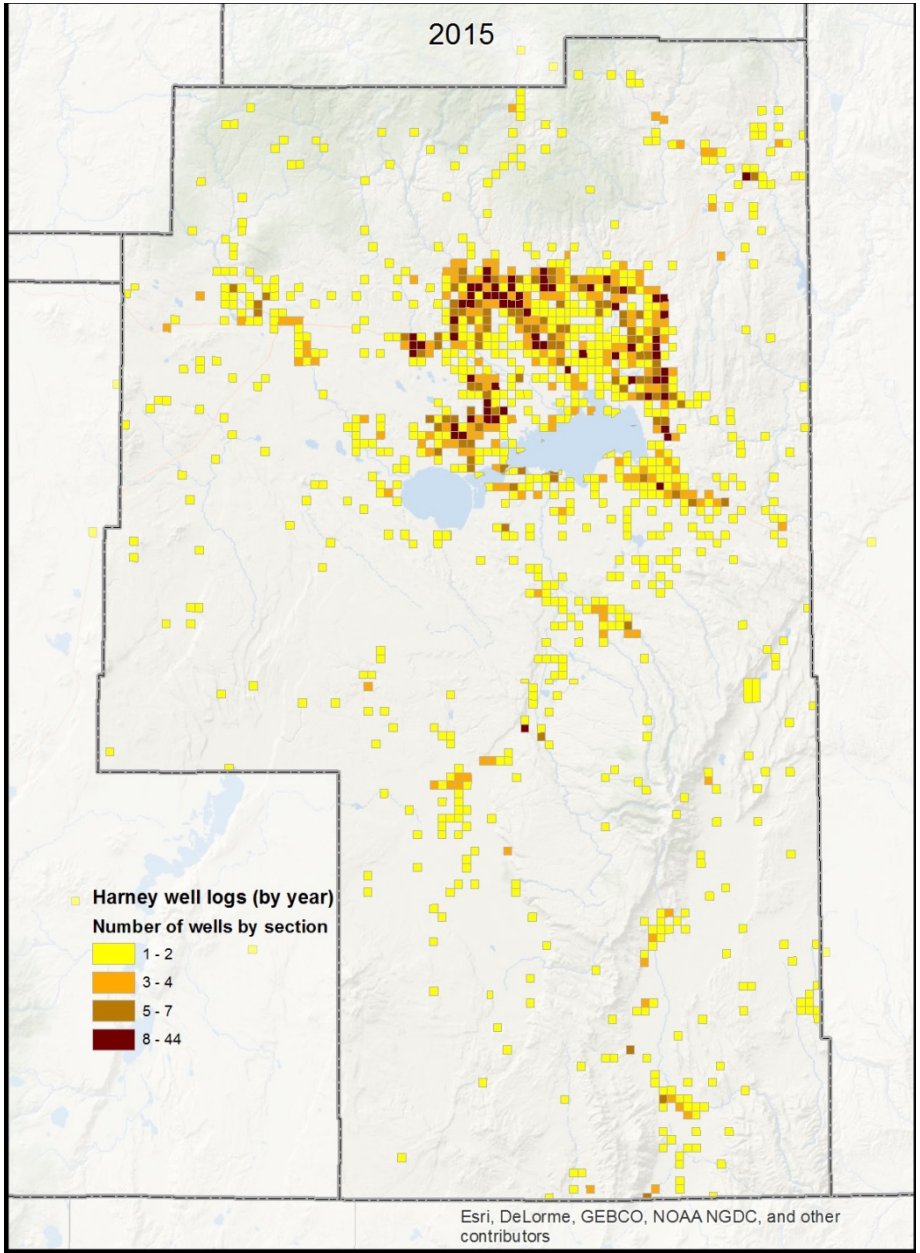
8 - 44
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

2015


2015
Harney well logs (by year)
Number of wells by section
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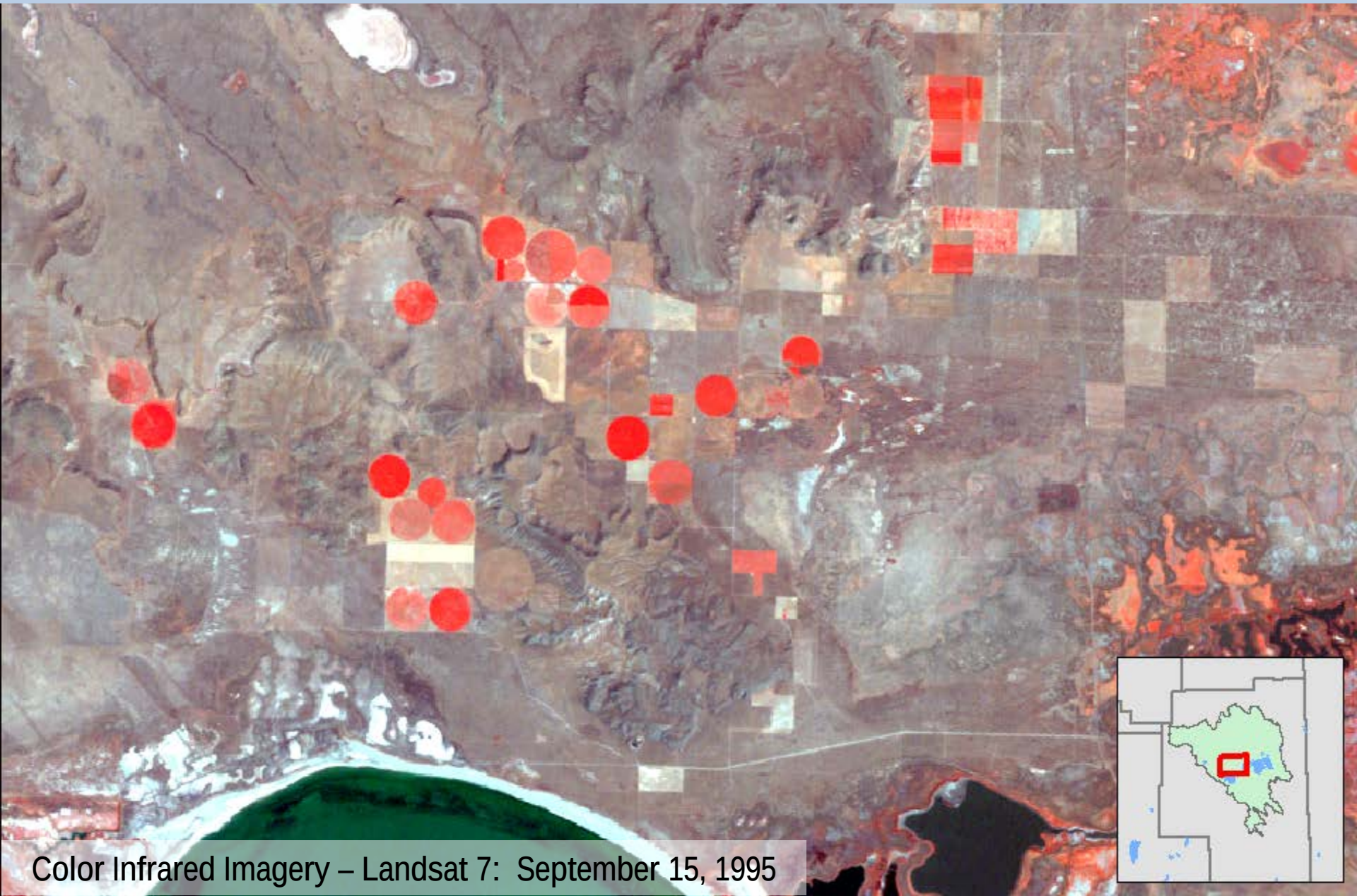
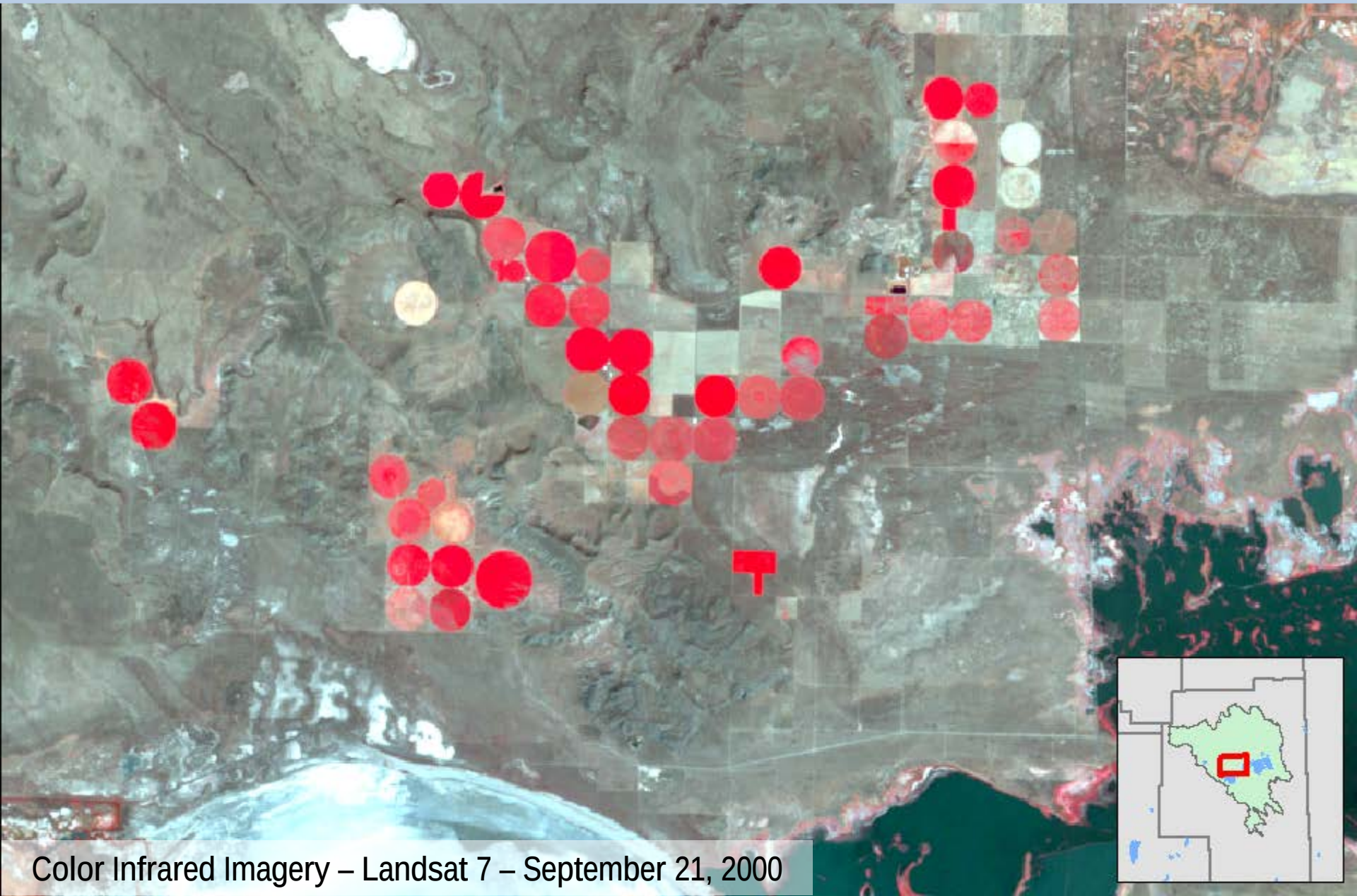
September 1995



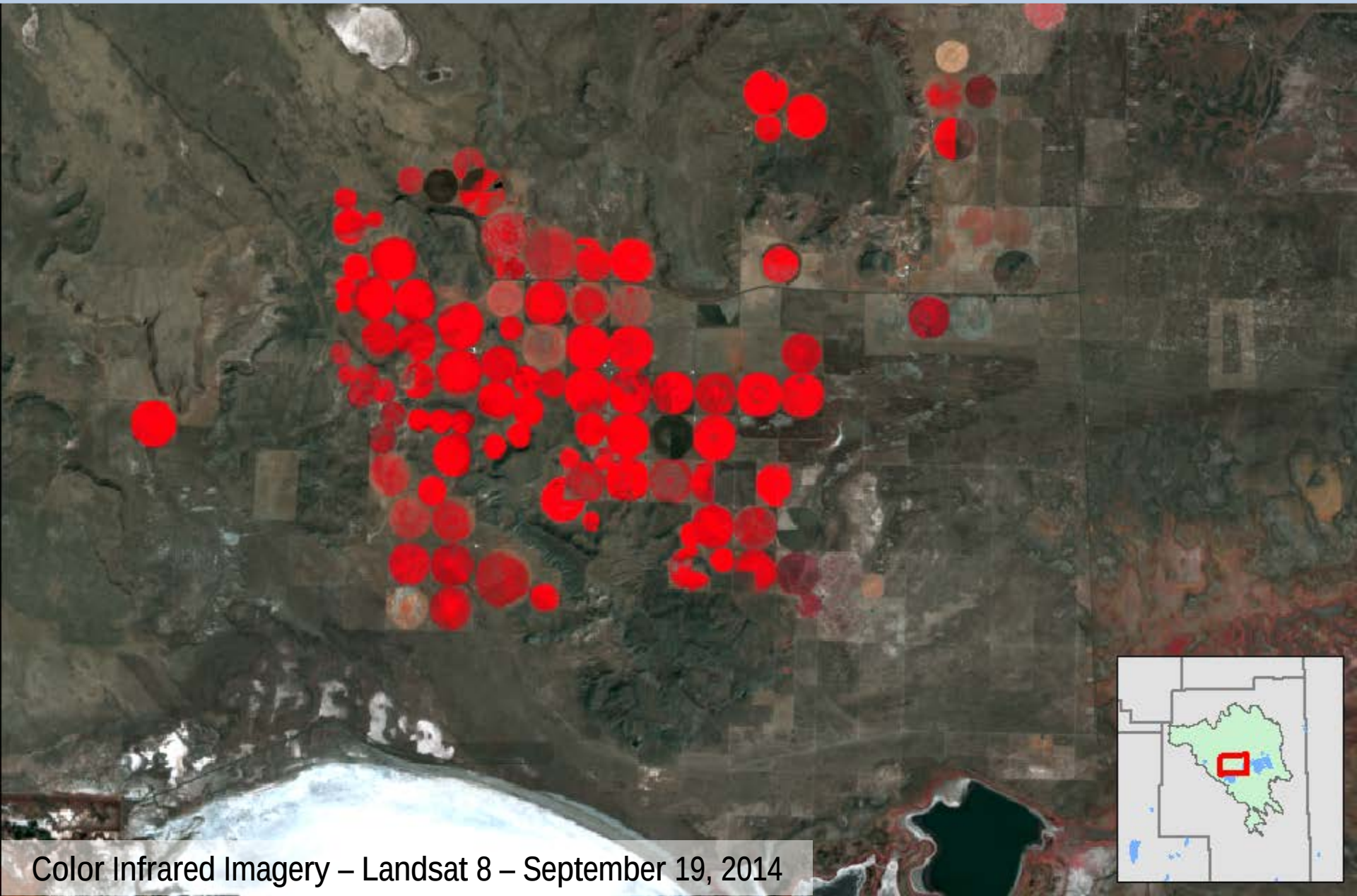
Color Infrared Imagery – Landsat 7: September 15, 1995

September 2000



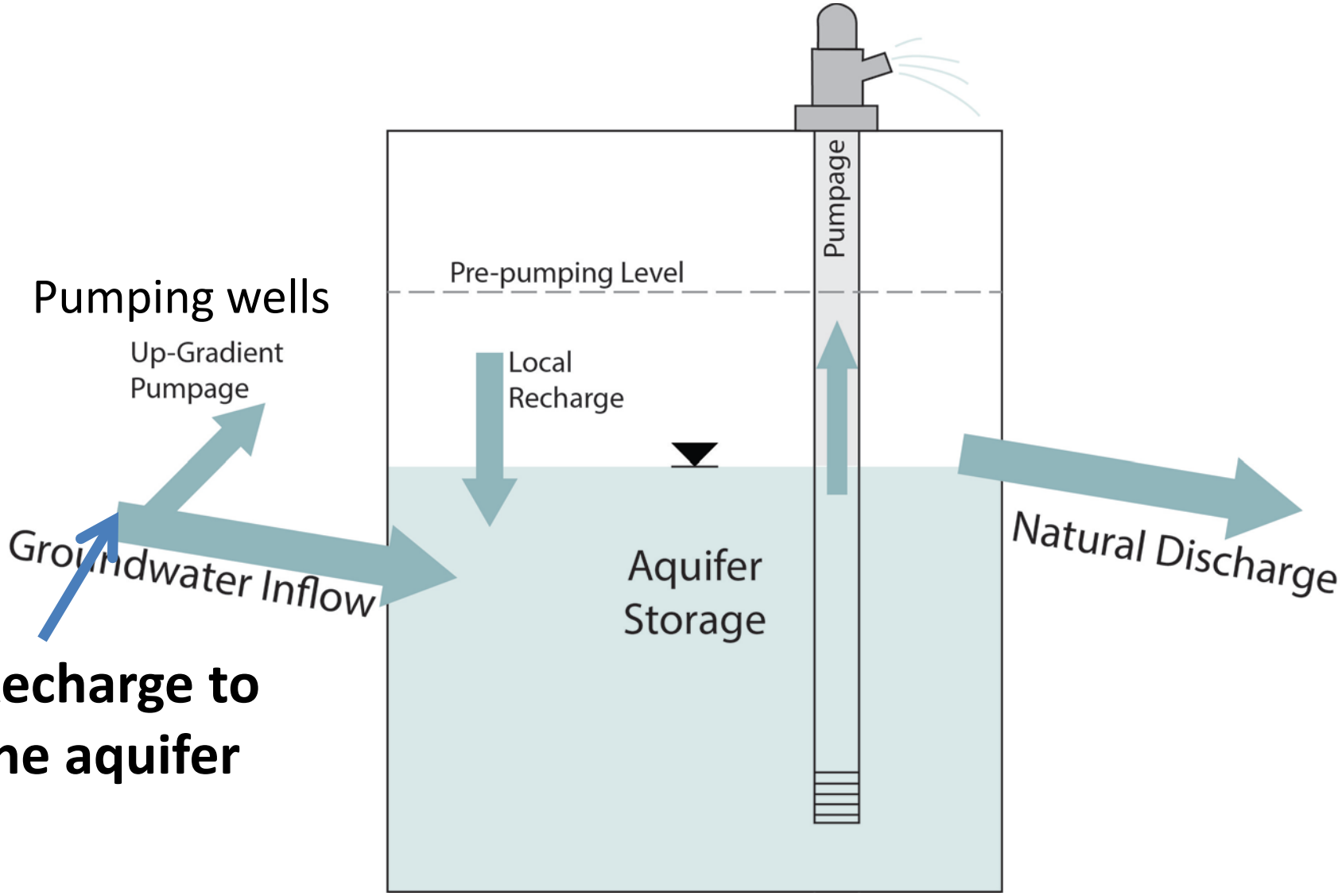
Color Infrared Imagery – Landsat 7 – September 21, 2000

September 2014

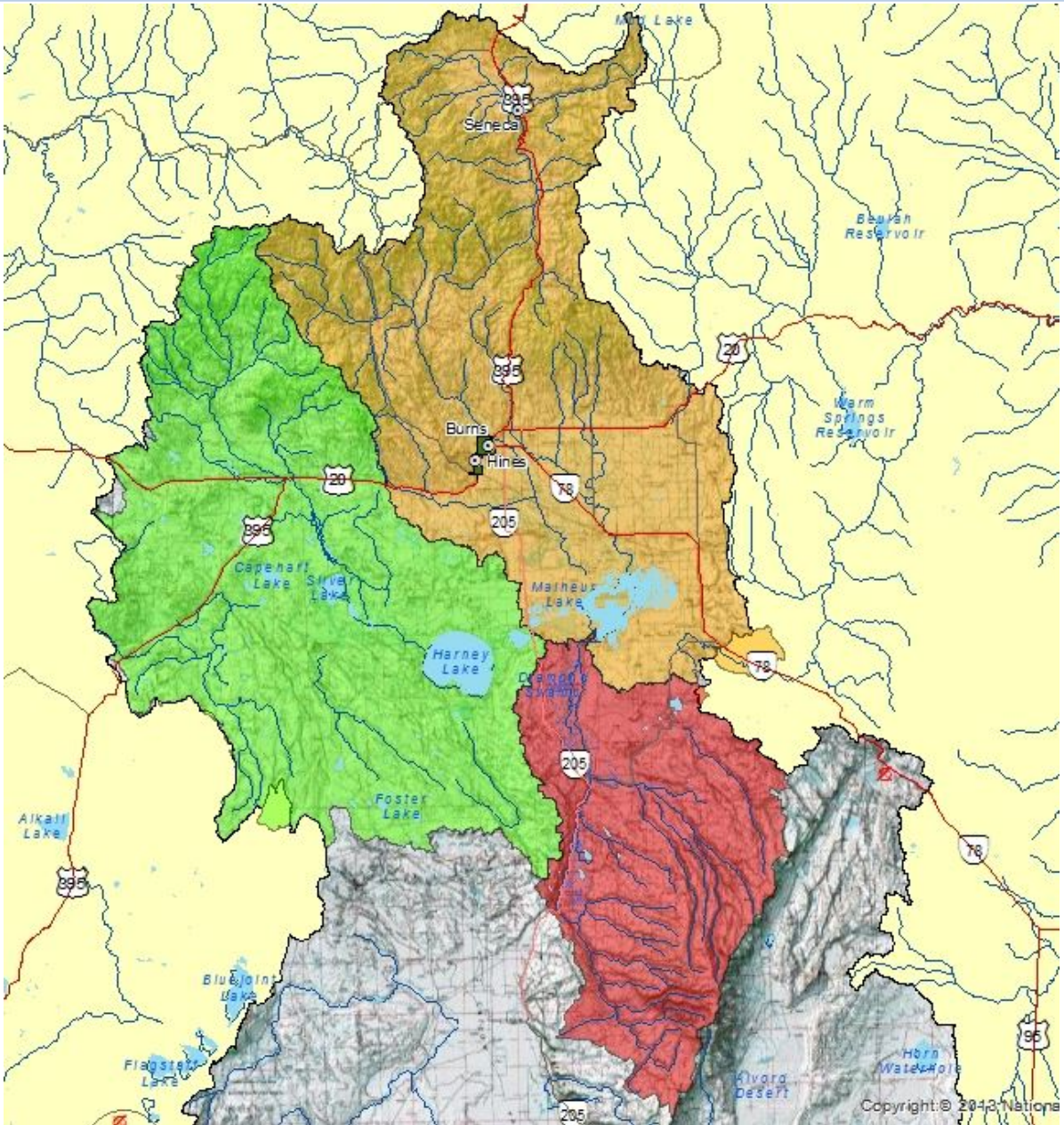


Color Infrared Imagery – Landsat 8 – September 19, 2014

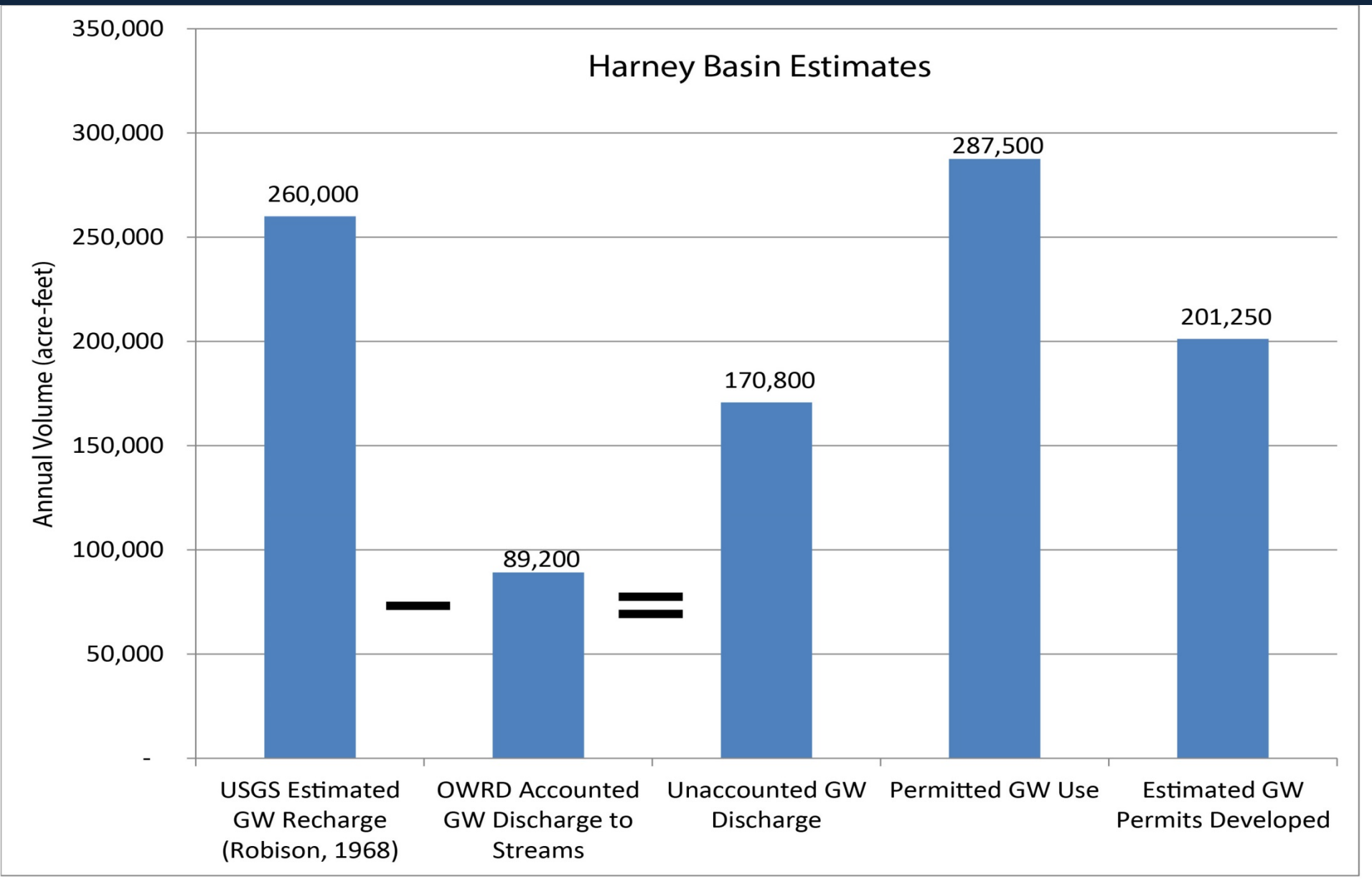
Aquifer system with pumping wells:



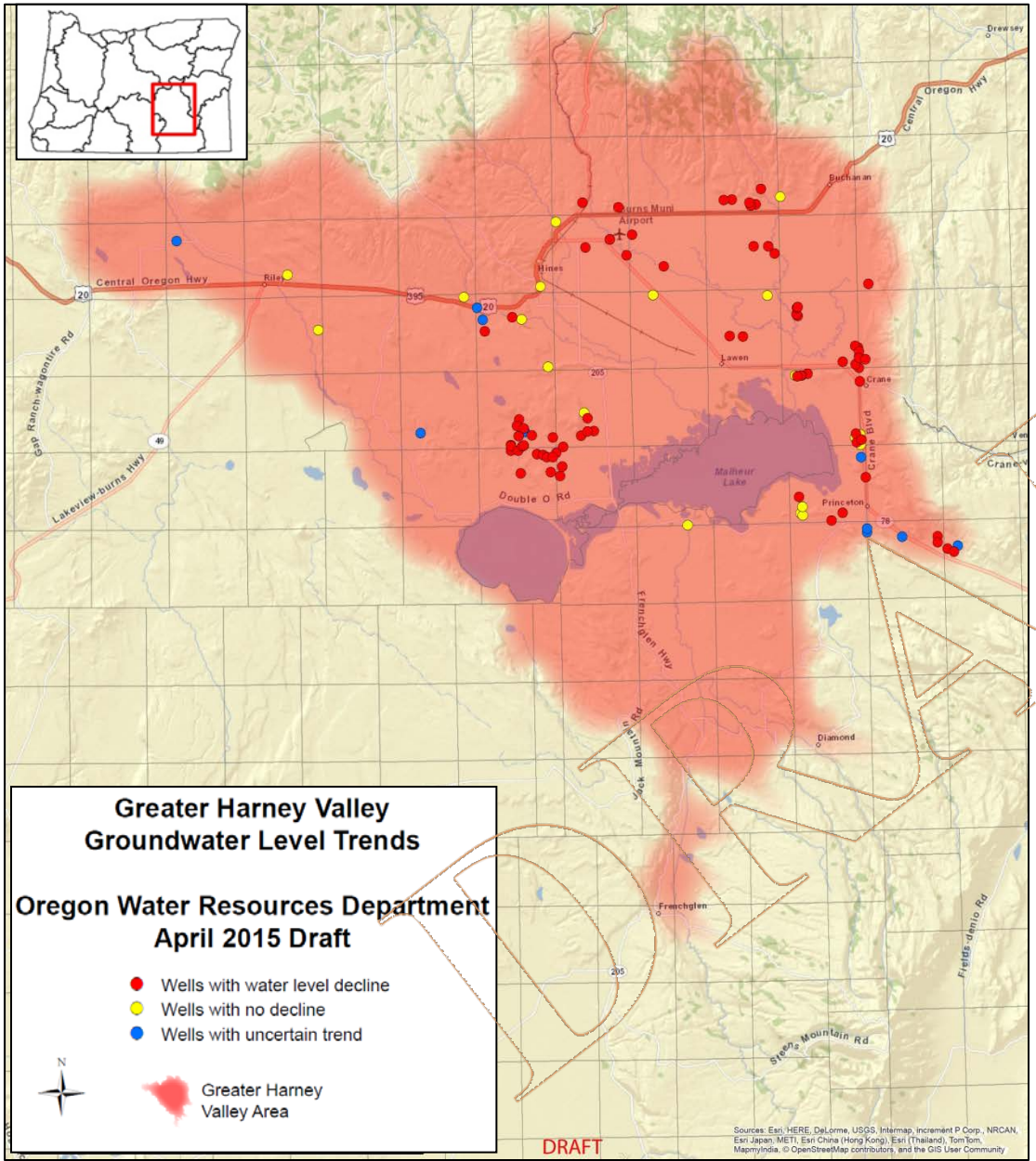
Area of Likely Recharge to Aquifer System



Harney Basin: Groundwater Budget Compared to Groundwater Permits

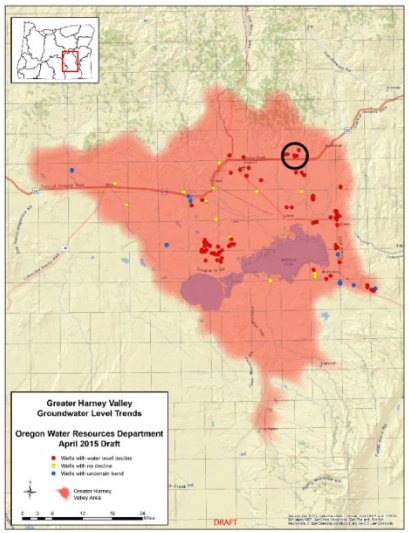


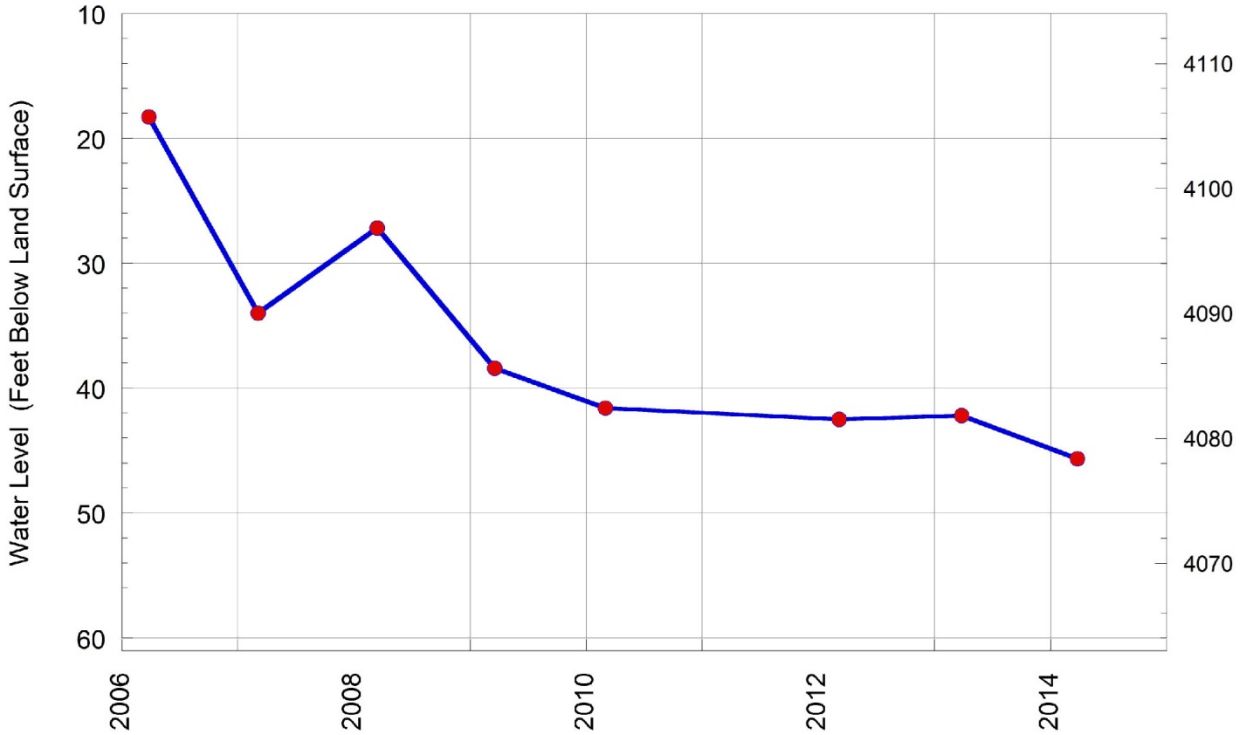
Groundwater Level Trends



Groundwater Level Trends: HARN 50422

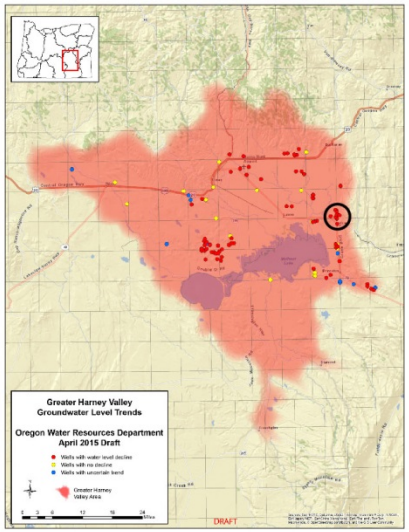
HARN 50422
Land surface elevation: 4132'
Well Depth: 400'

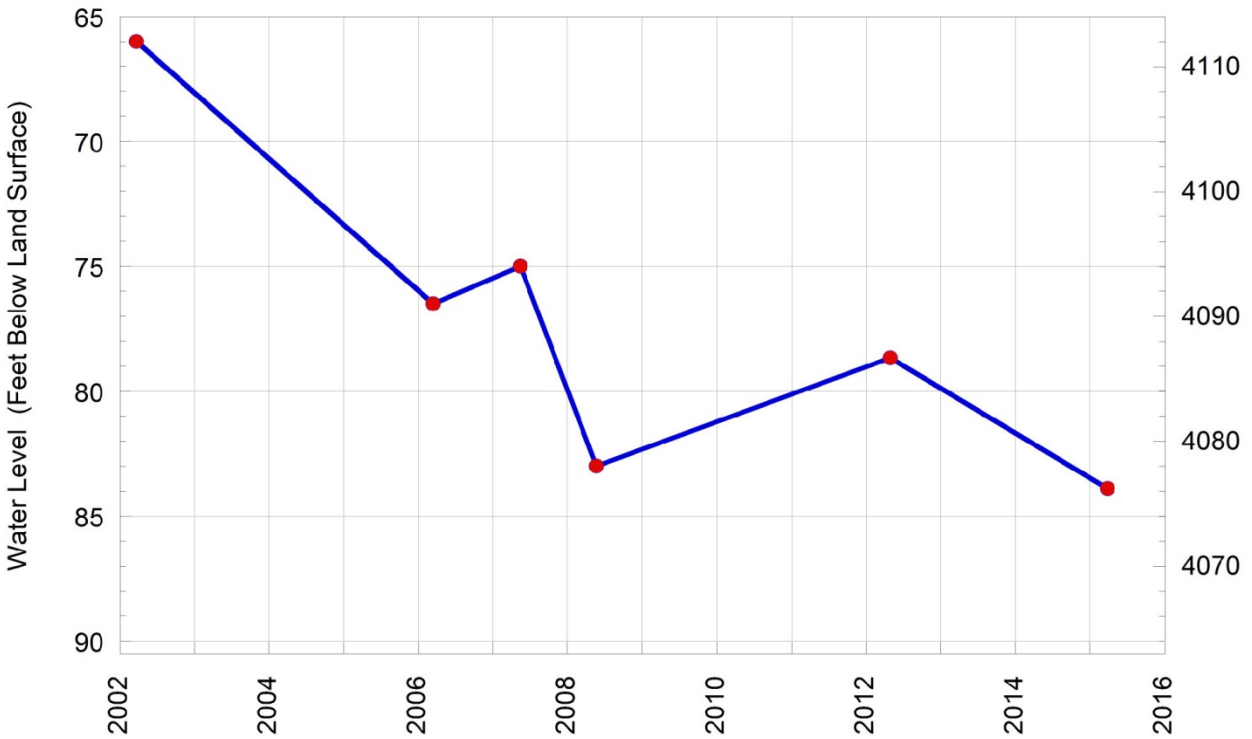




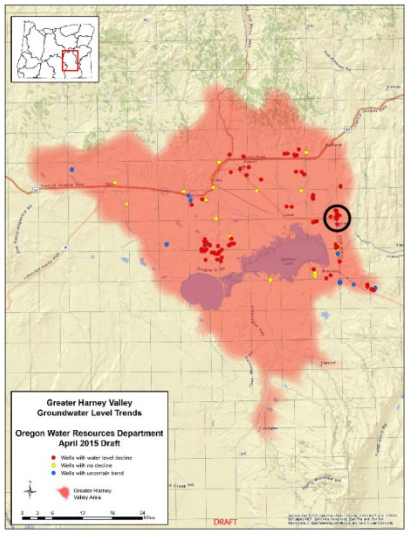
Groundwater Level Trends: HARN 1061

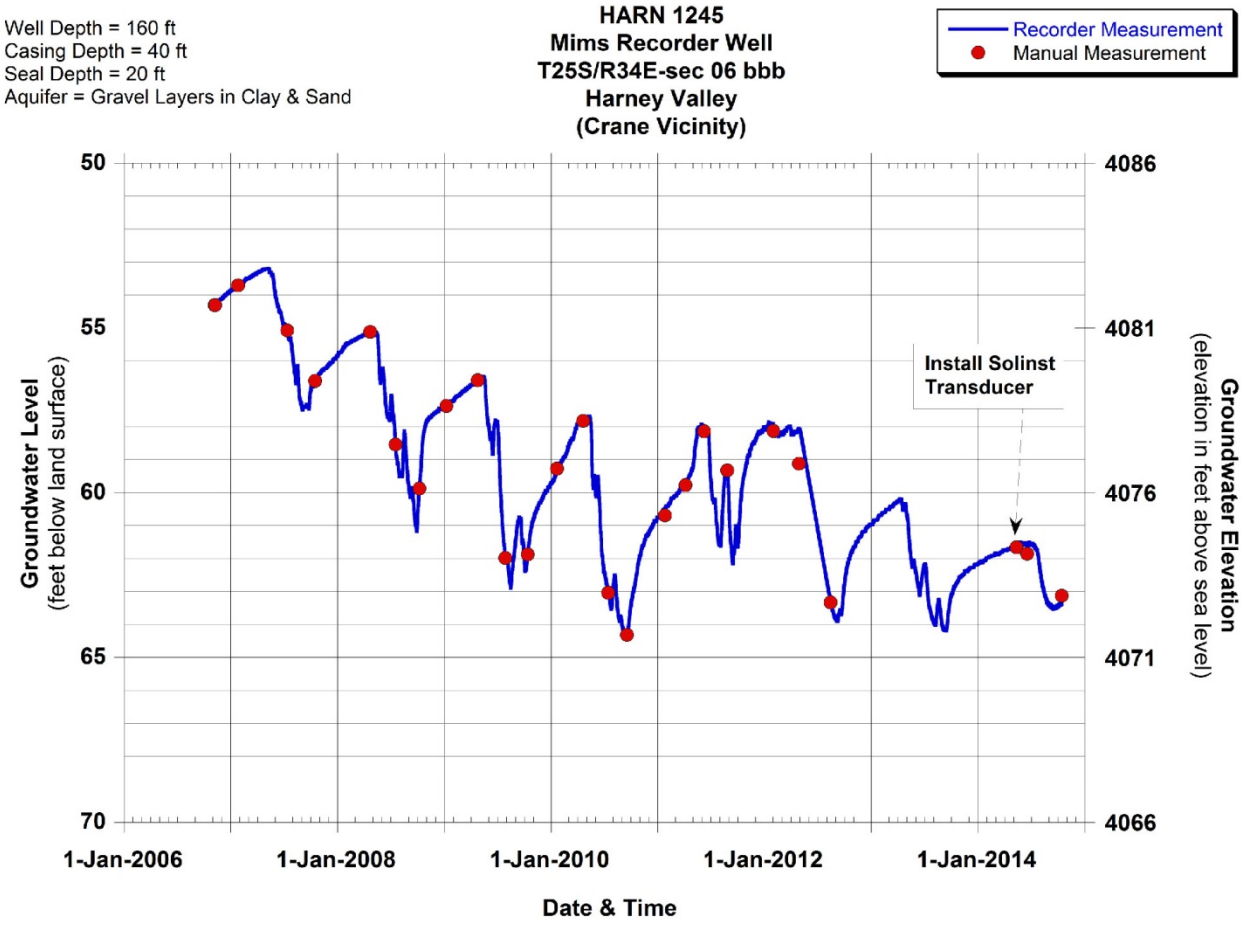
HARN 1061
Land surface elevation: 4136'
Well Depth: 135'





Groundwater Level Trends: HARN 1245

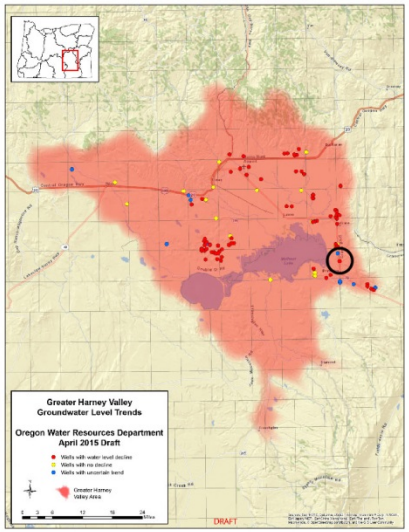


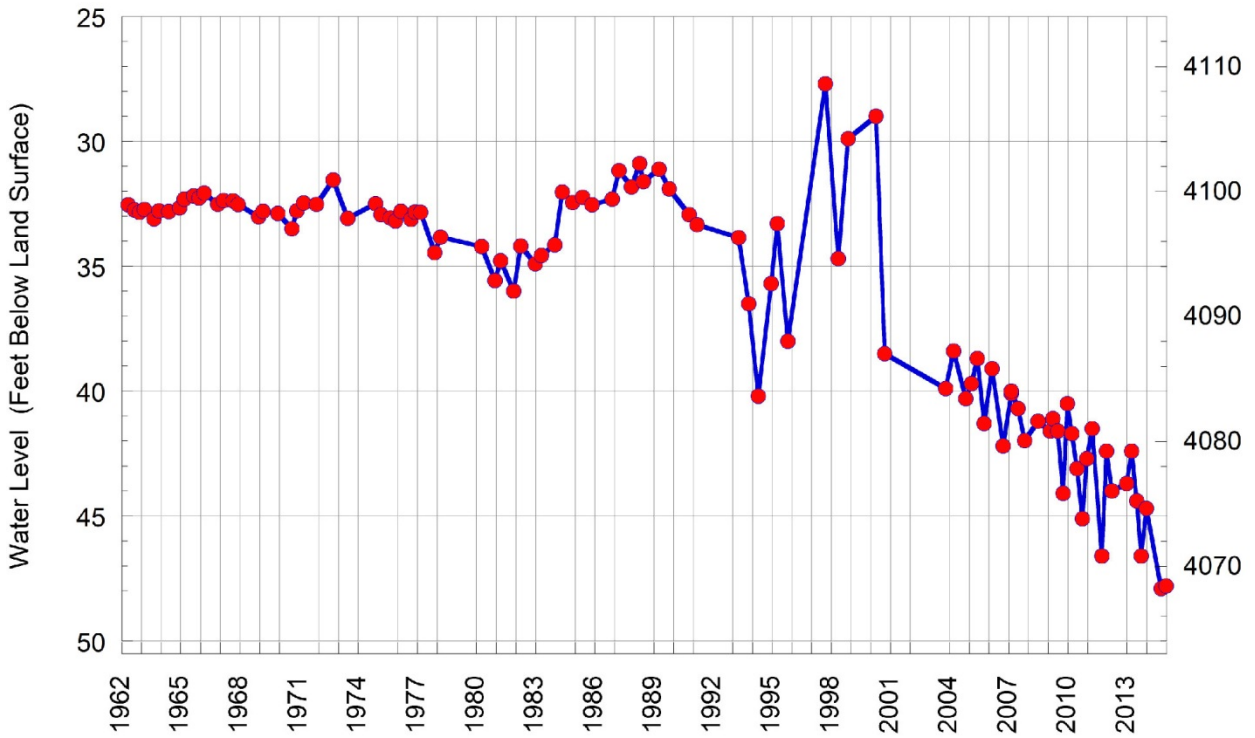


Groundwater Level Trends: State Obs. Well 180

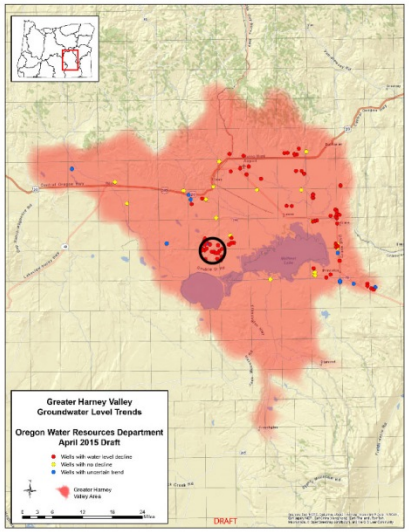
HARN 1387
Land surface elevation: 4132'
Well Depth: 108'

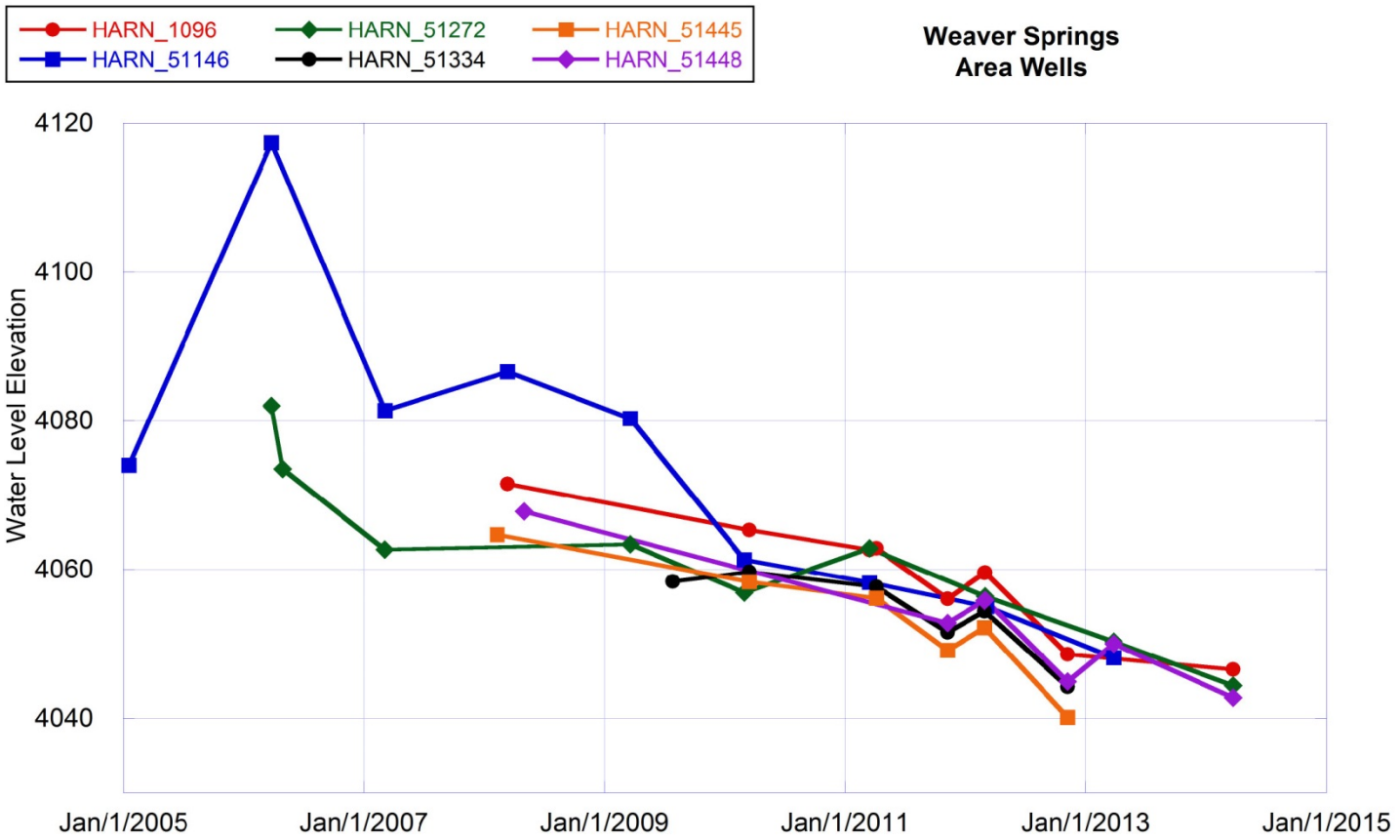
State Obs Well 180
OWRD LOGID HARN 1387
Harney County
26S/33E - 13daa



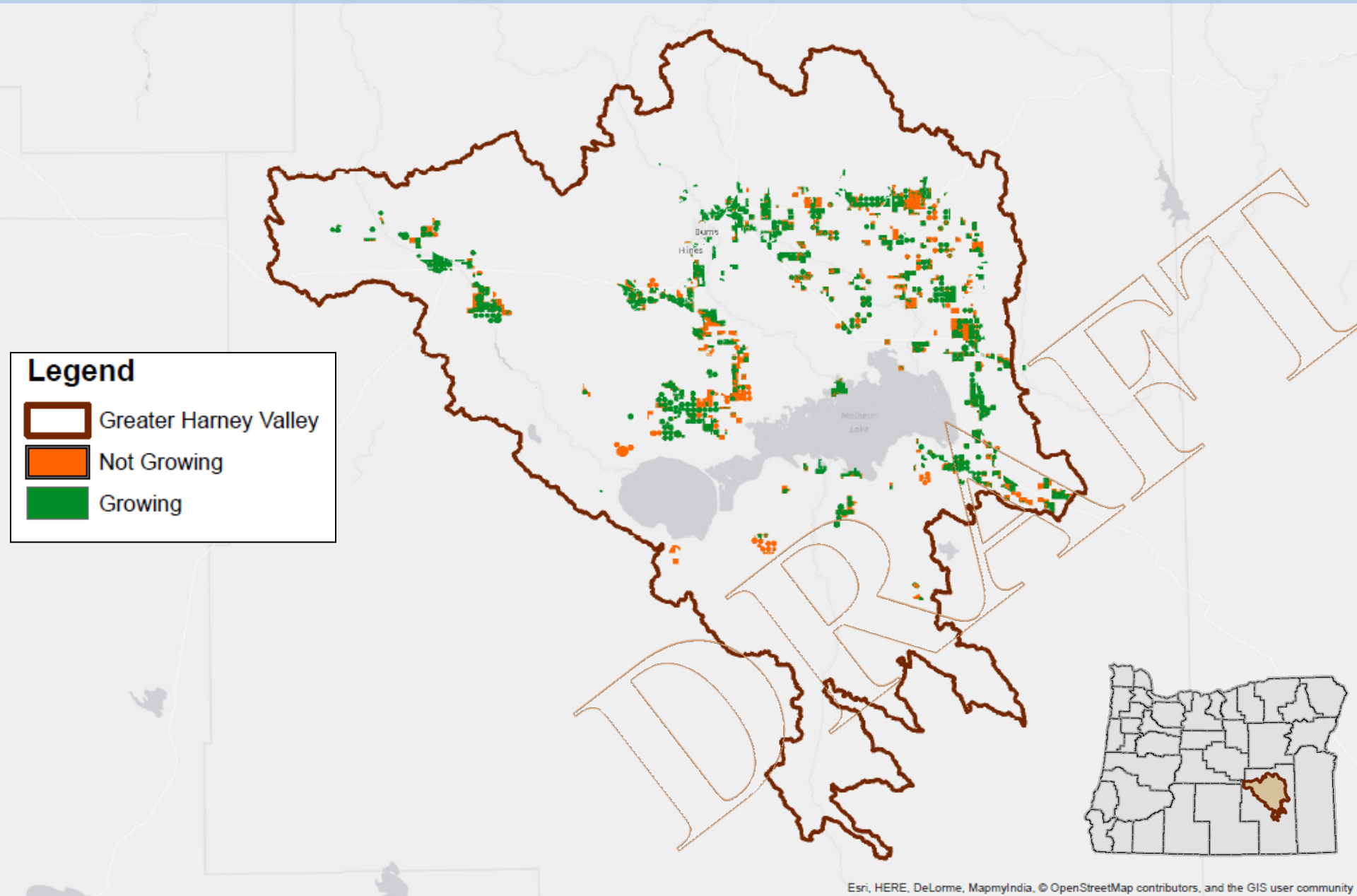


Groundwater Level Trends: Weaver Springs Area





Allocated versus Developed in the Harney Valley Area



Looking Forward

- Basin groundwater study: 3-5 years for results
- Water right transfers and offset/mitigation option
- Basin Rules update for OAR 690-512
- Place-Based Planning

Looking Forward: Groundwater Study

- ✓ More detailed geological mapping
- ✓ Locate wells and measure groundwater levels
- Surface water and groundwater interaction
- LIDAR acquisition
- Estimate groundwater use
- Refine recharge estimates and groundwater basin boundaries

Looking Forward: Transfers and Mitigation

- Water right transfers: moving wells and acres on certificated groundwater rights

- Offset/mitigation: flexibility with groundwater permits; some limitations

Looking Forward: Update Basin Rules

- Add option, that would sunset, to offset/mitigate for a new use by canceling existing permit

- Classify groundwater for exempt uses only in the Greater Harney Valley area

Looking Forward: Place-based planning

- Understand current water conditions and evaluate other water supply options
- Design solutions that account for unique basin hydrology
- Meeting water quality and water quantity needs
- Collaborative process will help leverage broader array of funding sources

Questions ? ?

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