Basalt Groundwater of the Walla Walla Sub-Basin

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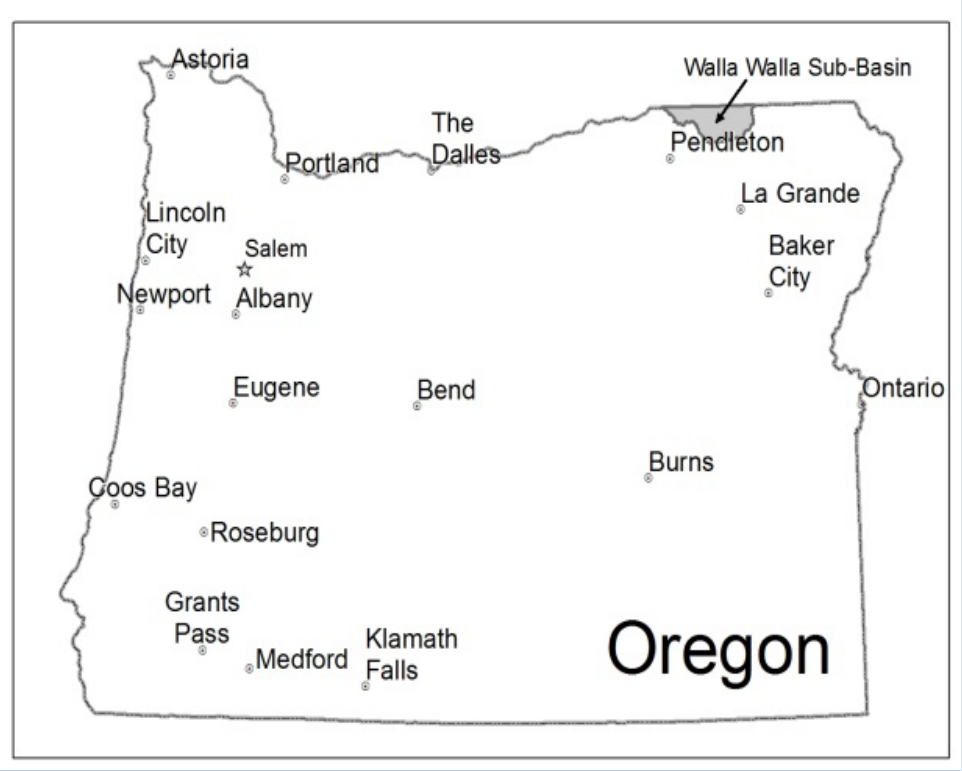
October 2016 WRC Meeting

Background



- **2006-present, WRD increased groundwater monitoring in the Walla Walla Sub-Basin**
- **May 2016: Educational public meeting on groundwater and water level declines**
- **September 2016: Public meetings to review groundwater data and explain management options**

Columbia River Basalt Group (CRBG) Overview

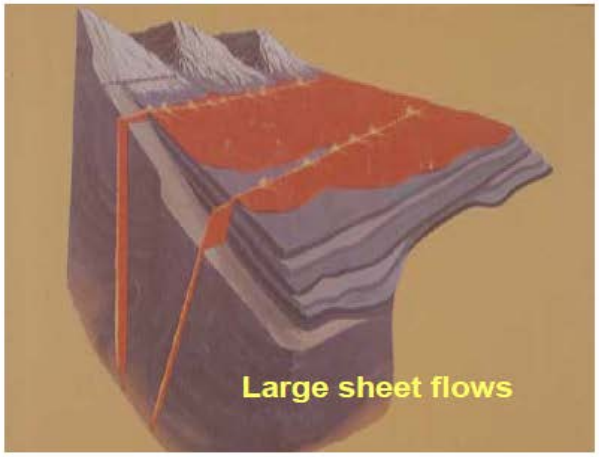
- Originated in Northeastern Oregon, parts of Idaho and Washington
- Total thickness greater than 10,000 feet in some places
- Note Abbreviations: CRB, CRBG

Camp and Ross (2004)

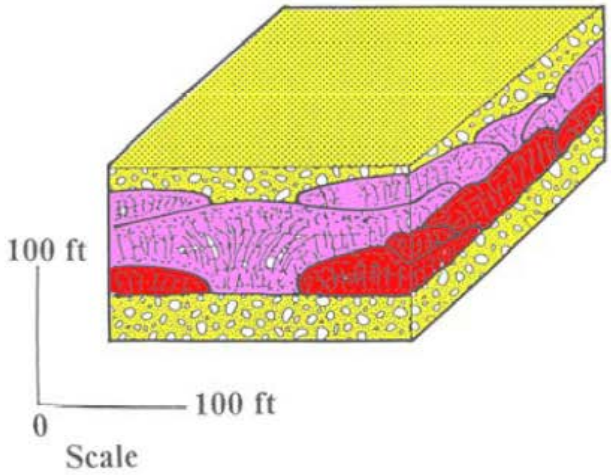
Types of Basalt Flows

Typical Basalt Eruptions

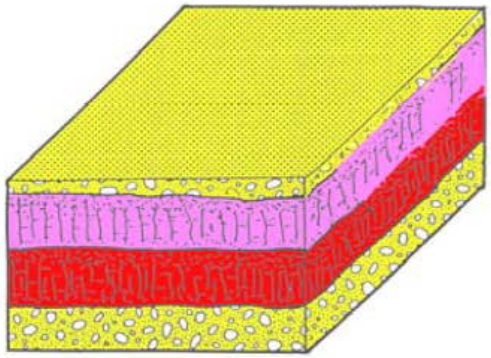
CRBG Eruptions



Compound Flows



Sheet Flows



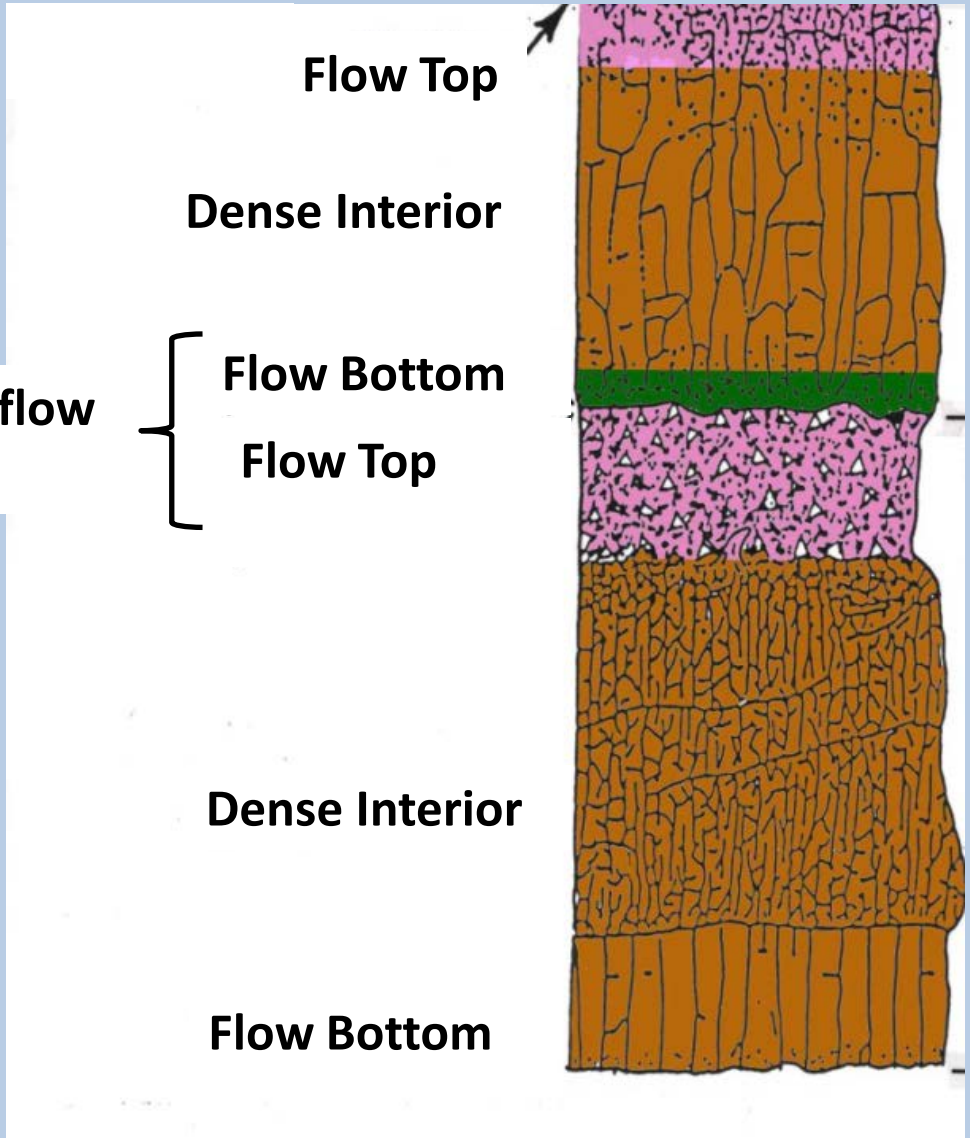
Tolan and Lindsey, 2007

CRBG Flows Have a Three Part Internal Structure

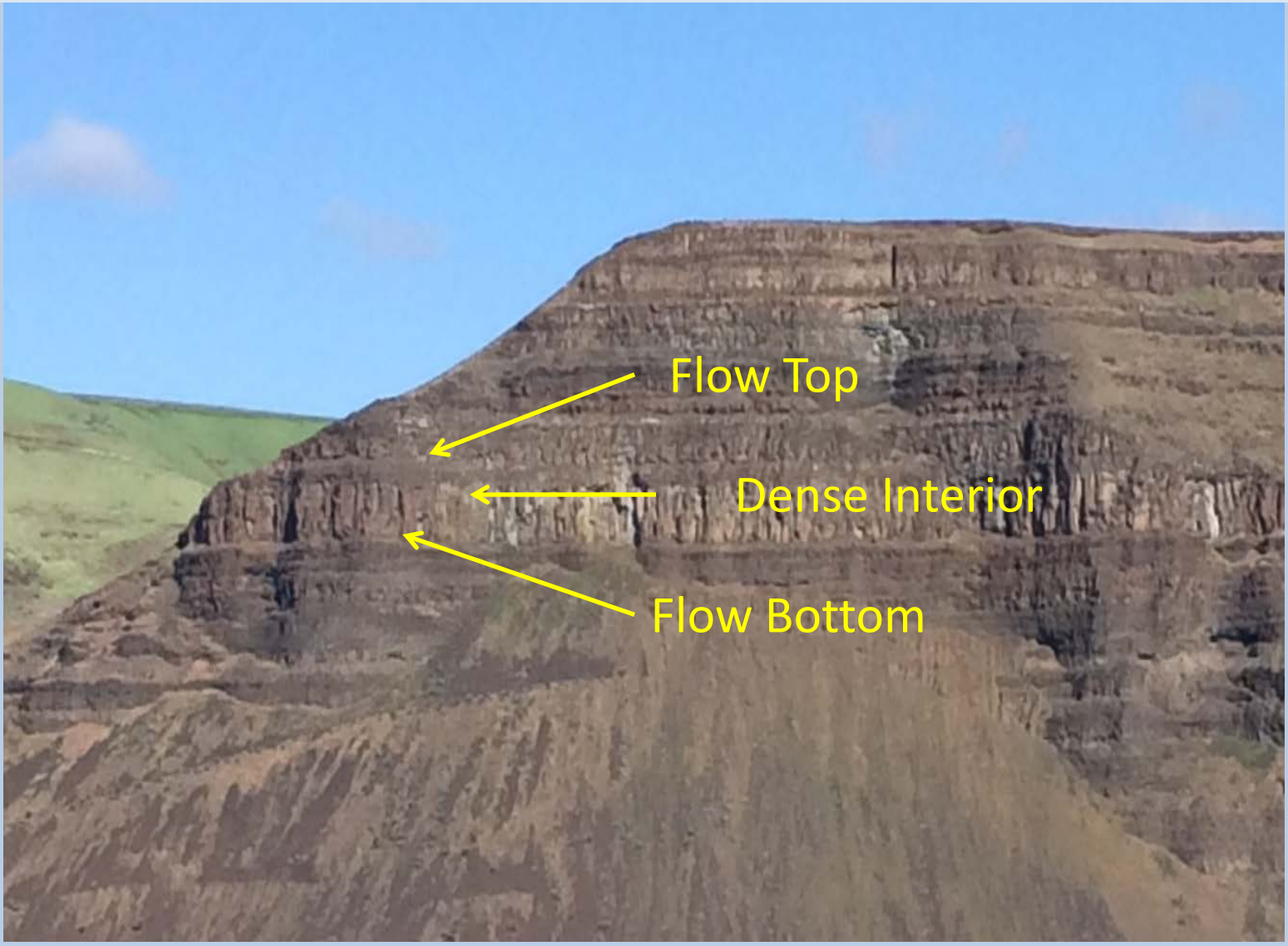
1) Flow Top
2) Dense Interior
3) Flow Bottom

Interflow zones (flow top & flow bottoms) can host aquifers

Dense interiors separate aquifers



CRBG Flows Have a Three Part Internal Structure



Interpreting Geologic Maps

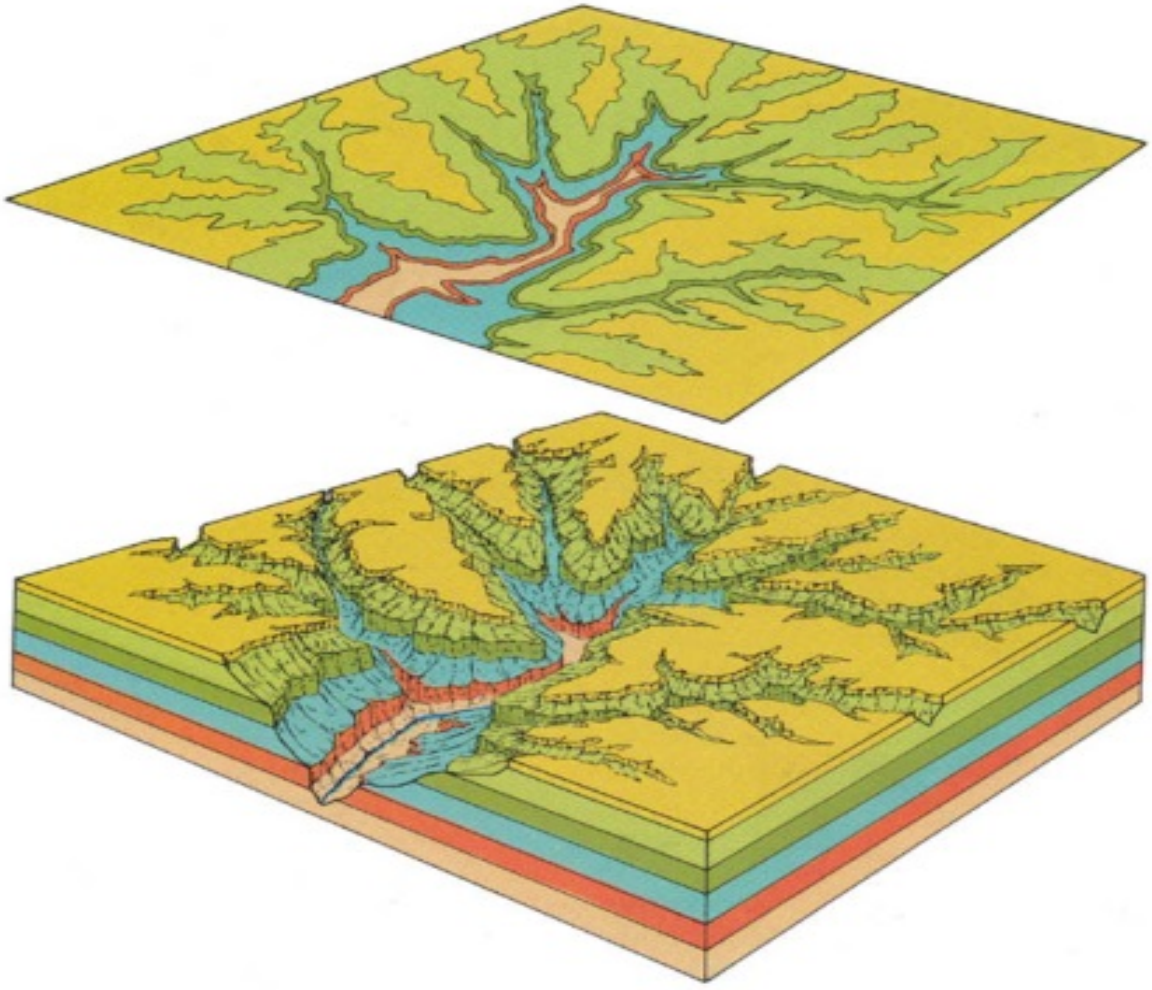
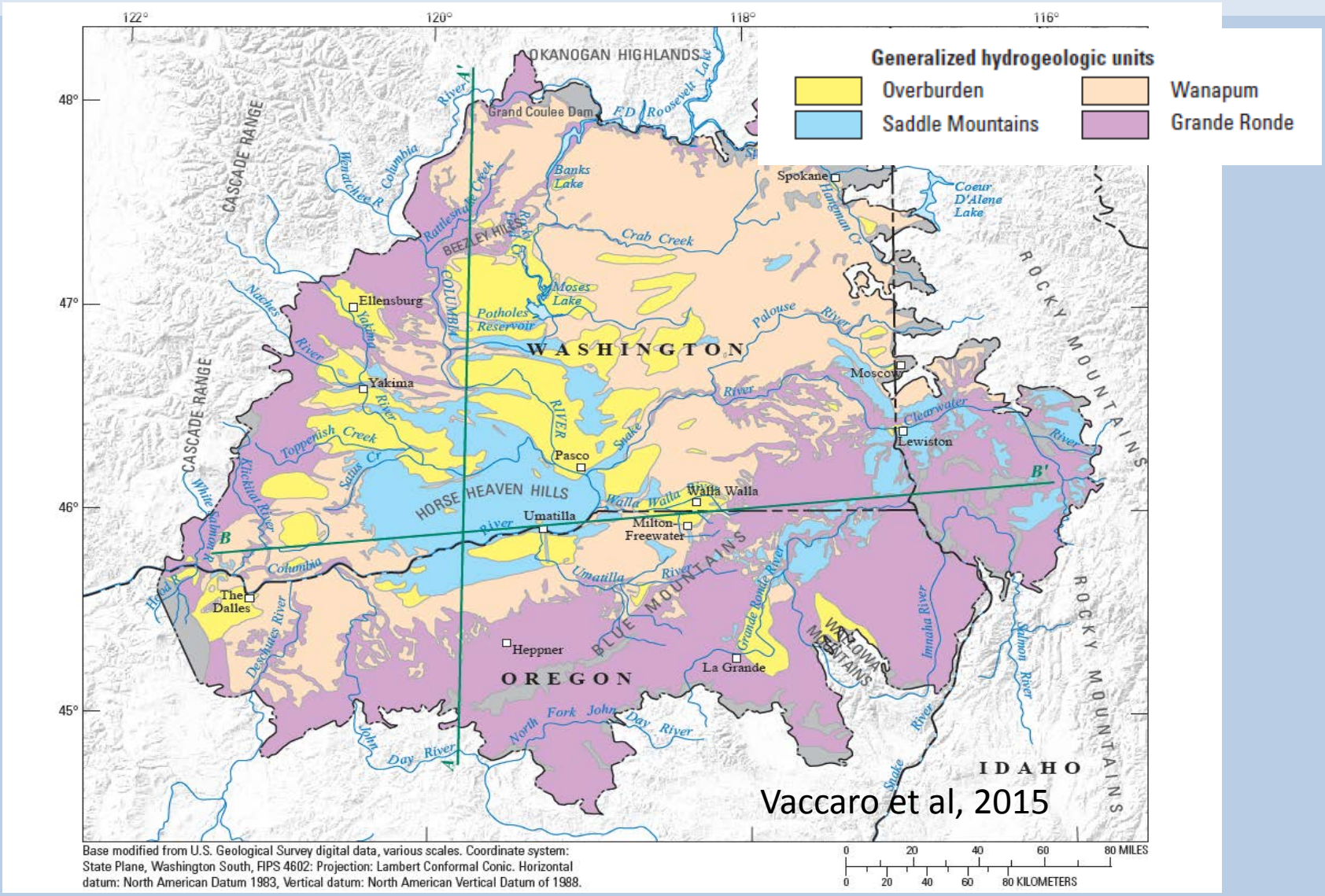
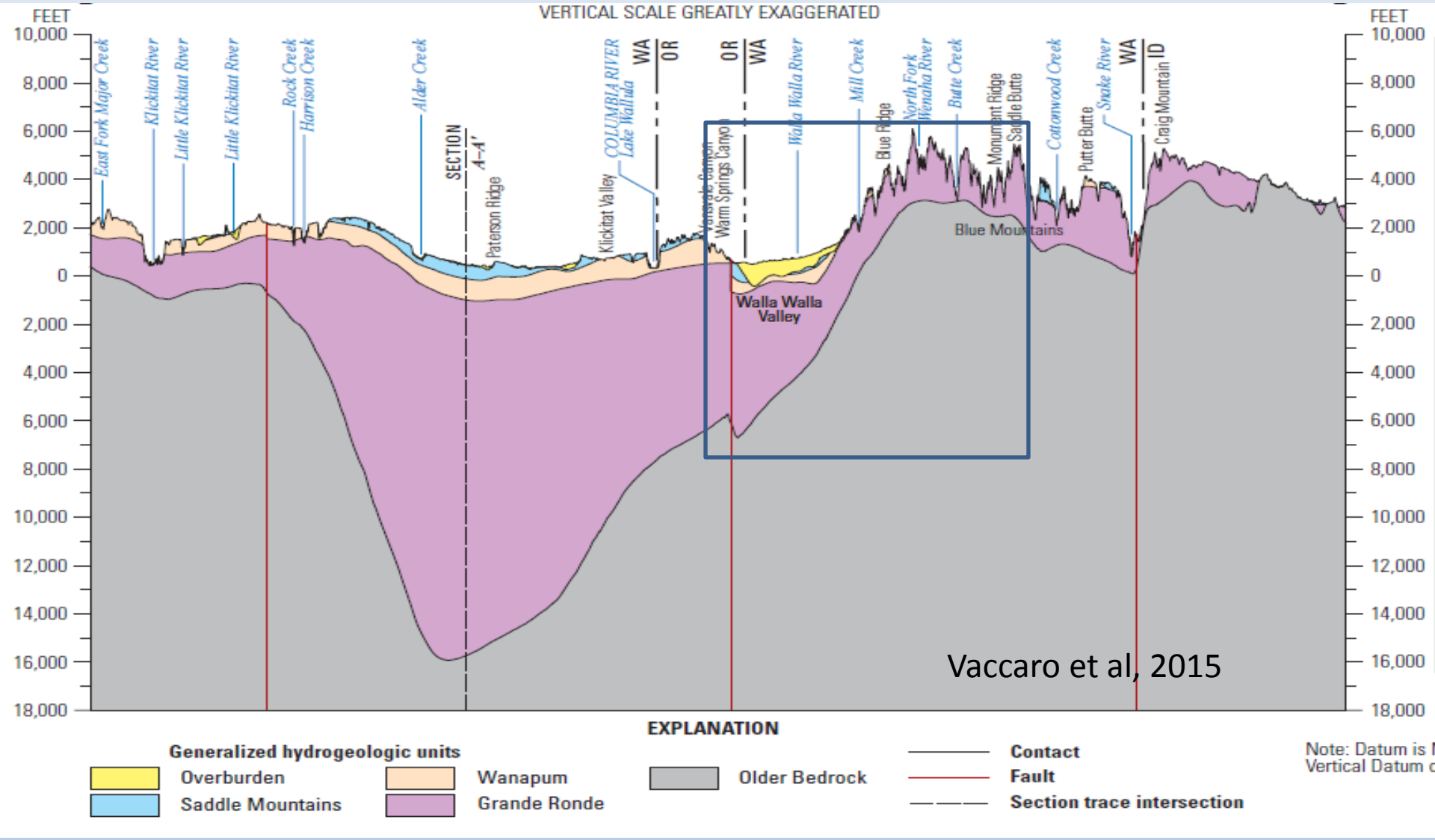


FIGURE 16.3
Outcrop Patterns of Horizontal Strata

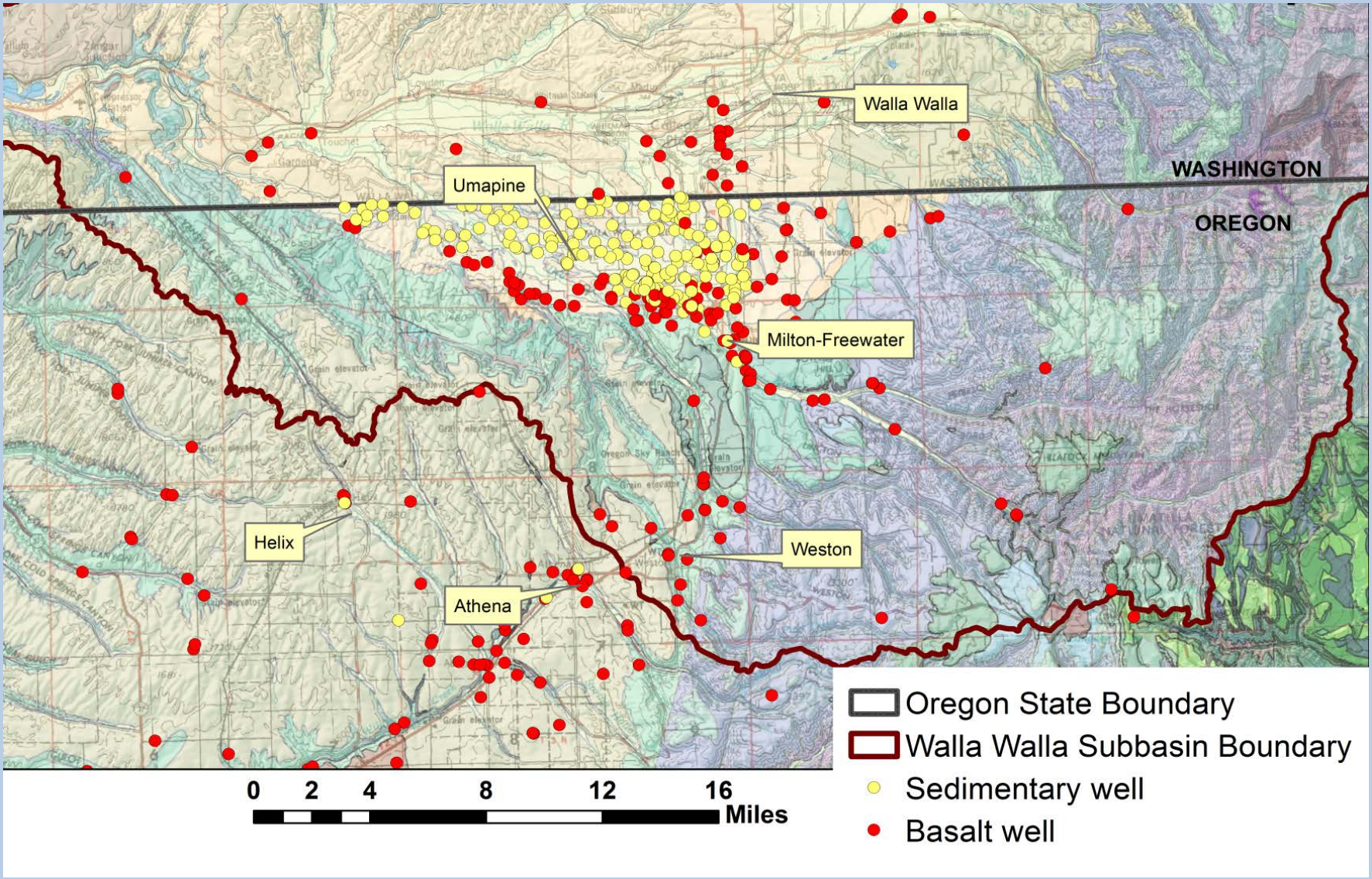
Regional Geology



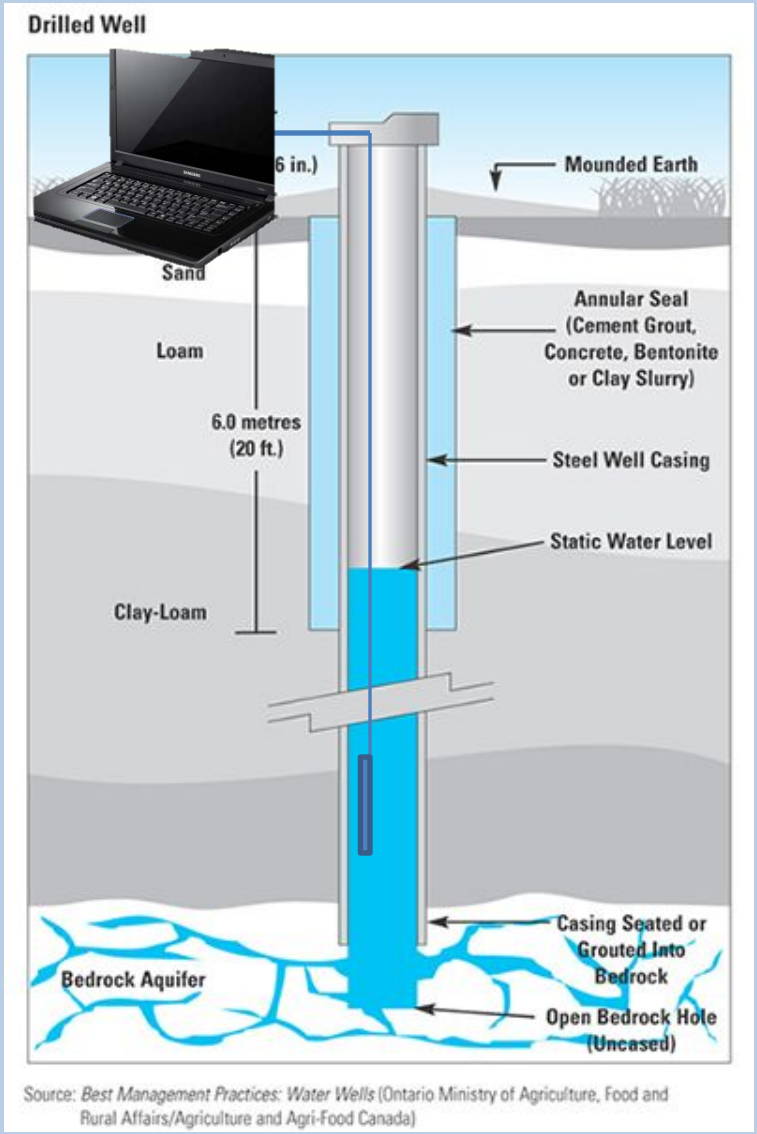
Regional Geology in Cross-Section



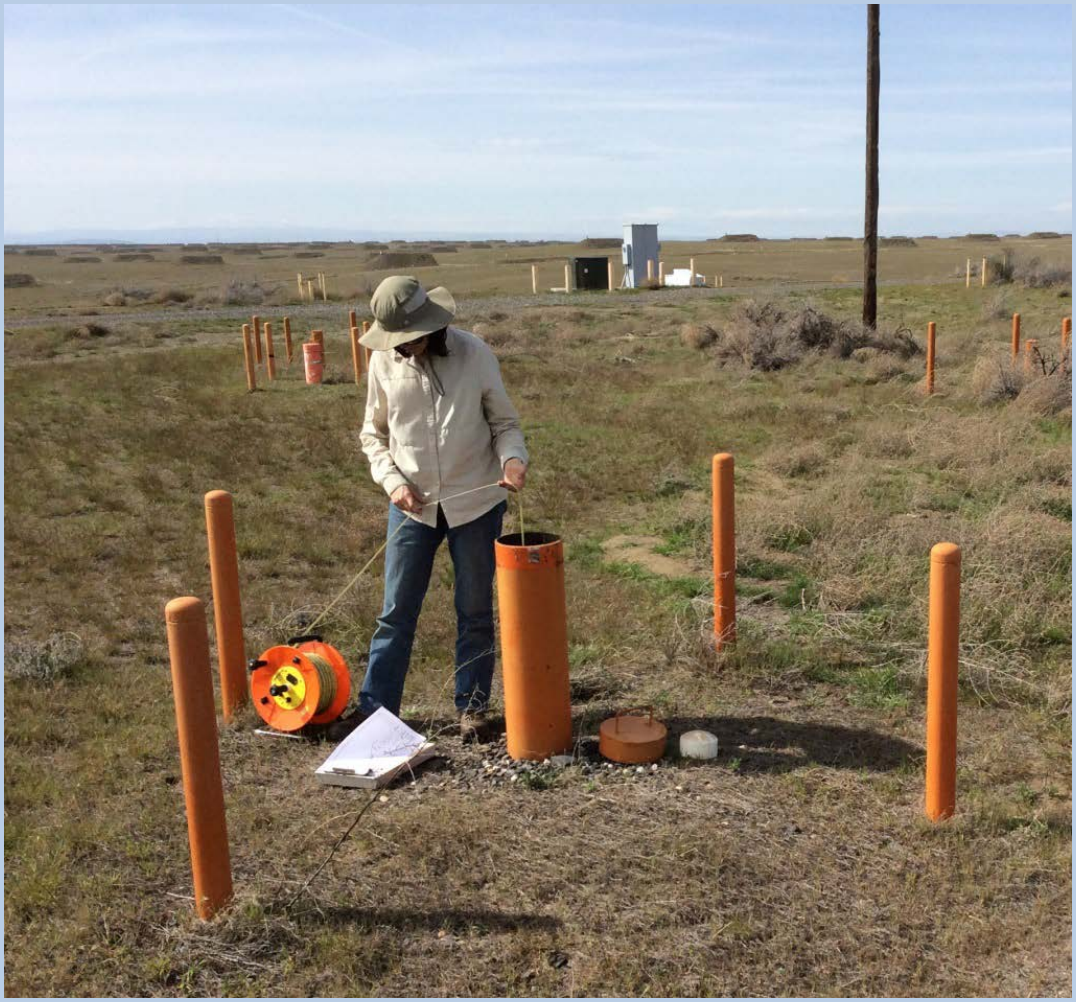
Located Wells by Aquifer



Groundwater Level Measurements



Source: *Best Management Practices: Water Wells* (Ontario Ministry of Agriculture, Food and Rural Affairs/Agriculture and Agri-Food Canada)



Why do we measure groundwater levels?

- **Water levels are an indicator of the overall water in storage**
  - **Rising water levels indicate recovery**
  - **Stable water levels indicate the volume of water in storage is stable**
  - **Declining water levels indicate water is being removed at a rate greater than is being recharged**

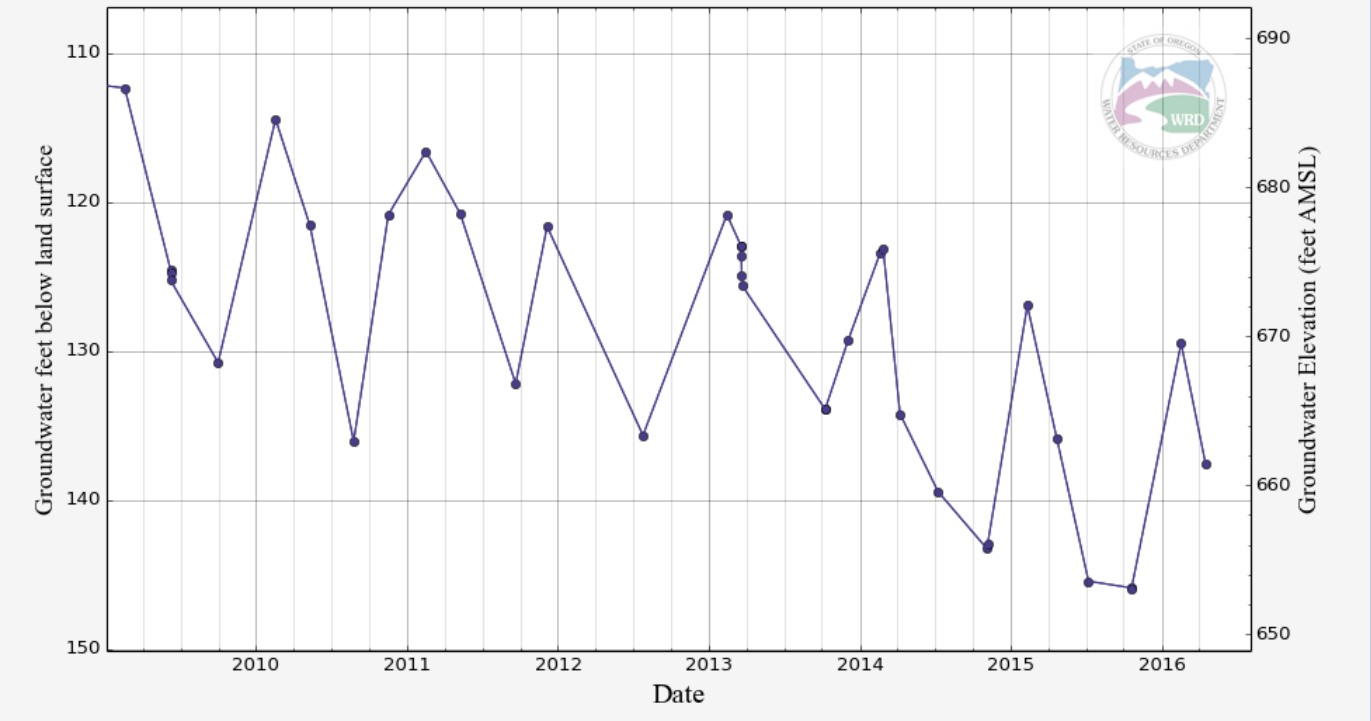
- **Stability ensures a long-term supply**

Groundwater Level Measurements

Feet below land surface

110

150



Feet above sea level

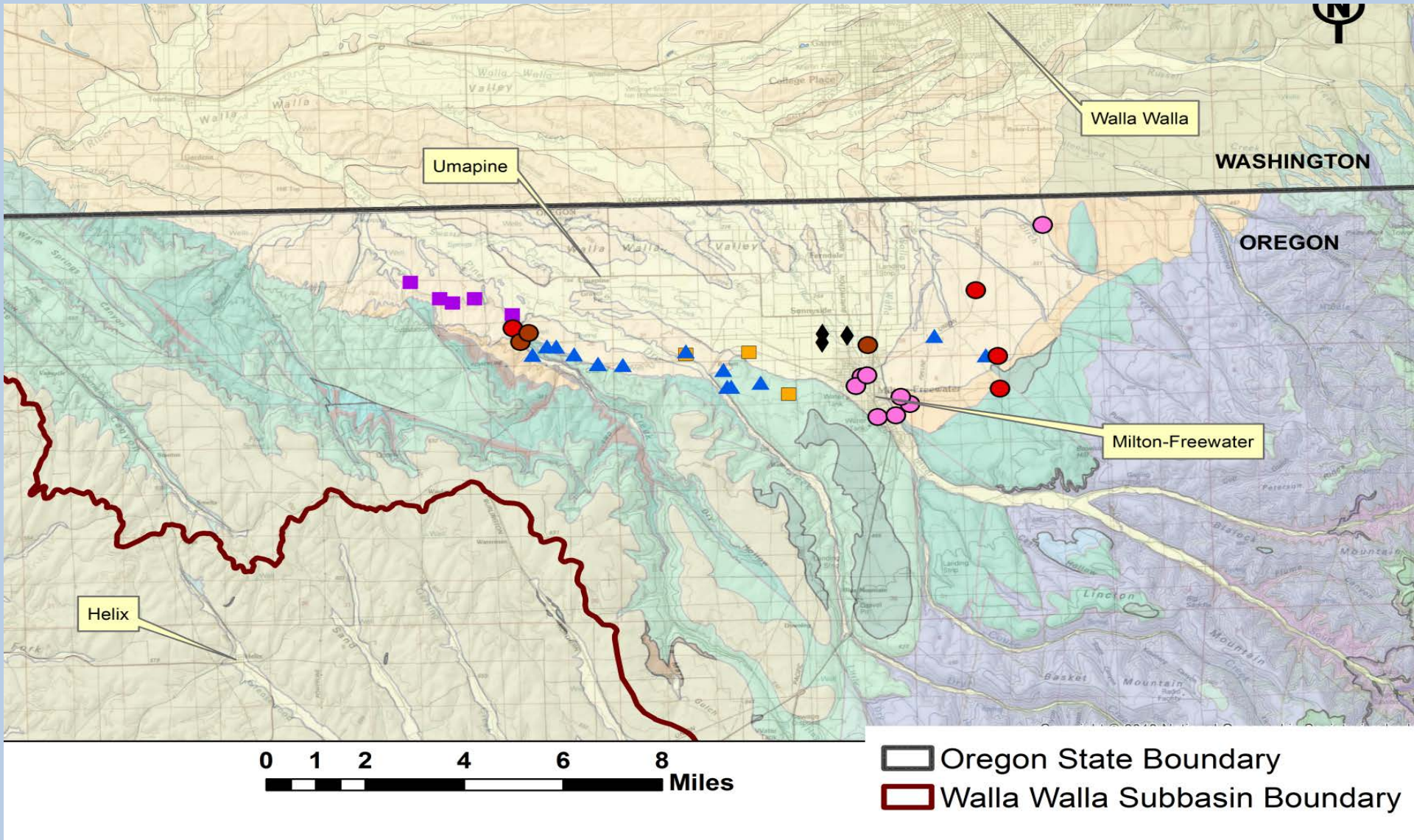
690

650

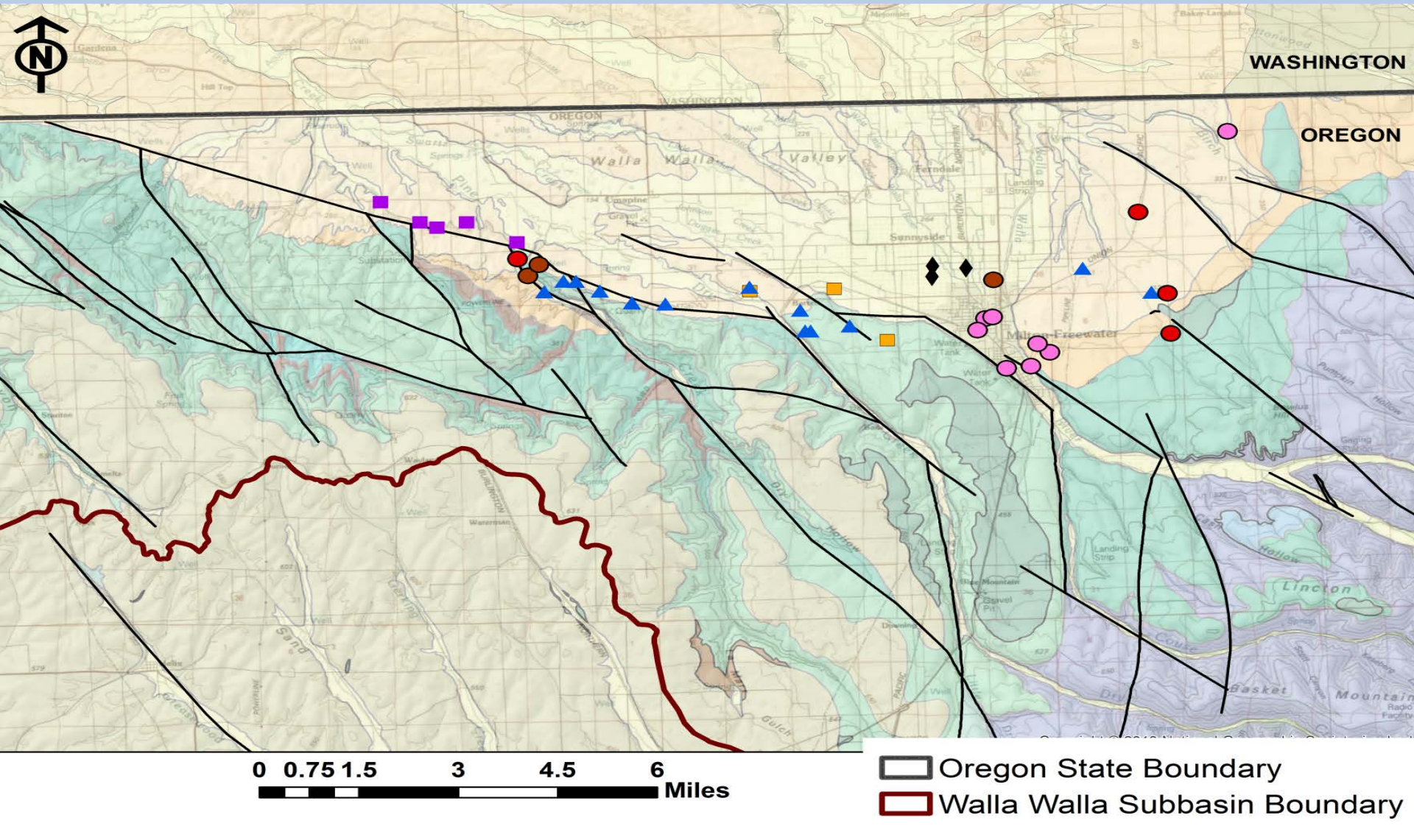
2009 → 2016

Increasing Time

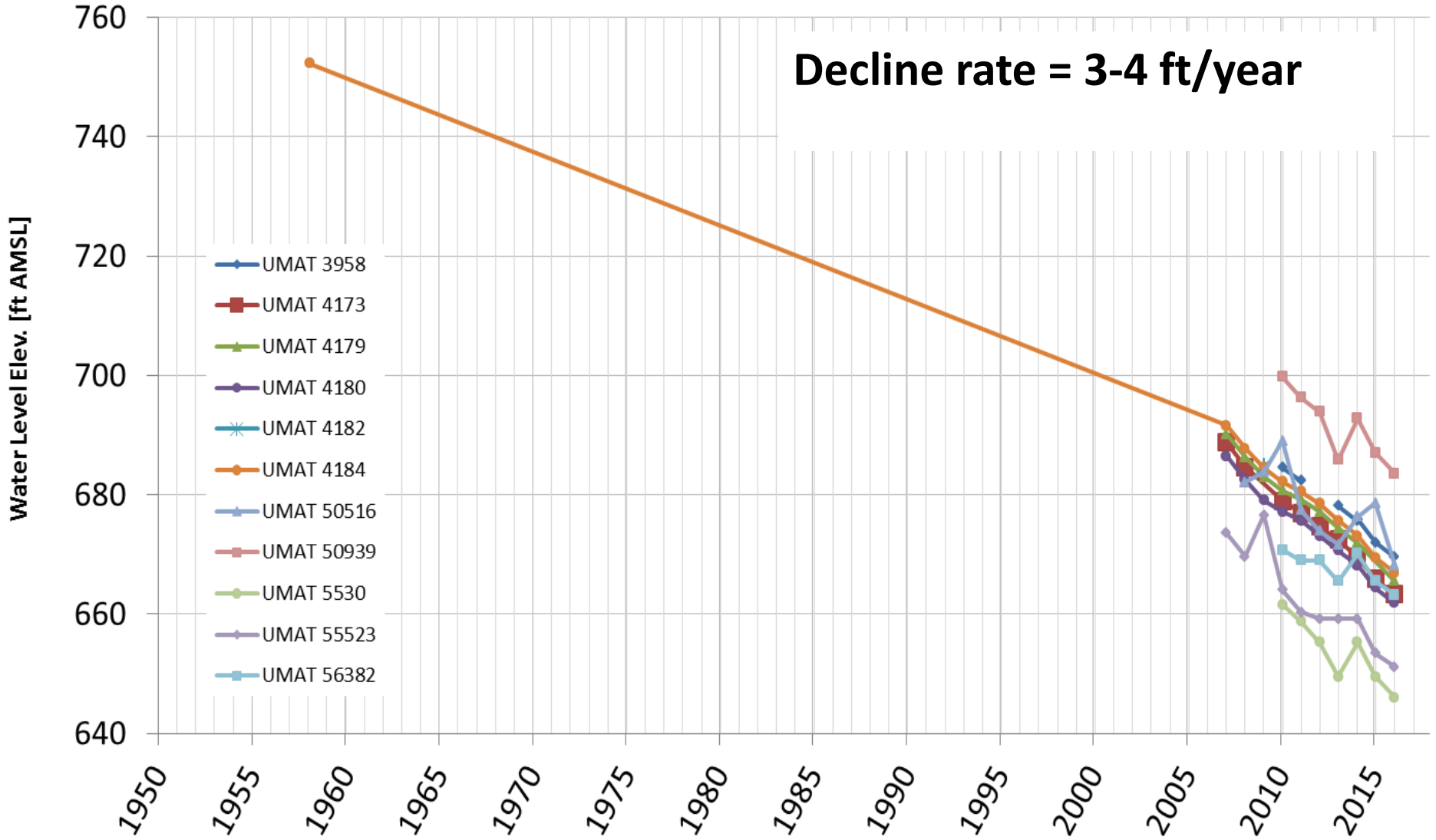
Basalt Wells Grouped by Groundwater Elevation



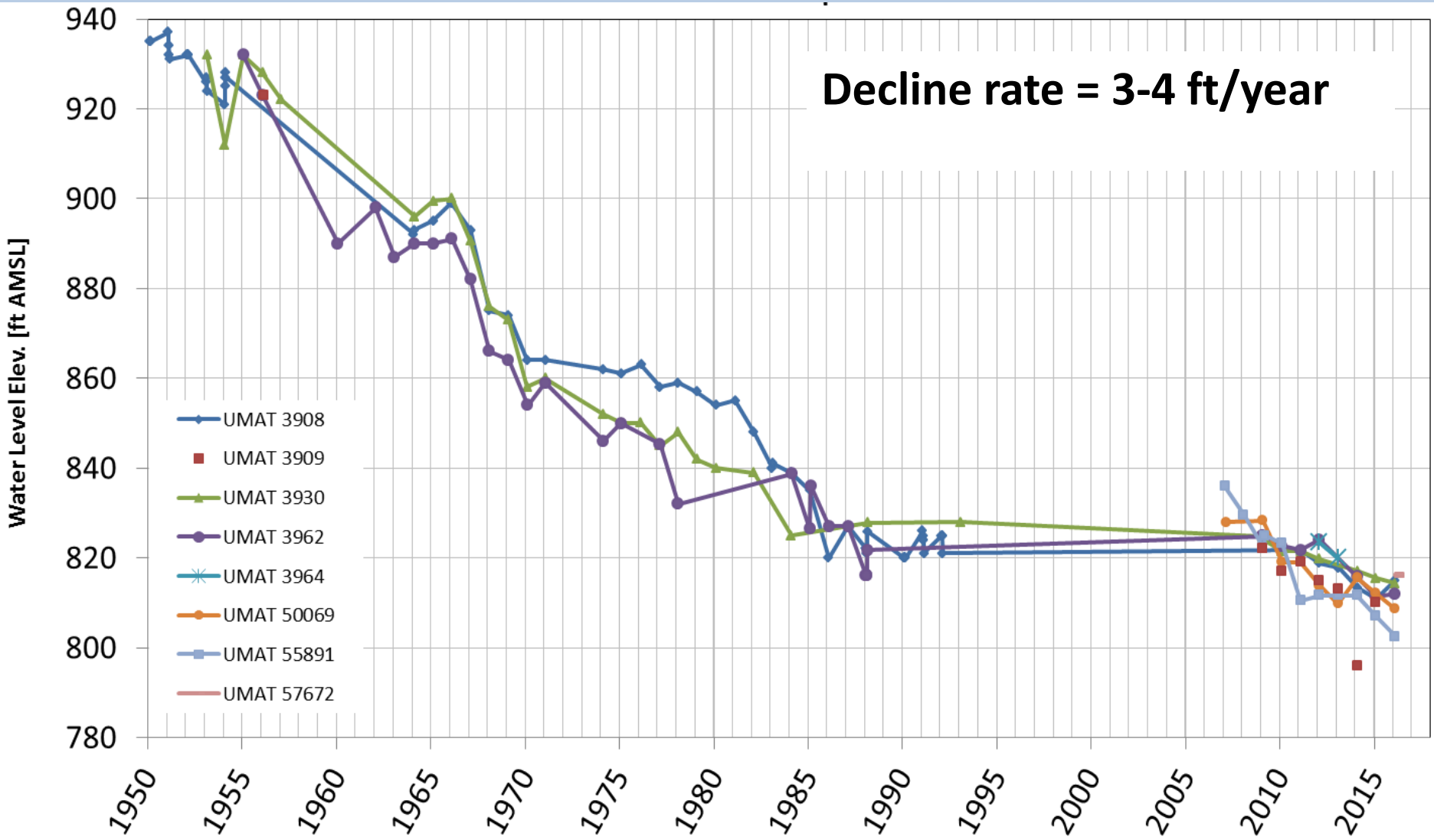
Basalt Wells Grouped by Groundwater Elevation



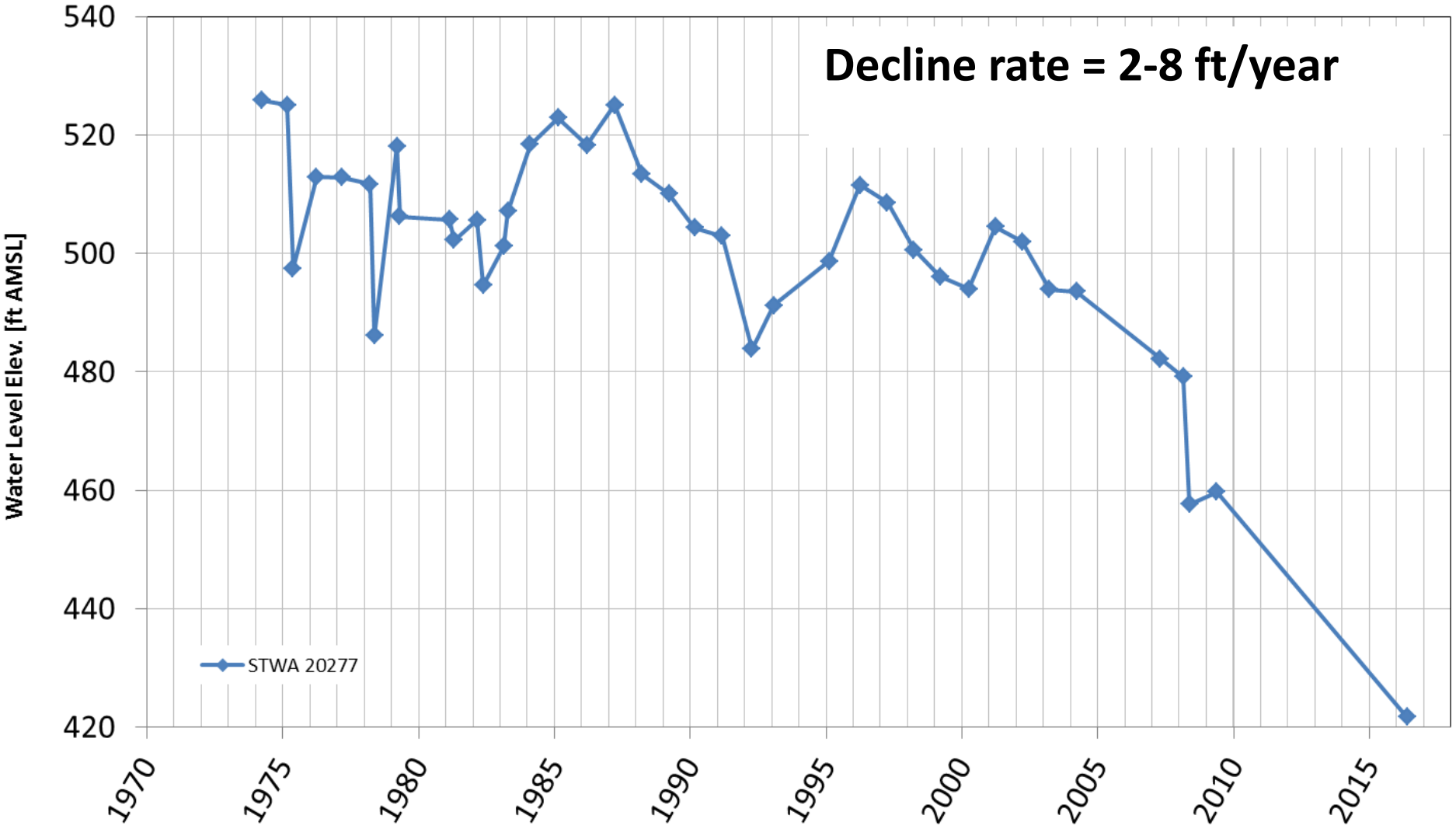
Groundwater Levels: West Side



Groundwater Levels: Central Valley and East



Groundwater Levels: North (Washington)



Basalt Groundwater Level Declines

- **Declines are occurring in the CRBG aquifers across the Walla Walla Sub-basin at rates ranging from 2 to 4 feet per year.**
- **The fact that water levels are declining means use exceeds natural recharge.**
- **Department staff have started a conversation with locals about management options.**

Walla Walla Sub-Basin
Groundwater Management Priorities

1. **Prevent further groundwater allocation; increase basalt water use measurement and reporting.**
2. **Stabilize groundwater levels.**
3. **This is not just a groundwater problem; we need a long-term, holistic water supply plan.**

Next Steps

- **October 24 & 25: next public meetings in Milton-Freewater**
- **Provide multiple opportunities for local input and conversation with Department staff over the next many months**
- **Increase groundwater data collection**
- **Develop a long-term water supply plan that balances supply and demand**

Questions?