OREGON
WATER RESOURCES DEPARTMENT

Item H - Groundwater Declines – Impacts & Managing for Sustainability

Oregon Water Resources Commission

November 17, 2023

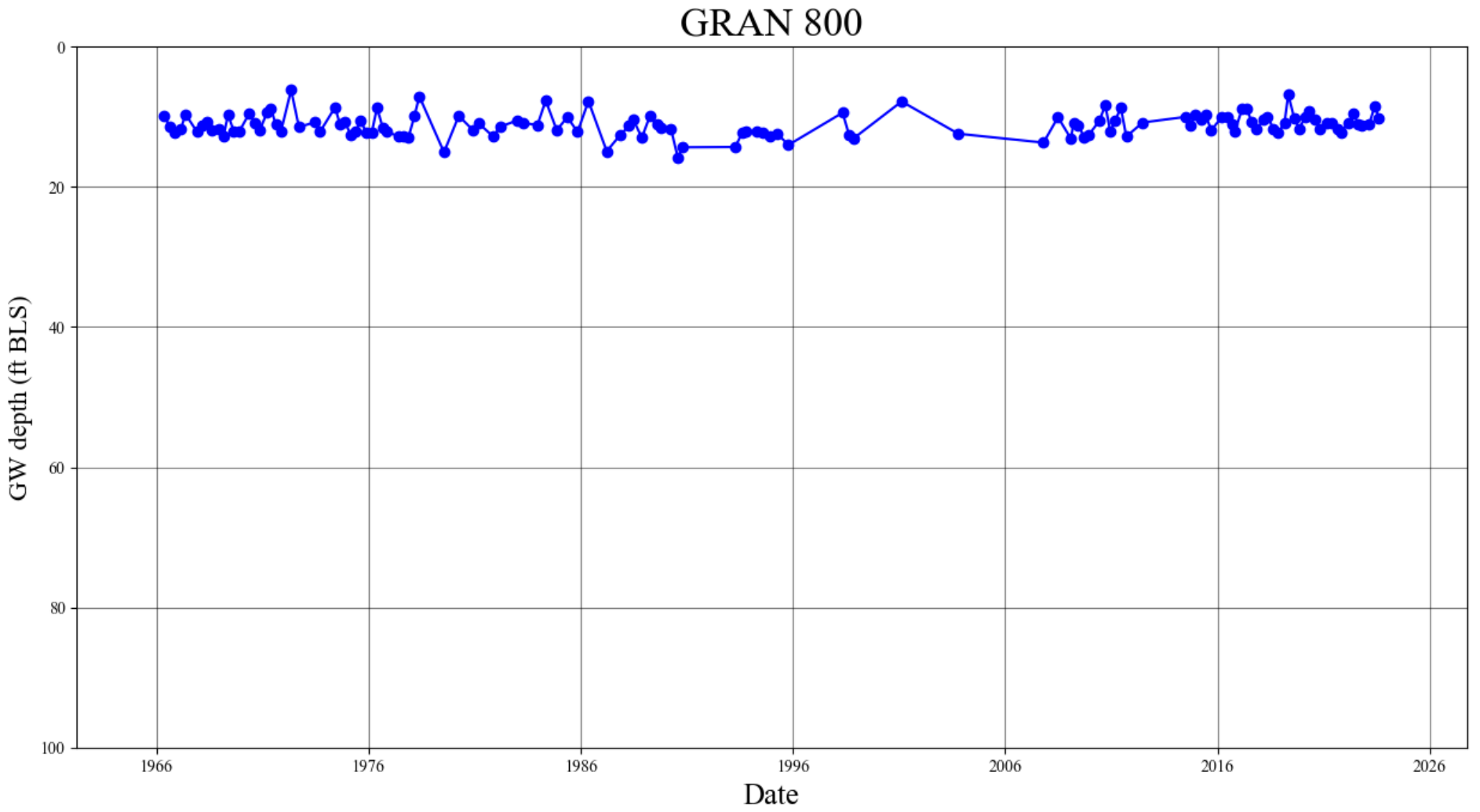
OREGON WATER RESOURCES DEPARTMENT

Presentation Outline

- Groundwater level trends
- Aquifer management
- Decisions to be made
- Approaches for reducing groundwater use
- Discussion and questions
- Next steps

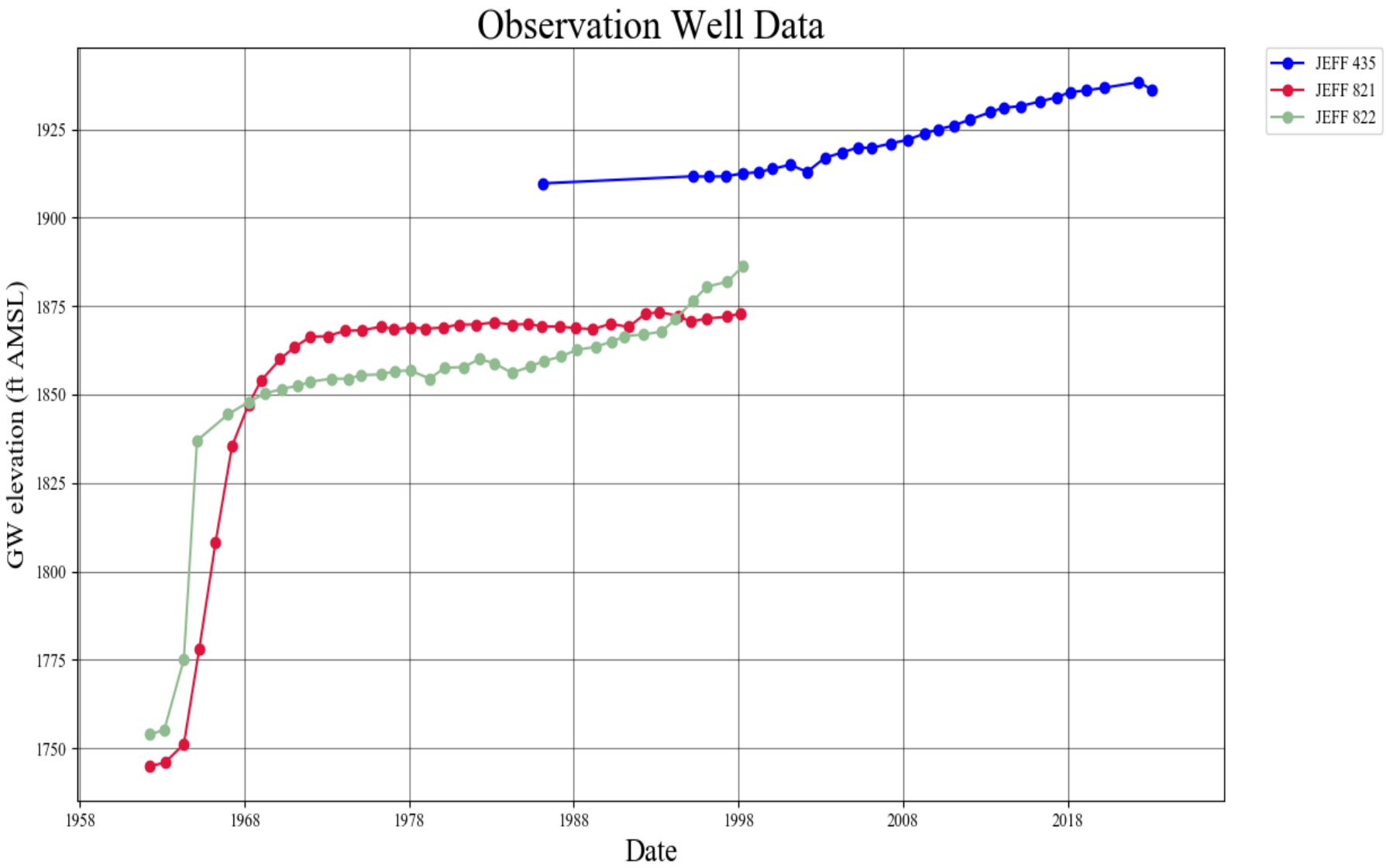
OREGON WATER RESOURCES DEPARTMENT

Dynamic Stability



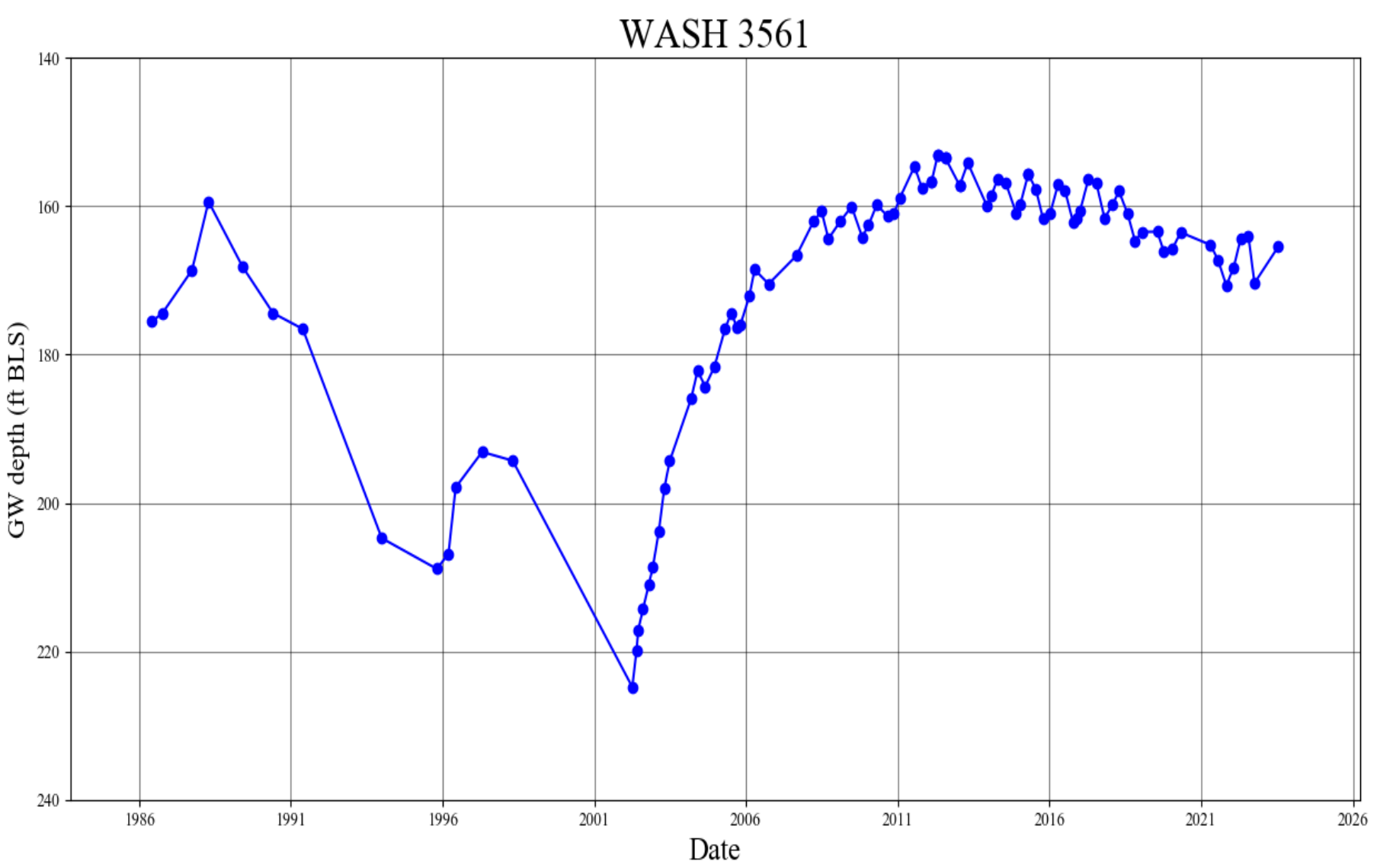
OREGON WATER RESOURCES DEPARTMENT

Increasing water level trend



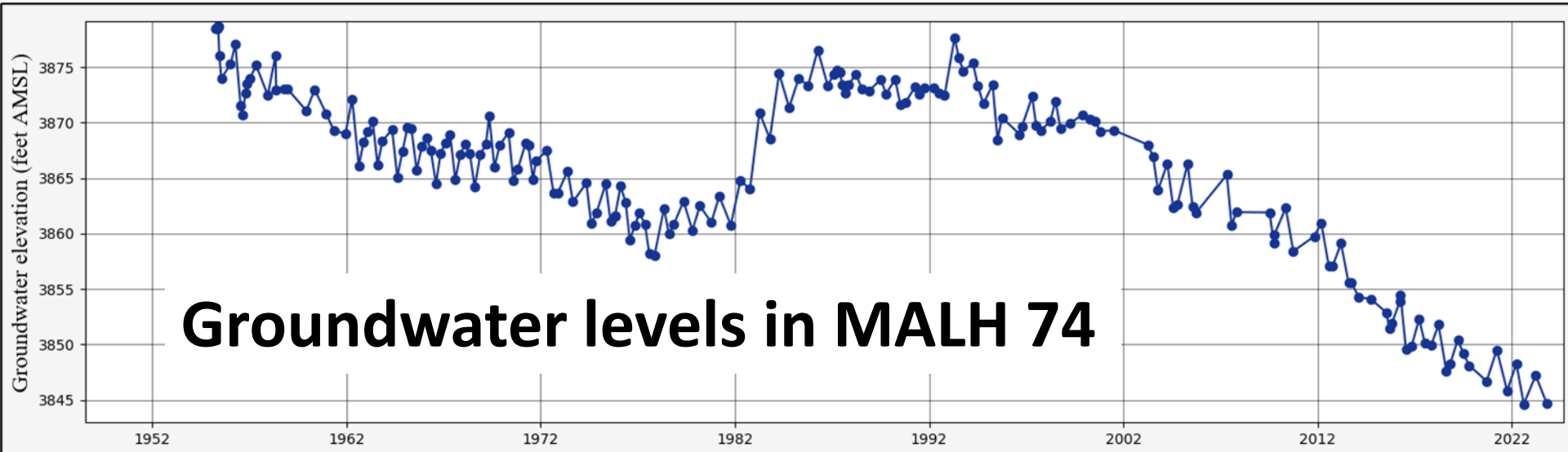
OREGON WATER RESOURCES DEPARTMENT

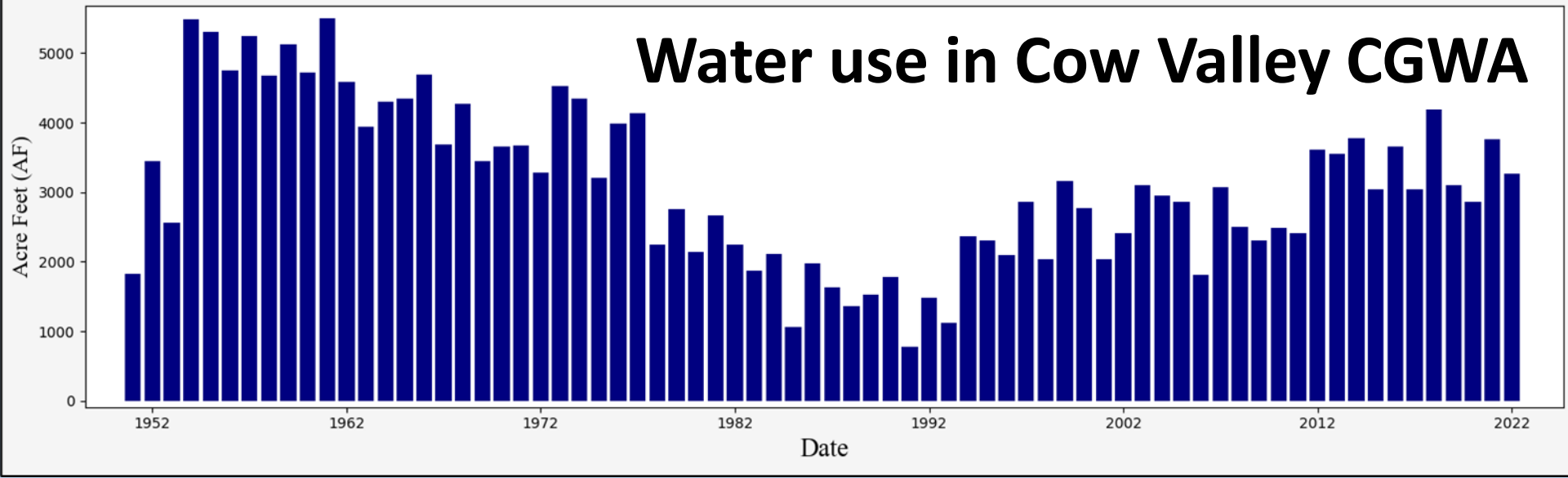
Decline – Recovery - Decline



OREGON WATER RESOURCES DEPARTMENT

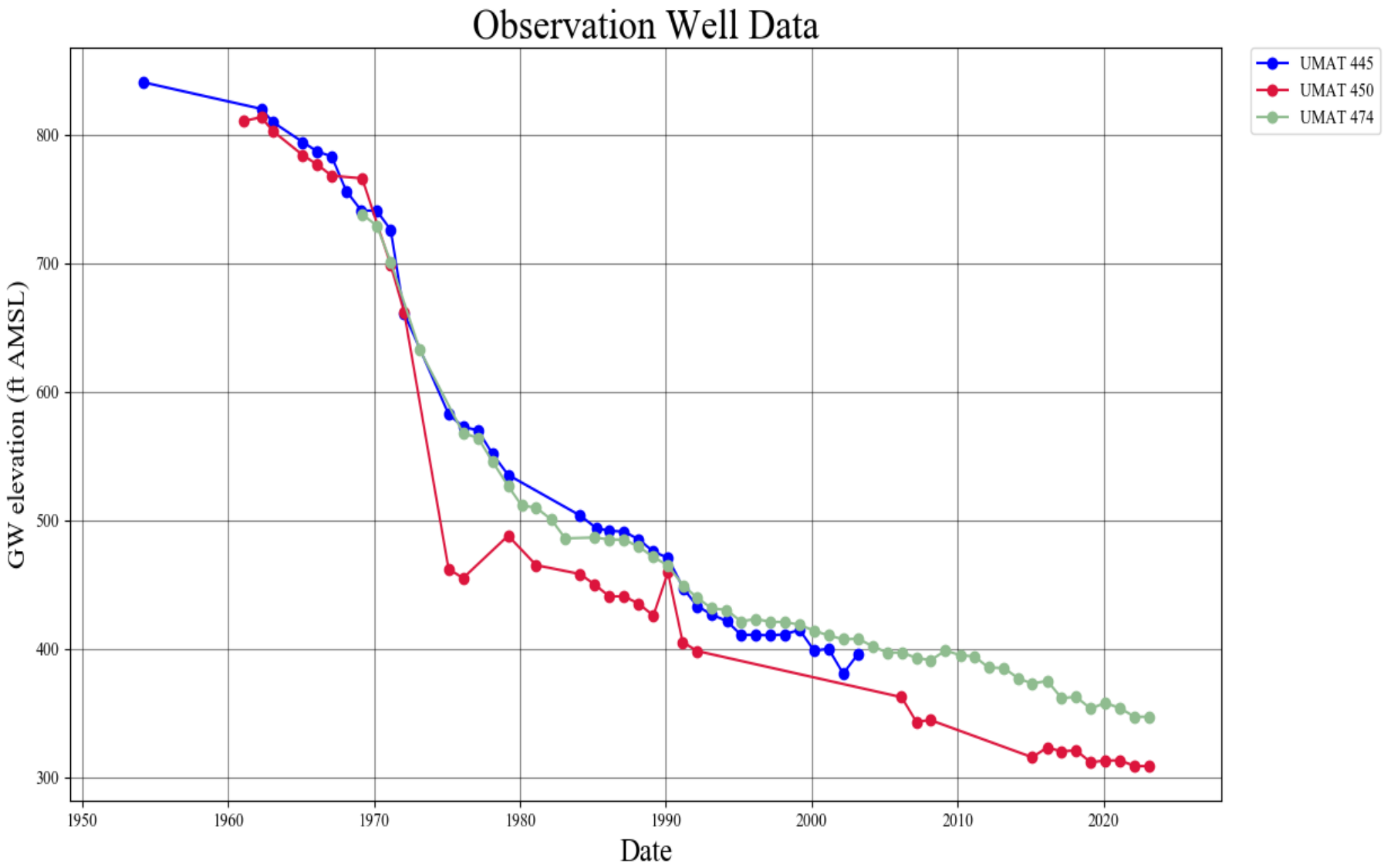
Declining water level trend





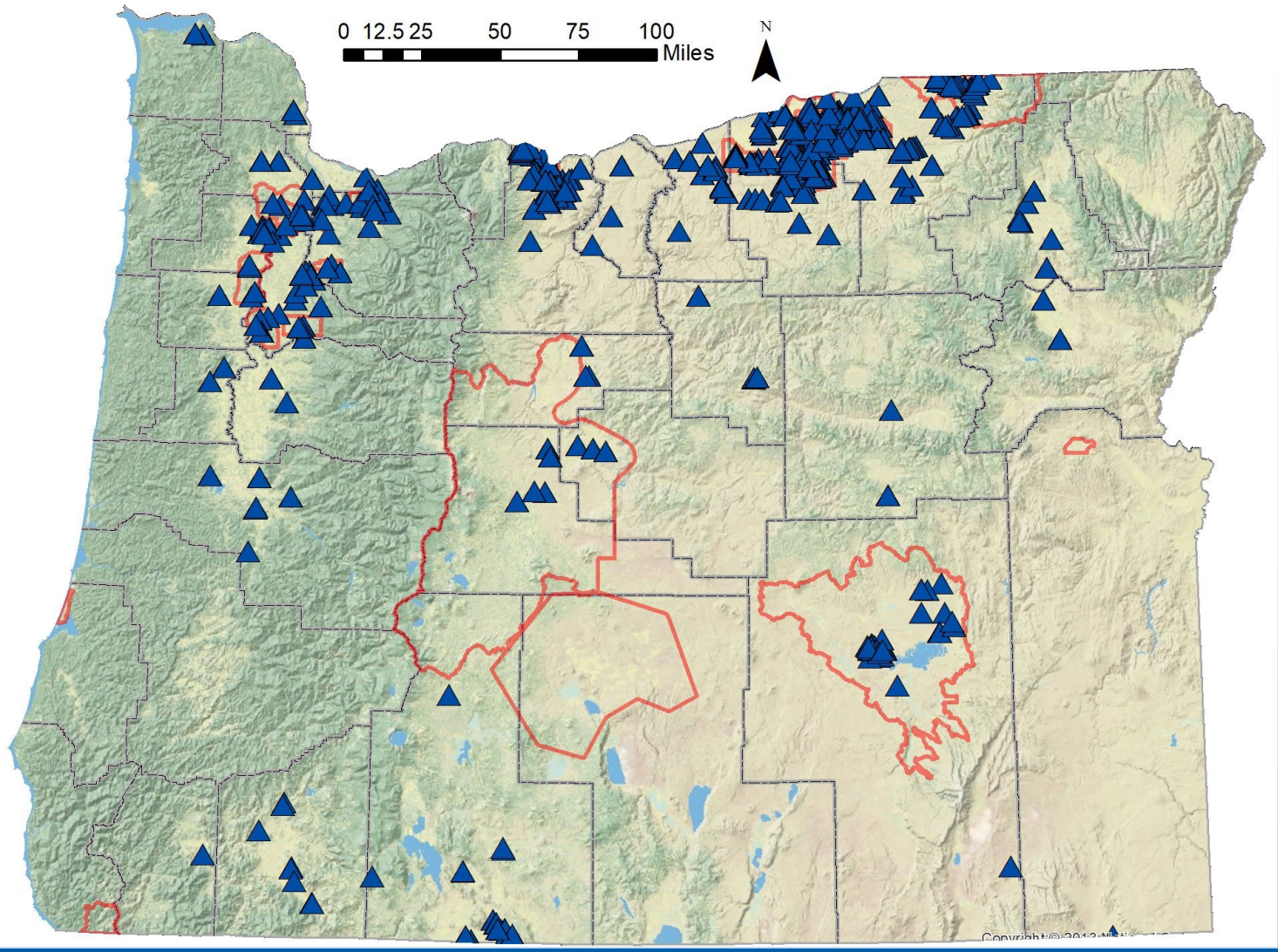
OREGON WATER RESOURCES DEPARTMENT

Declining water level trend



OREGON WATER RESOURCES DEPARTMENT

Over-Allocation: Excessively Declined Water Levels



Source: OWRD

OREGON WATER RESOURCES DEPARTMENT

Impacts of declines

- Dry wells and decreased yields
- Reduced streamflow and spring discharge
- Deterioration of water quality
- Increased pumping costs
- Land subsidence

Photo:

OREGON WATER RESOURCES DEPARTMENT

Aquifer management

- Groundwater allocation rules – develop for beneficial uses; be protective & sustainable
- Basin program rules – classify or withdraw
- Critical groundwater area (CGWA) – over-allocated, declines need to be slowed or stopped, likely requires reduction in use

Photo:

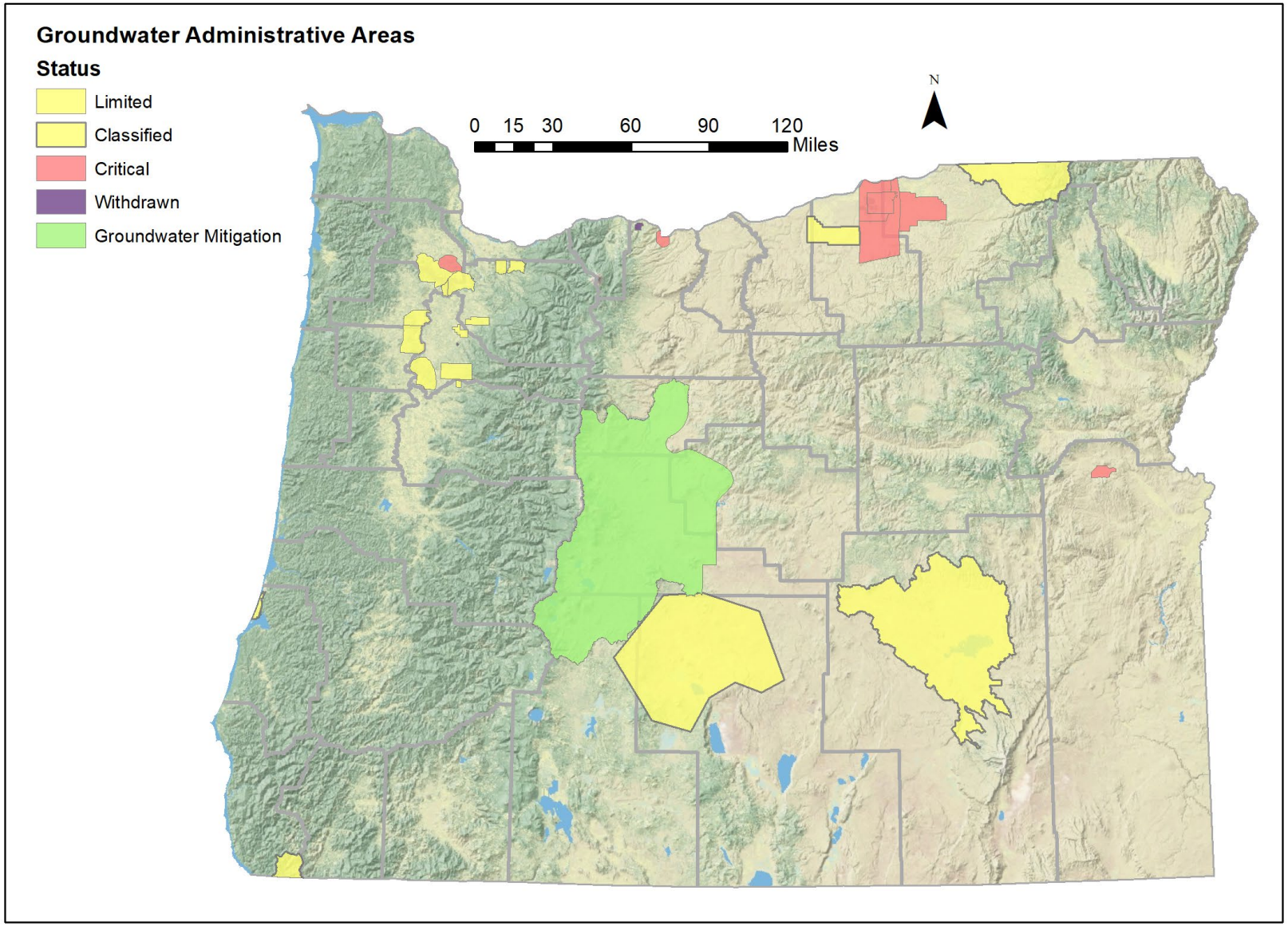
OREGON WATER RESOURCES DEPARTMENT

Aquifer management

- Groundwater allocation rules – develop for beneficial uses, protective, sustainable
- Basin program rules – classify or withdraw
- Critical groundwater area (CGWA) – over-allocated, declines need to be slowed or stopped, likely requires reduction in use

OREGON WATER RESOURCES DEPARTMENT

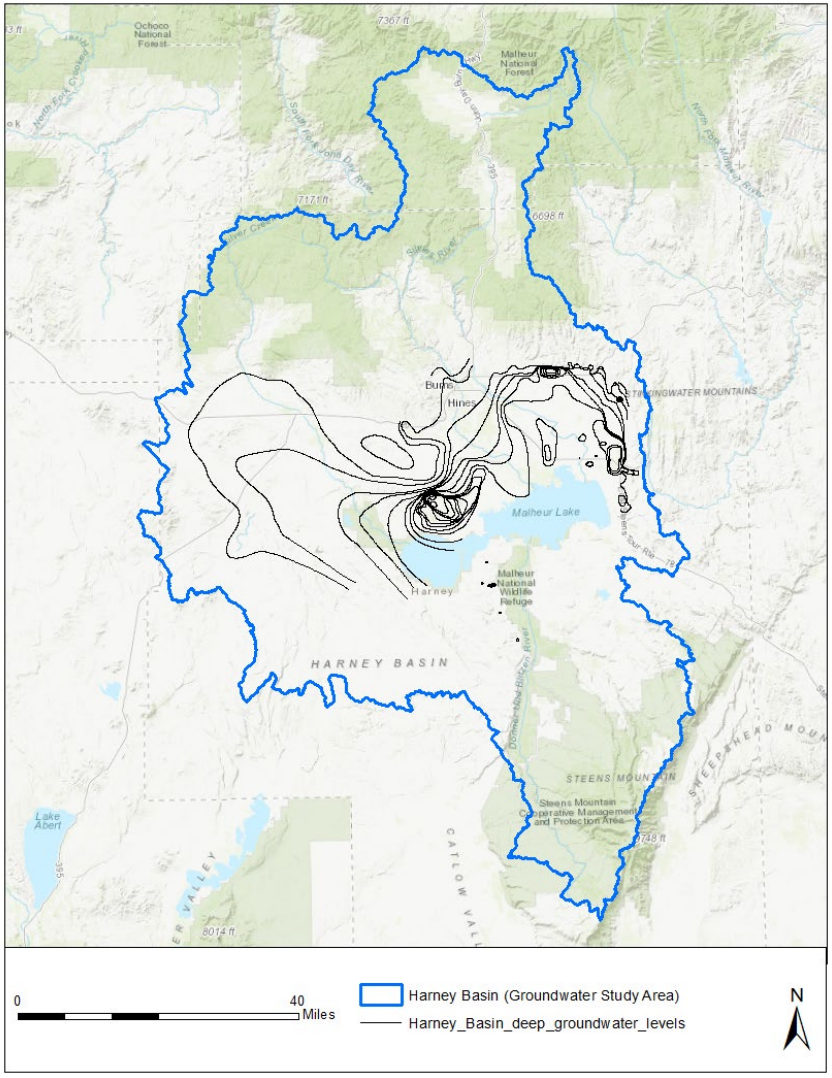
Groundwater Administrative Areas



OREGON WATER RESOURCES DEPARTMENT

Basins in Decline

- Water is a finite resource
- Stopping allocation is unpopular, but better than curtailment
- Curtailment is socially and economically disruptive
- No action is not an alternative



Source: OWRD

OREGON WATER RESOURCES DEPARTMENT

Decision Points

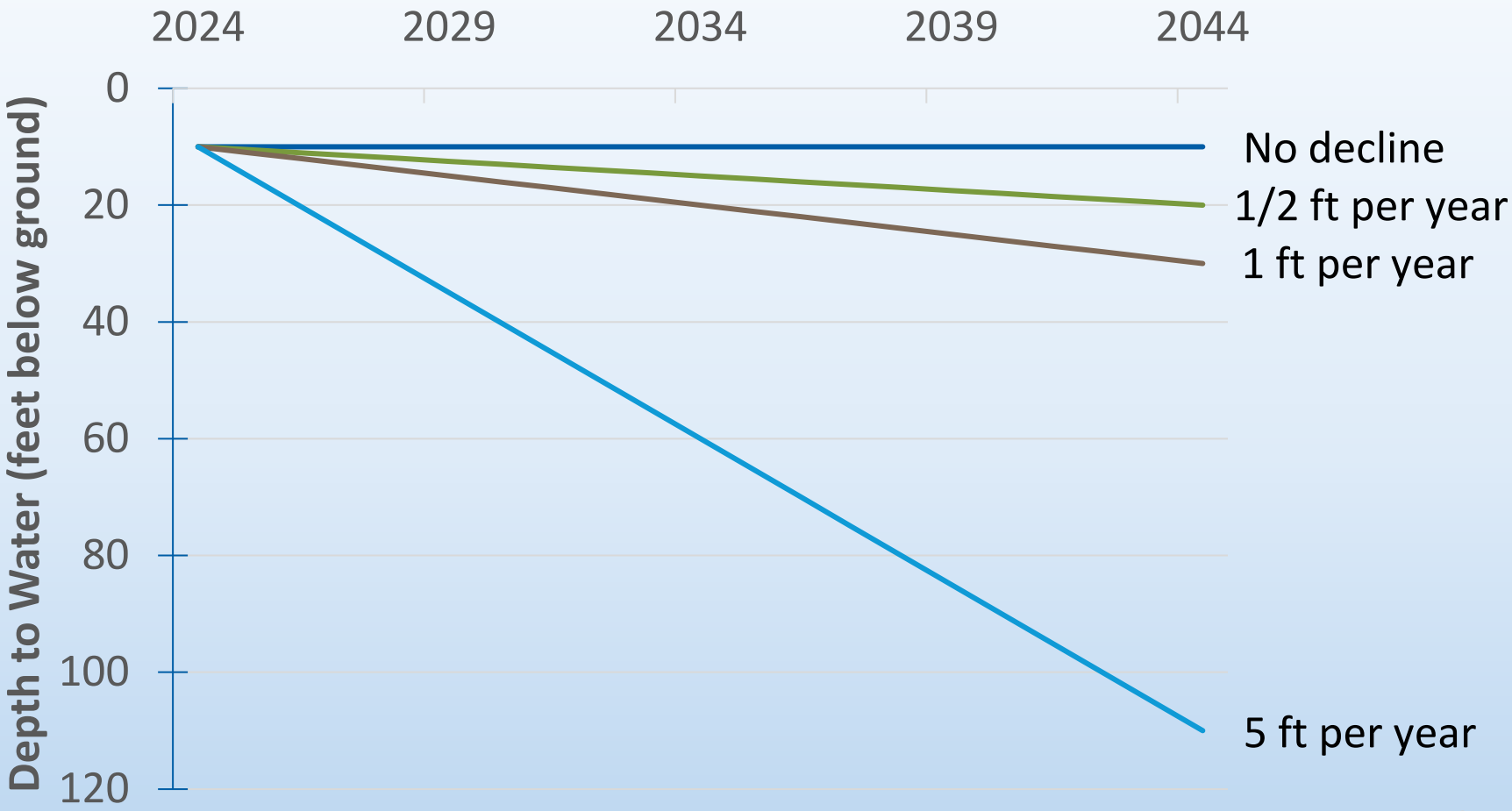
- Establish target water level trend
- Establish permissible total withdrawal (PTW; in rule)
- Establish volume and timing for groundwater use reduction

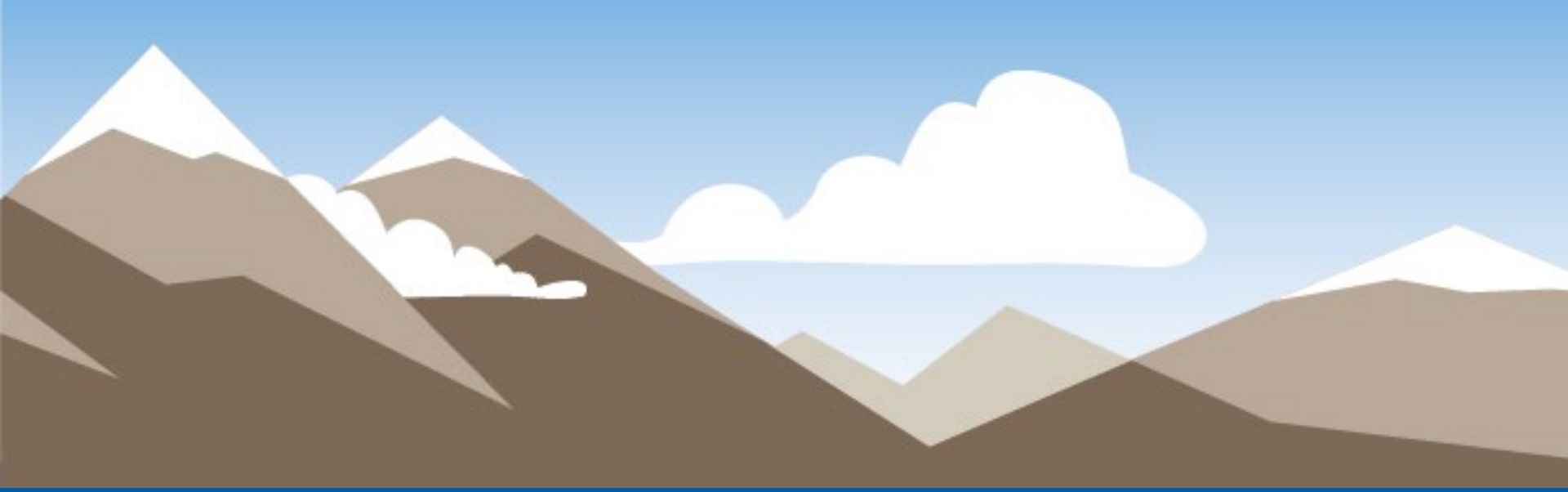
Decision 1:
Establish target water level trend

OREGON WATER RESOURCES DEPARTMENT

Target Water Level Trend

Various decline rates over 20 years





Decision 2: Establish permissible total withdrawal

OREGON WATER RESOURCES DEPARTMENT

Permissible Total Withdrawal

Data needs:

- Current groundwater level trends
- Current groundwater use (versus allocation)
- Target water level trend

OREGON WATER RESOURCES DEPARTMENT

Permissible Total Withdrawal

Options to calculate PTW:

- Hydrograph approach
- Pumping rate & decline rate analysis

Note: A numerical flow model can help with forward-looking simulations

Decision 3:
Establish the volume and timing for groundwater use reduction

OREGON WATER RESOURCES DEPARTMENT

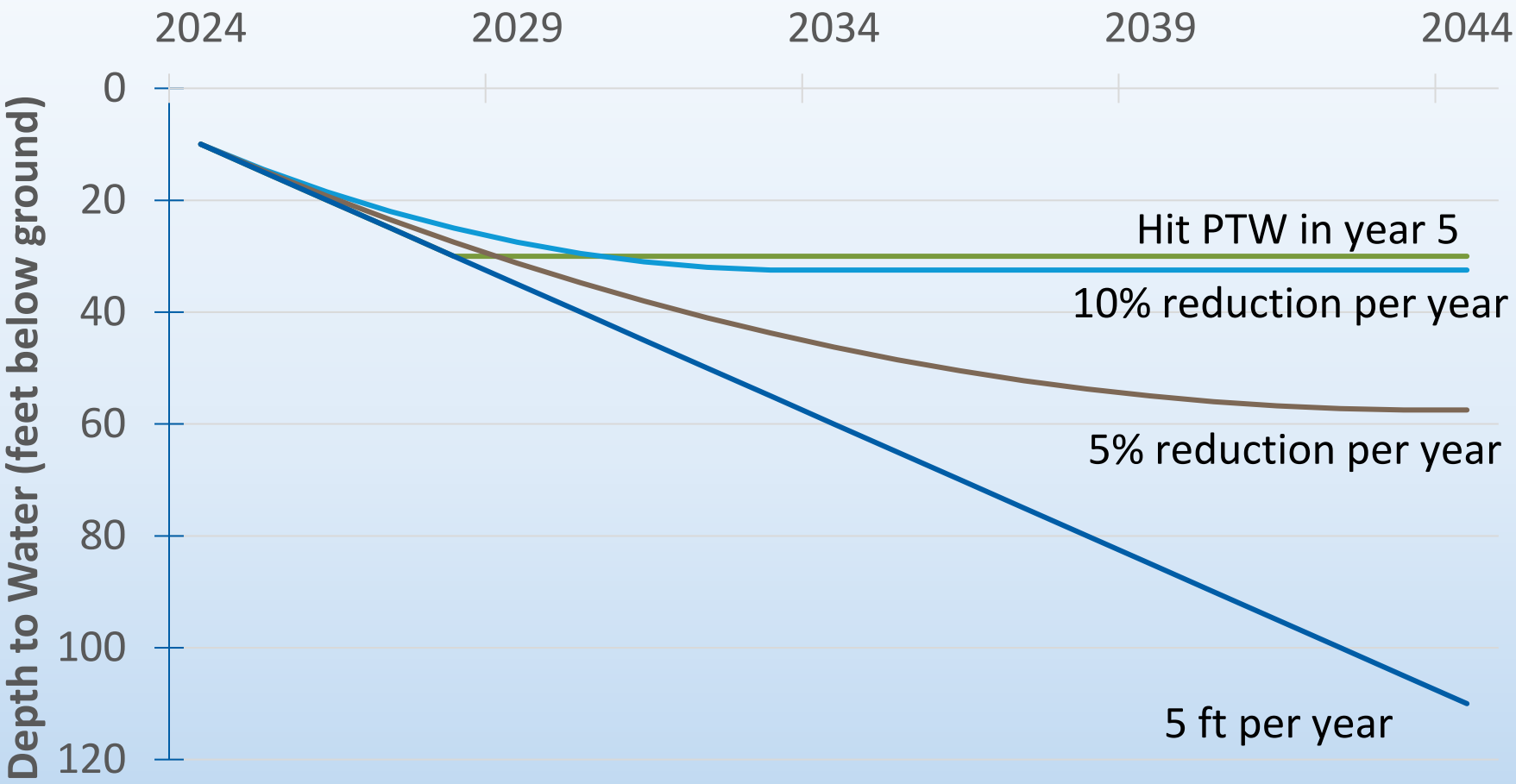
Options to reduce use

- Conservation programs (like CREP) to retire water rights
- Regulatory curtailment through CGWA process
- Voluntary agreements (ORS 537.745)
- Alternate water sources or aquifer recharge

OREGON WATER RESOURCES DEPARTMENT

Timing of Reductions in Use

Different Use Reduction Scenarios



OREGON WATER RESOURCES DEPARTMENT

Next Steps

- Continue Division 512 rules update
- Evaluate criteria and options for voluntary agreements
- Continue WRC updates and discussions
- Enhanced long-term aquifer monitoring