Harney Basin Groundwater Investigation
Continuing the OWRD-USGS Collaboration Legacy of Ken Lite and Marshall Gannett

GSA Cordilleran Section Meeting
Portland, Oregon
15 May 2019
1980s Hydrogeology

Time of Transition
1980s Hydrogeology

Davis & DeWeist
To
Freeze & Cherry

1-D & 2-D
Analytic & Numerical Models (Flow - Transport)
To
3-D Finite Difference & Finite Element Numerical Models

Time of Transition
1980s Hydrogeology

USGS Cooperative Studies

Portland Basin
Hydrogeology &
Numerical Model
(Morgan, McFarland, others)

Fort Rock Basin
Numerical Model to
Assess Data Adequacy
(McFarland & Ryals 1991)

Goose Lake Basin
Hydrogeology &
Numerical Model
(Morgan 1987)

Photo Source: City of Portland

Photo Source: Oregon State Parks

Photo Source: Oregon State Parks
1990s & 2000s Hydrogeology

USGS-OWRD Collaboration

Upper Deschutes Basin
Hydrogeology &
Numerical Model
(Gannett, Lite, others)

Upper Klamath Basin
Hydrogeology &
Numerical Model
(Gannett, Lite, others)

Willamette Basin
Hydrogeology &
Numerical Model
(Conlon, Herrera, Wozniak, others)

USGS-OWRD Cooperative-Collaborative Groundwater Studies

Photo Source: USGS
Advancing the Characterization and Understanding of Basin-Scale Groundwater Systems in Complex Volcanic Terrains with Significant Surface Water Interaction

Applying Cutting Edge Scientific and Numerical Modeling Tools
- Geologic Tools
- Hydrologic Tools
- Numerical Modeling
- Optimization Modeling

Demonstrating and Setting Standard for Successful USGS-State Cooperator Collaborative GW Studies
# Harney Basin Groundwater Study

## USGS-OWRD Collaboration

### USGS Core Team
- Steve Gingerich
- Hank Johnson
- Amanda Garcia
- Nick Corson-Dosch

### OWRD Core Team
- Jerry Grondin
- Darrick Boschmann
- Jordan Beamer
- Mellony Hoskinson

## Anticipated Reports
- Hydrogeology (Phase 1)
- Numerical Model (Phase 2)

## Citizen Advisory Committee
- Appointed by State & County
- Quarterly Update Meetings

## Team Coordination Meetings

## Data Share with Other Studies

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**USGS-OWRD Cooperative-Collaborative Groundwater Studies**
Applying Best Available Data & Tools

Potentiometric Map

- Project Wells
- Permit Condition Wells
- Watershed Council Wells
- OWRD GW Database
- OWRD Well Log Database
- Springs
- Survey Grade GPS
- Lidar
- Satellite Imagery
- Surface & Borehole Geology
Applying Best Available Tools

Evapotranspiration

- Phreatophytes
- Irrigated Agriculture
- Satellite Imagery
- Model Evapotranspiration
- Validation:
  - Ground Measurements
  - Pumping Measured
Thank You

Photo Source: Chad Sobotka