

# **She Flies With Her Own Wings: The Oregon Water Center Story**

# Institute for Water and Watersheds

The State Water Resources Research Institute for Oregon

## Program Overview

The IWW is the state water resources research institute for Oregon and is one of 54 state or territory-based, institutes established by the 1964 Federal Water Resources Research Act. Through this program, the IWW receives federal matching funds from the US Geological Survey to support water resources research and technology transfer

activities in Oregon. The IWW's goals are to:

- Assemble diverse research teams and lead interdisciplinary and transdisciplinary water research projects.
- Help policy makers and water managers collaborate with university faculty and students.
- Offer training and access to water quality and stable isotope analysis facilities through a shared laboratory called the IWW Collaboratory.
- Encourage community and collaboration among water faculty, students and water managers by sponsoring events and producing a weekly e-newsletter.



## Why Water?

Oregon's economic vitality is directly tied to water. Water is "virtually" embedded in all Oregon products, from timber and salmon to solar panels and semiconductors. But water supply and demand in the state is changing. There is now less snowpack in mountain regions and the snow is melting earlier in the spring and summer. These changes have implications for irrigation, human consumption, hydropower

## Willamette Water 2100

In 2010 the IWW and Oregon University System partners were awarded a 4.3 million dollar grant from the National Science Foundation to evaluate how climate change, population growth, and economic growth will alter the availability and the use of water in the Willamette River Basin on a decadal to centennial timescale. The project will create a transferable method of predicting where climate change will create water scarcities and where those scarcities will exert the strongest impacts on society. The team is collaborating with public officials, resource managers, and other stakeholders to help translate the results of the research into planning and decision making processes.

<http://water.oregonstate.edu/ww2100>



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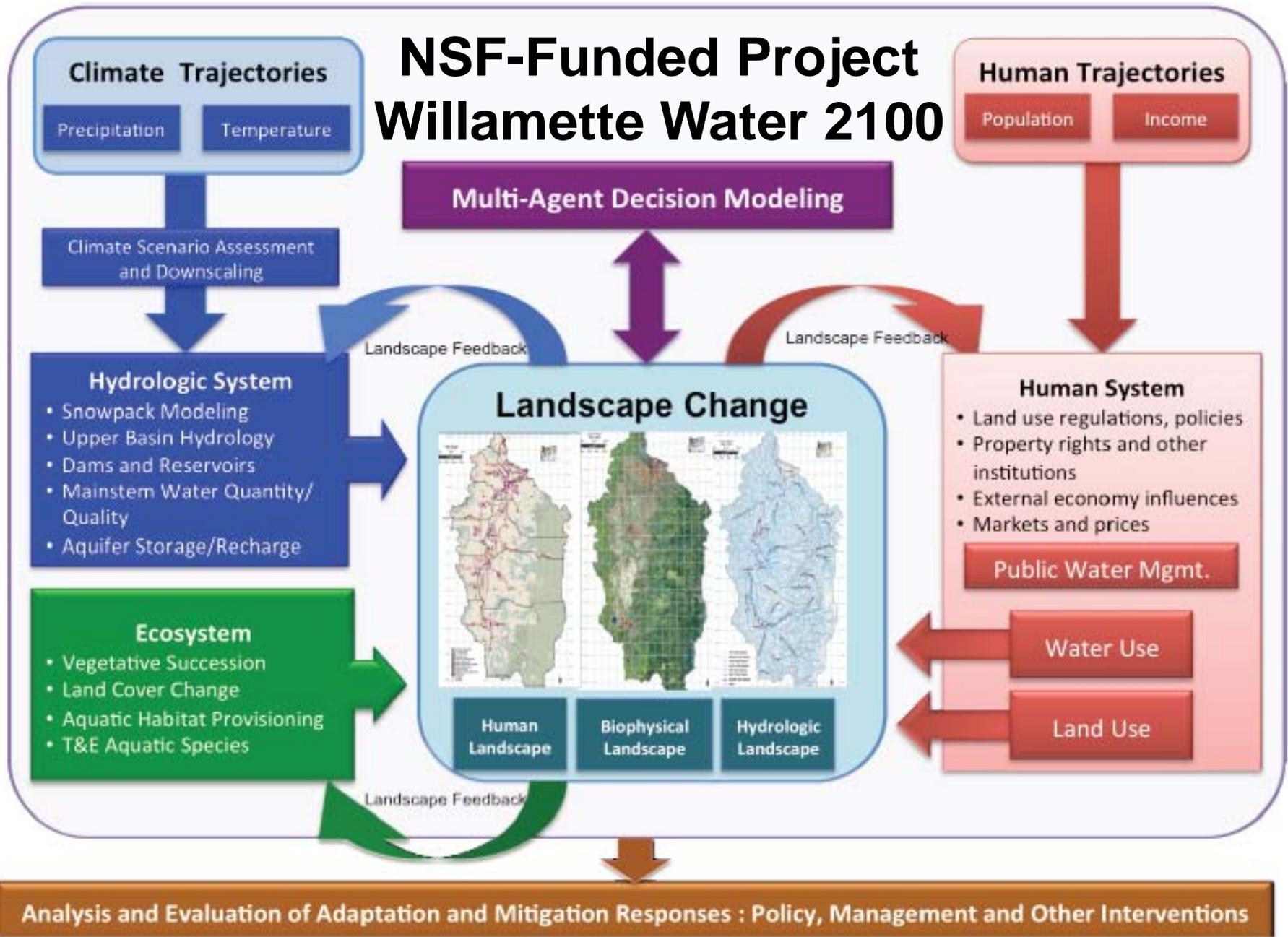
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# Mission

- 🔥 **Facilitate Research Teams** – Help write proposals, budgets, project management, project close-out, water laboratory services, look international for opportunities (example: TAHMO to USAID and Gates Foundation)
- 🔥 **Facilitate Education** – Workshops for new faculty at OSU, Oregon Sea Grant, COAS, INR, and OCCRI on proposal and grant writing for large projects; eCampus courses; Workshops on Water Conflict Management, Catchment Hydrology
- 🔥 **Facilitate Outreach & Information Transfer** – Yearly World-class Seminar Series (partnering with WRGP, USGS, PSU); new Visiting Scholars Program; Regional Topical Conferences with OSU Extension & Neighboring Water Centers (Exempt Well Conference, May 17-18, Walla Walla)

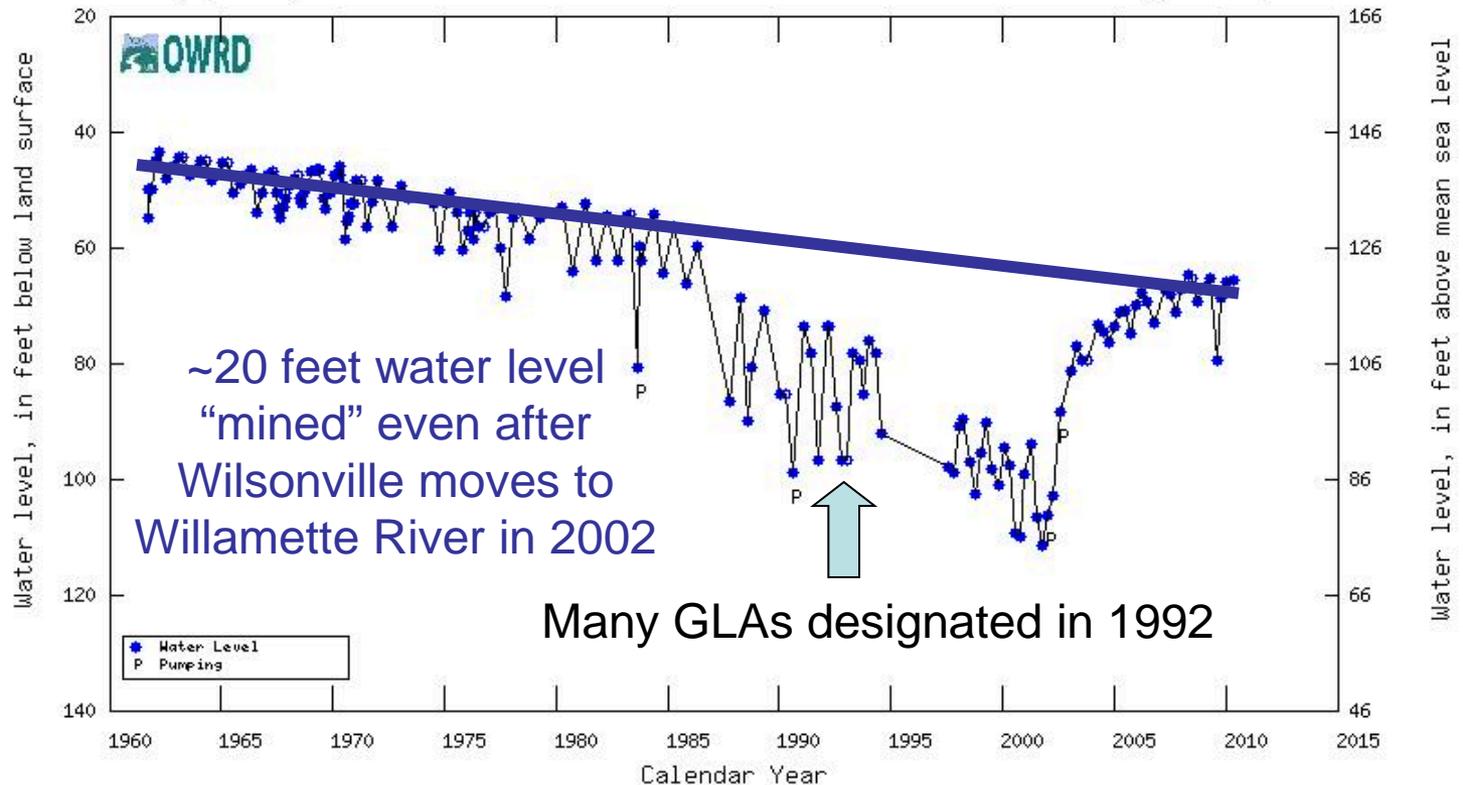
# NSF-Funded Project Willamette Water 2100



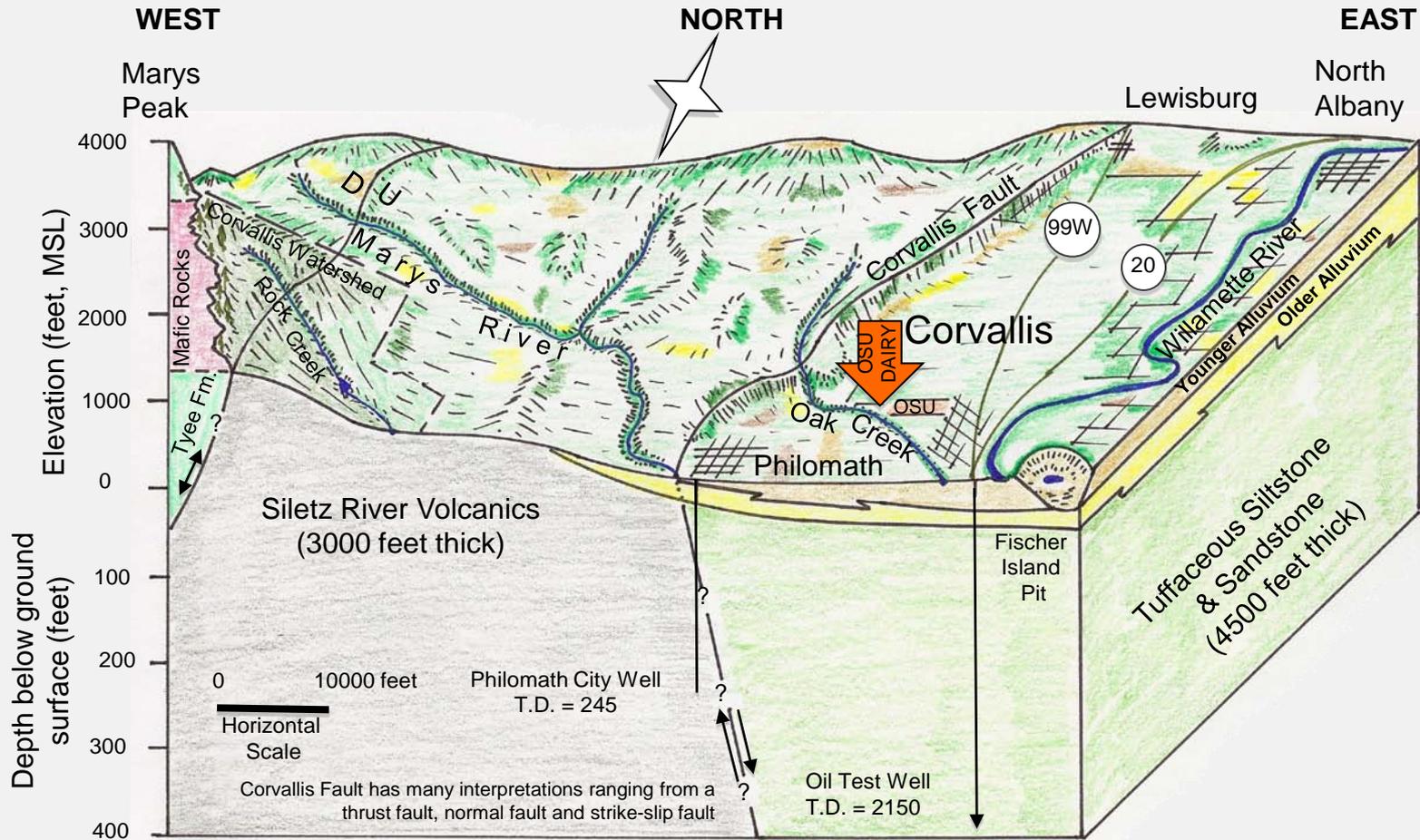
# Urban Hydrology: Aquifer Storage & Recovery

## West of Wilsonville

Oregon Water Resources Department Well Location	
Oregon Water Resources Department Logid	CLAC 8231
Oregon Water Resources Department Well Tag (Well ID)	----
Oregon Water Resources Department State Observation Well Number	40
Total well depth (feet below land surface)	1000
Land surface elevation (feet above mean sea level)	186
Primary use of well	PUBLIC SUPPLY
Primary aquifer system	Late Tertiary Basalt Aquifers

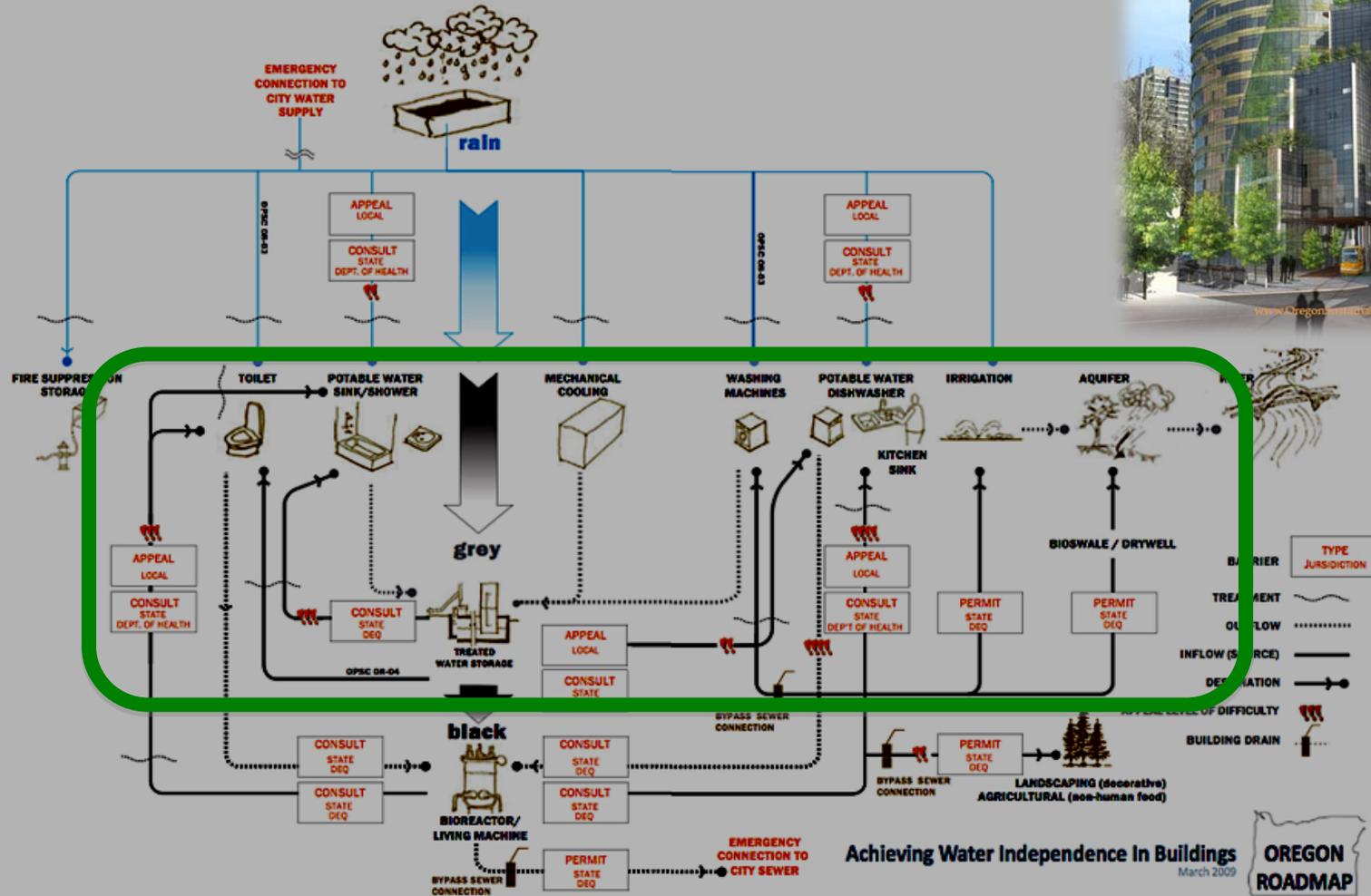


# Urban Hydrology: Temperature & Wastewater Disposal



Drawn by Todd Jarvis, PhD (2011) using readily available geologic maps published by State of Oregon and US Geological Survey

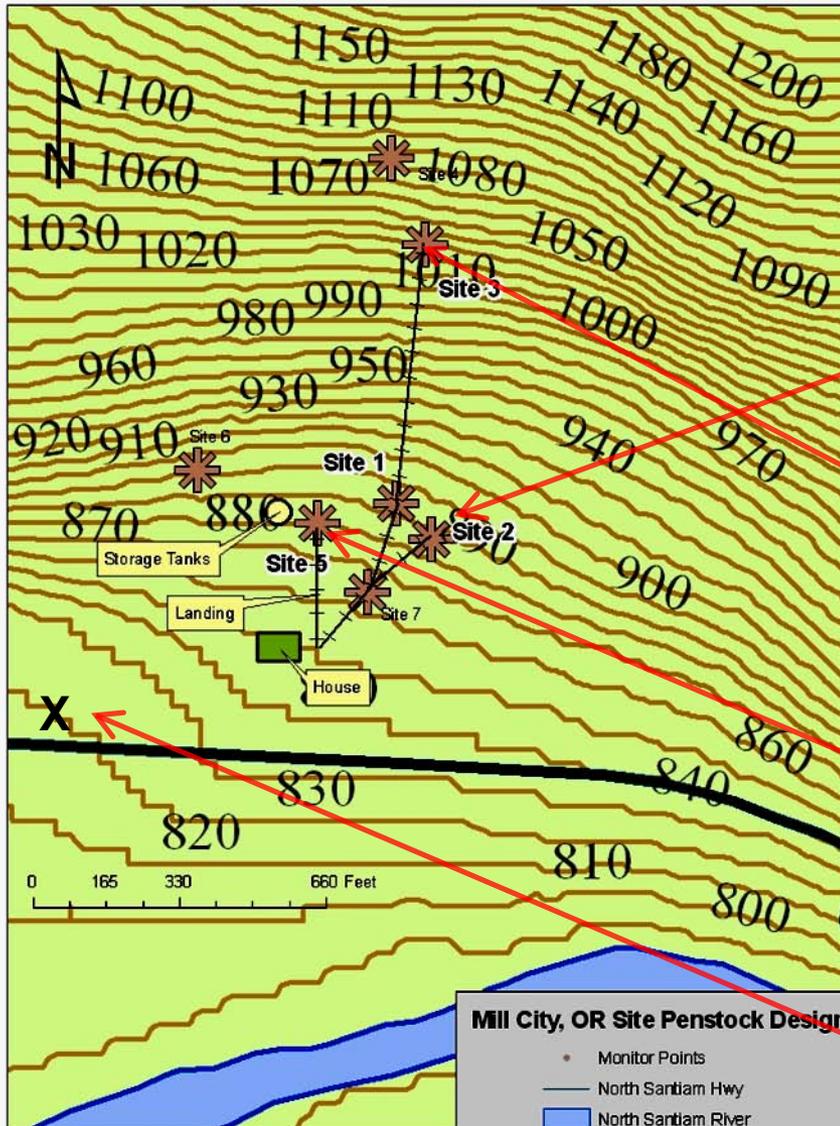
# Urban Hydrology: Oregon Sustainability Center “Net-zero” Water



Achieving Water Independence In Buildings



## Mill City, OR Site Preliminary Penstock Design Three



**Mill City, OR Site Penstock Design**

- Monitor Points
- North Santiam Hwy
- North Santiam River
- Contours: 10 ft intervals

Site data and figure courtesy of Jennifer Holderman and Todd

# Green Energy: Micro-hydro Site Evaluation

### Site 2

Elevation (ft.): 890

Distance to X (ft.): 970

### Site 3

Elevation (ft.): 1030

Distance to X (ft.): 1600

### Site 5

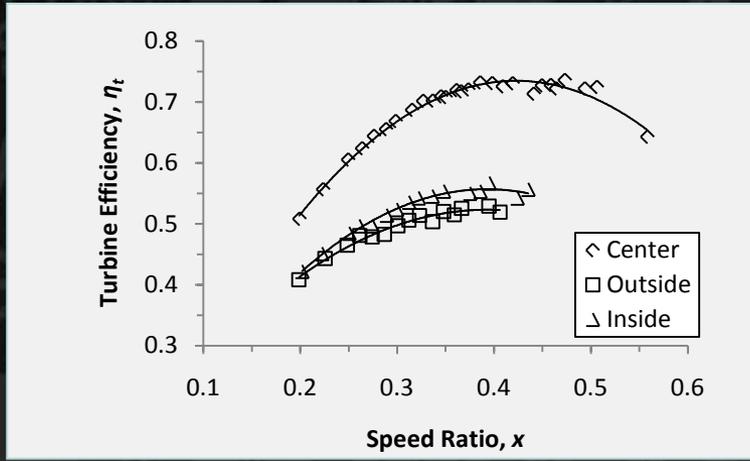
Elevation (ft.): 880

Distance to X (ft.): 880

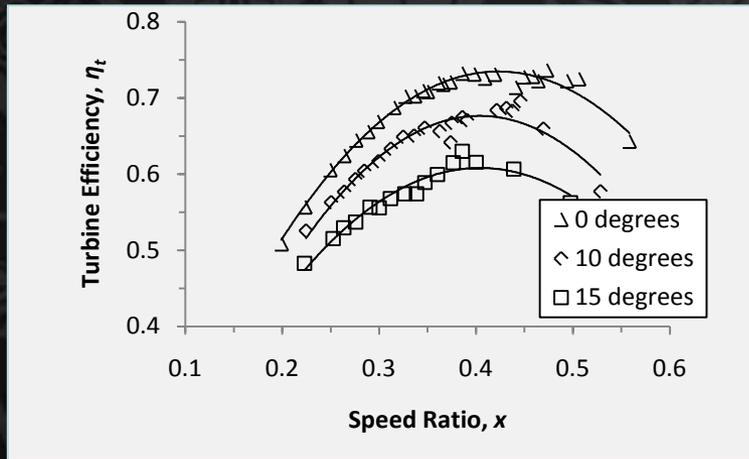
Turbine (Holderman, 2011)

Elevation: 820

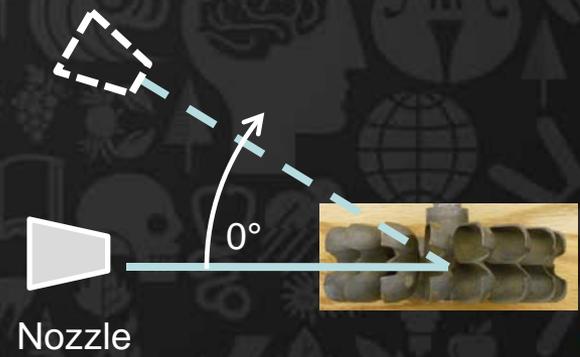
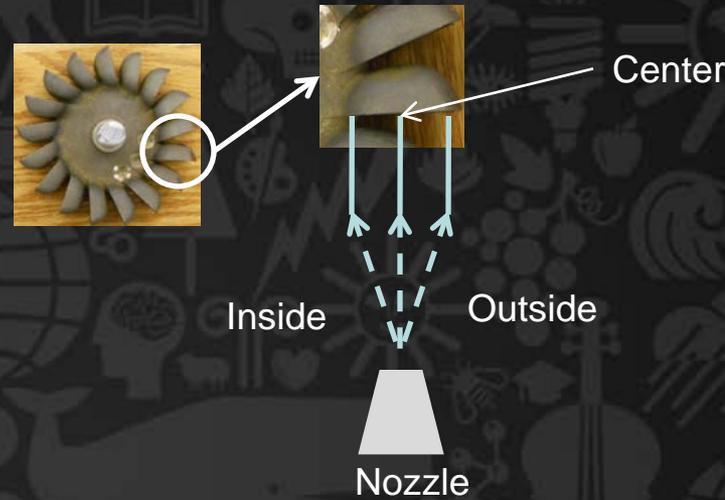
# Green Energy: Research on Turbines



(a)

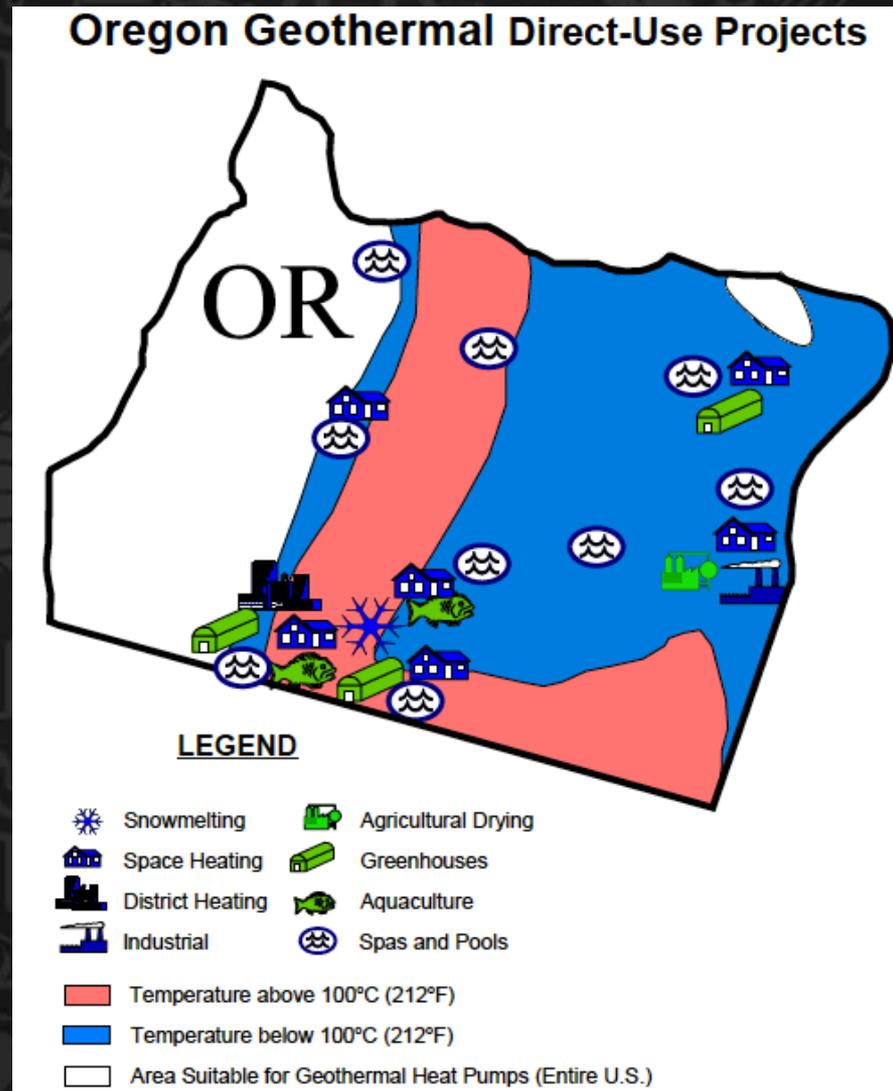


(b)



Turbine efficiency vs. speed ratio for a 100-mm Pelton turbine with a 3/8" nozzle and (a) radial misalignment and (b) angular misalignment. (Cobb, 2011).

# Green Energy: OIT Geo-Heat Center In Business Since 1975



# Fiber Optics for Water/Air Temp.

OSU Gets Fiber-optic Temperature Sensor



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# International Waters



## ICIWaRM

Under the auspices of  
**UNESCO**  
United Nations  
Educational, Scientific and  
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International Center for  
Integrated Water  
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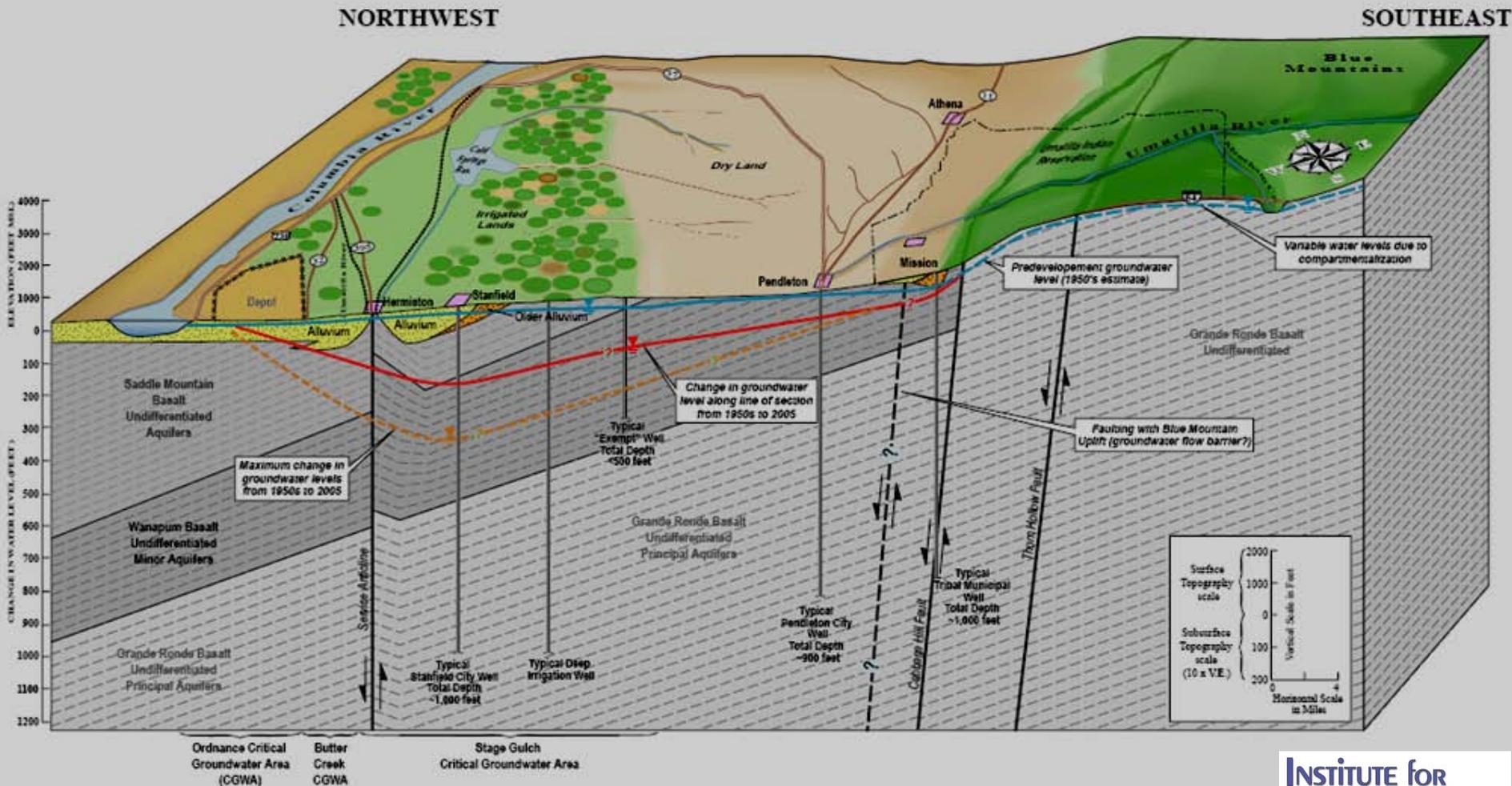


PROGRAM IN WATER CONFLICT MANAGEMENT AND TRANSFORMATION

[www.transboundarywaters.orst.edu](http://www.transboundarywaters.orst.edu)

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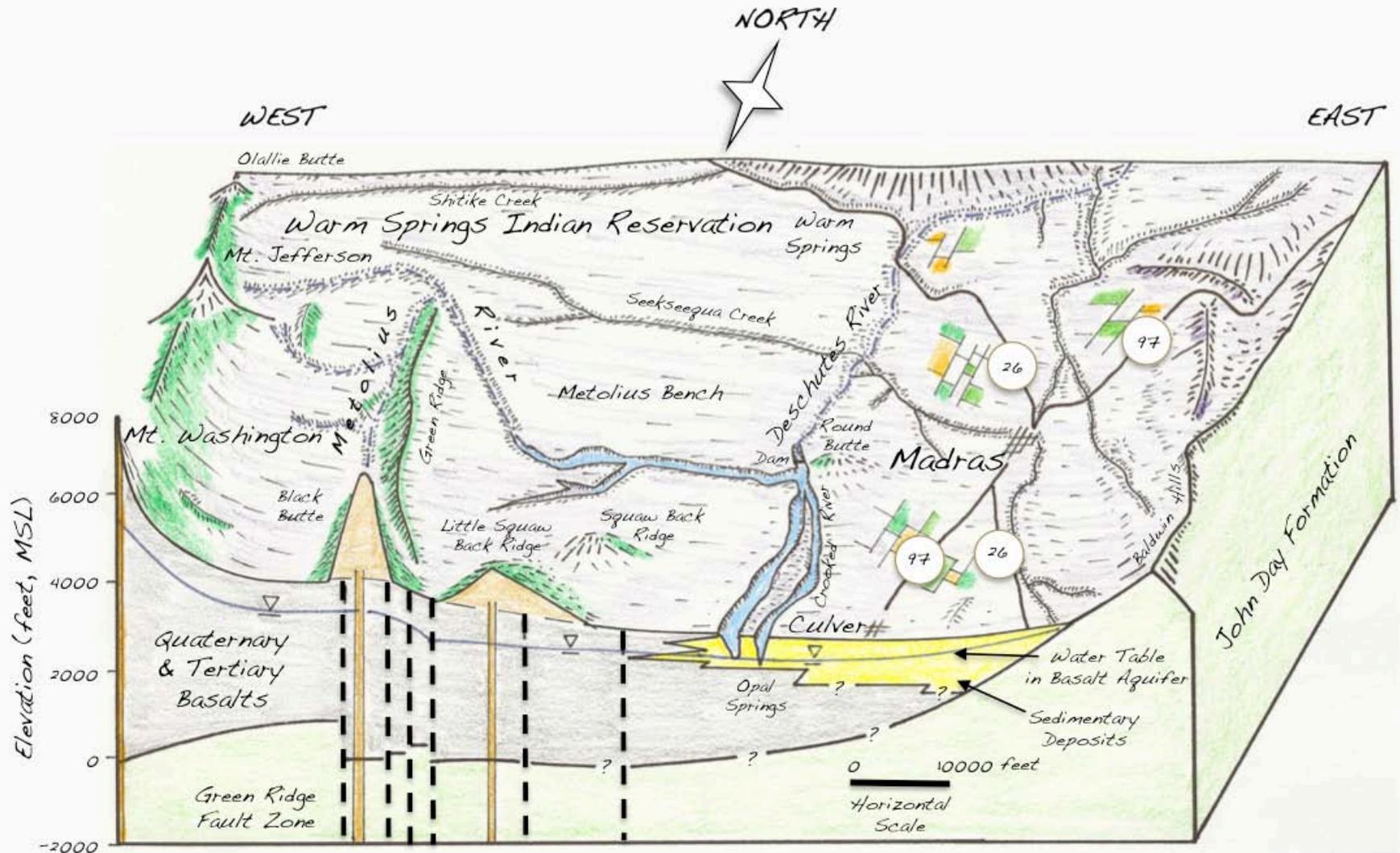
# Using the Columbia River & CRT Renegotiations



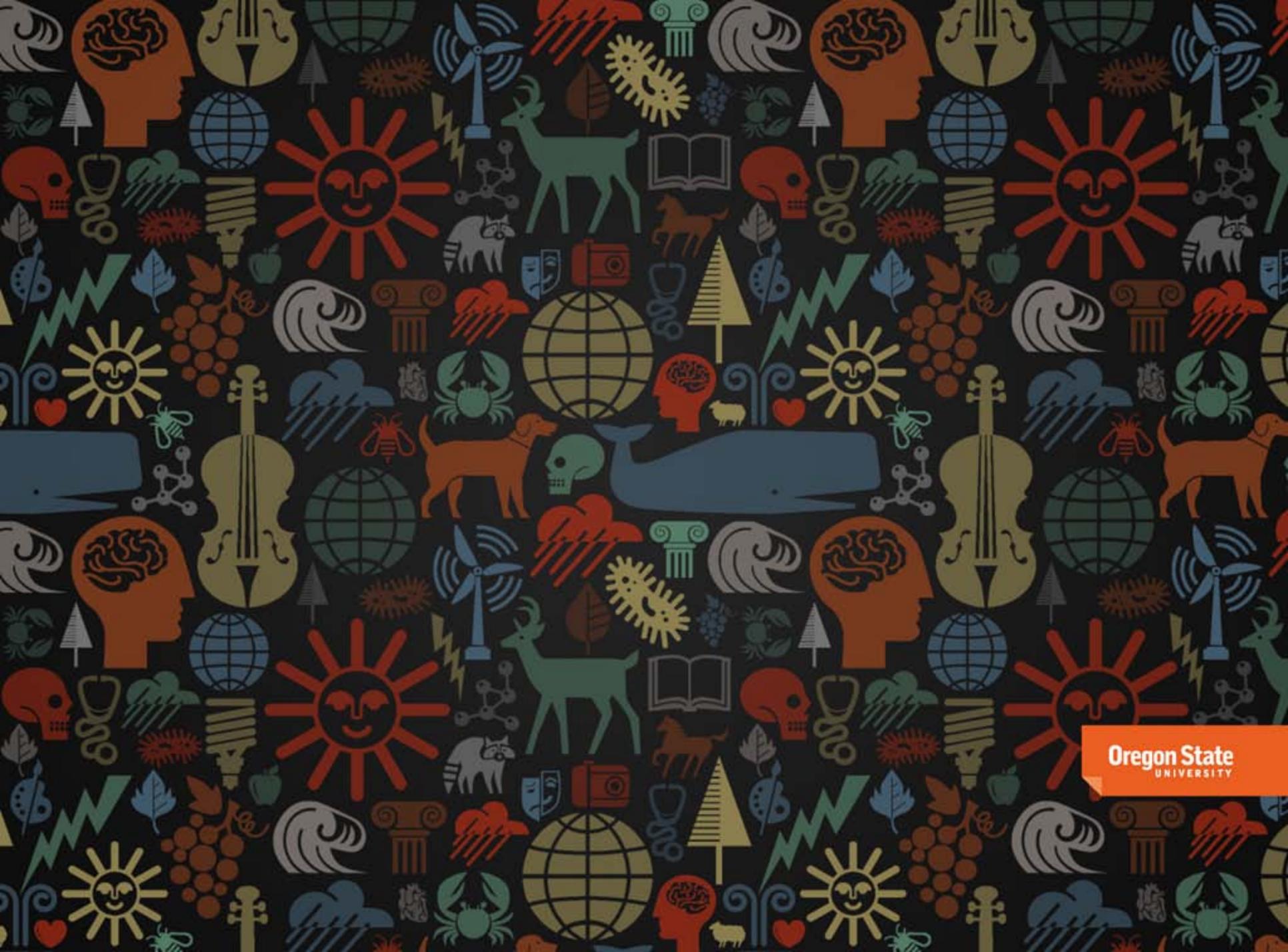
# New Partnerships

- ◆ OSU Water Resources Graduate Program (MS/PhD in Water Engineering, Water Science and Water Policy and Mgmt).
- ◆ Sea Grant Program ventures into water education & watersheds and is part of NSF WW2100 Project.
- ◆ OSU Ag Extension ventures into water through water well program and is a partner for International Conference on Exempt Wells
- ◆ College of Oceanography and Atmospheric Sciences and new state legislative-funded Climate Change Research Center venture into “freshwater” & water scarcity and is part of NSF WW2100 Project.
- ◆ New state legislative-funded Institute of Natural Resources ventures into “water” and ecosystem services

# Work with NGOs



Drawn by Todd Jarvis, PhD (2010) using readily available geologic maps published by State of Oregon and US Geological Survey



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