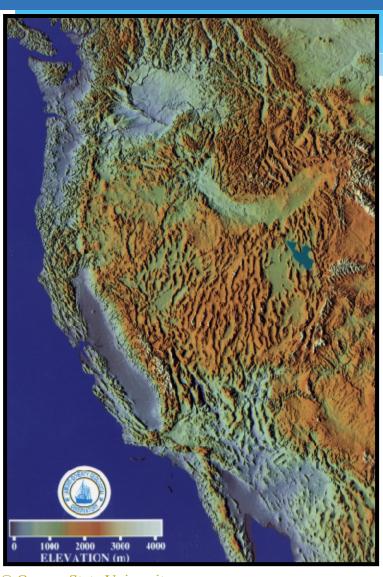
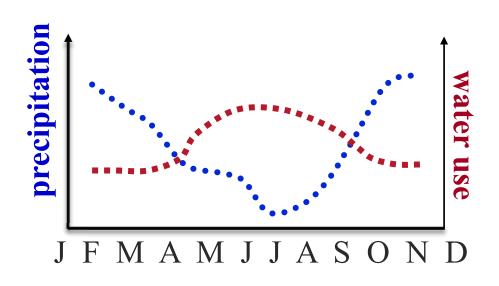
Water, Sustainability and Climate Futures for the Willamette River Basin

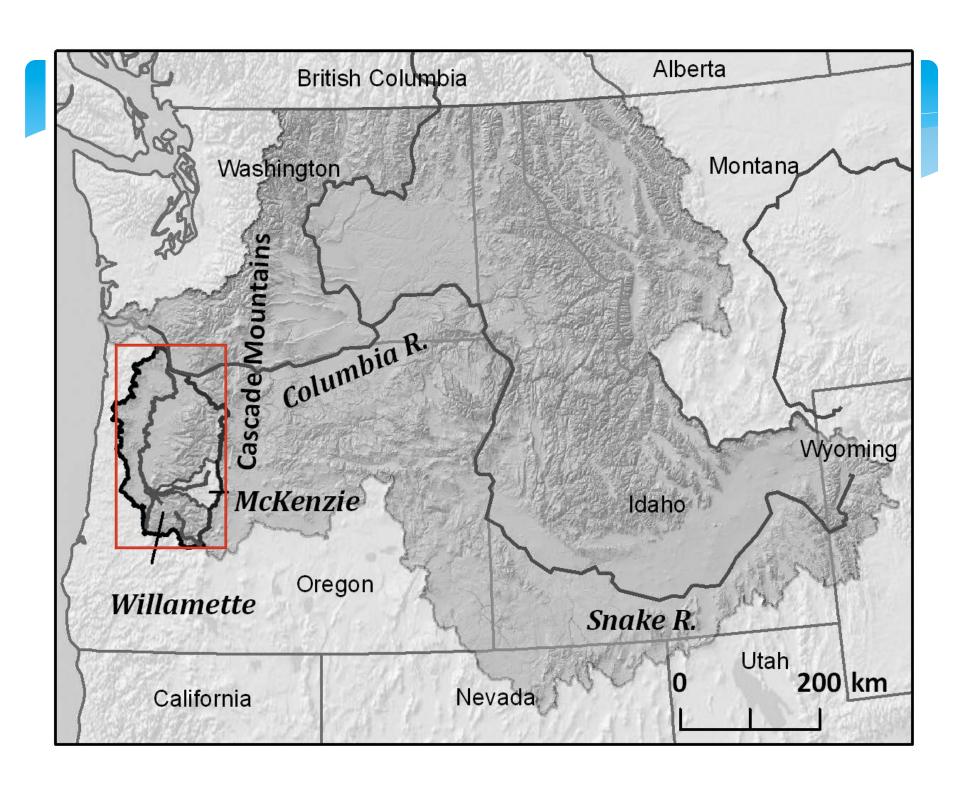
Anne Nolin and the WW2100 Team College of Earth, Ocean, and Atmospheric Sciences Oregon State University

Water in the West – it's all about supply and demand

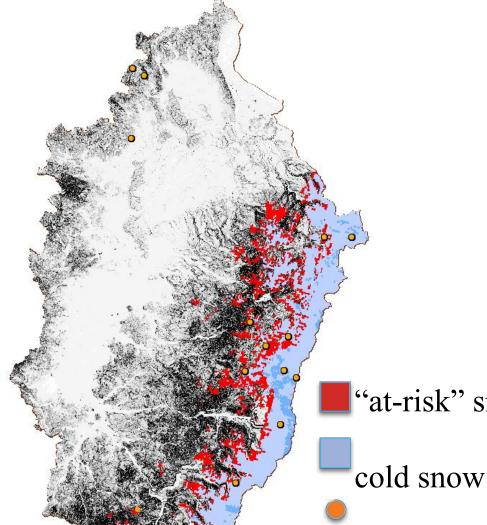




This problem will be intensified by climate change



Willamette River Basin, Oregon



Willamette River Basin:

- * 29,000 km²
- * 70% of Oregon's population
- Water use: hydropower, fish, irrigation, municipal

At-Risk Snow:

- For a 2°C temperature increase we project a
 25% decrease in snow covered area
- "at-risk" snow * Low elevation snowfall converts to rainfall
 - * ~4 km³ of water volume per year

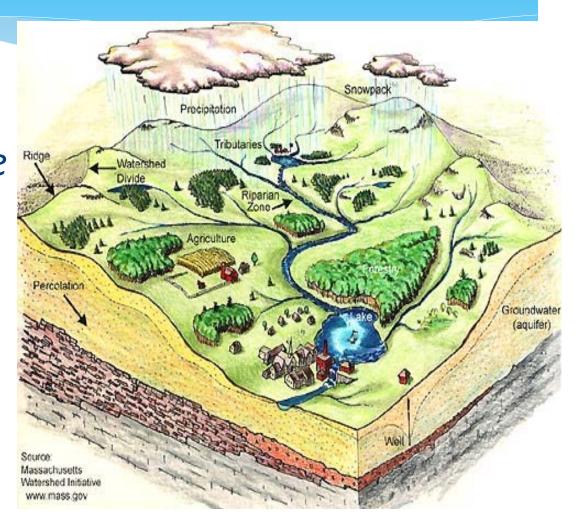
SNOTEL stn.

(Nolin and Daly, 2006; Nolin et al., in press)

Willamette Water 2100 Project

Water sustainability and climate

Anticipating water scarcity and informing integrative water system response in the Pacific Northwest

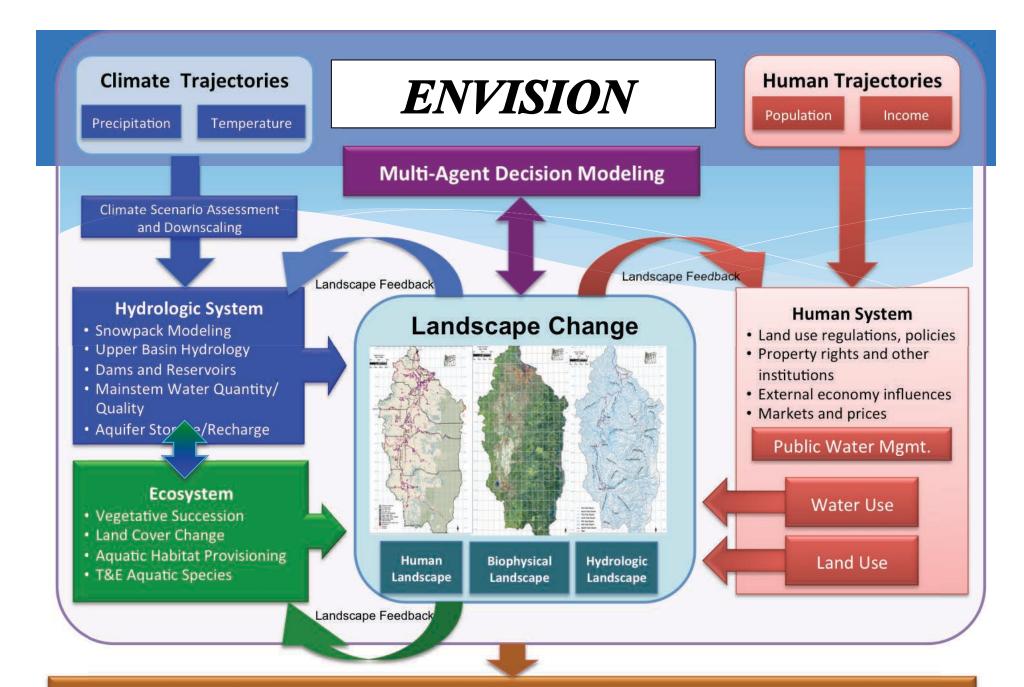


Willamette Water 2100 Project

Our Key Questions:

- Where are climate change and human activity most likely to create conditions of water scarcity?
- Where is water scarcity most likely to exert the greatest impact on ecosystems and communities?
- What strategies would allow communities to prevent, mitigate, or adapt to scarcity most successfully?





Analysis and Evaluation of Adaptation and Mitigation Responses: Policy, Management and Other Interventions

Willamette Water 2100 Project

Envision Willamette 2100 v2 (Summer 2012)

Landscape Data

Land Use/Land Cover Streams, *DEMs*, Roads Soils Population Density Pattern Population Growth Stand density/age Zoning Climate, Water Rights, ...

Policies and Scenarios

Socioeconomic Models

Population Growth

Land Use/Land Cover Change

Agriculture and Forest Management

Urban and Rural Development

Upper Basin Hydrology Mainstem Hydrology/ Temperature Dam Operations Demand/Water Rights/Withdrawals Snow Groundwater Ecosystem Models

Forest Carbon Dynamics

Fish Community Dynamics

and Biodiversity

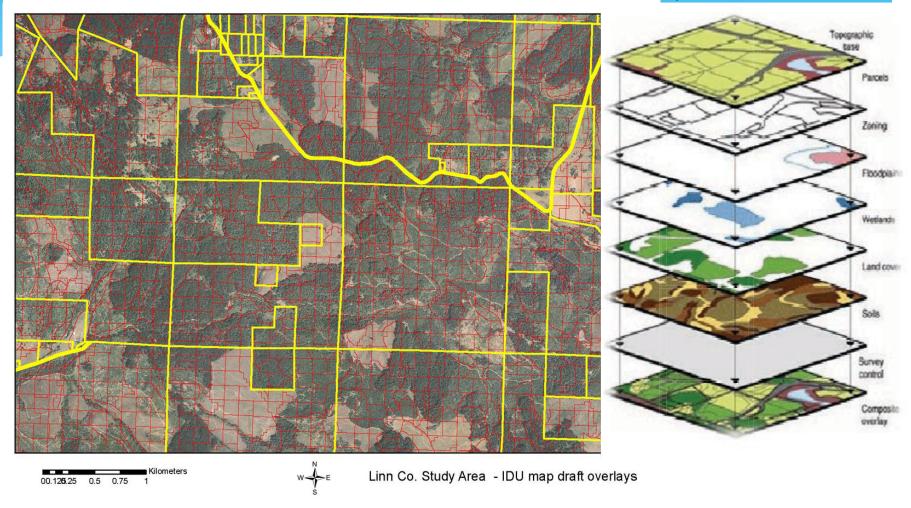
Vegetation Dynamics

Water System Models

© Oreg

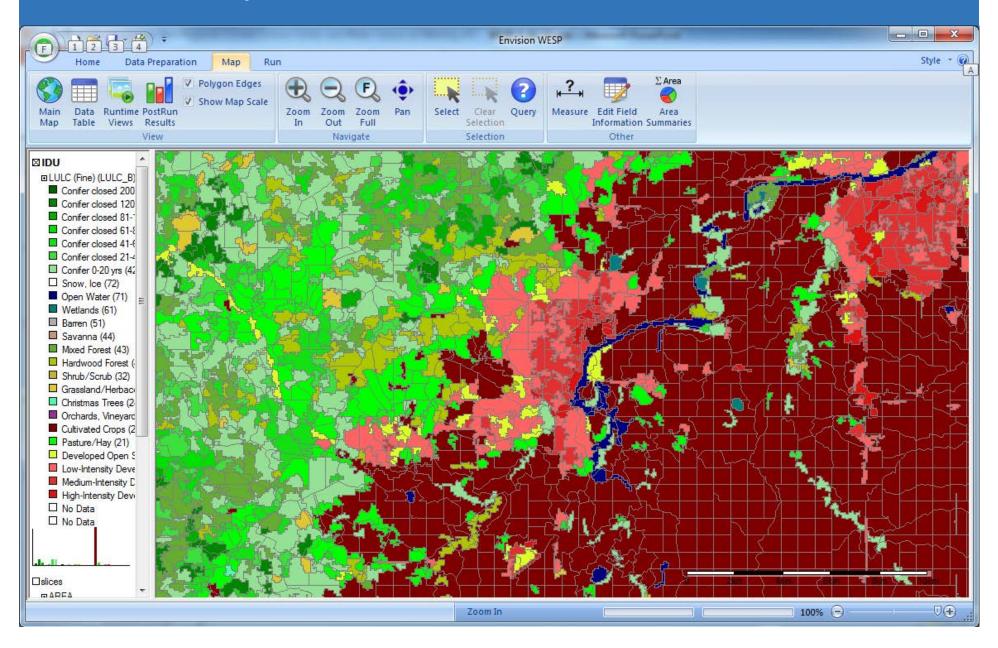
Integrated Decision Units (IDUs)

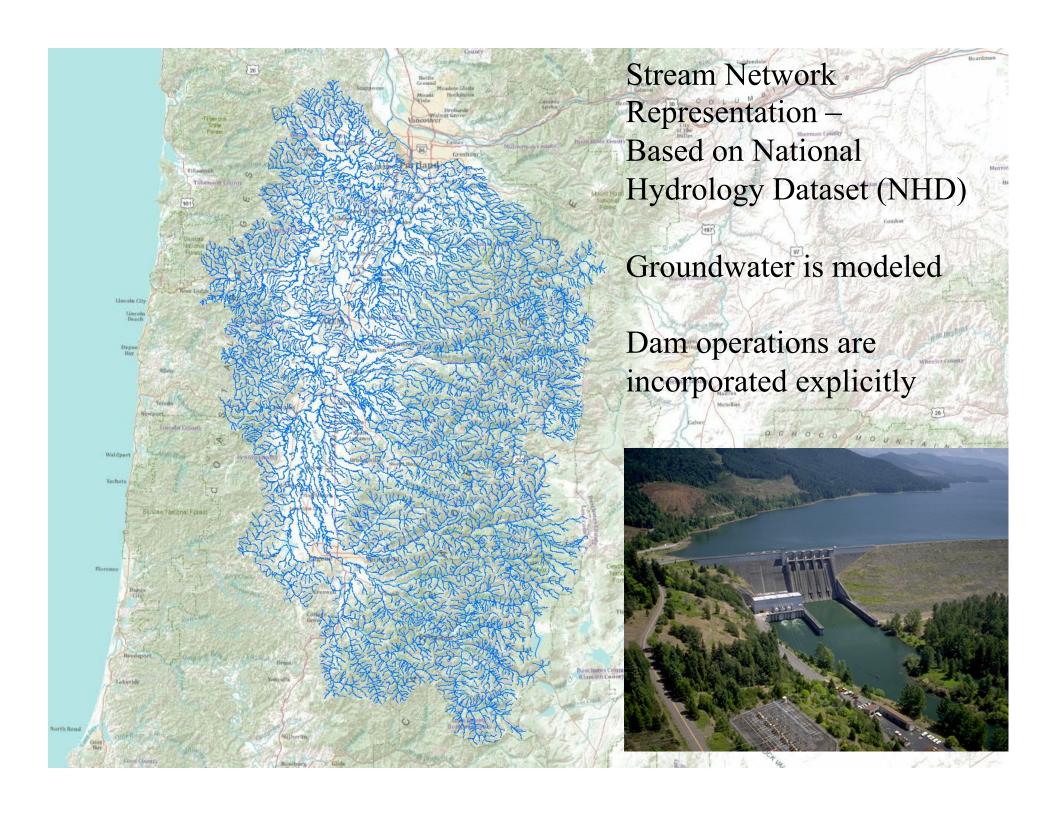
A spatial geometry to model both human decisions and biophysical processes



Each IDU described in GIS by a set of attributes used to model climate effects, vegetation dynamics, hydrology, decisions...

Spatial Scale of IDUs for WW2100





Tradeoff Analysis - Willamette

