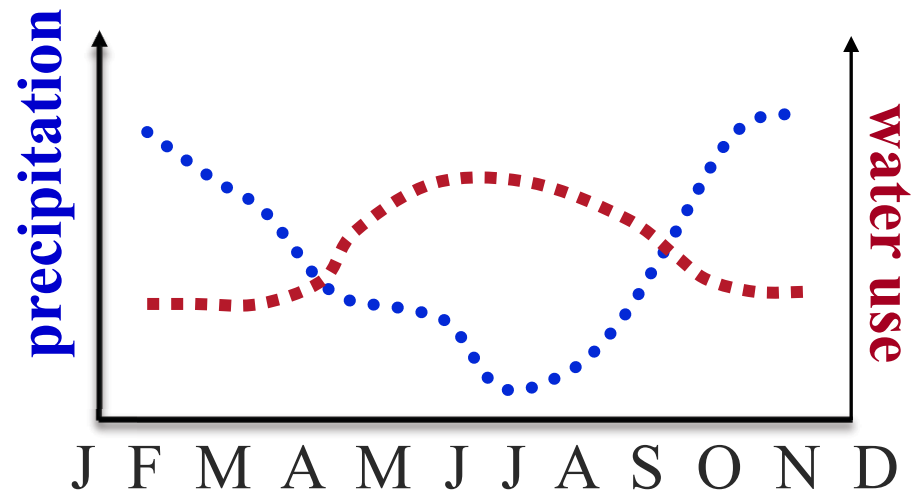


Water, Sustainability and Climate Futures for the Willamette River Basin

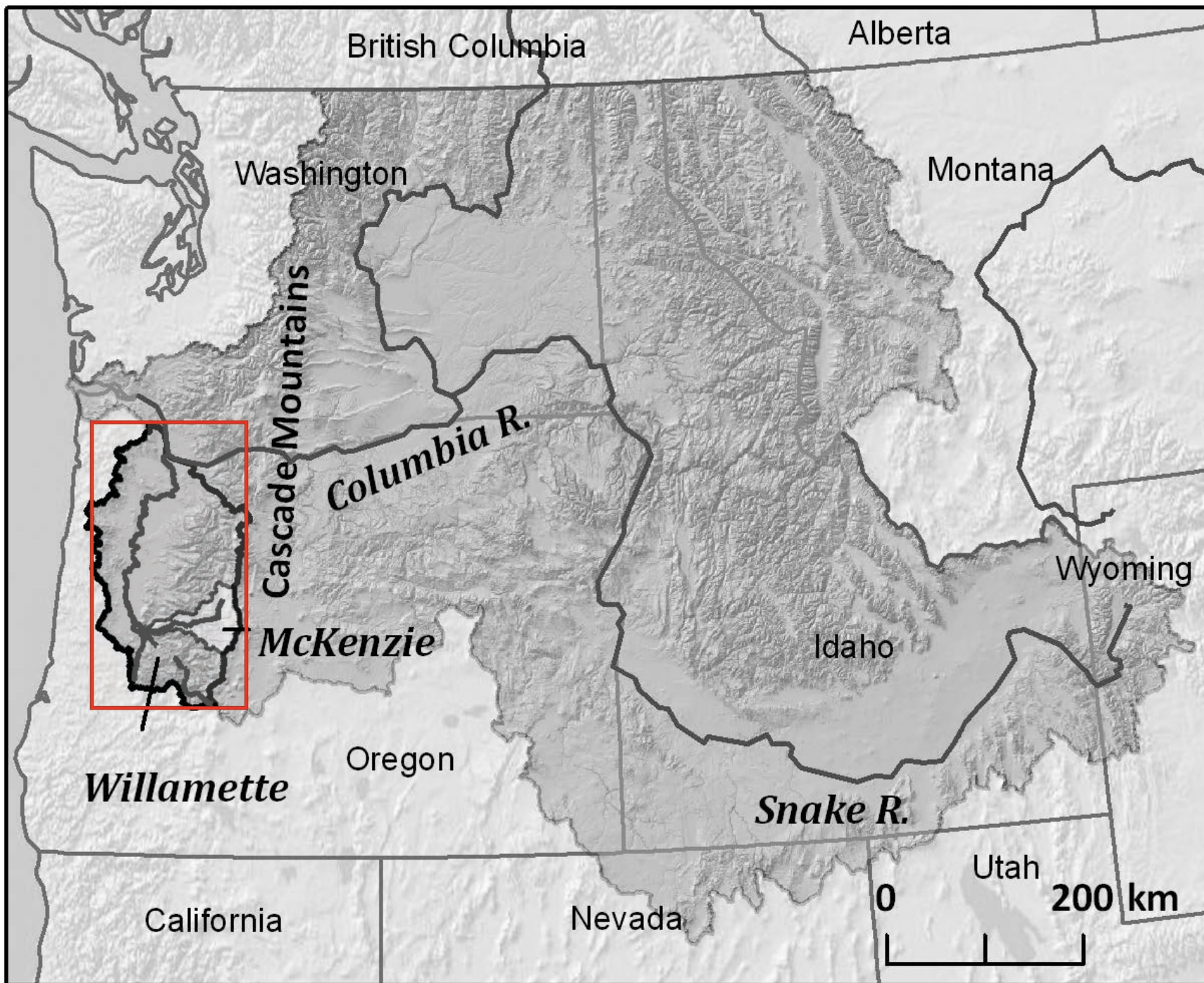
Anne Nolin and the WW2100 Team
College of Earth, Ocean, and Atmospheric Sciences
Oregon State University

Water in the West

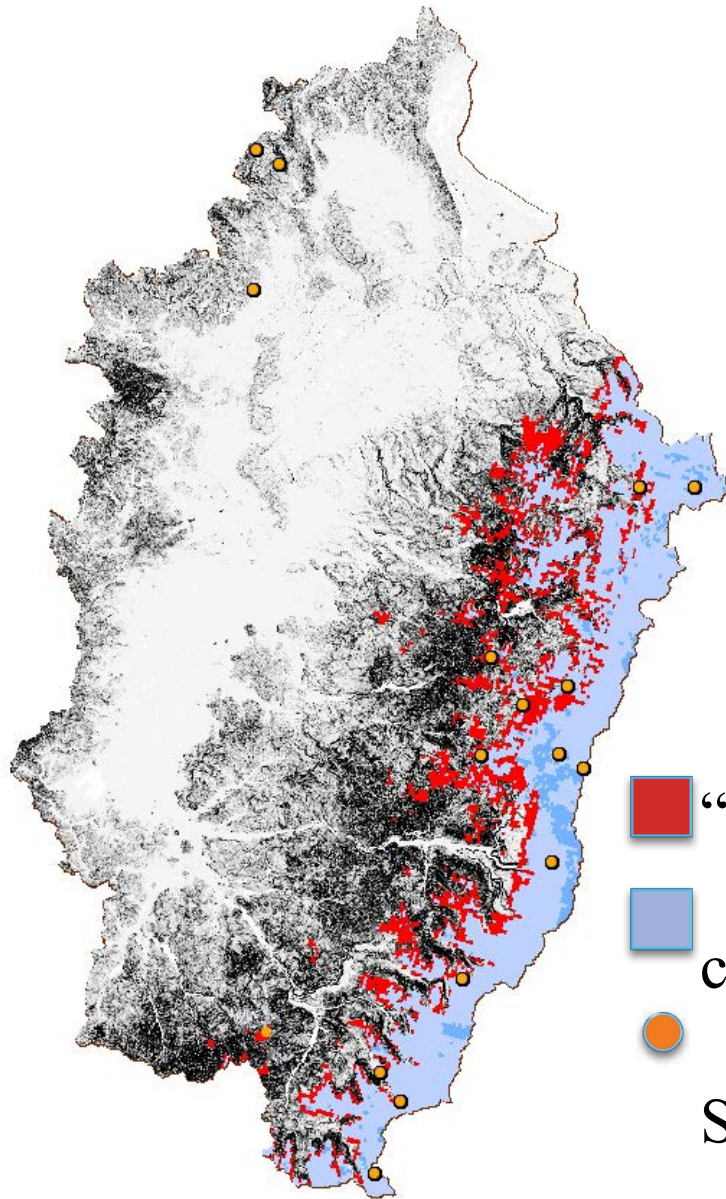
– it's all about supply and demand



This problem will be intensified
by climate change



Willamette River Basin, Oregon



■ “at-risk” snow

■ cold snow



SNOTEL stn.

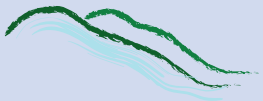
Willamette River Basin:

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

At-Risk Snow:

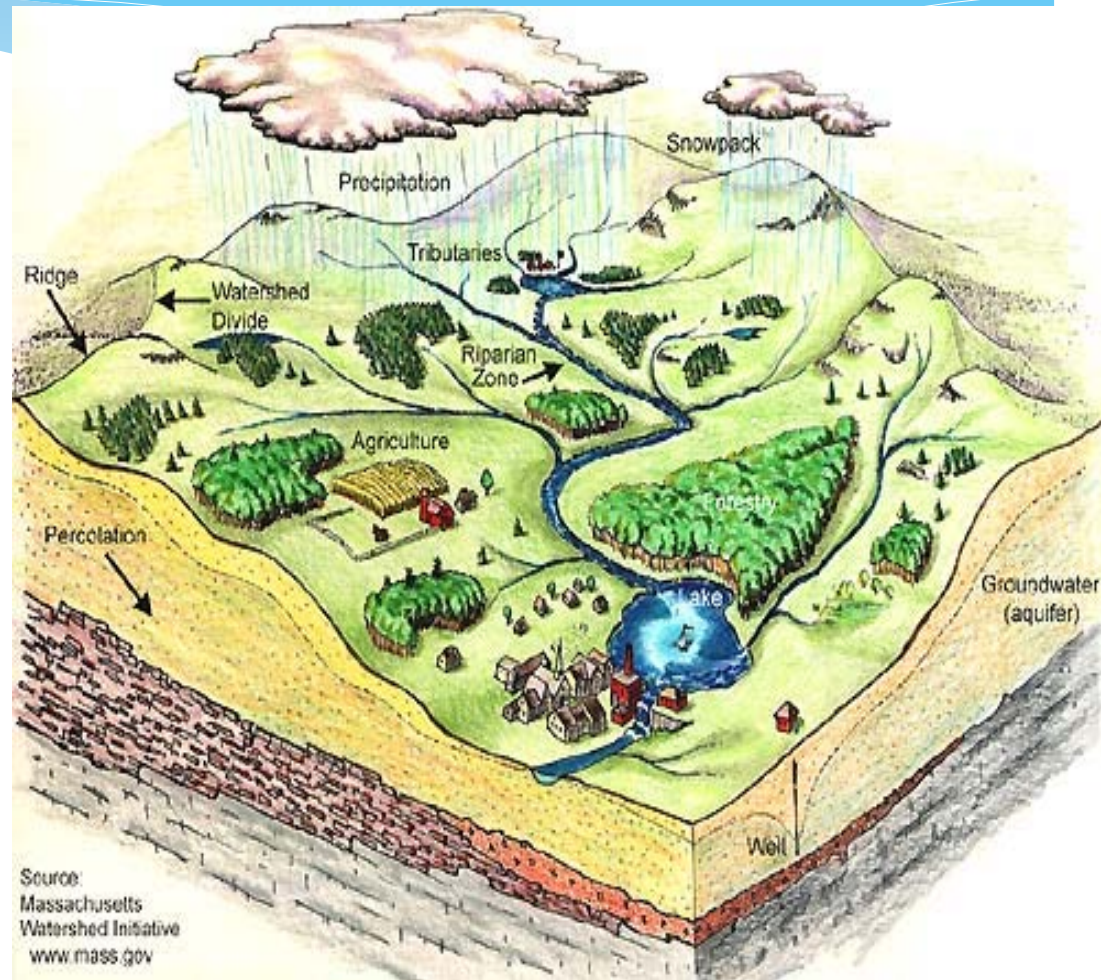
- * For a 2°C temperature increase we project a **25% decrease in snow covered area**
- * Low elevation snowfall converts to rainfall
- * ~4 km³ of water volume per year

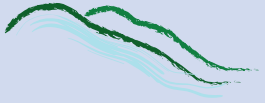
(Nolin and Daly, 2006; Nolin et al., in press)



Water sustainability and climate

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

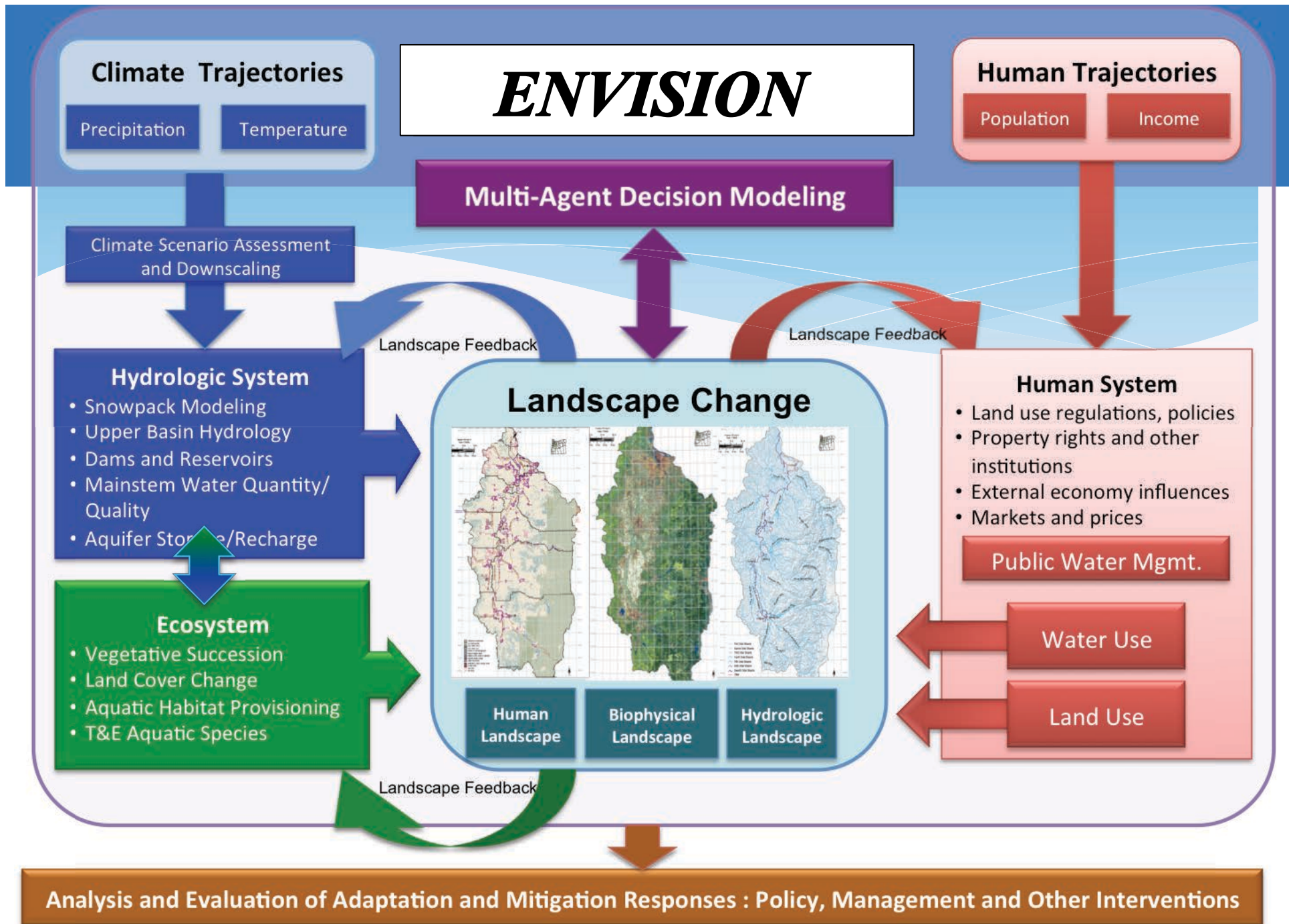


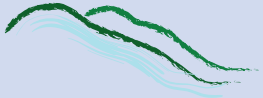


Our Key Questions:

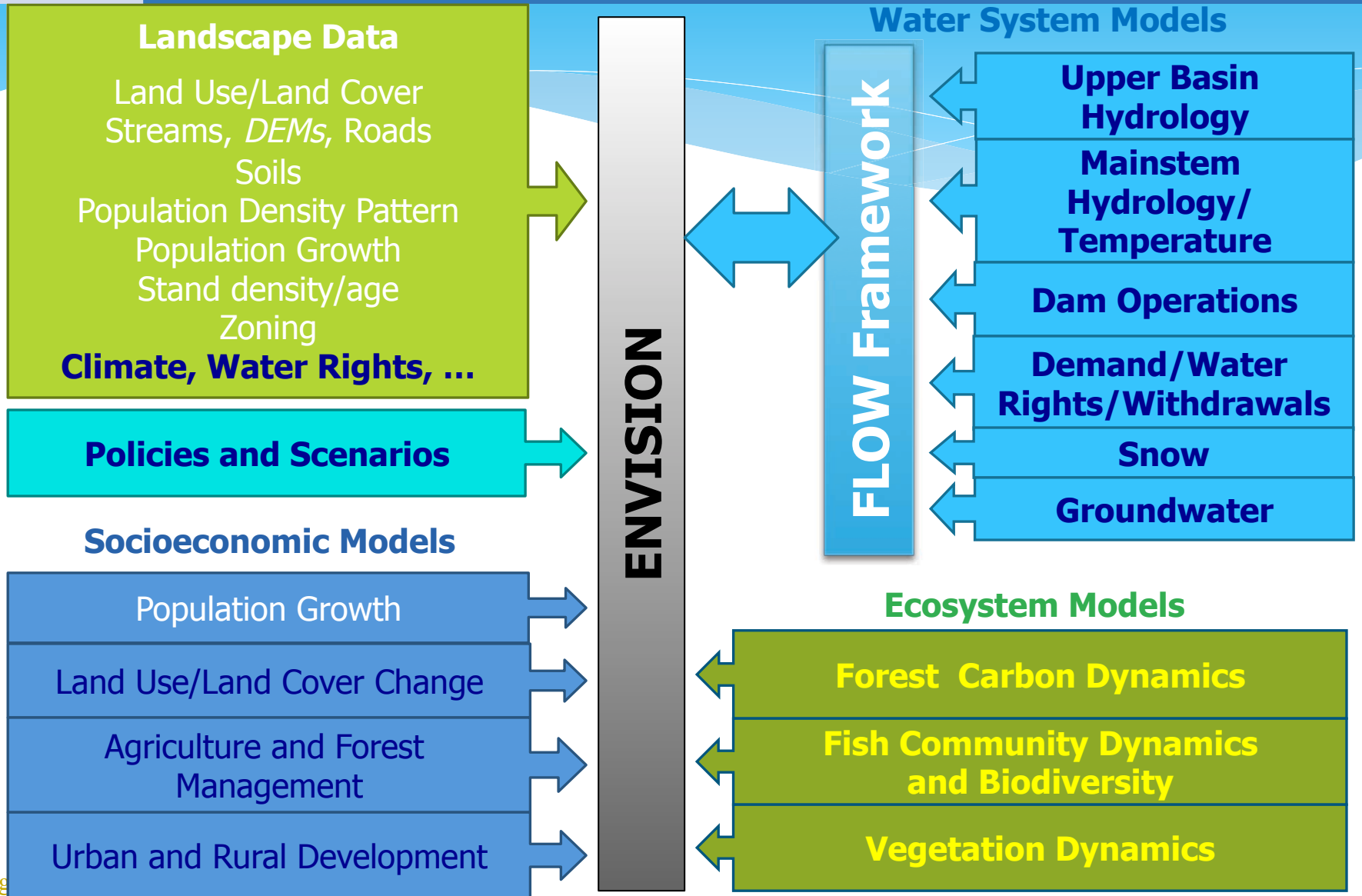
- Where are climate change and human activity most likely to create conditions of water scarcity?
- Where is water scarcity most likely to exert the greatest impact on ecosystems and communities?
- What strategies would allow communities to prevent, mitigate, or adapt to scarcity most successfully?





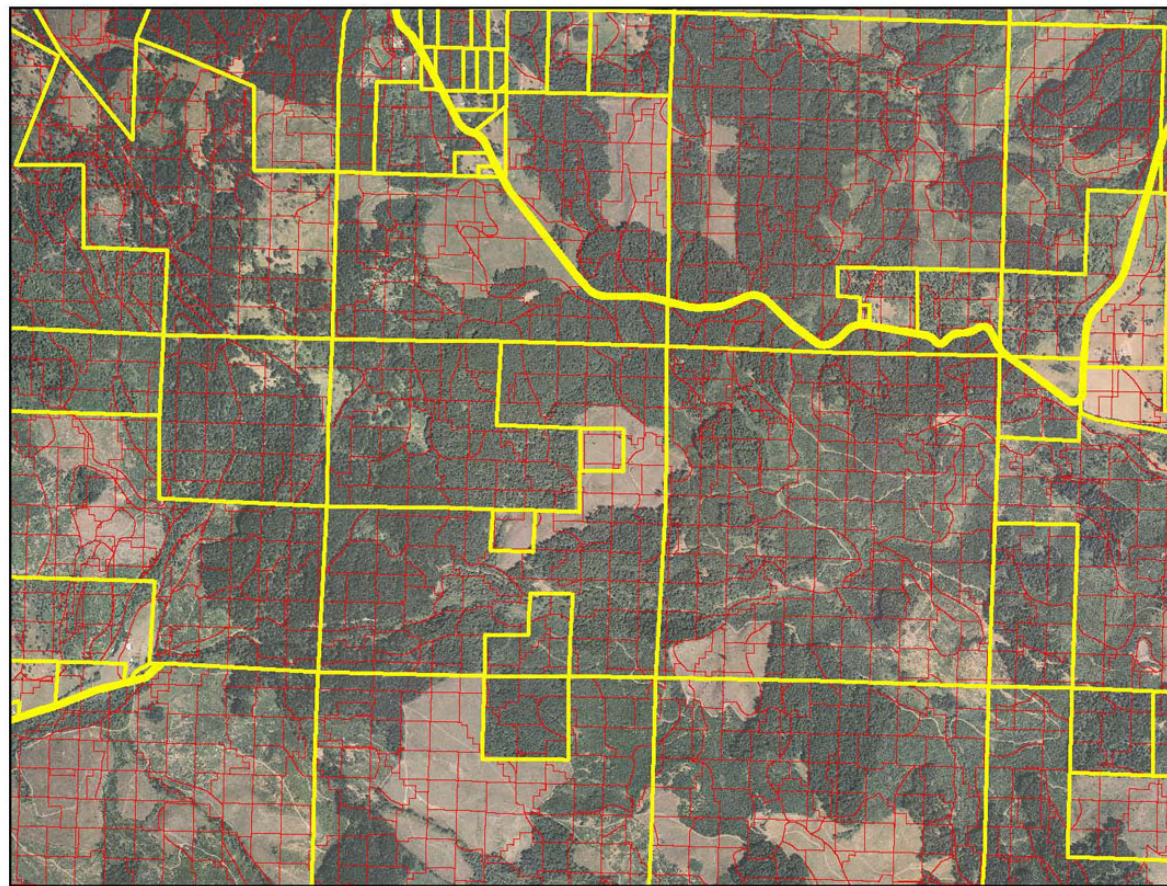


Envision Willamette 2100 v2 (Summer 2012)



Integrated Decision Units (IDUs)

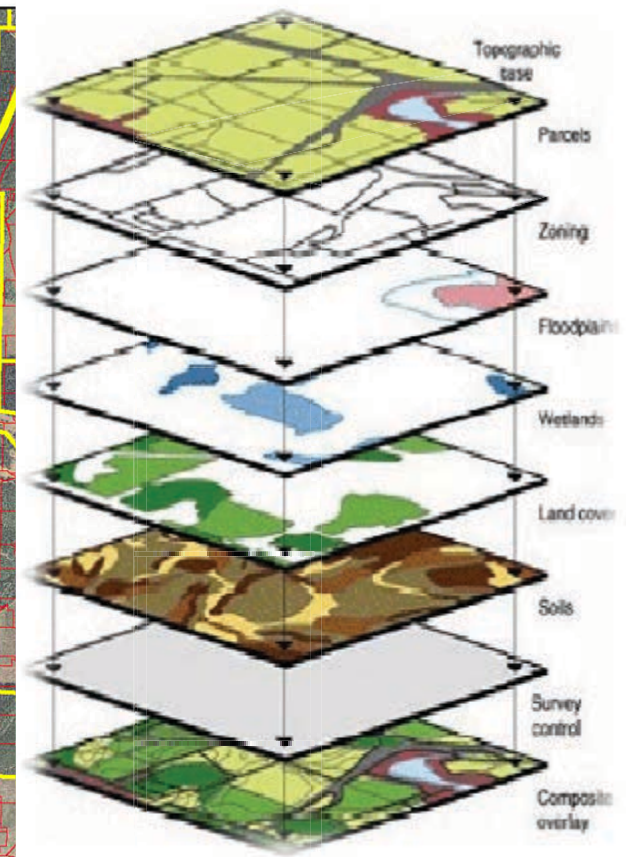
A spatial geometry to model both human decisions and biophysical processes



0 0.125 0.25 0.5 0.75 1 Kilometers

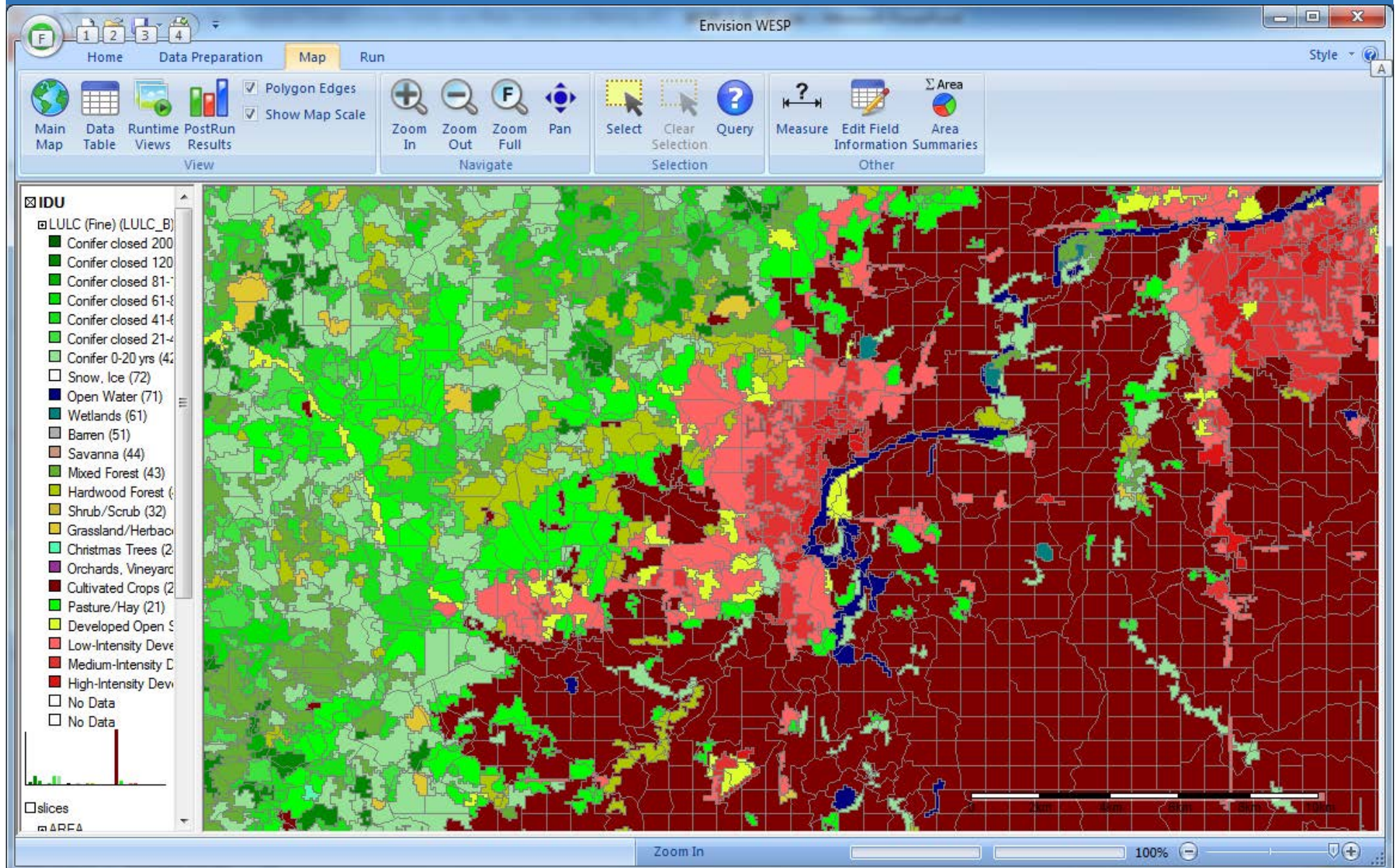


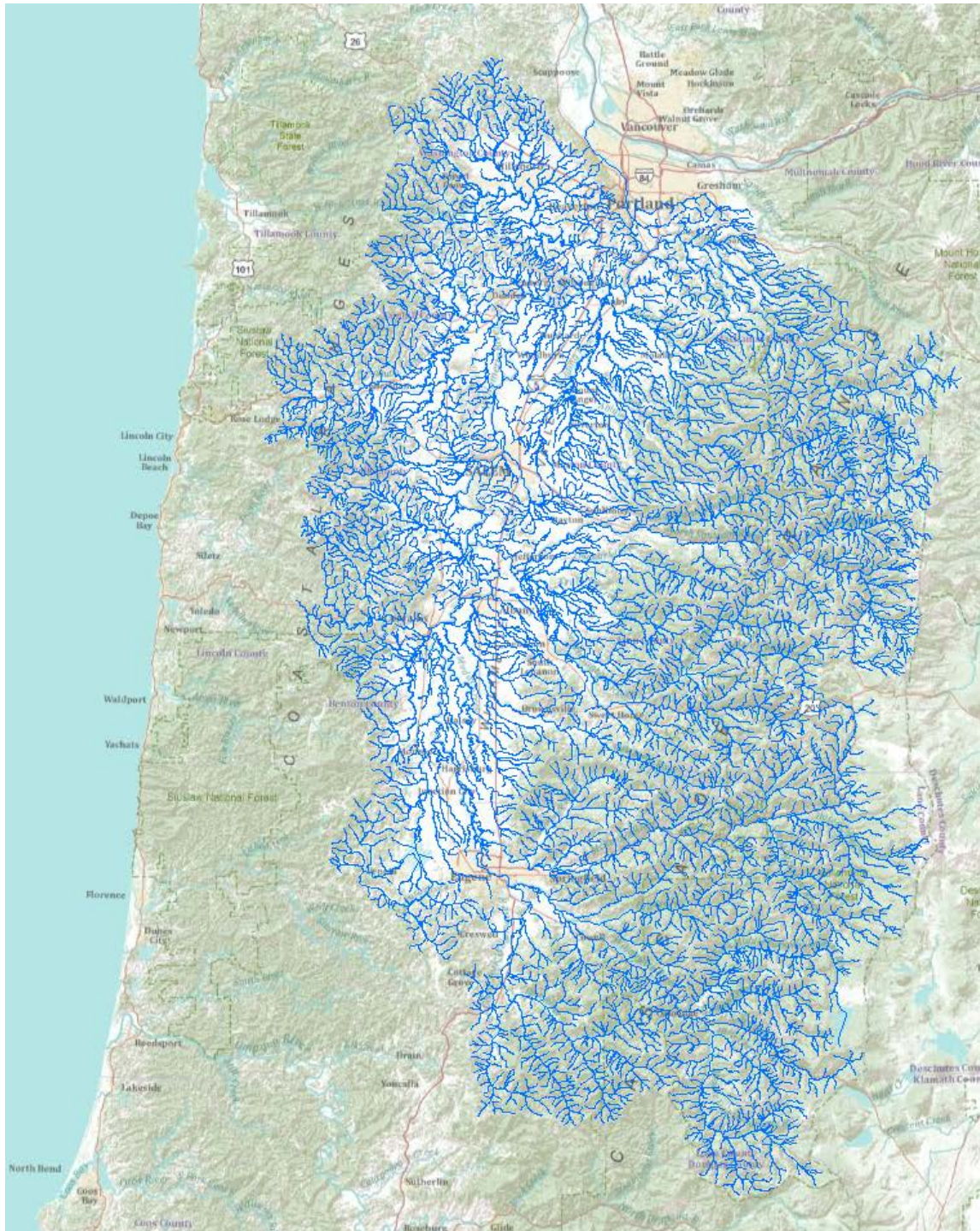
Linn Co. Study Area - IDU map draft overlays



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





Stream Network
Representation –
Based on National
Hydrology Dataset (NHD)

Groundwater is modeled

Dam operations are
incorporated explicitly



Tradeoff Analysis - Willamette

Percent Change 2010-2060



