

Willamette Water 2100

Anticipating water scarcity and informing integrative water system response

Project Overview

This project is evaluating 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 five year project began in October 2010, and is a collaborative effort of faculty from Oregon State University, the University of Oregon and Portland State University. It is funded by the National Science Foundation.

What questions does the project address?

The project is addressing three main 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?

What will the project do?

- Model the Willamette water system. The project will develop or adapt hydrologic, socio-economic, and ecological models for the Willamette basin. It will integrate these models into a GIS-based modeling framework called *Envision*.
- Elucidate and explain interactions. *Envision* will allow the team to study interactions, linkages and feedbacks in the Willamette water system. For example – how are farmers, fisheries, and reservoir managers likely to respond if climate change leads to earlier snowmelt that alters the timing and distribution of stream flows?
- Identify vulnerabilities. The project will identify locations, timing, and uses where water scarcity is likely to emerge or expand in future decades.
- Compare alternatives. With stakeholder input, the project will conduct policy analysis to evaluate ways to prevent, mitigate or adapt to water scarcity.
- Simplify. Lessons learned in the Willamette may help others identify, evaluate, and respond to water scarcity in other regions.

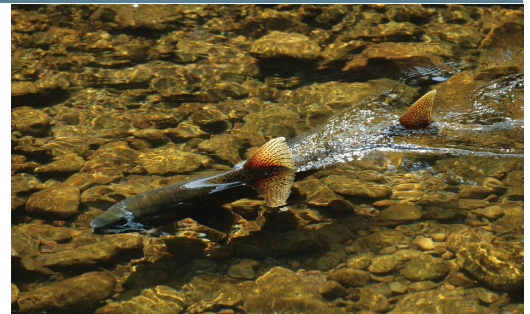


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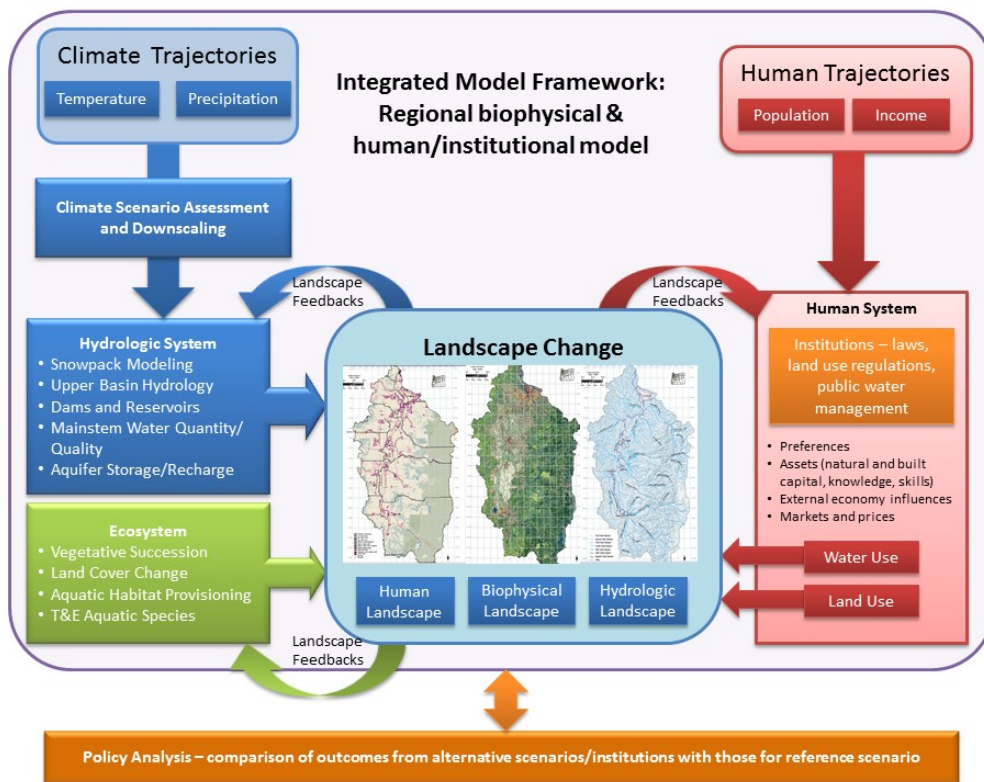


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What is Envision?

The Willamette Water 2100 project is creating a computer model of the Willamette water system using Envision, a modeling platform developed at OSU. Envision integrates a geographic information system, an interface for plugging in hydrological, ecological, and socio-economic process models, and a system for analyzing and visualizing the results of multiple scenarios. Envision enables sophisticated models from different disciplines to share data and communicate via a landscape, a data repository that represents instantaneous conditions at specific locations. Each time one of the models runs, it draws as its input the relevant output from the other state-of-the-art models running within the framework.

The completed model will give scientists, policymakers, and other stakeholders the ability to ask "what if?" questions for a wide range of interventions such as changes in regulations, prices, or management rules. As the model runs, responses and feedbacks occur that reflect the changing conditions forecasted by the hydrologic, ecological and economic models. When "reference case" and "alternative" scenarios are completed, scientists, policymakers, and other stakeholders can examine the scenario output and compare how the allocation of water, land, and other resources, has changed as a result of interactions between the natural and human systems.



How are stakeholders involved in the project?



A field trip with researchers and stakeholders, April 2011.
Photo credit: Adam Stebbins.

Through field trips, workshops, and seminars researchers, water managers, water users, and decision makers interact and learn together as part of a "learning and action network". Stakeholders provide input for the model and critique the modeling framework and outcomes. These discussions will help the research team develop and refine realistic policy scenarios, analyze model results and develop usable products.

To learn more about the project or to join the stakeholder mailing list, please visit the project website at water.oregonstate.edu/ww2100.

Project Executive Committee:

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