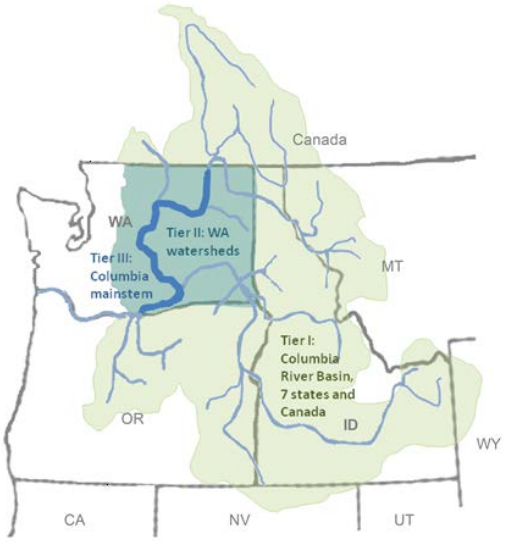
Long-Term Water Supply and Demand Forecast

Background: Since its establishment in 2006, the Department of Ecology's Office of Columbia River (OCR) has rapidly improved water supply for eastern Washington, with approximately 150,000 acre-feet already developed and another 200,000 acre-feet in near-term development. Consistent with its legislative directives, OCR is developing a portfolio of diverse projects including modification of existing storage, new storage facilities, conservation piping and canal lining projects, transmission piping projects, and water right acquisitions. Every five years, OCR is required to submit a long-term water supply and demand forecast to the Legislature. The 2016 Forecast will help OCR strategically fund water supply projects by improving under-standing of where additional water supply is most critically needed, now and in the future. The Forecast provides a generalized, system-wide assessment of how future environmental and economic conditions are likely to change water supply and demand By the 2030s, and is evaluated at three geographic tiers: the entire Columbia River basin, Eastern Washington's watersheds, and Washington's Columbia River mainstem.

Three Geographic Tiers

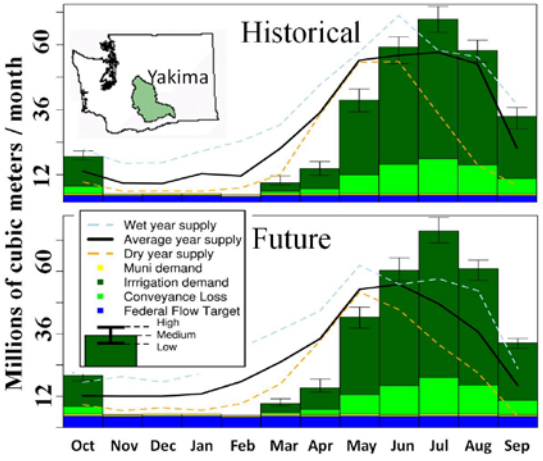


Example Results from the 2011 Forecast

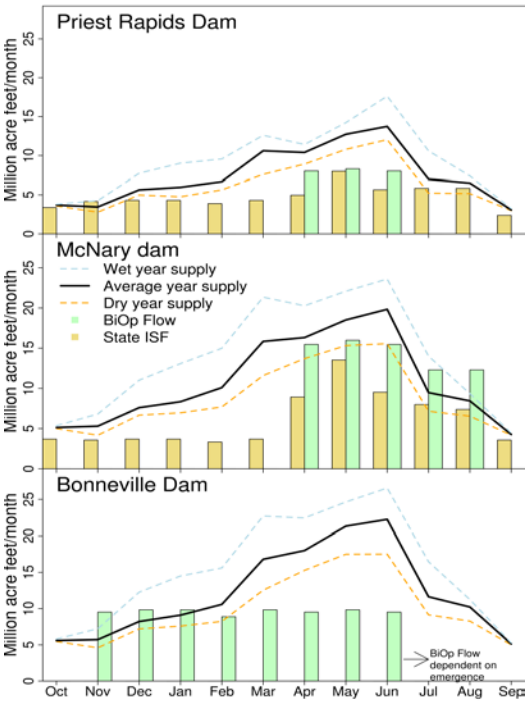
Tier I: Columbia River Basin

- Small increase of around 3% in average annual supplies
- Timing changes will shift water away from times when demands are highest: 14% decrease Jun.-Oct.; 18% increase Nov.-May.
- Increase in WA irrigation demand of 5%

Tier II: Yakima Basin Supply and Demand



Tier III: Future Surface Water Supply



Planned Improvements for the 2016 Forecast

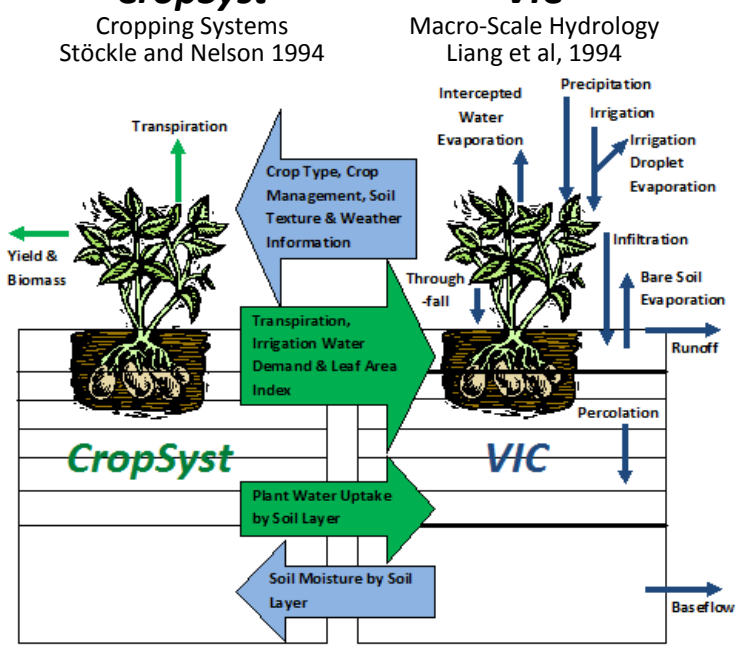
Substantially improved modeling platform: framework integration and feedbacks; irrigation technology, management, consumptive losses; reservoirs and curtailment modeling; multiple time-period economics (within-season, multi-year, long-term); improved climate forecast data; Yakima in-depth analysis; and incorporation of additional modules (see attached).

For More Information: www.ecy.wa.gov/programs/wr/cwp/forecast/forecast.html

WRC State of Washington Water Research Center
Washington State University
The University of Utah
Aspect Consulting
Department of Ecology State of Washington

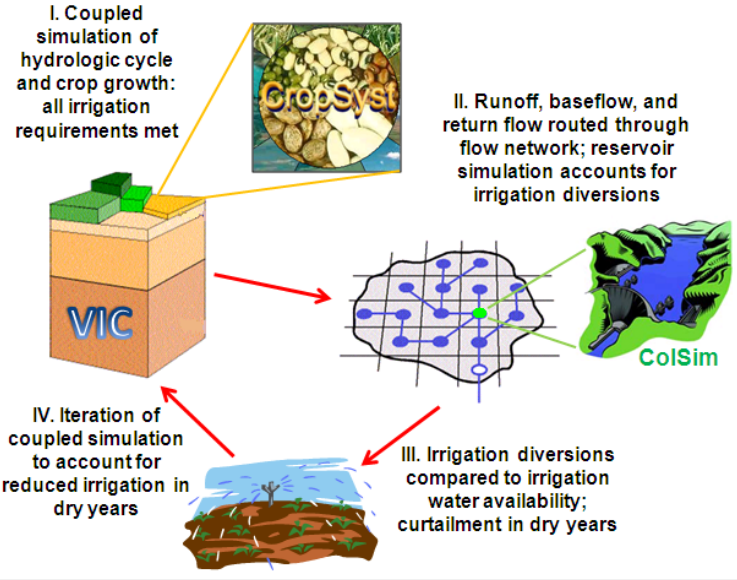
Long-Term Water Supply and Demand Forecast

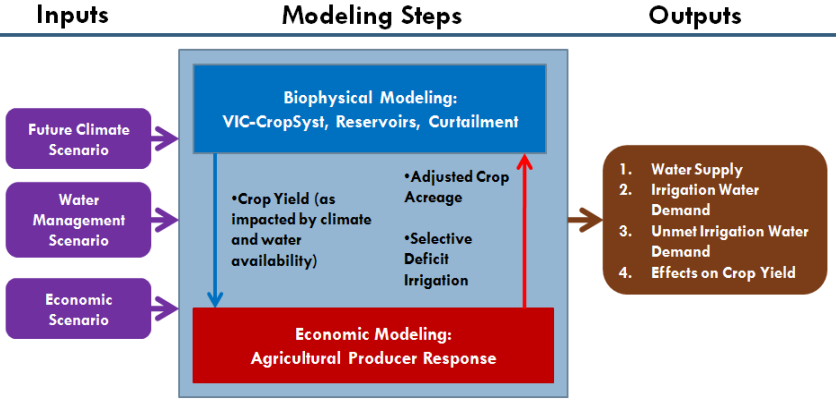
Approach: Development of three novel integrated modeling tools.



1. We performed a tight coupling between models for land surface hydrology and cropping systems; this tool can be applied over both dryland and irrigated crop-lands from watershed to global scales. CropSyst has the flexibility to simulate any crop type and was parameterized for ~40 crop groups. Capabilities were included to predict the impacts of changes in irrigation technology and practices.

2. We linked our coupled crops/hydrology model (VIC-CropSyst) with water resources management modules (including reservoir operations and water rights curtailment) that allowed us to predict the impacts of water scarcity (in space and time) on agricultural productivity. This tool can be used to inform management decisions in drought periods.





3. This biophysical modeling framework was then linked to economic decision making for both long- and short-term agricultural producer responses, and run under a range of scenarios.

WRC STATE OF WASHINGTON WATER RESEARCH CENTER

WASHINGTON STATE UNIVERSITY

THE UNIVERSITY OF UTAH

Aspect CONSULTING

DEPARTMENT OF ECOLOGY State of Washington