

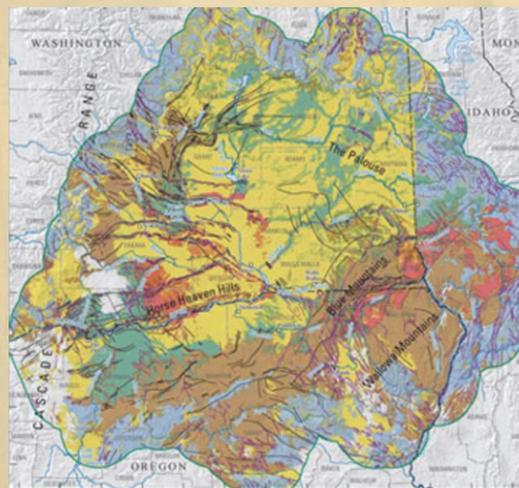
LONG-TERM WATER SUPPLY AND DEMAND FORECAST

GREATER DEPTH IN THE 2016 LONG-TERM SUPPLY AND DEMAND FORECAST

The following technical and policy issues will be examined in greater depth in the 2016 edition of the forecast.

METRIC

METRIC is a satellite-based image processing methodology that calculates evapotranspiration at the field scale (~30 meters). The Forecast Team will collaborate with farmers in Eastern Washington to measure water use and soil moisture to field-calibrate satellite aerial imagery and weather data. METRIC can be used to determine basin-level ET for forecasting purposes, identify crop stress areas, and estimate water use in the absence of metering data.



Columbia Plateau Groundwater Availability Study Area

Groundwater Integration

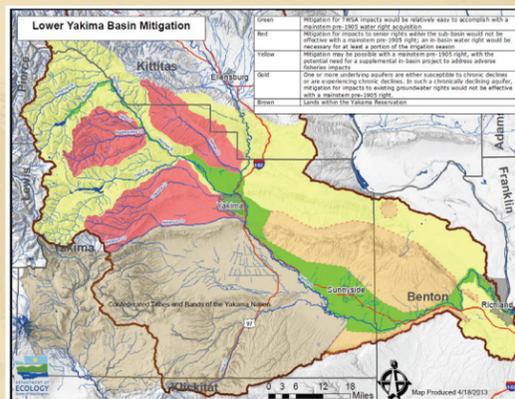
The 2011 Forecast Model did not include groundwater limitations as a factor in determining future water use. The 2016 Forecast Model will begin to integrate groundwater information by identifying published areas of groundwater decline, summarizing existing groundwater models and tools used by basin planners, and forecasting delayed impacts (physical and economic) of declining groundwater on the water budget.

Water Banking

Water banking has emerged as a strong tool for meeting demands in critical areas of the State. In the last 10 years, the number of water banks has expanded tremendously. At the same time, Ecology's portfolio of trust water rights has expanded and diversified to provide instream flow needs and mitigation for out-of-stream needs. The forecast team will evaluate the different roles Ecology plays in water banking, how water banking can be enhanced in Washington, and how OCR's mission can be met through water banking functions.

Effect of Water Costs on Applicants

Since 2000, the Legislature has begun to change the dynamics of water right processing for applicants, moving from a fully state-funded system to an applicant funded system. Existing programs are in place for cost recovery of both the cost to process the application and the development cost of the water supply used to hydrate the project. The forecast team will evaluate the effect this change is having on applicant's willingness to pursue projects, and on Ecology's backlog of applications.



THE OFFICE OF COLUMBIA RIVER

2016 LONG-TERM WATER SUPPLY AND DEMAND FORECAST



THE LONG-TERM WATER SUPPLY AND DEMAND FORECAST

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 375,000 acre-feet already developed and another 330,000 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, pump exchanges, aquifer storage and recovery, and water right acquisitions.

Every five years, OCR is required by statute to submit an updated long-term water supply and demand forecast to the Legislature. The 2016 Forecast will help OCR strategically fund water supply projects by improving understanding 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.

EXAMPLE RESULTS FROM THE 2011 FORECAST

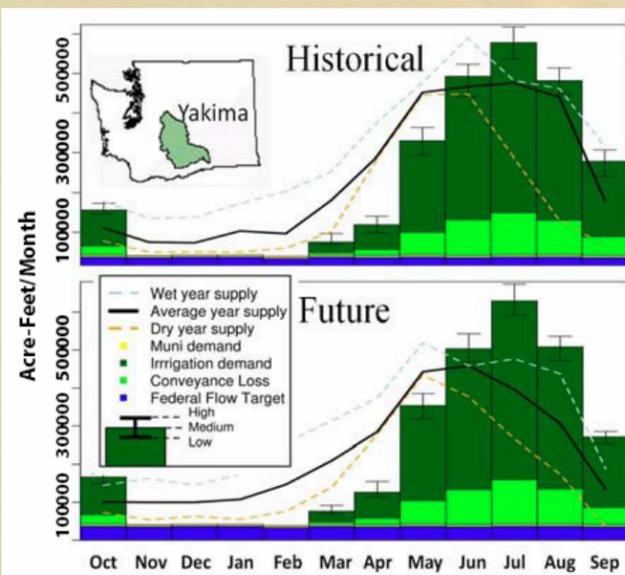
Columbia River Basin

- Small increase of around 3% in average annual supplies.
- Timing changes are forecasted to shift water away from times when demands are highest: 14% decrease June-October; 18% increase November-May.
- Increase in existing WA irrigation demand of 5%.

Forecasted Demand by Sector*

Demand Type	Estimated Volume (Acre Feet)
2030 New Irrigation Demand	170,000
2030 New Municipal and Domestic Demand (including municipally-supplied commercial)	117,500
Unmet Columbia River Instream Flows	13,400,000
Unmet Tributary Instream Flows	500,000
2030 New Hydropower Demand	0
Alternate Supply for Odessa	164,000
Yakima Basin Water Supply (pro-ratables, municipal/ domestic and fish)	450,000
Unmet Columbia River Interruptibles	40,000 to 310,000

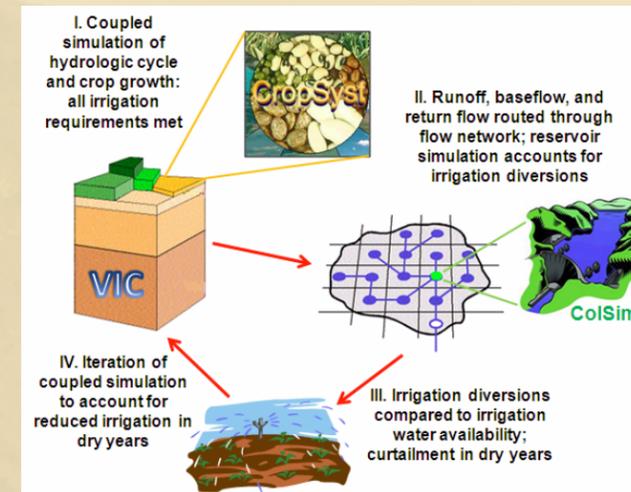
Watershed Specific Supply and Demand



*See the 2011 Columbia River Basin Long-Term Water Supply and Demand Forecast (page ix) for sources and methodology.

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

APPROACH: DEVELOPMENT OF THREE NOVEL INTEGRATED MODELING TOOLS



The Modeling Tools

1. VIC (Variable Infiltration Capacity) - a land surface hydrology model.
2. CropSyst (Cropping Systems Simulation) - models crop use.
3. ColSym (Columbia River Simulator) - models reservoir operation

What Goes Into The Forecast?

The forecast team simulated instream supply and out-of-stream demands with an integrated computer model that accounted for :

1. Climate
2. Hydrology
3. Irrigation demand
4. Municipal demand
5. Crop productivity
6. Economics
7. Existing Water Supply
8. Field Calibration

VIC and CropSyst were integrated for the first time, anywhere, in the 2011 Demand forecast. VIC informs CropSyst about daily weather and water supply. CropSyst informs VIC in the other direction with crop water needs and water stress levels.

