Focus on Water Demand

DEPARTMENT OF ECOLOGY State of Washington

Office of Columbia River

August 2011

Forecasting Water Demand in the Columbia River Basin

In November 2011, the Office of Columbia River (OCR) will publish its five year update of the Water Supply and Demand Forecast (Forecast). A draft report will be released in September, with workshops held in the Tri-cities, Wenatchee, and Spokane, Sept. 7-9.

OCR contracted with Washington State University (WSU) to study the out-of-stream piece of the Forecast and with Washington Department of Fish and Wildlife (WDFW) for the report's instream component. It will be the most comprehensive study of future demand ever produced in the state of Washington. It employs state-of-the-art technology and scientific research to identify where additional water supply is needed, now and in the future. The results will guide OCR in developing a water management plan and in making strategic capital investments in water infrastructure to meet eastern Washington's environmental and economic needs.

Scope

The Forecast evaluates supply and forecasts demand on three tiers: basin-wide (which includes seven states and British Columbia,) at the watershed (water resource inventory area or WRIA) level, and within a one-mile corridor along the Columbia River. The Forecast examines:

- Water demand for four sectors: agricultural, municipal, hydroelectric, and instream flows.
- Water supplies in the Columbia River and its tributaries.
- Climate change impacts.
- Instream flows for eight critical fish basins in eastern Washington.

Peer Review

A team of experts independently peer reviewed the models and methods used in the Forecast. The team was composed of engineers and scientists from the University of Washington, University of Idaho, Kansas State University, and Texas A&M University.

Water Supply

Water supply modeling conducted for the Forecast predicts warmer, wetter winters, when water demand is low, and hotter, dryer summers, when demand peaks. More winter precipitation will fall as rain rather than snow, thus lessening available snowpack. Hotter, dryer summers will increase

Why this is Important

The 2011 Columbia Basin Water Supply and Demand Forecast will serve as the basis for the state's water supply planning in the Columbia Basin.

Draft Report Workshops

- **Sept. 7: Richland**, 3-7 pm, WSU Tri-Cities. Room 131, Tri-Cities West Building, 2710 Crimson Way
- **Sept. 8: Wenatchee**, 1-5 pm, WSU Tree Fruit Research and Extension Center, Overley Laboratory Building, 1100 N Western Ave.
- **Sept. 9: Spokane**, 9am-1pm, WSU Spokane County Extension Office, Rooms B & C, 222 N Havana

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Office of Columbia River Mission

Aggressively pursue development of water supplies to benefit both instream and out-of-stream water uses.

Special Accommodations:

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crop water demand and potentially shorten the growing season for some crops. By 2030, the model predicts an increase in average annual flow in the basin of 2%, but the timing of flows could change dramatically depending on location within the basin. For example, flows on the Columbia River at Bonneville Dam are expected to increase by up to 35% from November to May, but decrease by up to 9% from June to October.

WSU also evaluated the effect of making more water supply available through new projects funded by OCR, and the effect of recovering the cost of water supply development from new permittees. The report considered projects ranging from 100,000 acre-feet to 800,000 acre-feet at cost of $25 to $200 per acre-foot per year. The model predicted little impact on acreage irrigated and crop selection at $25 per acre-foot, with significant changes as water supply development costs approached $200 per acre-foot per year or availability increased to 800,000 acre-feet.

Agricultural Demand

Agriculture is the largest single user of water in eastern Washington. The combined influences of climate change, economic trends and population growth will result in an increase in the amount of water needed for agricultural irrigation.

WSU employed Cropping Systems Simulation (CropSyst), Variable Infiltration Capacity (VIC) and Columbia Simulator (ColSim) models to examine agricultural supply and demand. CropSyst modeling simulates soil water budgets, crop growth, crop yield, soil erosion, and other parameters for tree fruit, grains, biofuels, and row crops. VIC modeling is used to simulate a broad range of climate change scenarios and the effects on regional water flow. ColSim models reservoir operations on the mainstem Columbia and Snake Rivers. The models allow WSU to project water supply and demand under a variety of climate change scenarios.

Municipal Demand

The Forecast predicts that by 2030, diversions for cities and communities in Eastern Washington will increase by approximately 24 percent or an additional 109,000 acre-feet per year, based on expected population growths.

Municipal forecasting relied on data on water use from the two to three largest public water systems in each WRIA (based on available data), These municipalities generally included a majority of residents in a WRIA. For those municipalities where data allowed, industrial growth was also forecast, and was assumed to occur at the same rate as population growth. City populations were counted in their primary WRIA, while county level growth projections for other growth was distributed spatially by WRIA to account for rural growth. Water use in rural areas assumed to be similar to that in nearby municipal areas.

Instream Demand

The Forecast includes an "instream atlas," created by WDFW for eight fish critical watersheds in Eastern Washington: Walla Walla (WRIA 32), Middle Snake (WRIA 35), Yakima (WRIAs 37, 38, & 39), Wenatchee (WRIA 45), Methow (WRIA 48), and Okanogan (WRIA 49). The atlas incorporates maps and information on streamflow restoration priorities and stream-level information on fish life history stages. The instream atlas shows that recovery opportunities exist in all eight WRIAs to improve fisheries, and that adopted instream flows for many of these WRIAs are routinely not met. OCR will use these tools to ensure that new water supply projects it funds will benefit instream flow and protect fish habitats

Photo courtesy of the Yakama Nation

Hydropower Demand

Future demand is estimated based on a review of power planning by entities including Bonneville Power Administration, Northwest Power Planning Council, and local public utility districts. Hydropower use in Eastern Washington is expected to remain fairly stable (no significant growth) over the next 20 years, with increases in demand being met through conservation and power from other sources.

Questions?

If you have questions about the Forecast, please contact Carolyn Comeau, (509) 454-7894, carolyn.comeau@ecy.wa.gov.

More information about the 2011 Columbia Basin Water Supply and Demand Forecast is available at http://www.ecy.wa.gov/programs/wr/cwp/wsu_supply-demand.html.