

Columbia River Basin Real-Time Snow Updating System

BONNEVILLE POWER ADMINISTRATION

PROJECT SUMMARY

Bonneville Power Administration required a system capable of estimating snow water equivalent values in real-time that accurately represented the snow water equivalent conditions in a sub-area. Riverside Technology, inc. provided expertise in analyzing snow water equivalent and developed new software allowing the Bonneville Power Administration the ability to graphically analyze and distribute the data.

LOCATION
Pacific Northwest U.S.A.

PERIOD
2000 – 2004

PROJECT DETAILS

Riverside Technology, inc. (Riverside) developed and implemented an operational streamflow forecast system for the Columbia River Basin for the Bonneville Power Administration (BPA). The system is based on the operational National Weather Service River Forecast System (NWSRFS), which includes conceptual hydrologic models for snow cover simulation and soil moisture accounting.

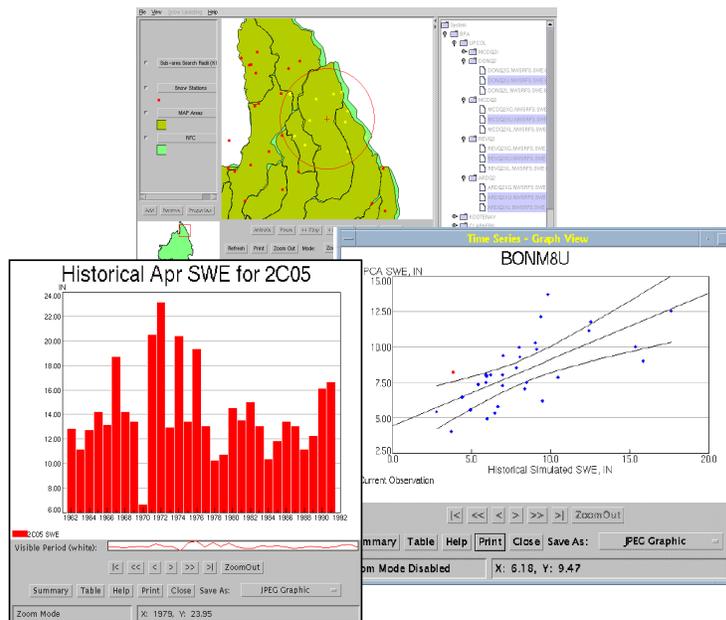
In addition to the operational support contracts awarded in 1997-1999, Riverside was contracted by BPA in 2000 and 2001 to develop a real-time snow updating system for the BPA forecast system. The system was delivered in two phases.

In Phase I, Riverside developed a system using principal components analysis to generate a regression equation estimating the areal average snow-water equivalent (SWE) for a sub-basin. BPA could then choose to use that predicted value to modify the SWE value computed by the NWSRFS snow model.

In Phase II, Riverside developed a graphical user interface (GUI) for the system delivered in Phase I. The interface allows the user to:

- See the basin boundary of interest and the location of nearby snow stations.
- Modify a search radius to include or exclude stations based on distance from the centroid of the basin.
- View the historical SWE values at each station.
- Check the accuracy of the regression equation in predicting historical values.

Should the user wish to modify the SWE generated by the snow model, the system can automatically generate the appropriate NWSRFS input to do so.



The figures above show the map interface to the system, an example of a historical data plot, and some results from a regression analysis.

RELATED PROJECTS

Columbia River Basin Streamflow Forecast System

Reservoir Operations Study for the Tennessee and Cumberland River Basins

Upper Snake River Basin Forecast System

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