

# Hydropower Dam Modeling on the Clark Fork River

AVISTA CORPORATION

## PROJECT SUMMARY

Avista Corporation needed a flexible policy model for two hydropower dams, the Noxon Rapids and the Cabinet Gorge, on the Clark Fork River in northwestern Montana. Riverside Technology, inc. developed a model that analyzed the variation in power generation from the dams under a variety of scenarios. The results of this analysis provided critical information to decision makers about the costs and benefits of equipment maintenance and upgrade scenarios. Riverside Technology, inc. provided training and support for Avista engineers while they took ownership of the model solution.

LOCATION  
Montana, Washington,  
U.S.A.

PERIOD  
2007

## PROJECT DETAILS

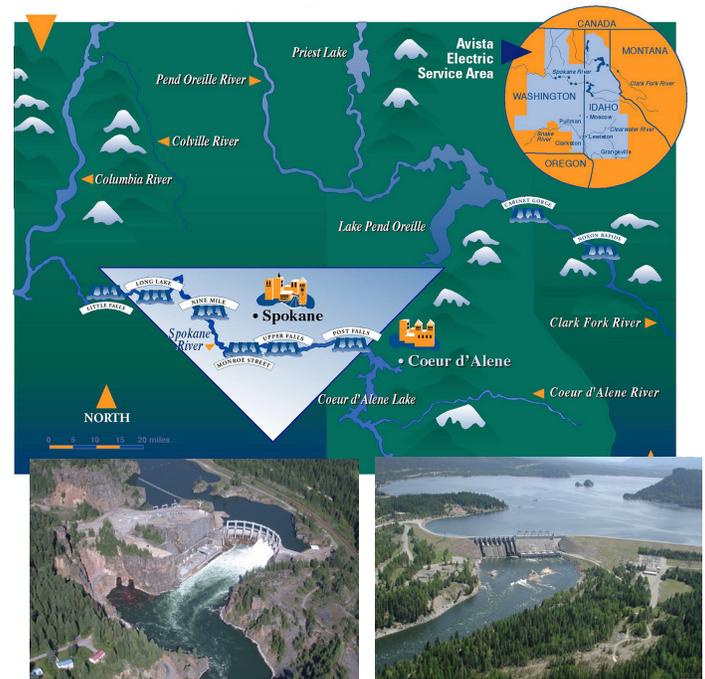
Avista Corporation (Avista) was looking for an economical solution for its equipment maintenance and upgrade concerns. Riverside Technology, inc. (Riverside) recommended using a simulation model, developed in the University of Colorado's RiverWare® application to simulate operations to reflect current policy. The model needed to be flexible enough for quick modifications to be made to the system, allowing Avista the ability to show enhanced generation capacity or scheduled maintenance downtime scenarios. The model also needed to be simple and easy to use so Avista staff could maintain the system independently, without long-term consultation.

With these objectives in mind, Riverside collected and cataloged existing data to describe and drive the parameters of a RiverWare® model. Existing algorithms were identified to reflect the dam and power plant configurations. Out of this preliminary data collection and identification stage, a basic daily prototype model was developed and tested to determine how relevant and effective it would be for Avista's objectives.

Riverside engineers collaborated with and trained Avista staff to construct the model from scratch by presenting the details of the process and guiding Avista staff through the steps for building the prototype. Riverside identified decision points in the development, clarified the rationale behind using the selected modeling tools, and pointed out various challenges encountered and how those challenges could be successfully addressed.

Riverside enhanced the prototype to ensure the driving policy rule set met the requirements associated with erosion control, turbine capacity, seasonally varying minimum and maximum pool, and minimum downstream discharge. The modeling process was first documented internally and then an external report was finalized and produced. Upon delivery of the model to Avista, the staff tested it and found that it met their requirements and provided flexibility for then-future expansion of features.

As a result of this successful collaboration, Avista joined Riverside to present this project at the RiverWare® Users Group Meeting in 2008.



Cabinet Gorge Dam

Noxon Rapids Dam

## RELATED PROJECTS

Upper Snake River Basin  
Forecast System

Reservoir Operations Study for  
the Tennessee and Cumberland  
River Basins

CADSWES RiverWare®  
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