Klamath RiverWISE Model

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The Klamath RiverWISE Model allows for basin stakeholders to investigate the layout and run scenarios. Stakeholders can create scenarios and adjust select physical conditions and operations variables that the model uses as inputs. RiverWISE runs their scenario to produce outputs for the specified arrangement of inputs. To compare the scenario outputs to the baseline or other scenarios, stakeholders can examine plots or tabular data within RiverWISE.

The model runs from February 22, 2018 to September 30, 2019 and has an operation start date on April 15, 2018. This is the date at which the model switches from observed data to forecasted data; it is essentially the date at which the system is being operated. RiverWare and RiverWISE 7.5 were used in this work.

The inputs the stakeholders can edit are shown in Table 1.

Table 1. Editable inputs for the Klamath RiverWISE Model

Operation /Area	Slot	Bounds	Additional input constraints
Upper Klamath Lake	UKL.Short Season Adj Factor	0.8 – 1.3	
	UKL.Season Adj Factor	0.9 – 1.2	
Williamson River Inflow	Williamson River Inflow.CNRFC	10 - 90	10 / 25 / 50 / 75 /90
	Williamson River Inflow.CNRFC Short Term	0 – 3500 cfs	
	Williamson River Inflow.Short Adj Factor	0.8 – 1.3	
	Williamson River Inflow.Season Adj Factor	0.9 – 1.2	
Agricultural Diversions	UKL.Ag Short Adj	0.8 – 1.2	
	UKL.Ag Long Adj	0.9 – 1.1	
Accretions	F and FF Pump.Op Percentile	0.01 – 0.9	multiple of 0.1 *
	Keno to Boyle Gain.Op Percentile	0.05 – 0.9	multiple of 0.1 *
	Lake Ewauna Gain.Op Percentile	0.1 – 0.9	multiple of 0.1 *
	Lost River Diversion Channel.Op Percentile	0.1 – 0.9	multiple of 0.1 *

*Accretions also can have values for (0.05, 0.25, 0.75) dependent on their bound's tolerance

To prevent the model from failing, bounds were added to limit the possible changes that stakeholders can set on a variable. Bounds are wider on variables active for short periods since their influence is unlikely to cause the model fail. While the combinations of adjustments are numerous, some scenarios become unrealistic due to the dependent relation between certain variables (i.e. Williamson River is above Upper Klamath Lake, increasing the inflow to Williamson would cause the inflow at UKL to rise as well). Along with the "Baseline" scenario, the RiverWISE file contains two other scenarios to demonstrate how adjustments alter outputs. They are the "Wetter Conditions" and "Drier Conditions" scenario in which the input variables have been scaled up or down respectively to represent the abundance or lack of water available in the basin. These serve as starting points for stakeholders to adjust the model to represent certain climate scenarios. If stakeholders want to explore different operation objectives, adjustment factors for major diversion channel requests can be changed in the provided scenarios or the stakeholder can create their own scenarios on the "RiverWare Model and Scenarios tab".

As shown in Table 2, outputs were chosen for viewing in the RiverWISE model.

Table 2. Outputs with viewable plots and tabular data

Operation/Area	Slot
Upper Klamath Lake	UKL.Outflow
	UKL.Pool Elevation
Agricultural Diversions	A Canal.Diversion
	Ady Canal.Ady to Ag
	North Canal.Diversion
	Miller Hill Pump.Diversion
	Station 48.Diversion
Environmental Water Account	Dashboard.EWA Remain
	Dashboard.EWA Used
Project Supply	UKL.Supply Volume
Iron Gate Dam	IGD.Outflow