

**FY 2016 Project Proposal
San Juan River Basin Hydrology Model
Operation and Maintenance**

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Relationship to SJRIP: Supports Program goals and management by developing, operating and maintaining a hydrology model of the San Juan Basin. The model is key to hydrological analysis of water development scenarios or other scenarios in relation to the flow recommendations.

Background:

The San Juan Basin Hydrology Model (SJBHM) is a hydrologic model of the San Juan River Basin. The SJBHM actually consists of a series of models including evapotranspiration models, a natural flow model in StateMod, and a simulation model in Riverware. Revisions and modifications to the models and supporting data have occurred through a multi-year model development and validation phase. The FY2016 scope of work includes updates to data as available, annual operation and maintenance of the model and data management. FY2016 activities may also include initial steps in the collaborative testing and incorporation of revised flow recommendations as scenarios are developed by the Biology Committee. In addition, at the discretion of the Coordination Committee, scoping the development of a natural flow model may begin. The Bureau of Reclamation has the primary responsibility for model development and O&M.

Once approved, the model will be available to generate and analyze runs associated with Section 7 Consultations and/or special requests from the Biology or Coordination Committees related to the flow recommendations or other hydrological aspects of the Program.

Objective:

The objective for this work is to ensure that the San Juan Basin Hydrology Model is available for run requests. This will be accomplished by developing and incorporating a revised hydrologic baseline as well as potential flow recommendation scenarios. Adjusting model configurations or operating rules to incorporate new data and/or scenarios and evolving the data set forward through time is also necessary. The FY2015 request also includes funds to continue coordination and interaction with the Hydrologic Baseline Workgroup and Program participants and their technical designees.

Deliverables:

An annual hydrology meeting detailing the accomplishments of the model development, data development and model runs will be held for program participants. A report of the meeting will be provided to the coordination

committee. In addition, data, documentation and reports from model runs will be provided throughout the model run process. The modified model(s) and supporting data and scripts will also be delivered / made available.

Task Descriptions:

Task 1: Model Modifications In collaboration with the Biology Committee, begin work testing and implementing revised flow recommendation scenarios. Document all modifications to the model, communicate changes to Program and interested parties.

Task 2: Model Maintenance Includes maintenance of the actual model as well as the supporting data and software. Maintain data to evolve the data set forward through time. This includes an annual update of USGS data, Reclamation data, New Mexico non-irrigation data, New Mexico irrigation data, Arizona and Utah depletions, Colorado depletions, climate data, and natural flow data. Data must be obtained from various sources and processed for compatibility with the multiple data loaders. Load updated data into the model, run and test the new data. Adjust model configuration, methodologies, or assumptions, as needed. Update and expand documentation to reflect current state of model. Update and maintain data management interfaces and other software associated with the data and models. Apply all Riverware updates and patches as they become available. Provide technology transference to Reclamation's Western Colorado Area Office and Fish and Wildlife Service staff in the details of maintaining the data and models. Technology transfer will take place as model, data and software updates take place to ensure that several people are trained in the maintenance of the model.

Task 3: Model Runs and Analyses Generate and analyze model runs associated with the implementation of a revised hydrologic baseline, revised flow recommendation scenarios, Section 7 consultations or special requests from the Biology and/or Coordination Committees and/or special work groups. A consultation or scenario run usually requires model reconfiguration and the implementation of operating criteria. Provide technology transference to Reclamation's Western Colorado Area Office and Fish and Wildlife Service staff in the details of maintaining the data and models, and in operating the models. Technology transfer will occur as model runs and analyses are being executed to ensure that several people are trained in the operation of the model.

Task 4: Program Management and Coordination Attend or provide written reports for Coordination Committee meetings, as needed, to update the committee on the model status and model results. Attend and assist in conducting Hydrologic Baseline Workgroup meetings to provide model status updates, present results, and work on developing the revised hydrologic baseline. Conduct an annual hydrology meeting of Program participants to review and solicit input on accomplishments and activities relating to the model for the previous year, status of the model, and proposed activities for the coming year; and provide a report on the meeting to the Coordination Committee for their review and approval. Develop the FY2017 budget and track FY2016 expenditures.

Budget Summary FY 2016

Model Modifications	\$22,150	
Model Maintenance	\$10,500	
Model Runs	\$22,400	
Program Management	\$25,100	
Grand Total	\$78,550	
FY-2017	\$73,400	†
FY-2018	\$75,650	†

FY-2019 **\$77,970** †

† Assumes ongoing model maintenance, model runs, tech transfer, documentation and program management and includes ~3% adjustment

Task 1 Model Development

A) Labor

Task	Position	Salary total/hr	Total Days	Total Cost
Model incorporation of new flow recommendations and scenarios	TSC ¹ Eng	\$80	15	\$9,600
	WCAO ² Eng	\$80	10	\$6,400

B) Travel

Purpose	Destination	Trips	Days/ Trip	Airfare/ trip	MI&E, Car, Lodging/day	Total Cost
TSC meeting w/WCAO	DUR	1	3	\$400	\$250	\$1,150

C) Other Costs

Task	Total Cost
Riverware technical support	\$5,000

Task 2 Model Maintenance

A) Labor

Task	Position	Salary total/hr	Total Days	Total Cost
Annual Data Update	TSC Eng	\$80	5	\$3,200
	WCAO Eng	\$80	5	\$3,200
Annual Software Update	TSC Eng	\$80	5	\$3,200

B) Travel

Purpose	Destination	Trips	Days/ Trip	Airfare/ trip	MI&E, Car, Lodging/day	Total Cost
WCAO meet for Coordination	DEN	1	2	\$400	\$250	\$900

Task 3 Model Runs

A) Labor

Task	Position	Salary total/hr	Total Days	Total Cost
Model Runs and Analyses	TSC Engineer	\$80	20	\$12,800
	WCAO Engineer	\$80	15	\$9,600

Task 4 Program Management Coordination

A) Labor

Task	Position	Salary total/hr	Total Days	Total Cost
Meetings and Coordination	WCAO Engineer	\$80	25	\$16,000
Budget	WCAO Engineer	\$80	5	\$3,200

B) Travel

Purpose	Destination	Trips	Days/ Trip	Airfare/ trip	MI&E, Car, Lodging/day	Total Cost
TSC to Hydro Wk Grp Mtg	ALB	1	2	\$500	\$250	\$750
WCAO to Hydro Wk Grp Mtg	ALB	1	2	\$500	\$250	\$750
TSC to Annual Hydro Mtg	DUR	1	4	\$400	\$250	\$1,400
WCAO to Annual Hydro Mtg	DUR	1	4	\$400	\$250	\$1,400

¹ Technical Services Center (Denver)

² Western Colorado Area Office (Durango)