

**FY 2019 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 FY2019 scope of work includes updates to data as available, annual operation and maintenance of the model and data management. FY2019 activities will also include continued streamlining of model processes as new Riverware updates and methods allow, and incorporation of extensive comments as appropriate from the validation process for Gen 4. 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 FY2019 request also includes funds to continue coordination and interaction with the 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 SJRIP Program Office, implement and document any changes to the model based on the comments received during the validation period for Gen 4.

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 (when available) 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. New Riverware updates and versions include streamlined methods that will be adopted when appropriate. 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 continue 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 continue 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 FY2019 budget and track FY2019 expenditures.

Budget Summary FY 2019

Model Modifications	\$30,000
Model Maintenance	\$18,400
Model Runs	\$12,000
Program Management	\$26,000
Grand Total	\$86,400

FY-2020	\$89,000	†
FY-2021	\$91,700	†
FY-2022	\$94,400	†

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

Task 1 Model Development

A) Labor	Task	Salary total/hr	Total Days				Total cost
	Continued incorporation of Gen 4 Validation Comments	\$100	20				\$16,000
	Continued Tech Transfer	\$100	10				\$8,000
B) Travel	Purpose	Dest.	Trips	Days/ Trip	Airfare/ Trip	Lodging, expenses/day	Total Cost
	Reclamation meeting with SJRIP	ABQ	1	2	\$500	\$250	\$1,000
C) Other Costs	Task						Total Cost
	Riverware Technical Support						\$5,000
						<i>Task 1 Total</i>	\$30,000

Task 2 Model Maintenance

A) Labor	Task	Salary total/hr	Total Days				Total cost
	Data Updates as Available	\$100	10				\$8,000
	Software Updates	\$100	3				\$2,400
	Methodology updates as needed	\$100	10				\$8,000
						<i>Task 2 Total</i>	\$18,400

Task 3 Model Runs

A) Labor	Task	Salary total/hr	Total Days				Total cost
	Model Runs and Analyses	\$100	15				\$12,000
						<i>Task 3 Total</i>	\$12,000

Task 4 Program Management Coordination

A) Labor	Task	Salary total/hr	Total Days				Total cost
	Meetings and Coordination	\$100	25				\$20,000
	Budget	\$100	5				\$4,000
B) Travel	Purpose	Dest.	Trips	Days/ Trip	Airfare/ Trip	Lodging, expenses/day	Total Cost
	Reclamation to Workgroup Meetings	ABQ	2	2	\$500	\$250	\$2,000
						<i>Task 4 Total</i>	\$26,000

TOTAL	\$86,400
FY 2019	\$88,992
FY 2020	\$91,662
FY 2021	\$94,412

(Assumes ongoing model maintenance, model runs, tech transfer, documentation updates, program management and includes ~3% adjustment.)

**Improve Stream Gaging and Flow Measurements
San Juan River Basin Recovery Implementation Program
Fiscal Year 2019 Project Proposal**

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Background:

There are five United States Geological Survey (USGS) streamflow gaging stations on the main stem of the San Juan River that are very important to management of the river and the operation of Navajo dam to implement the San Juan Recovery Implementation Program (SJRIP) flow recommendations. Stream gaging data on the San Juan River are necessary to reliably implement and revise the SJRIP flow recommendations.

Study Area:

San Juan River Basin in New Mexico

Objective:

Provide funding to the USGS to take additional flow measurements as needed at the four San Juan River gages in New Mexico. The four gages are San Juan near Archuleta, San Juan at Farmington, San Juan at Shiprock, and San Juan at Four Corners. (Note: Base cost for operation of the stations is paid for by non-Program funds.)

Products:

1. Improved flow measurement and more accurate gage readings.
2. Technical presentation at the end of the year from USGS summarizing the activities completed and the value of obtaining additional readings.

Budget FY-2017:

	Staff days	Labor	Travel	Equipment and supplies
Objective: Provide funding to USGS for 12 additional flow measurements at the four San Juan River Gages in NM.				
Personnel	7.5	7,000		
Travel			1,700	
Equipment and supplies				0
Total				\$8,700

Estimated Outyear Funding (Based on 3% adjustment for inflation)

Fiscal Year 2020	\$8,950
Fiscal Year 2021	\$9,200
Fiscal Year 2022	\$9,450