Memorandum

To: URGWOM Technical Team Members

Date: September 13, 2019

Subject: Notes of September 10, 2019 URGWOM Technical Team Meeting

These notes summarize the salient matters discussed during the September 10, 2019 Upper Rio Grande Water Operations Model (URGWOM) Technical (Tech) Team meeting. The meeting began at 9:00 am in the New Mexico Interstate Stream Commission Office in Albuquerque, NM. An attendance list is included on the last page of these meeting notes.

The principal meeting agenda topics include Technical Team meeting organization and scheduling, updates on Corps of Engineers URGWOM activities, updates on Bureau of Reclamation URGWOM activities, update on NM Interstate Stream Commission URGWOM activities, updates on U.S.G.S. URGWOM activities, review of the draft URGWOM five-year plan, a report on the status of the Hudspeth County TX / Juárez Valley MX model expansion, and a status report on the implementation of the deep aquifer groundwater objects in URGWOM.

Dave led a discussion on the organization and scheduling of the Technical Team meetings. Previously, as a general rule, a minimum of three agenda items were required to hold a regular monthly meeting of the Tech Team. Nabil had previously suggested that in the future, the standing Tech Team agenda would include reports on the status of activities of the cooperating agencies (USBR, USACE, USGS and NMISC). Additional agenda items would include “other business” or reports from other entities.

Marc reported for the Corps of Engineers that he has been occupied with the informal URGWOM training sessions which are held every other week. Phillip has been working on developing or revising scopes of work needed for updating and extending contracts with private consultants contributing to URGWOM development and upgrades.

Cindy reported that the NMISC has been working with Hydros Consulting in the development of a method for forecasting Elephant Butte Effective Supply based in part on estimates of local inflow (monsoon runoff) to the middle Rio Grande valley. Cindy stated that this will be a long-term project and that when completed, could be implemented in the URGWOM real-time model. Andrew reported that Reclamation is working with the National Center for Atmospheric Research (NCAR) in developing improved forecast methods that could be of use in developing the Elephant Butte Effective Supply forecasts.

Dave stated that the USGS has nothing new to report to the Tech Team at this month’s meeting.

Lucas reported on Reclamation’s URGWOM development related activities, included working with CADSWES in the development of a task order for:

* User (Albuquerque Area Office ) support and documentation;
* RiverWare Software maintenance;
* Development of an “undo” feature for numerical slots;
* Development of “windowing” enhancements;
* Development of an executable for a flag that will empty storage accounts to another storage account in the same reservoir;
* Develop the ability to modify values, rules and to save models after partial runs;
* Develop the ability to save a ruleset that will open whenever a model file is opened;
* Develop the ability to allow a model file to be saved after every run of a multiple run, in RiverWare and RiverSMART;
* Develop the ability to make it more apparent if a slot can be switched to periodic when opened in a Slot Viewer;
* Develop means to reduce the number and frequency of warning messages;
* Add slot viewer and RPL viewer button to make it easier to bring them into the foreground;
* Develop the ability to change periodic slot values to series slot in a script.

Lucas reported on the status of the Rio Grande Basin Study. Reclamation has been performing multiple tests to ensure he model is running correctly. Reclamation also developed a new statistical relationship to calculate Lower Rio Grande demand based on end of year storage at Elephant Butte and Caballo Reservoirs and current year inflow. This work may be ready for a presentation at next month’s Tech Team meeting.

Lucas also reported that Reclamation is working on automatic implementation of National Weather Service forecasts into AOP runs. Data formatting issues have been resolved and the next steps include creating a DMI to import the NWS ESP traces into URGWOM and setting up URGWOM for MRM runs.

Lucas reported that Reclamation is working with NCAR on two projects related to improvement of forecasts for use in URGWOM. These include incorporation of seasonal temperature forecasts into the NRCS statistical forecasts. Reclamation plans to include analysis of snowmelt runoff and predicting hydrographs using seasonal data and incorporating it into the National Weather Service forecasts. Also in cooperation with NCAR, Reclamation is researching how changes in regional patterns of atmospheric pressure can be used to improve forecasts in amounts and frequency of monsoon rainfall. This research is concluding and Reclamation will seek funding to implement the research report’s findings.

Finally, Lucas reported that Reclamation will:

* Investigate using RiverWare’s optimization feature to maximize power output from the Elephant Butte hydroelectric turbines, and
* Run the last AOP run for 2019, which is being done principally for planning of operations at Elephant Butte and Caballo Reservoirs.

Miller updated the Team on the development of the URGWOM Five-year plan, which will be circulated for review by Tech Team members for their review and comment. The plan is divided into three portions, 1) Ongoing Activities, 2) Model Development and Enhancements and 3) Planning Applications. Miller reported that the ongoing activities are well known to Team members and they include database and DMI updates and maintenance, rules development and updates, daily accounting model runs, preparation of AOPs, maintenance of model documentation, RiverWare software maintenance, update of vegetation surveys in middle Rio Grande, Rio Chama and Espanola Valley for consumptive use estimates and public outreach efforts. Cindy suggested that NAIP aerial imagery, along with MRGCD Ditch Rider data may be more cost effective that an effort involving a contract for flying and inventorying crop date specifically for URGWOM.

The objectives of the Development and Enhancement portion of the Plan includes Middle Rio Grande enhancements ( using full growing season for computing crop ET, implementation of evaporation based loss rates on the mainstem above Otowi, and adding the Santa Fe River to the model). Additional objectives include development of CIR for crops along the lower Rio Chama and the Española Valley; ET Toolbox enhancements (including QA/QC of local weather station data, if available), develop a method for forecasting effective precipitation based on the SCS TR-21 method, and developing a link between the ET Toolbox and the URGWOM real-time model and database). Additional enhancements include extending the Lower Rio Grande to include Hudspeth County, TX and Juárez, MX, development of the real-time water operations model and continuing work on the water quality (salinity) simulation. The Team discussed the need to add the Santa Fe River to the model in that it will not necessarily improve the reliability of the model results. Miller reported that this Task was inserted at the request of the City of Santa Fe. Andrew reported that Reclamation is working with the Jet Propulsion Laboratory for improvements to the ET estimates based on remote sensing data and that the Five-year plan should incorporate this work. Miller will meet with Andrew to obtain information on this effort to include in the Plan.

Nick reported to the group on the progress of the expansion of URGWOM into Hudspeth County TX and the Juárez Valley, MX. He displayed a screenshot of the workspace before and after the addition of the new objects for the area to illustrate the nature and extend of model changes. The model expansion includes three new subareas in Hudspeth Co. and six new subareas in Mexico and the addition of two diversions into Mexico downstream of the Acequia Madre. Hydros has compiled all of the necessary historic data and the model is being calibrated using the 1975 -1980 period, which will be expanded to use a longer time period. The calibration targets are the flow of the Rio Grande at Fort Quitman and groundwater level data in Hudspeth County. The new deep groundwater objects will be included in this area of model expansion as well as the existing lower Rio Grande portion of the model.

Nick reported on the addition of the new deep groundwater objects in the Middle Valley and/or the Lower Rio Grande, which will help with the calibration of the Hudspeth County and Juárez Valley portions of the model. A total of 33 new aquifer objects were added in the Lower Rio Grande area, including the area of new expansion. Nick displayed the new object link structure and described the aquifer object parameters, including storativity (currently set at 0.2), and is a calibration parameter, the aquifer area, which is set to the same area as the overlying shallow groundwater aquifer, horizon conductance, also set to the same value as the overlying shallow aquifer. The initial storage value is based on a 1,000 ft. thick aquifer which is taken from the results of USGS studies of the area. Nick displayed graphs of shallow and deep groundwater aquifers head for some of the subareas for the 1975-1980 period and initial estimates of the value of percolation from the shallow aquifers to the deep aquifers. The next steps will include the addition of boundary condition that will allow groundwater to discharge from the study area to downstream areas, finishing the calibration, incorporate the new objects into the official URGWOM model and prepare documentation.

Nick reported no loss in runtime efficiency due to the addition of the new groundwater objects. He anticipates that all work will be completed in about one month. The addition of the new deep groundwater objects to the middle valley portion of the model will not take long, but the calibration of this model may take time. Lucas indicated that Reclamation would like to use the calibrated model in the Rio Grande Basin Study.

Under other business, Miller reported that he will begin planning for an on-snow field trip to accompany a USDA snow survey crew to one of the snow course sites this winter. The Team then viewed aerial video obtained by the NMISC of the sediment plug that formed in the channel of the Rio Grande near Bosque del Apache during this year’s spring snowmelt runoff.

The next meeting of the Team will be on October 8, 2019, at 9:00 am at the NMISC office in Santa Fe.

The meeting adjourned at about 11:00 am.

ATTENDANCE LIST

URGWOM TECHNICAL TEAM MEETING

September 10, 2019

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| NAME | REPRESENTING |
| Dave Moeser | USGS |
| Carolyn Donnelly | USBR |
| William Miller | WJM Engineers/USACE Contractor |
| Lucas Barrett | USBR |
| Andrew Gelderloos | USBR |
| Cindy Stokes | NMISC |
| Marc Sidlow | USACE |
| Mike Brown | Tetra Tech / USACE Contractor |
| Phillip Carrillo | USACE |
| Viola Sanchez | Designated Engineer / BIA |
| Those participating via telephone conference included: | |
| John Carron | Hydros Consulting |
| Nick Mander | Hydros Consulting |
| Jerry Melendez | USBR |