Memorandum

To: URGWOM Technical Team Members

Date: October 10, 2019

Subject: Notes of October 8, 2019 URGWOM Technical Team Meeting

These notes summarize the salient matters discussed during the October 8, 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 update on Corps of Engineers URGWOM activities, update on Bureau of Reclamation URGWOM activities, update on NM Interstate Stream Commission URGWOM activities, update on U.S.G.S. URGWOM activities, review of the draft URGWOM five-year plan as it relates to Reference ET and a report on the status of modelling of local inflows between Cochiti and Elephant Butte Reservoir.

For the Corps of Engineers, Phillip reported that two new IDIQ contracts have been awarded by the Albuquerque District Office:

* New contract with Bohannan Huston who will subcontract with Hydros for continued work on deep aquifer objects in the Middle Rio Grande Valley and subsequent model calibration;
* New contract with Tetra Tech for continued work on rule development and documentation on the URGWOM model; and
* A renewed contract for CADSWES to continue RiverWare support and RiverWISE development.

Marc reported that the URGWOM training series is continuing and that next week’s session (October 15, 2019) will cover the operations rule set.

Carolyn stated that Reclamation did not have a specific item to report on at this week’s meeting. Reclamation is awaiting approval of a contract with CADSWES that they may continue their efforts on RiverWare development for URGWOM related activities.

Cindy reported that the NM Interstate Stream Commission has been participating in the Corps’ URGWOM training and that she has found the training beneficial. She also reported that the ISC is working with Hydros in the development of local inflows for the Middle Rio Grande Valley.

Dave stated that the U.S.G.S. did not have any URGWOM related activities to report to the Technical Team this month.

Nick reported on the Hydros efforts to develop local inflows to the Middle Valley section of the model (Cochiti Dam to Elephant Butte Reservoir). Local inflow to the Middle Valley is currently not simulated in URGWOM. Nick summarized the methods used by the Technical Team to develop local inflow for the reach of the mainstem above Otowi will be applied in the Middle Valley, which is based on the calculated residual values between USGS steam gages to satisfy the mass balance between the upstream and downstream gages. The raw residual data are then “smoothed” by using a seven-day moving average. The annual local inflow volume is then distributed within the days with positive local inflow values and the negative local inflow values are set equal to zero. Since the last calibration run was performed for the Middle Valley (2013) a total of 12 local inflow objects were added, but local inflow is not simulated.

Nick reported that Hydros set up a historic run model for the period December 31, 1975 to December 31, 2014, although not all of the gages necessary to compute local inflow have a continuous record that extends back to 1975. Nick presented hydrographs of local inflow and tables of computed annual local inflow that were developed based on the method previously described. On average, the total annual local inflow between Cochiti and Elephant Butte Reservoir was computed to be 197,265 acre-feet for the 1976-2014 period.

In response to a question, Nick stated that the computed local inflows have not been compared to local rainfall events to see if there is a correlation between rainfall and local inflow. Nick reported that their next steps will be:

* Validate local inflow computations with a rainfall runoff model, such as the North American Land Data Assimilation System, or some other rainfall runoff model;
* After the deep groundwater objects are added to the Middle Valley section of the model, the model will be recalibrated and this model will be used to compute local inflows; and
* Add local inflow values into the URGWOM DSS database.

Dave reported that the USGS model Precipitation Runoff Modeling System (PRMS) can be used for computing local inflow to the Rio Grande from its headwaters down to Ft. Quitman, Texas. The calibration of this model will be completed by the end of the year and Dave will present this model to the Team when it is completed. This model will be used by Reclamation in the Rio Grande basin study.

Miller presented to the Team a summary of the relationship between Reclamation’s ET Toolbox and URGWOM when computing Reference ET. This relates to the computation of crop and riparian vegetation and the related task identified in the Five-Year plan. Miller outlined the similarities and differences between the two:

* URGWOM uses crop acreage reports or MRGCD Ditch rider reports to determine irrigated acreage, Reference ET is computed using air temperature data from fixed weather stations and the Hargreaves Samani method of computing Reference ET is used. URGWOM is not yet a “real time” model and uses historic data when making forecasts.
* The ET Toolbox computes reference ET for the area extending from the lower Rio Chama and Velarde Valleys to the El Paso, TX area; climate data used to compute Reference ET is taken from automated weather stations, or if not available, the National Digital Forecast Database; seven-day forecasts are available and the ET Toolbox is more of a “real-time” model.

Reclamation is working with NASA’s Jet Propulsion Laboratory to upgrade the ET Toolbox using Landsat satellite images to compute Reference ET. (See paper by Joshua Fischer of JPL which describes this method). This effort means that it would no longer be necessary to collect and maintain climate data to compute Reference ET using Hargreaves Samani or maintaining records of vegetation type and acreage. This one-year effort is just beginning but Reclamation hopes to continue work on the project into a second year. Miller proposed that the Five-Year Plan include tasks whereby the URGWOM method of computing Reference ET and the upgraded ET Toolbox method be carried on concurrently for a two year period at the end of which time the results of the two method could be reviewed and evaluated.

Brian stated that the Landsat satellite coverage is based on approximately weekly passage, and he inquired as to how the ET Toolbox would provide data for times when Landsat images are not available. Andrew responded by stated that JPL proposed to use other satellite data that while have less spatial resolution it has greater temporal resolution than Landsat. The ET Toolbox upgrade would also be suitable for making longer term projections, greater than seven days, which could be used in developing the AOPs.

Miller reported that he has reached out to the NRCS snow survey crew in an attempt to arrange for the URGWOM Technical Team to accompany a snow survey crew when snow course measurements are made. He anticipated that this field trip would be in January or February, 2020. Miller will report back to the Team at the next meeting about progress in planning this trip.

The next meeting of the Team will be on November 12, 2019, at 9:00 am at the NMISC office in Albuquerque.

The meeting adjourned at about 10:00 am.

ATTENDANCE LIST

URGWOM TECHNICAL TEAM MEETING

October 8, 2019

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| NAME | REPRESENTING |
| Dave Moeser | USGS |
| Grady Ball | USGS |
| Carolyn Donnelly | USBR |
| William Miller | WJM Engineers/USACE Contractor |
| Scott Anderholm | USACE Contractor |
| Andrew Gelderloos | USBR |
| Cindy Stokes | NMISC |
| Shalamu Abudu | NMISC |
| Marc Sidlow | USACE |
| Phillip Carrillo | USACE |
| Those participating via telephone conference included: | |
| David Neumann | CADSWES |
| Nick Mander | Hydros Consulting |
| Jerry Melendez | USBR |
| Brian Westfall | Keller-Bliesner / BIA |
| Mike Brown | Tetra Tech / USACE Contractor |