Memorandum

To: URGWOM Technical Team Members

Date: June 17, 2019

Subject: Notes of June 11, 2019 URGWOM Technical Team Meeting

These notes summarize the salient matters discussed during the June 11, 2019 Upper Rio Grande Water Operations Model (URGWOM) Technical 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 a report on current mountain snowpack, May 15, 2019 URGWOM Tech Team field trip wrap-up, URGWOM rules documentation, URGWOM database, DMI, SCT documentation, RiverWISE Scenario Explorer documentation and the URGWOM and MODFLOW model groundwater/surface water interaction comparison.

Marc introduced Phillip Carrillo who will serve as URGWOM Program Manager for the Corps. Phil provided those present with a rundown on his background and experience. Jesse advised the Team that he has accepted a position as the Director of Water Utilities with the City of Santa Fe and will no longer be participating as a member of the Team. He introduced Mike Brown of Tetra Tech who will participate on the Team in Jesse’s stead.

Dave M. presented a brief report on the current snow pack based on SNOTEL data from stations at Beartown, Wolf Creek Pass, Santa Fe and Quemazon. Dave’s presentation included cumulative plots of current and previous year’s daily snow-water equivalent and cumulative precipitation for each station. The SWE at the Beartown, Wolf Creek stations are above average, but the snowpack at the Santa Fe site was nearly depleted and there was no snow at the Quemazon station.

Miller led a Team discussion concerning the “take-aways” from the May 14, 2019 Team Field trip of the Espanola and lower Rio Chama basins. The discussion items included the weather data collected at the NMSU Science Center in Alcalde, the URGWOM simulation of agricultural depletions on the Rio Grande through the Espanola Valley and agricultural depletions in the lower Rio Chama.

The automated weather station at Alcalde does not always provide reliable data, but the Science Center staff maintains instruments to measure air temperature and precipitation. This data limitation means that ET values will have to be computed using the Hargreaves Samani method, as here are not enough reliable data to utilize an ASCE Penman Monteith type of Reference ET equation. The weather station is located in a cut grass field that would produce data that is representative of conditions experienced in agricultural fields.

There are about 5,000 acres of irrigated land in the Espanola Valley between Velarde and Santa Clara. No hydrographic surveys of the location and extent of these irrigated lands or a census of crop type are available for this area. The Rio Arriba County Extension Agent estimates that about 85% of the crops are forage crops. In addition, NMSU has published research reports of water use in the Alcalde area that could provide additional information about water use in the Valley. If the consumptive use associated with these lands were to be simulated in URGWOM, information about the location and extend of irrigated lands would be required. Cindy reported that the NMOSE Water Use and Conservation section may have polygons of the irrigated fields in the Velarde Valley. The Team had no objection to including this task under the model development work in the URGWOM Five-year plan.

There are approximately 4,900 acres of irrigated land along the Rio Chama between Abiquiu Dam and the mouth of the river. These acres have been surveyed and reported in the NMOSE hydrographic survey maps and a crop type census was performed, although the crop type census may be out of date as it was prepared about 50 years ago. Currently, URGWOM simulates crop consumptive use based on recorded or authorized diversion rates and an assumed return flow value. Computation of crop ET using Hargreaves Samani method, climate data (from Alcalde) and FAO crop coefficients would improve the model reliability in this reach. In addition, the Rio Chama Acequia Association and individual Rio Chama Acequias are considering the consolidation of certain Acequias into groups of four that could be served by a single high line canal. The simulation of the Acequia depletion of Rio Chama Acequias in URGWOM could be organized in a manner that is consistent with the RCAA consolidation effort. The Team had no objection to including this task under the model development work in the URGWOM Five-year plan.

Jesse presented the final copy of the URGWOM rules documentation, which includes eight appendices. He proposed that all of the URGWOM documentation be arranged in a series of volumes as follows:

Volume 1: Physical Documentation (complete)

Volume 2a: Policy Rules Documentation (complete)

Volume 2b: Initialization Rules Documentation (not complete)

Volume 2c: Expression Slot Functions Documentation (not complete)

Volume 3: Accounting Concepts and Methods (not complete)

Volume 4: Database Documentation (complete)

Volume 5: DMI and SCT Documentation (complete)

Volume 6: Script Documentation (User's Manual), will be completed this year.

The rules documentation will be posted on the myUSGS web site. Jesse solicited comments from Team members on the proposed documentation Volume organization.

Jesse reported a daily timestep RiverWISE model that was prepared and based on the 2019 April AOP URGWOM runs which include a number of adjustable input and viewable output. A monthly timestep RiverWISE URGWOM planning model with adjustable inputs and viewable outputs is envisioned the next time a planning study is done. Jesse described several changes that were made to the URGWOM model to enable RiverWISE functionality in the AOP run. He reported that the Fish and Wildlife Service and the ABCWUA are interested in working with RiverWISE and arrangements are being made to acquire copies of the software for them. The RiverWISE documentation will be posted on the URGWOM myUSGS web page.

Edie reported that a RiverWare executable is required to run RiverWISE, which is included in a standard RiverWare license. RiverWise is not available in the RiverWare Reader. Edie also reported that Version 7.5 of RiverWare has just been released with new capabilities, including HTML documentation, an addition that was spearheaded by Carolyn.

Jesse briefed the Team on the development of the documentation for the Database, DMIs and SCTs. The current database metadata includes a brief description in the dss file Part F, along with a metadata spreadsheet developed many years ago, and is found on the Corps URGWOM web page. Jesse pointed out the problems with using the dss file Part F for metadata, including that the Part F field has a small and fixed character limit and that if the Part F is changed, the DMI will also have to be changed. Jesse proposed to provide the database metadata on a excel worksheet form of a workbook catalog. He briefly presented and described the workbook system, which focuses on the dss file Part B and Part C. Jesse will circulate a copy of the workbook and supporting documentation for review by Team members.

Jesse summarized the DMI documentation Version 7.4 (Volume 5). The document lists all of the DMIs, including their purpose, status and description. Users would be required to look at the DMI in the model for more detailed information about each of the DMIs. Jesse noted that there are a number of apparently obsolete DMIs that should be rooted out. Jesse proposed that this DMI documentation could be used to identify the obsolete DMIs, with review of the DMI list by those most familiar with the use of the URGWOM DMIs.

Jesse presented the documentation of SCT including a list or library of SCTs commonly used by regular RiverWare users. SCT files are not saved with the RiverWare model file but are saved as an external file. Fourteen SCT files are identified in the documentation and Jesse requested that those regular users of URGWOM review the documentation to check information about the purpose of the SCT and whether they should be retained. The SCT documentation, which is included with the DMI documentation, will be posted on the URGWOM myUSGS web page.

Jesse followed with a report on the results of his investigation into a comparison of river head stage (and groundwater/surface water interaction) in the Albuquerque Basin MODFLOW model with locations in URGWOM where river stage is calculated. The period of study was March 15, 1999 through October 31, 1999 and November 1, 1999 through March 14, 2000, to correspond to the MODFLOW model stress periods. Differences in river stage were noted. To simulate groundwater surface water interaction in the tow models, URGWOM river stage output was input into MODFLOW model runs. The comparison of model results shows that shallow groundwater mass balance is noticeably different between URGWOM and the Albuquerque Basin model (~100KAF in 1999). The URGWOM model has shown good correlation with historic (low) 1999 flow, except for that URGWOM underestimated some of the historic peaks. Jesse said that this would be a good opportunity to recalibrate the MODFLOW model based on URGWOM data, although he also pointed out that separate deep aquifer objects are being developed and that in the future, URGWOM may no longer rely on data from the MODFLOW model.

Edie reported that initial testing of the deep aquifer objects is underway and that additional work is scheduled to be completed in the upcoming fiscal year. CADSWES would like additional direction from Nabil for development of these objects.

Andrew reported that Reclamation is working with the Jet Propulsion Lab on a pilot remote sensing-based ET project. The scope of work is being developed at this time. An upcoming presentation on remote sensing-based ET result compared to the current ET Toolbox data is scheduled for June 20, 2019. In addition, Jake Collision will present the results of this PhD research on monitoring reservoir evaporation rates utilizing a floating evaporation pan. The presentation will precede the JPL presentation.

Marc discussed the planned informal URGWOM training seminars he will be presenting. He envisions about 10-15 sessions, with each two hour session occurring twice each month. He plans to start the sessions sometime in August. Marc said that the sessions would be accessible on-line to allow for remote viewing of the presentations and discussions.

Edie invited representatives from the URGWOM Tech Team to attend the RiverWare Users Group meeting scheduled for August, 2019.

The next meeting of the Team will be on August 13, 2019

The meeting adjourned at about 10:30 am.

ATTENDANCE LIST

URGWOM TECHNICAL TEAM MEETING

June 11, 2019

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| NAME | REPRESENTING |
| Dave Moeser | USGS |
| Jesse Roach | Tetra Tech / USACE Contractor |
| Shalamu Abudu | NMISC |
| William Miller | WJM Engineers/USACE Contractor |
| Lucas Barrett | USBR |
| Anders 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: | |
| Conrad Keyes, Jr. | EPdNWC |
| Nick Mander | Hydros Consulting |
| Jerry Melendez | USBR |
| Edie Zagona | CADSWES |