

# Memorandum – DRAFT

To: URGWOM Technical Team Members  
Date: February 16, 2017  
Subject: Notes of February 14, 2017 URGWOM Technical Team Meeting

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These notes summarize the salient matters discussed at the February 14, 2017 Upper Rio Grande Water Operations Model (URGWOM) Technical Team meeting. The meeting began at 9:00 am in the conference room at the NMISC office in Albuquerque, NM. An attendance list is included on page five.

The principal Agenda topics included Lower Rio Grande diversion / release patterns, Lower Rio Grande USDA Project, salinity model testing, merged monthly models and a report on ruleset updates.

## Lower Rio Grande diversion and release pattern development

Nick Mander reported to the Team that Hydros is currently providing QA/QC on the rules implementing the Lower Rio Grande release / diversion logic and would like to implement these rules changes soon. Marc reported that both he and Jesse also have items to update in the model and rules which will be implemented by Marc next week and Hydros could follow up with their rules changes sometime during the week of February 27<sup>th</sup>. The model and rules updates should be completed in time to use the updated model for developing the March 1, 2017 Annual Operating Plan runs.

## USDA Lower Rio Grande study

Zhuping reported to the Team on the USDA Lower Rio Grande investigation into the impact of climate change on the sustainable development of water resources in the reach of the Rio Grande between Elephant Butte Dam to Presidio, TX. Texas A&M AgriLife Research is a study collaborator. The study will attempt to resolve competing demands for water resources among agriculture, municipal and environmental requirements using collaboration and improved technologies. The study objectives and anticipated outcomes were described.

Zhuping explained the system of integrated models, including MODFLOW, RiverWare, a climate model, watershed runoff model (SWAT) and an economic model, which is not directly linked to the water resource models. The models are applied to the Project study area, except that MODFLOW models are not currently available for portions of the study area (available for Mesilla and Hueco Bolson areas only). The types of data used in the model and their sources, watershed delineations and the study data periods of record were presented. Zhuping described the conceptual modeling coupling and issues to be overcome for the successful model coupling, including normalization of the temporal and spatial scales of the various models. Zhuping concluded his presentation by describing potential benefits to URGWOM, including local stakeholder familiarization with URGWOM, obtaining a better understanding of local needs and an enhanced RiverWare model.

Jesse stated that although climate change would have an impact on runoff from watersheds tributary to the Rio Grande in this reach, the local inflow from these watersheds has no significant impact on system operations, although it may impact local groundwater recharge.

#### Salinity model testing

Scott reported to the Team on the results of his testing of the URGWOM salinity model, which documentation had been previously circulated to Team members. The CADSWES two layer groundwater object along with the groundwater/surface water interaction were tested. Scott described the changes to the groundwater objects that CADSWES made along with their (Scott and Mike Roark) testing approach. Four iterations of the model were developed to arrive at the most reliable model. He described the calibration process and the sources and sinks of groundwater salinity. Scott presented box plots and hydrographs of model results comparing simulated versus measured salinity for Middle Valley reaches for the 12-year period of record used in the investigation. The model results indicate that for the period of time studied, the model simulation results compare well with measured salinity at the Central Ave. gage, but not as well at Bernardo. The simulated salinity concentrations at the San Acacia and San Marcial gage reasonably reproduced historic data, except for that part of the irrigation season following snow melt runoff. The testing conclusions are summarized in the documentation and include that the salinity in the groundwater object layers are sensitive to thickness depending in part on the time of the year. He also reported that there is a lag time inconsistency between the model

and field conditions because the model does not simulate the interior drains but assumes that groundwater return flow travels directly to the riverside drains.

#### Merging monthly models and ruleset modification

Jesse described the steps necessary to change the time step for model runs (Colorado and Middle Rio Grande) which include changing the model timestep, accepting default aggregation parameters, ignoring an error window related to K Factors, and running a script which removes time lags and resets (dampens) hydraulic conductivity. Changing a model timestep with a script is not currently possible in RiverWare, but David stated that in addition to fixing the K Factor error, CADSWES is working on this enhancement so that soon conversion of daily to monthly model will require only running a script. After Hydros adds the generalized (1-day and monthly time step) Lower Rio Grande portion rules to the model next week, there will be two rulesets. Jesse suggested that the Tech Team decision to maintain two separate rule sets be revisited at next month's Tech Team meeting. It was pointed out that the proposed real-time model will have a one-hour time step, requiring the development of third ruleset, unless the generalized ruleset is adopted.

Jesse presented a summary of the way in which some of the rules were generalized in the Colorado model and also presented some results of testing the generalized policy with an ensemble of monthly time step AOP runs for the 1982-2010 period.

Jesse summarized the method used in the model for selecting forecast year hydrographs, which is currently based on selection of the year with a runoff volume that is closest to but greater than the current year forecast volume. Jesse reported on tasked work to update the rule so that the selection is based on the year with the closest forecast volume. The updated rule and how it changed which hydrograph year was used at a variety of locations in a 2016 AOP run was presented.

Jesse reported on his work on the modification of the stepped release rule for the operation of Cochiti Lake, Abiquiu and Jemez Canyon Reservoirs. Under certain circumstances, the stepped release rule results in negative Rio Grande storage content in these reservoirs. A solution to this problem was proposed which consider the stepped release volume requirements (using tables that relate maximum stepped release to available volume) as a function of the

amount of Rio Grande water in storage when setting the initial desired Rio Grande release. Included in this solution was modifications to other rules to clean them up and remove obsolete functionality. Tests of this rule change in the simulated operation of Cochiti Lake indicate that this approach will resolve the problem. Marc said that he will review the proposed fix before adopting it.

#### Other topics

Marc reported that he had run and posted results of an AOP model run based on the February 1, 2017 forecast. The runoff forecast has increased since the January 1<sup>st</sup> forecast because of above average snowfall in the basin during January, with the forecasted spring flow at Otowi Bridge at over one million acre-feet (1,080 MAF during March to July time period). He presented hydrographs for reservoir storage and streamflow based on the 10%-30%-50%-70% and 90% exceedance probabilities runoff forecast values.

The next meeting of the Team has been scheduled for March 9, 2017 at the NMISC office in Albuquerque beginning at 9:00 am.

The meeting adjourned at about 11:50 am.

ATTENDANCE LIST  
URGWOM TECHNICAL TEAM MEETING  
February 14, 2017

<u>NAME</u>	<u>REPRESENTING</u>
Amy Louise	USACE
Marc Sidlow	USACE
Jesse Roach	Tetra Tech / USACE Contractor
Walt Kuhn	Tetra Tech / USACE Contractor
Kyle Douglas-Mankin	USGS
William Miller	WJM Engineers/USACE Contractor
Nabil Shafike	USACE
Beiling Liu	NMISC
Lucas Barrett	USBR
Scott Anderholm	USACE Contractor
Garrett Ross	USACE
Zhuping Sheng	Texas A&M University
Brian Westfall	Keller Bliesner Engineering / BIA

Those participating via telephone conference:

David Neumann	CADSWES
Nick Mander	Hydros Consulting
John Carron	Hydros Consulting
Conrad Keyes Jr.	USACE Contractor
William Schneider	City of Santa Fe
Jerry Melendez	USBR