Memorandum

To: URGWOM Technical Team MembersDate: May 13, 2021Subject: Notes of the May 11, 2021 URGWOM Technical Team Meeting

These notes summarize the items discussed during the May 11, 2021 Upper Rio Grande Water Operations Model (URGWOM) Technical Team meeting. The meeting began at 9:00 am and was conducted as an on-line collaboration hosted by the Corps of Engineers using the Corps' WebEx account. All those participating in the meeting introduced themselves and their names and affiliation are listed on the last page of these meeting notes.

This month's meeting agenda topics include a presentation on the Rio Chama Acequia Diversion and Depletion Study, a report on the HDB Webservice RiverWare Import Capabilities and general updates on ongoing URGWOM related activities from the Corps of Engineers, the Bureau of Reclamation, and the Interstate Stream Commission.

Phil reported that Marc Sidlow has retired and that the Corps is looking for an individual to fill his role with URGWOM with the Corps of Engineers.

Miller briefed the Team on the Final Report on the Rio Chama Acequia Diversion and Depletion Study with the assistance of several PowerPoint slides. There are 17 Acequias diverting from the Rio Chama below Abiquiu Dam which are simulated in four aggregate diversion objects. He reported that the current diversion and depletion data used in the model is monthly time-step data for the 1975-2000 period, and data for the 2001-2015 period is a fixed amount based on water right allocation amounts, except for 2001, 2008 and 2009 which are based on daily data. The simulation depletion rate is also fixed at 67%.

Miller reported that diversion data for all 17 Acequias for the 2012-2020 were downloaded from the NMOSE web page, compiled and subject to quality control review. The final diversion data will be incorporated into the URGWOM database. The crop consumptive irrigation requirement (CIR) computation is based on weather data from the Alcalde Weather Station, 2019 USDA NASS crop pattern data for Rio Arriba County and the total irrigated acreage data from the 2009 Rio Chama Watermaster Report. The crop ET was computed using the Hargreaves-Samani method with crop growth coefficients taken from FAO-56. Crop mix CIR values were determined using the Keller Bliesner Effective Precipitation software application. The average CIR was computed to be 2.55 acre-feet per acre. He compared this value to the CIR value of 1.5 acre-feet per acre computed by the NMOSE based on climate data from the 1931-1959 period using the original Blaney-Criddle method.

Miller presented a series of hydrographs showing the daily diversion and CIR values for selected Acequias for 2012-2020. The hydrographs showed that the Acequias in the lower end

of the reach with senior priority dates generally had a full supply, however Acequias in the upper reach with junior priority dates had less than full supply in 2019 and 2020 when water supply shortages were experienced when the Acequias were put on a diversion rotation schedule.

Miller's presentation concluded with the following recommendations:

- Update the URGWOM database to include the recorded Rio Chama Acequia diversion and depletion data for the 2012-2020 period.
- The Acequia depletion requested should remain at 67% of the diversion until return flow reaching the river is more precisely quantified.
- Run the model using updated diversion data to determine local inflow values, post process results and evaluate return flow component of local inflow.
- Delete the following Acequias from the model as they are no longer in existence:
 - Martinez Duranes #2
 - Monastery and Scull (above Abiquiu Reservoir)
 - Winfield Morton

Nabil suggested that the NMOSE be contacted to see if there are any (written) diversion records available for the period of time between 2001 and 2012 when the fixed diversion rate is used. Miller said he will follow up with the Rio Chama Watermaster to see if these records exist. Miller will upload the Report and supporting data to the myUSGS web page.

Lucas reported to the Team on the use of the HDB web services data import method developed by CADSWES. Lucas described the steps required to use the service, including the files to be downloaded and installed (openssl-1.0.2u) and locating and using the extension in RiverWare. He demonstrated how the service could be used to select and download runoff forecast data (31 traces) of the National Weather Service Ensemble Streamflow Prediction. The NWS forecast data are based on the 1981-2008 period with the 90%, 50% and 10% exceedance frequency values available. Lucas will be adding the 30% and 70% exceedance frequency values. The forecasts are updated weekly.

Lucas discussed some known problems with the forecasts for the Rio Blanco and Navajo River which are not being pulled into HDB properly, which he will address soon. He suggests that uses of the forecast data carefully review the data to check for quality issues. Also, the user cannot run ensemble Ensembles using Web Service DMIs. The NWS will be performing further calibration of the ESP model over the next three years. Lucas suggested that Tech Team members contact him if they are having any difficulty with this application.

Cindy Stokes reported that Shalamu Abudu has left the NMISC to take a position in California and that the NMISC is seeking an individual to fill his position.

Lucas reported that he will be sending out to the Technical Team the updates to the URGWOM models and rules taking over one of the roles that Marc Sidlow previously performed.

The next regular meeting of the Technical Team is scheduled for June 8, 2021 at 9:00 am, which will also be an on-line collaboration.

There being no other business, the meeting adjourned at approximately 9:45 am.

ATTENDANCE LIST URGWOM TECHNICAL TEAM MEETING May 11, 2021

NAME	REPRESENTING
Reynalden Delgarito	USACE
Nabil Shafike	USACE
Phillip Carrillo	USACE
William Miller	Southwest Water Design/USACE Contractor
Mike Brown	Tetra Tech/USACE Contractor
Walt Kuhn	Tetra Tech/USACE Contractor
Lucas Barrett	Bureau of Reclamation
Michele Estrada Lopez	Bureau of Reclamation
Andrew Gelderloos	Bureau of Reclamation
Jerry Melendez	Bureau of Reclamation
Cindy Stokes	NM Interstate Stream Commission
Nick Mander	Hydros Consulting
Guillermo Martinez	Intera
Ashenafi Madebo	Colorado Division of Water Resources
Zhuping Sheng	Paso del Norte Watershed Council
Viola Sanchez	BIA, Designated Engineer

OPPER RIO GRANDE WATER OPERATIONS MODEL REPORT TO TECHNICAL TEAM May 11, 2021

EQUIAS

GONZALES ACEQUIA DIVERSION ABIQUIU, NM

ANALYS

DIVERSION AND DEPLEMON

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RIO CHAMA ACEQUIAS BELOW ABIQUIU RESERVOIR

		WATER	URGWOM MAX		URGWOM	
	LENGTH	RIGHT AREA	DIVERSION RATE		DEPLETION	
ACEQUIA NAME	(mi.)	(Ac.)	(cfs)	(af/yr)	(af/yr)	
Salazar	4.9	487	13	5,518	3,680	
Hernandez	3.9	583	12.5	5,306	3,536	
Chamita	3.8	717	12.5	5,306	3,536	
Chili	3.4	281	8	3,396	2,263	
Martinez y Duranes	7.5	539	12.5	5,306	3,536	
Rio de Chama	3.9	381	11	4,669	3,111	
Manzanares y Montoya	1.1	41	1.5	637	425	
Martinez	1.8	139	4	1,698	1,133	
Tierra Azul	3.6	176	7	2,971	1,982	
Ferran	2.5	130	4	1,698	1,133	
Mariano	2.1	121	4	1,698	1,133	
Valentine Martinez	0.6	21	1	424	284	
Quintana	0.8	31	1	424	284	
La Puente	3.0	177	5	2,122	1,413	
Gonzales	1.4	211	6	2,547	1,698	
Jose Pablo Gonzales	4.7	521	16	6,792	4,530	
Winfield Morton	-	90	-	-	-	
Abeyta Trujillo	3.9	236	6	2,547	1,698	
		4,882	125	53,059	35,375	
Water Right acreage take	n from the	2009 Rio Chama	Watermaste	r Report		



RIO CHAMA ACEQUIAS BELOW ABIQUIU RESERVOIR URGWOM Database Acequia Diversion Data



RIO CHAMA ACEQUIAS BELOW ABIQUIU RESERVOIR

Acequia Depletion - Cropping patterns along Rio Chama Acreage used in analysis: 4,482 acres

	Percent of Total					
	1961	1961 USDA-NASS				
	Hydrographic	ET	Rio Arriba			
Crop	Survey	Toolbox	County (2017)			
Alfalfa	22.5	30.0	55.0			
Hay and Pasture	39.1	40.0	40.0			
Orchard	10.7	30.0	2.0			
Corn	10.7	0.0	1.0			
Grain	6.4	0.0	0.0			
Garden	4.0	0.0	2.0			
Fallow	6.6	0.0	0.0			
Total:	100.0	100.0	100.0			



RIO CHAMA ACEQUIAS BELOW ABIQUIU RESERVOIR

Diversion and CIR summary

	A		Average Consum	ptive Irrigation	
	Average irrigation	season diversion	Requirement (CIR, 2.55 af/ac)		
ACEQUIA	Acre-feet	CFS	Acre-feet	CFS	
ABEYTA TRUJILLO	1,742	4.1	563	1.3	
CHAMITA	3,700	8.7	1,709	4.0	
CHILI	2,227	5.2	670	1.6	
FERRAN	380	0.9	310	0.7	
GONZALES	669	1.6	503	1.2	
HERNANDEZ	5,042	11.9	1,390	3.3	
J. P. GONZALES	4,569	10.8	1,242	2.9	
J. V. MARTINEZ	1,237	2.9	331	0.8	
LA PUENTE	1,215	2.9	422	1.0	
MANZANARES MONTOYA	271	0.6	98	0.2	
MARIANO	1,187	2.8	288	0.7	
MARTINEZ-DURANES	5,010	11.8	1,285	3.0	
QUINTANA	255	0.6	74	0.2	
RIO DE CHAMA	4,508	10.6	908	2.1	
SALAZAR	4,129	9.7	1,161	2.7	
TIERRA AZUL	2,064	4.9	420	1.0	
VALENTINE MARTINEZ	85	0.2	50	0.1	
	38,293	90.2	11,423	26.9	

ACEQUIA DE CHAMITA 2012-2020



ACEQUIA DE CHAMITA 2019-2020



ACEQUIA ABEYTA TRUJILLO 2012-2020



ACEQUIA ABEYTA TRUJILLO 2019-2020



ACEQUIA CHILI 2012-2020



ACEQUIA CHILI 2019-2020



Recommendations

Update the URGWOM database to include the recorded Rio Chama Acequia diversion data for the 2012-2020 period.

The Acequia depletion requested should remain at 67% of the diversion until return flow reaching the river is more precisely quantified.

Run the model using updated diversion data to determine local inflow values allow for the further evaluation of the return flow component of local inflow.

Recommendations (Continued)

- Delete Martinez Duranes #2 Diversion from the model because there is only one Martinez Duranes Acequia diverting from the Rio Chama below Abiquiu Dam;
- Delete the Monastery and Scull Diversions. The Monastery and Scull Ditch are included in the AbvAbiquiuDiversions aggregate diversion site object above Abiquiu Reservoir;
 - There is no current or historic record of diversion by the Scull Ditch
 - The Monastery diversion has never exceeded 0.6 cfs and there is no record of flow since 1985.
 - There are no permanent diversion structures and no water meters.
- Delete the Winfield Morton Acequia. The Winfield Morton Ditch is one of fourteen Acequias represented in the object BlwAbiquiuDiversions. The Acequia was formerly served by pump from the J. P. Gonzales Acequia.
 - There is no record of historical diversion since 1982 and the maximum diversion rate did not exceed 2.7 cfs.
 - There is no water meter and the distribution infrastructure has been abandoned.

Questions?



HDB Web Service

OpenSSL

- Currently, to be able to connect to HDB through the Web Service API, OpenSSL must be downloaded to your computer.
- Does not take administration rights.
- First download the correct version of OpenSSL
 openssl-1.0.2u



- The folder must contain
 - openssl.exe
 - libeay32.dll
 - ssleay32.dll





- Unzip the Folder and place it somewhere in your C: Drive
- > Windows (C:) Name app CDMFISMA CDSS Dell HDB-POET HEC-DSSVue_2.6 Install Intel OneDriveTemp OPENDCS openssl-1.0.2u-win64 PertLogs Program Files Program Files (x86) ProgramData Python27 SoftwareLogs Sun Temp Users Windows SWINRE_BACKUP_PARTITION.MARKER



- Go to Environmental Variable for your Account (Do not edit system variables, as that requires admin access)
- Create a Path variable and add the OpenSSL file destination (Path may already be created)
- Restart your computer



If Path already has a value use a semicolon to separate the variable values:





- Open up RiverWare to make sure everything was successful.
- Go to Help ->About and OpenSSL should now be in the list when you scroll down.



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RiverWare is a trademarked name.



Center for Advanced Decision Support for Water and Environmental Systems (CADSWES)

http://cadswes.colorado.edu/





HDB Web Service DMI

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InputDailyAccountingFromUCHDB2					
InputNWSForecast_fromDSS					
InputSeriesForAOPRulebasedSimulation_fromDSS					
InputSeriesForHistoricalSimulation_fromDSS					
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O MRM_Output					
O MRM_Output_COPortion					
I NWS_ESP_Forecast_fromExcel					
I NWS_ESP_Forecast_fromHDBWebservice					
I NWS_ESP_Forecast_fromUCHDB2					
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M DailyInflowForecasts.Mogote		12-31-2020	12-31-2021	cfs		
M DailyInflowForecasts.NavajoRiver		12-31-2020	12-31-2021	cfs		
M DailyInflowForecasts.NorthFloodwayChannel		12-31-2020	12-31-2021	cfs		
M DailyInflowForecasts.NrJemez		12-31-2020	12-31-2021	cfs		
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HDB Web Service DMI

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Base URL: https://www.usbr.gov/pn-bin/hdb/hdb.pl 5
Desired HDB: Upper Colorado Regional Office \checkmark Observed Model Run ID = 100243
OK Apply Reset Cancel



HDB Web Service DMI

- Model Run ID Determines which of the NWS ESP traces you want to pull in.
- Currently there are 31 traces
 - 1981-2008
 - 90%, 50%, 10% Exceedances
- Plan on adding 70% and 30% soon.
- Can send out Excel Sheet with what Model Run IDs = Trace





Current Known Issues

- Rio Blanco and Navajo Diversions are not being pulled into HDB properly
 - Hoping to fix it soon
- Occasionally a forecast point can be off or even negative
- Further calibration to the ESP model will be completed over the next 3-years
- Can not do Ensembles using Web Service DMIs



Websites

- <u>https://www.cbrfc.noaa.gov/outgoing/abqbor/</u>
- <u>https://www.cbrfc.noaa.gov/outgoing/ucbor/</u>
- <u>https://www.usbr.gov/lc/region/g4000/riverops/ HdbWebQuery.html</u>

