Agenda

Updates:

USBR:

- Climate / Hydrology
- Storage Assessment
- Groundwater
- Water Resource Modeling

Consultants:

- IFIM
- Water Needs Assessment
- Water Conservation Assessment

HR County (Mattie):

- Groundwater Monitoring Program
- Irrigation System Inventory

Next Steps:

- Short-term (this study)
- Long-term (future studies, implementation)

Other:

No HRWPG meeting in February, next meeting March 6, 2-4pm

USBR

Climate / Hydrology

Completed
1. DHSVM is up and running, working on obtaining glacier mass balance observations to compare to modeled glacier mass balance.

Next Steps
2. Working towards completing glacier calibration process by March.

3. Output from DHSVM will be used in the IFIM modeling. Need to determine period for 'historical'.

Storage Assessment

Completed
1. Trip report from USBR site visit to evaluate storage sites complete.

Next Steps
2. USBR/HRWPG will revisit site report after preliminary DHSVM / Water Resource Modeling complete.

Groundwater

Completed
1. Additional available data was collected by Reclamation from various sources including OWRD and Hood River County.

Next Steps
2. Groundwater model design document was started and will be available for comment around the end of January. The document will be provided to the groundwater experts that attended the November workshop for comment. A webinar will be scheduled with the workshop attendees in February to discuss any comments to the design document.

3. Calculations on a water budget have commenced using the available data. The water budget will be included in the design document.

Design Document Outline (from USBR)

1) Introduction
   a) Brief description of the Basin Study requirements
   b) Purpose and Scope
      - The purpose of this report is to document the design decisions that have been made to date regarding the development of the groundwater model. This report will not describe the model development, calibration, or alternatives that will be evaluated with the model.
   c) Groundwater Study Purpose and Scope
      - A simple MODFLOW model of the system will be developed to evaluate alternatives that may include:
        (1) What is the current state of groundwater in the basin?
        (2) How will new development impact groundwater conditions in the basin including discharge to streams?
        (3) How will hydrologic changes due to climate change impact groundwater conditions?
        (4) Is managed recharge a viable option for improving stream flow and temperature conditions?
        (5) Can the basin aquifers be used for aquifer storage and recovery?
      - Any alternatives investigated will seek to gain an understanding towards broader questions such as:

(1) To what extent can groundwater be developed for use?
(2) What impact will new development have on groundwater resources?
(3) What impact will climate change have on groundwater resources?

2) Geology
   a) Field Trip
      - Summary of November 27, 2012 field trip
      - General understanding of Geology in relation to groundwater

3) Preliminary Hydrogeologic Understanding
   a) Hydrogeologic information is limited and based on limited data
   b) Wells logs provide insight into stratigraphy
      - Logs are not often verified by geologists, material identification may not be correct
   c) Fourteen wells are currently measured by OWRD
   d) Flow is generally south to north, somewhat following the Hood River

4) Water Budget
   a) The water budget components listed below will be calculated using available data and will be presented in this document
      - Recharge from Precipitation
      - Canal Losses
      - On-farm Infiltration
      - On-site Water Treatment
      - Boundary Inflows
      - Pumping withdrawals
      - River Gains and Losses
      - Springs
      - Boundary Outflow
      -

5) Observation data
   a) Fourteen wells measured quarterly since 2008 (one since 1964)
   b) Three long term streamflow gages.
   c) Output from DHSVM
   d)

6) Proposed Model Design
   a) Based on available data
   b) Limited by schedule and budget

Water Resource Model

1). Propose using ModSim instead of RiverWare and/or Excel.

RECLAMATION
Managing Water in the West

U.S. Department of the Interior
Bureau of Reclamation

Western Water and Power Solution Bulletin

Research and Development Office — Denver, Colorado

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MODSIM-DSS River Basin Management Model Enhancements

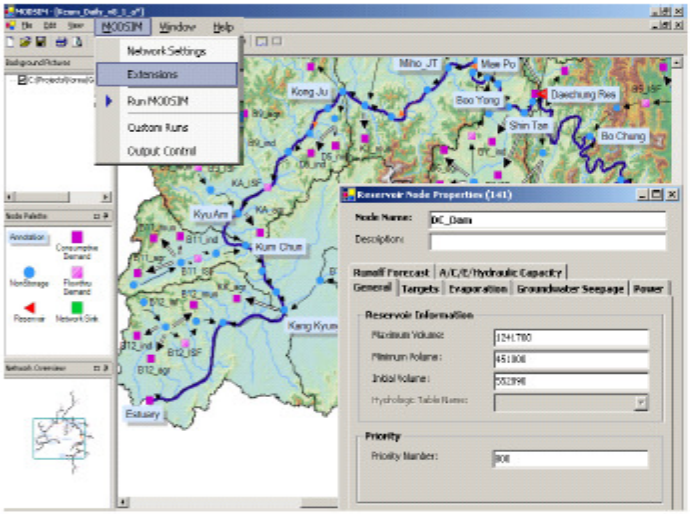
Enhanced utility and capabilities of popular river systems modeling tool make it accessible to a wider user-base

What Is The Problem?

The nation faces an increasing set of water resource challenges: aging water infrastructure, rapid population growth in some of the driest regions of the country, depletion of groundwater resources, impaired water quality, conflicts between human and environmental water needs, and climate variability and change, among others. Water shortages and water-use conflicts have become more commonplace in many areas of the United States, even in normal water years. As competition for water resources grows, the need for information and tools to aid water resource managers also grows. Management of complex river basin systems requires effective decision support tools for analyzing all of the system components in an integrated manner.

What Is The Solution?

MODSIM-DSS is a generic river basin management decision support system for developing basin-wide strategies for short-term water management, long-term operational planning, and drought/climate change contingency planning. , Originally conceived in 1978 at Colorado State University (CSU), MODSIM-DSS has been updated to its current version 8.1 through joint collaboration between CSU and Reclamation's Pacific Northwest Regional Office. MODSIM-DSS is available to users without cost or licensing requirements.



Numerous contributions to enhancement of MODSIM-DSS have been made by Reclamation staff at the Pacific Northwest Regional Office, particularly Roger Larson, in collaboration with CSU. These include enhancing the graphical user interface (GUI) ease-of-use and functionality and developing a Water Rights Control form which greatly improves analysis of water rights within a basin. In addition, Larson created valuable modules in MODSIM-DSS that realistically model reservoir operations in Reclamation projects, including multiple storage accounts, a scheme for integrating natural flow rights with ownership of accrued storage, logic for group ownerships, a rent-pool module, and last fill link logic. Because MODSIM-DSS uses Visual C++, custom code modules can be developed for complex reservoir operational logic. The powerful GUI connects MODSIM-DSS with database management components and a network flow optimization model, providing an efficient means of insuring water is allocated according to physical, hydrological, and institutional/ legal/administrative aspects. MODSIM-DSS can also easily be customized for a variety of purposes without recoding the program.

Who Can Benefit?

MODSIM-DSS is used extensively by Reclamation, as well as other water resource management entities at the federal, state, and local levels, and several international organizations. Its use facilitates communication between technical and managerial staff, improves interaction between study coordinators and the public, and reduces the costs of river basin modeling.

Where Have We Applied This Solution?

The Pacific Northwest Regional Office is applying MODSIM-DSS to many river basins (e.g., the Snake, Deschutes and Rogue Rivers) for several purposes, including quantification of impacts of proposed storage reallocation for satisfying instream flow requirements for endangered species.

Future Development Plans

GEO-MODSIM is being developed as a custom extension in ArcGIS® (ESRI, Inc.), allowing full integration of MODSIM-DSS with GIS. Reclamation will continue to collaborate with CSU on further enhancements to MODSIM-DSS.

More Information

The MODSIM-DSS 8.1 program, user manuals, and tutorials can be downloaded at: http://modsim.engr.colostate.edu/.

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Collaborators

Reclamation's Science and Technology Program and Pacific Northwest Region and Colorado State University

http://www.usbr.gov/research/science-and-tech/research/results/modsim7-23-10.pdf

Consultants

IFIM (Normandeau)

Completed
1. Completed the hydraulic measurements (all field data collected).

2. Built the PHABSIM (in RHABSIM) hydraulic models for each of the study sites.

Next Steps
3. ODFW is currently looking at the MFID habitat suitability criteria (HSC). CTWS has suggested additional species/life-stages to model. Once all have agreed on the HSC, will run the habitat models and calculate the habitat/flow index (WUA).

4. Need streamflow sequences from County/USBR to run habitat models.

Water Needs Assessment (Herrera / WPN)

Completed
1. Downloaded all available water rights and water use data from OWRD website.

2. Generated map of basin with all water rights data.

3. Sorted/compiled data for each major user:

Irrigation Districts:	Potable:	Hydropower:
MFID	Ice Fountain	MFID
EFID	Crystal Springs	FID
MHID	City of Hood River	
DID	Parkdale Water Company	
FID	Oakgrove Water Company	
	Odell Water Company	
	Mt. Hood Meadows	

Table 1. Water rights in the Hood River Basin filed under industrial, manufacturing or commercial.

Permit	Certificate	PriorityDate	name_compa	Water RightID	Source	POD Rate (cfs)	POD Use Rate (cfs)	Use_descrip	Wur Report ID	Remarks
6990	6333	10/19/1925	APPLE GROWERS ASSOCIATION	58713	MCGUIRE CREEK	1	1	Manufacturing		
30389	41214	4/21/1965	DBA: MOORE ORCHARDS, INC.	93611	NEAL CREEK	0.14	0.1	Commercial Uses		
	82802	12/31/1882	DIAMOND FRUIT GROWERS INC.	150130	A SPRING	0.07	0.07	Commercial Uses		4/15-10/1
890	56100	5/21/1958	DUCKWALL POOLEY FRUIT CO.	108502	A WELL	0.27	0.27	Manufacturing		
48023	55678	9/1/1983	DUCKWALL POOLEY FRUIT CO.	108080	DAVIS CREEK	0.79	0.79	Manufacturing		
		7/12/2006	DUCKWALL POOLEY FRUIT CO.	150397	A WELL	0.2228	0.2228	Commercial Uses		
16258		7/20/2006	DUCKWALL-POOLEY FRUIT CO.	155527	A WELL	0.223	0.223	Commercial Uses		8/15-12/31
16258		7/20/2006	DUCKWALL-POOLEY FRUIT CO.	155527	A WELL	0.223	0.223	Commercial Uses		1/1-6/1
		11/25/1895	EAST FORK IRRIGATION DISTRICT	162375	EAST FORK HOOD RIVER	0.135	0.135	Manufacturing	16087	10/2-12/31
		11/25/1895	EAST FORK IRRIGATION DISTRICT	162375	EAST FORK HOOD RIVER	0.135	0.135	Manufacturing	16087	1/1-3/31
	30440	9/30/1905	EDWARD HINES LUMBER CO.	82834	EAST FORK HOOD RIVER	29.3	1	Manufacturing		
	30440	9/30/1905	EDWARD HINES LUMBER CO.	82834	EAST FORK HOOD RIVER	29.3	2.7	Manufacturing		
	30440	9/30/1905	EDWARD HINES LUMBER CO.	82834	EAST FORK HOOD RIVER	29.3	15.5	Manufacturing		
	30440	9/30/1905	EDWARD HINES LUMBER CO.	82834	EAST FORK HOOD RIVER	29.3	5	Manufacturing		
7782	51661	12/21/1978	HAMEL LUMBER CO. INC.	104063	UNNAMED STREAM	2 ac-ft	0	Manufacturing		
7782	51661	12/21/1978	HAMEL LUMBER CO. INC.	104063	UNNAMED STREAM	0 ac-ft	0	Manufacturing		
43829	51662	12/21/1978	HAMEL LUMBER CO. INC.	104064	UNNAMED STREAM/RESERVOIR	1.11	1.11	Manufacturing		
43829	51662	12/21/1978	HAMEL LUMBER CO. INC.	104064	UNNAMED STREAM		0	Manufacturing		
13484		12/3/1997	MEADOWS UTILITIES LLC	24114	A WELL	0.78	0.78	Commercial Uses		
		9/3/2008	MEADOWS UTILITIES LLC	162831	A SPRING	0.21	0.21	Commercial Uses		
		3/2/2005	MEADOWS UTILITIES LLC / U.S. FOREST SERVICE	142854	EAST FORK HOOD RIVER	1.1	1.1	Commercial Uses		11/1-12/31
		3/2/2005	MEADOWS UTILITIES LLC / U.S. FOREST SERVICE	142854	EAST FORK HOOD RIVER	1.1	1.1	Commercial Uses		1/1-4/30
		3/7/2005	MEADOWS UTILITIES LLC / U.S. FOREST SERVICE	142857	A WELL	0.11	0.111	Commercial Uses		11/1-12/31
		3/7/2005	MEADOWS UTILITIES LLC / U.S. FOREST SERVICE	142857	A WELL	0.11	0.111	Commercial Uses		1/1-3/31
38081	48445	2/9/1973	MT HOOD MEADOWS DEVELOPMENT CORP.	100845	A SPRING	0.22	0.21	Commercial Uses		
53679		3/2/1994	OAK GROVE WATER CO.	136920	A SPRING	0.0896	0.001	Commercial Uses		
53679		3/2/1994	OAK GROVE WATER CO.	136920	A SPRING	0.0896	0.0006	Manufacturing		1/1-4/15
53679		3/2/1994	OAK GROVE WATER CO.	136920	A SPRING	0.0896	0.0006	Manufacturing		10/1-12/31
30324	39054	3/30/1965	U S PLYWOOD CORP.	91451	TONY CREEK	2.5	2.5	Manufacturing		
46439	54240	9/9/1980	U.S. MOUNT HOOD NATIONAL FOREST	106642	A SPRING	0.055	0.05	Commercial Uses	105	
48401	82174	11/9/1982	KLINDT, PAUL	148048	A SPRING	0.1	0.04	Commercial Uses		
48401	82174	3/2/1983	KLINDT, PAUL	148048	A SPRING	0.1	0.015	Commercial Uses		

4. Sent spreadsheet with all water rights and water use data to entities in #2 for comment.

5. Had meetings or phone calls to go over data. Specifically addressed following:

A. QA'd water rights and water use data.
B. Filled data gaps where possible (solicited additional water use data).
C. Input on maximum sustainable use.
D. Current number of patrons, projected number of patrons.
E. Previous conservation efforts.
D. Future conservation factors being considered.
E. GPS points.
D. Survey of external factor that could affect use.

6. Transferred Water Needs data to USBR for use in developing water resource model.

7. Held meetings with USBR to go over data and basin operations.

Next Steps

8. Compile / QA industrial water user data.

9. Continue to work with USBR in water resource model development.

10. Finalize / format data, generate maps for each entity in #2.

11. Write report, transfer electronic data to County.

Water Conservation Assessment (Herrera / WPN)

Next Steps

1. Work will begin third week in February.

2. Mattie working on irrigation system inventory that will be used in the Conservation Assessment.

Hood River County (Mattie)

Groundwater Monitoring Program

From Mid-December to the present, Mattie has been selecting wells to include in a basin wide groundwater level observation network. Mattie is using guidelines prepared by Marshall Gannet and Terrence Colon (USGS) which outline characteristics of an ideal groundwater level observation network. Mattie is also using guidelines given by Marc Norton (OWRD) focusing on the practical considerations of groundwater monitoring.

Completed

1. DOGAMI and Hood River County prepared different databases containing well log information for Hood River County. The two databases were compared to identify any discontinuities with the number of wells and a combined database was prepared to fill in missing well logs or remove un-needed logs from either database.

2. Terrence and Marc recommended including wells open at different aquifers, so the combined database was modified to include the stratigraphy of each well. A new column was created in the database to denote the water bearing zones of each well.

Next Steps

1. Using the stratigraphy and water bearing information, wells will be selected to represent aquifers from a wide range of geology layers.

2. Utilize remaining guidelines from Terrence, Marshall, and Marc to develop the monitoring network.

3. Complete a tentative list of recommended wells and a methodology describing the process used to select wells by the beginning of February. Send out list to Terrence, Marshall, and Marc and others who participated in the Groundwater Workshop for review and comment.

4. Send letters requesting permission to access properties of selected wells by Mid-February and a follow up phone call will be made to landowners who do not respond.

5. Measure groundwater levels of selected wells on March 15th with Bob Wood and Marc Norton.

Crop and Irrigation System Inventory

Mattie has also begun collecting data outlining crop type, acreage, and irrigation systems used for each customer in each of the irrigation districts.

Completed

1. An irrigation system inventory has already been completed by MFID. Obtained MFID inventory from MFID. Focus will be placed on EFID, FID, MHID, and DID.

2. In 2009, EFID sent out a survey to customers with 20 acres or more asking for acreage of each crop type on the property and the irrigation system(s) used.

Next Steps

3. Approximately half of the customers responded to the 2009 EFID Survey, so Mattie plans on contacting the remaining customers by phone for their crop type and irrigation system information.

4. Depending on previous data collected by other IDs, and methodology preferred, Mattie will use a similar approach to acquire crop and irrigation system data.

5. Compile a database by mid-March to assist in the Conservation Assessment containing crop type and irrigation system information of all the irrigation districts.

Next Steps

Short-term

Water Planning Study schedule (Niklas' estimate):

1. IFIM → done in April

2. Water Needs Assessment → done in March

3. Water Conservation Assessment → done in May

4. Climate / hydrology (DHSVM) → done in May

5. Storage Assessment → mostly done, will revisit in June

6. Groundwater → well monitoring is ongoing, modeling completed in fall

7. Water Resource Modeling → done by late summer / early fall

8. USBR reporting → done in winter 2014

Current CIP and other studies in basin (not comprehensive – partial list only):

1. City of Hood River

    A. New 24" water transmission main project with flow meters and telemetry. Will eliminate overflows at reservoir and instead overflow at spring instead. Will increase streamflow with these overflows.

    B. Updating Capital Facility Plan in 2013.

2. Dee Irrigation District

    A. Finishing installing ~5 miles of pipe. Should eliminate 2-3 cfs of historical losses.

3. EFID

    A. Working on basin optimization/operations plan.

    B. Central Canal Pipeline.

    C. Head gate project.

4. MFID

    A. Glacier Ditch pipe project.

    B. Clear Branch Dam Fish Passage Feasibility Study.

    C. IFIM Study.

5. FID

    A. Lowline Canal pipe.

6. Other

Long-term

Major Planned CIP (not comprehensive – partial list only):

1. MFID

    A. Coe Creek pipe to sediment pond.

    B. Address temperature issues and Bull trout passage around Clear Branch Dam.

2. FID

    A. Farmers Canal pipe project.

3. EFID

    A. Christopher Ditch pipe.

    B. Surge pond at Central Lateral Pipe (dependent on optimization plan).

4. Basin-wide: switch to more efficient irrigation, convert open ditch to pipe.

5. Other

Possible partners / funding sources:

1. USBR

    A. WaterSMART Water Conservation and Efficiency Grant (due Jan. 17).

    B. Basin Study (feasibility level).

2. CTWS

3. OWEB

    A. Regular Grants (Restoration, Monitoring, Outreach, Tech Assist, Protecting Water).

    B. Small Grants ($10k limit).

    C. Special Investment Partnerships (long-term, large-scale.

4. OWRD

    A. Community Planning Grants.

    B. Aquifer Storage and Recovery (ASR).

    C. Aquifer Recharge (AR).

    D. Conserved Water Program.

5. USFS

    A. Title II.

    B. Partners for Fish & Wildlife.

6. ODFW

    A. Fish Screening and Passage Program.

    B. Restoration and Enhancement Program.