

# ***HOOD RIVER BASIN STUDY STATUS UPDATE***

March 1, 2013

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## March 1, 2013 Status Update

### INTRODUCTION

This document provides an update of the Hood River Water Planning Group's (HRWPG) efforts from mid-January to March 1, 2013 associated with the Bureau of Reclamation's (Reclamation) Hood River Basin Study and the Oregon Department of Water Resources (OWRD) Hood River Basin Surface Water Storage Feasibility Study. The objectives outlined in the Plan of Study for this effort are:

1. Define current and future basin water supply and demands, with consideration of potential climate change impacts;
2. Determine the potential impacts of climate change on the performance of current water delivery systems (e.g., infrastructure and operations);
3. Develop options to maintain viable water delivery systems for adequate water supplies in the future; and
4. Conduct an analysis and modeling scenarios of the options developed, summarize findings and make recommendations on preferred options.

The Hood River Basin Study is conducted with Reclamation and Hood River County (HRC) through in-kind services and the OWRD study contracted to Herrera, Watershed Professionals Network (WPN), and Normandeau with coordination of the two studies by HRC. The studies have similar objectives and the key tasks from these studies overlap so Table 1 clarifies each task and the parties involved with completing each task. In the following sections, the to-date progress associated with each task is described.

Key Task	Responsible Party
Groundwater Modeling	Reclamation with assistance by HRC
Climate Change Analysis	Reclamation and WPN
Water Storage Assessment	Reclamation, WPN with assistance by HRC
In-stream Flow Assessment	Normandeau
Water Needs Assessment	Herrera/WPN
Water Conservation Assessment	Herrera/WPN
Water Resources Modeling	Reclamation/WPN

**Table 1. Key tasks associated with the Reclamation and OWRD studies and the responsible parties associated with each.**

**SCHEDULE**

**Hood River Water Planning Study Schedule**

2012				2013												2014				
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
<b>CONSULTANTS</b>																				
Project Management																				
	Water Needs Assessment																			
		Water Conservation Assessment																		
Instream Flow Assessment																				
<b>BUREAU OF RECLAMATION</b>																				
	Climate/ Hydrologic Modeling																			
	Groundwater Assessment																			
	Storage Assessment								Storage Assessment											
		Water Resources Modeling																		
																Reporting				
<b>HOOD RIVER COUNTY</b>																				
				Groundwater Monitoring Network																
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
2012				2013												2014				

## **OVERALL CONSIDERATIONS**

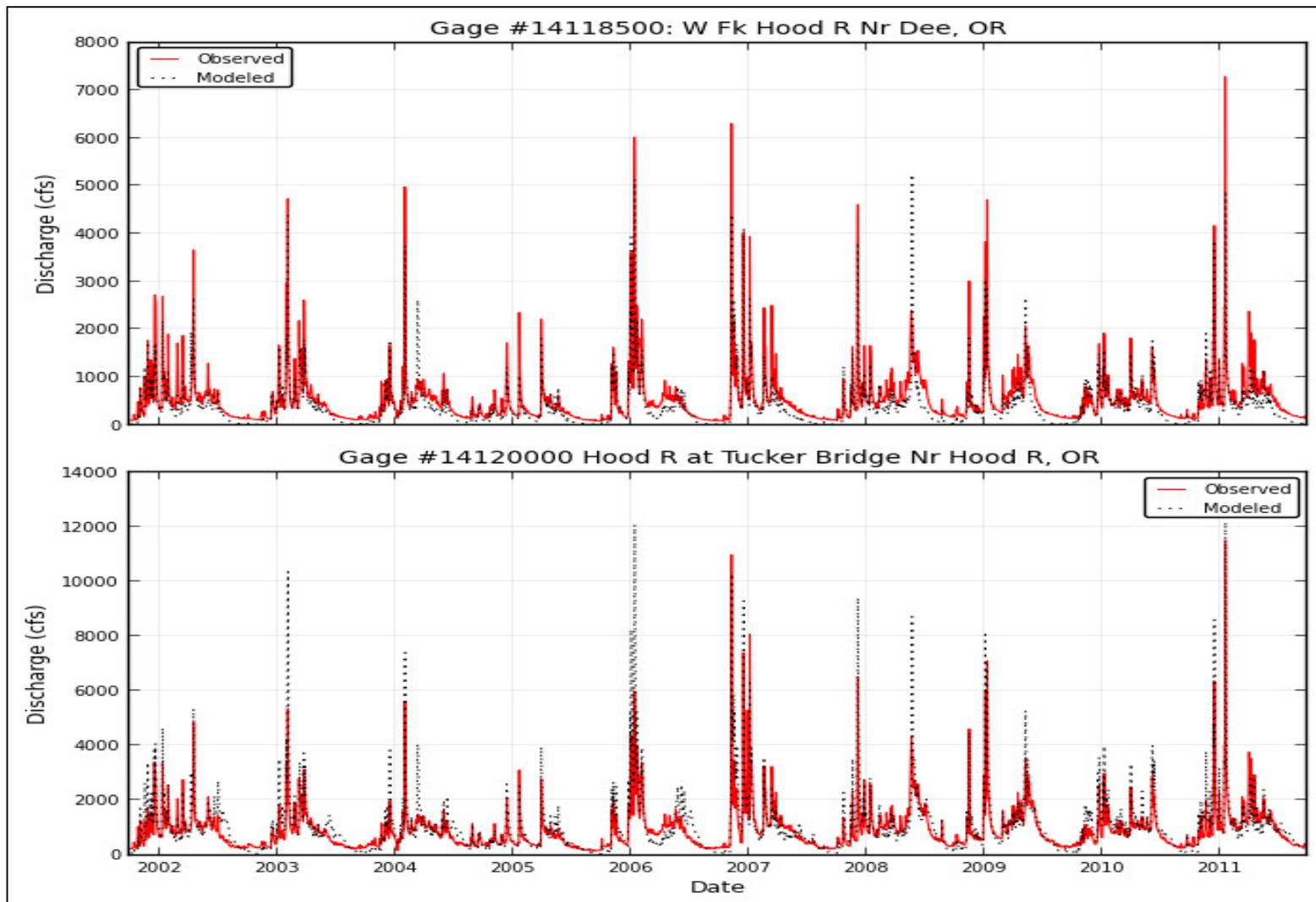
With only ten years of data to use for most of the analysis (historical DHSVM run is 10 years, and some available data in the Water Needs Assessment is even less), the conclusions drawn from the results could be limited. Reclamation and Niklas are discussing the proper course of action. Depending upon schedule and budget, this may include extending the historical DHSVM simulation, or continuing to do the analysis and as more data becomes available updating and refining the conclusions.

## **GROUNDWATER MODELING (RECLAMATION)**

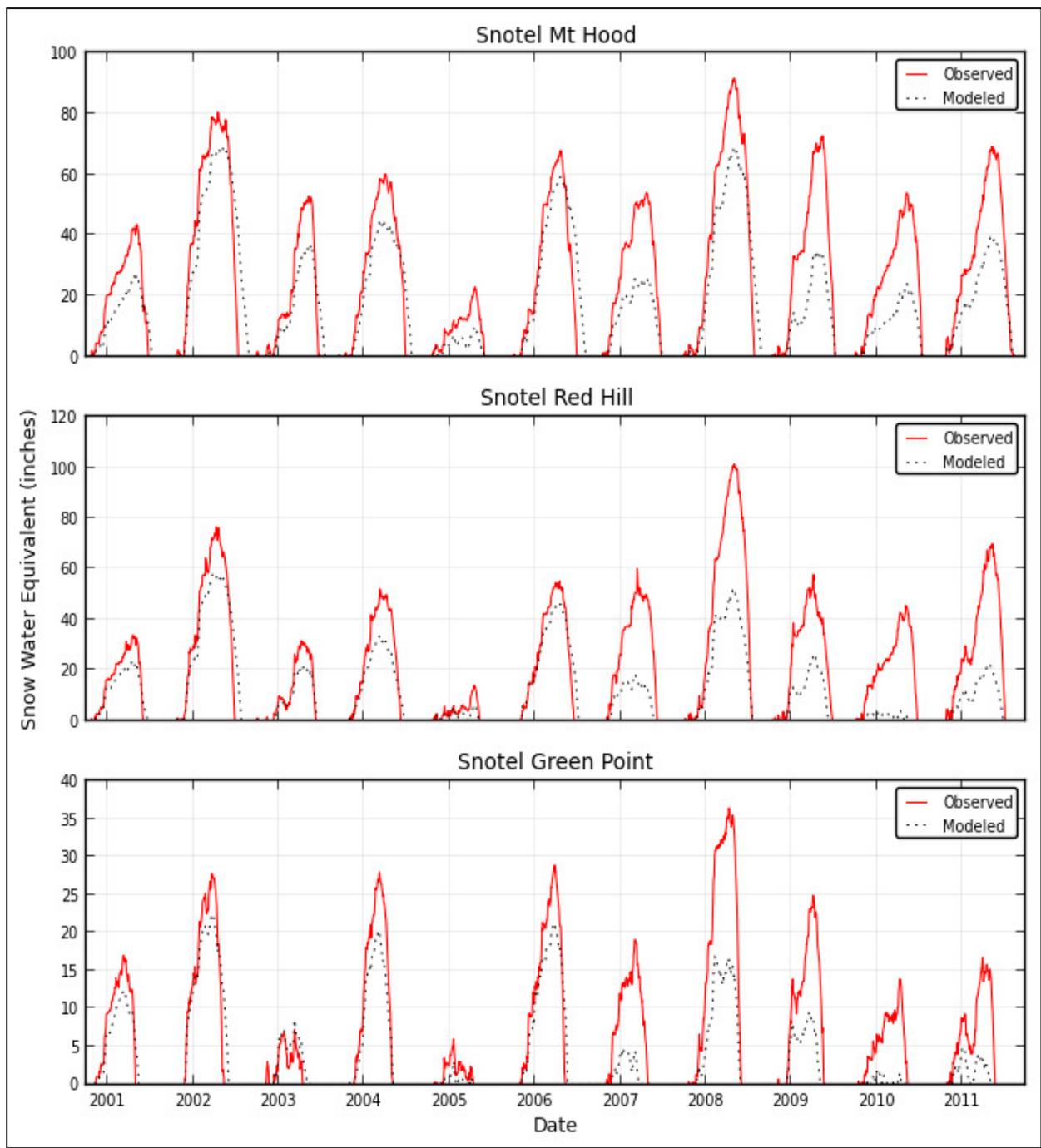
1. A draft model design document was sent to the USGS for comment in early February. Comments from the USGS were incorporated in the draft and it will be sent to the groundwater sub-group before the March 6 meeting. Concurrently, a doodle poll will be sent to the sub-group to coordinate a webinar where the contents of the design document will be shared. The groundwater sub-group will have the opportunity to comment on design document during the webinar.
2. Calculations of some of the water budget components were completed for the draft model design document. The remaining components require more data or other models to calculate and are currently being developed.
3. The model framework is currently being developed and is being populated with the components of the water budget that are available.

## CLIMATE CHANGE ANALYSIS (RECLAMATION)

1. Glacier mass balance data was sent to Garry Clarke at UBC, and he provided an estimate of glacier bed topology.
2. UW provided an estimate of initial glacier ice thickness based on the bed topology estimate and observed surface topology.
3. The coupled dynamic glacier code was run with this new initial glacier ice thickness. The attached plots (figures 1 and 2) show a similar streamflow and SWE calibration as was produced before implementing the dynamic glacier model.
4. Need to do some additional confirmation that the modeled glacier cover over the 10-year simulation is comparable to observed, and some additional streamflow checks.
5. Need to naturalize observed Tucker Bridge streamflow data for calibration.
6. Reclamation and Niklas are evaluating current model calibration to determine when it will be ready to run climate scenarios. Improving on modeled snow accumulation and melt will result in significant improvement to streamflow simulation.



**Figure 1: Plot of observed and modeled flow on the West Fork Hood River near Dee and the mainstem at Tucker Bridge.**



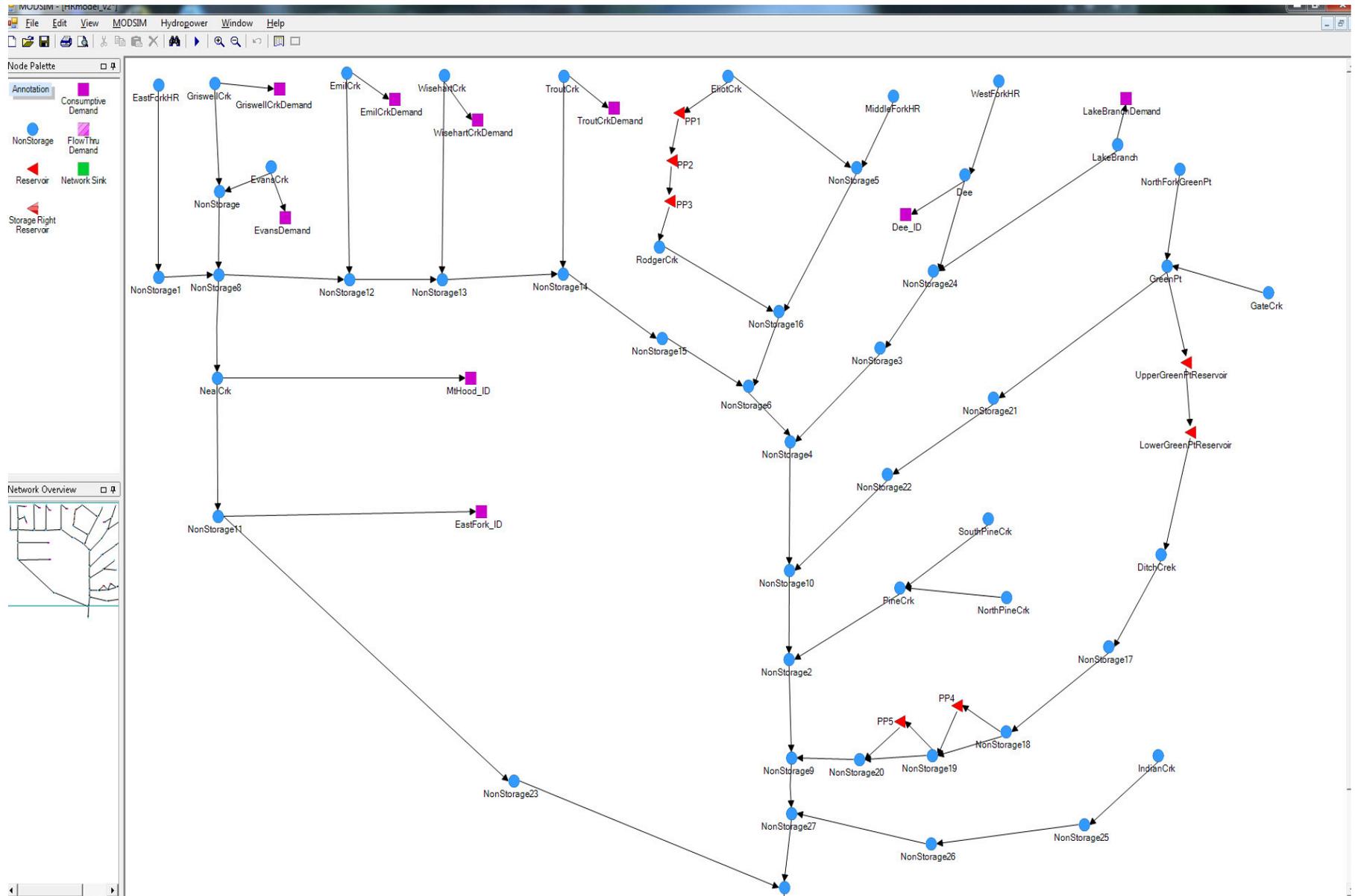
**Figure 2: Plot of Snotel site modeled vs. observed snow water equivalent (SWE) at three locations on Mt. Hood.**

## **WATER STORAGE ASSESSMENT (RECLAMATION)**

A site visit was conducted by Reclamation staff (Geology, Design, others) to consider the feasibility of several sites that have been identified in previous internal HRC meetings. The final trip report with suggested sites was distributed to the internal and external stakeholders in January 2013. Once preliminary DHSVM and Water Resource Model results become available, Reclamation and the HRWPG will discuss target storage volumes to use in the modeling scenarios.

## **RESERVOIR MODELING (RECLAMATION)**

1. The framework of the ModSim reservoir model was constructed in January (meaning all the links and nodes with names etc., were created in an .xy file, but no data had been input yet), but the model framework crashed. Reclamation staff requested assistance from Colorado State developers, but they were unable to recover it. The framework had to be reconstructed and the draft of this framework (work-in-progress) is shown in Figure 3.
2. Water needs data provided to Reclamation was in monthly, annual, and/or summary monthly time steps. These data have been processed into daily flows for input into the ModSim model. The missing years in some of the diversion locations will have to be “filled in.” Discussions with Niklas and others will be held in March to discuss approach.
3. Once the new ModSim framework is completed, the water needs data input process (inputting time series, documenting priority dates, generating unregulated flow, etc) is expected to be completed April or May, which one to two months ahead of schedule (completion originally scheduled for June).



4. **Figure 3: Draft MODSIM Schematic of Hood River Basin System.**

## **IN-STREAM FLOW ASSESSMENT (NORMANDEAU)**

### ***Completed***

1. Completed all hydraulic measurements (all field data collected).
2. Built the PHABSIM (in RHABSIM) hydraulic models for each of the study sites.
3. Tim Hardin and Chris Brun have provided comments on proposed HSC. HSC have been sent out to the Instream Flow Committee for additional comments.

### ***Next Steps***

1. Need streamflow sequences from County/Reclamation to run habitat models. These should be available by end of March.

## **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. Generated summary statistics, sent data to each entity for review.
4. Shared data with Reclamation, continuing to support development of Water Resource model.
5. Currently writing Water Needs Report. Have added most tables, figures, and appendices. Need to add text with other required data (e.g. # of patrons, gps locations, conservation measures, etc).

### ***Next Steps***

1. Finish writing text.
2. Send to entities documented in report for final review.
3. Finalize report and transfer all electronic data to County and Reclamation.

## INTERACTIVE MAP OF HOOD RIVER BASIN (GOOGLE EARTH OR ARC EXPLORER?)

Herrera/WPN was asked by HRC to create an interactive map of the Hood River Basin. The original scope specified ArcExplorer (free version of ArcMap), but since that time we've had issues with ArcExplorer and would like feedback on whether different software may be more appropriate. The map data will be stored on the HRC website where users will be able to access it. See Table 2 below for a comparison between the two; see Figure 4 below for an example screenshot from Google Earth.

Questions to the HRWPG are:

- 1). Does anyone have strong feelings about using either Google Earth or ArcExplorer?
- 2). Has anyone successfully used ArcExplorer?

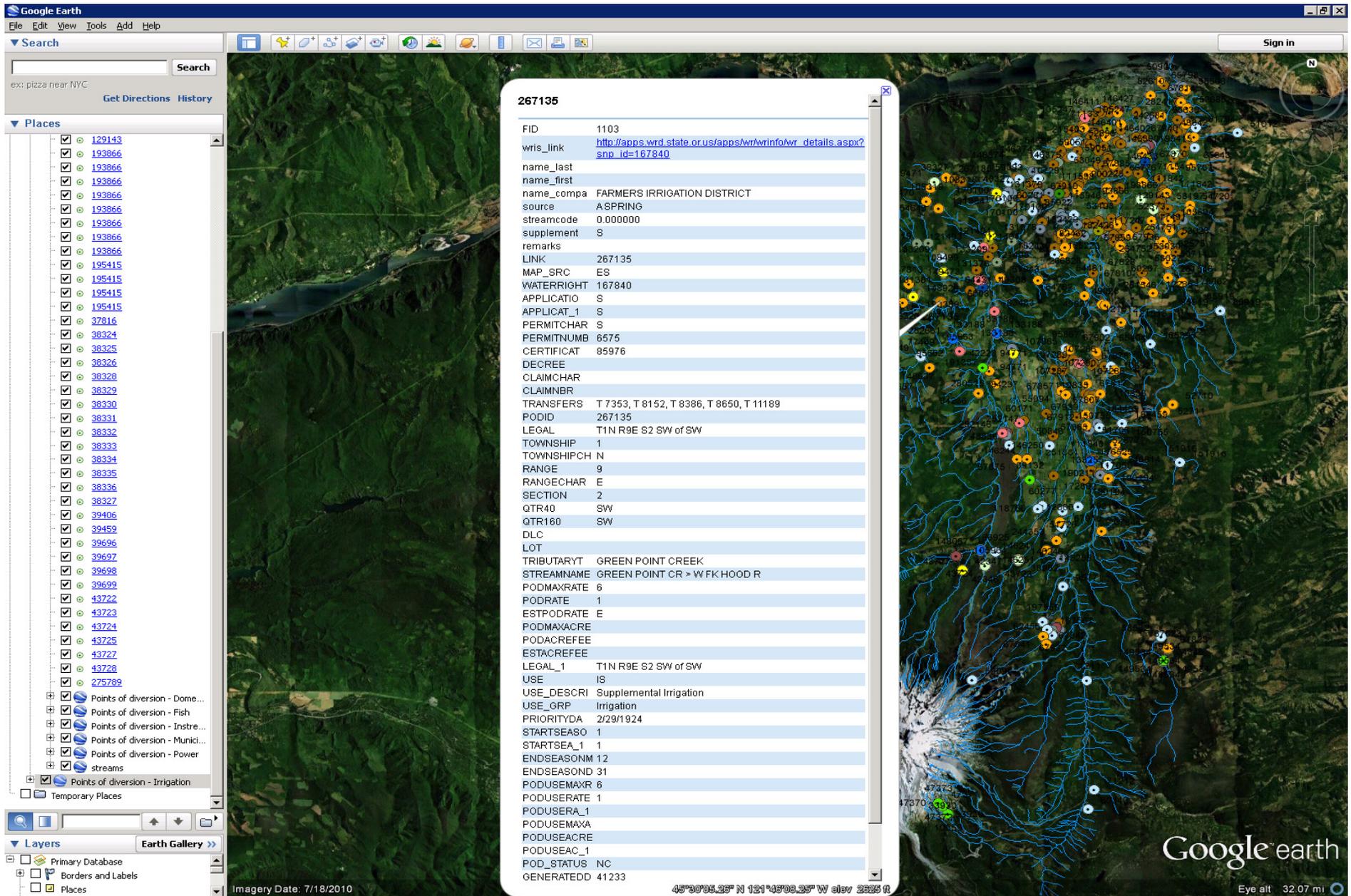
<b>Google Earth</b>	<b>ArcExplorer</b>
<b>Ease of Use</b>	
Requires little mapping experience to use and is intuitive to learn.	ArcExplorer is not as intuitive as Google Earth. Potential difficulty downloading ArcExplorer.
<b>Cost</b>	
Free.	Free.
<b>Analysis Capabilities</b>	
No ability to analyze spatial data.	ArcExplorer has limited capabilities.
<b>Cartographic Capabilities</b>	
Limited ability to produce maps, does not give the user any control in designing the map.	ArcExplorer has limited capabilities.
<b>Support of Different Data Formats</b>	
Only supports kml/kmz files.	ArcExplorer supports kml/kmz, geodatabases, shapefiles, servers.
<b>Ability to Run on Mac Operating Systems</b>	
Yes.	Yes, but requires additional software, like BootCamp or Parallels, which partitions space on the Mac to allow Windows applications like ArcExplorer to be used.

**Table 2. Comparison of Google Earth and ArcExplorer.**

Further information on each software can be found at:

ArcExplorer: <http://www.esri.com/software/arcgis/explorer>

Google Earth: <http://www.google.com/earth/index.html>



**Figure 4: Screenshot of Google Earth mapping software displaying points of diversion for major water users in Hood River County.**

## **WATER CONSERVATION ASSESSMENT (HERRERA/WPN)**

Consultants will begin working on the conservation assessment the second week of March.

## **CROP AND IRRIGATION SYSTEM INVENTORY (HRC/MATTIE)**

### *Completed*

1. Using the survey EFID completed in 2008 which asked customers with greater than 20 acres what irrigation systems they used and the corresponding acreage, Mattie organized a spreadsheet by categorizing the taxlots and the corresponding irrigated acres for each used irrigation system.
2. In late January, Mattie contacted customers with who did not respond to the 2008 survey or did not provide enough information originally.
3. Mattie met with Jer Camarata in early February to discuss her plans for conducting a survey with FID customers as well. He provided contact information for residential users in FID.

### *Next Steps*

1. Of the EFID customers Mattie contacted, 50 percent have responded and Mattie plans on contacting unresponsive customers again in Mid-March. Based on direction given by Niklas, Mattie will also ask these remaining customers what water scheduling technology, if any, they use.
2. Contact FIDs residential water users in mid-March. Fortunately, Mattie will not have to contact every individual customer. In FID there are 32 water user groups that represent the 2500 plus acres of residential customers, so Mattie will contact the president of each user group. Prior to contacting the user groups, Mattie will prepare a survey for the user groups and give to Jer for review and to add any additional questions he may want on the survey.
3. Contact Jordan Kim and Carly Heron for irrigation system information on farmers and orchardists who participated in EQUIP.

## **GROUNDWATER MONITORING PROGRAM (HRC/MATTIE)**

### *Completed*

1. Mattie presented at the January HRWG meeting announcing the groundwater monitoring network and solicited interest from well owners in the audience to participate.
2. On February 14<sup>th</sup> an article written by Hugh McMahan was published in the Hood River News which highlighted the groundwater monitoring program and reasons why a well owner should participate. Three well owners contacted Mattie to participate in the monitoring program in response to Hugh's article.
3. In late January, Mattie prepared a draft letter which was reviewed by the WPG and sent out on February 15<sup>th</sup>. As of February 27<sup>th</sup>, 20 Well Owners have contacted Mattie to participate in response to the letter. Only one well owner contacted Mattie declining to participate and they did not give any specific reason.

### *Next Steps*

1. During the week of March 5<sup>th</sup>, Mattie will be meeting with well owners and collecting information that will help Bob Wood and Marc Norton select 20 wells to add to OWRD monitoring network. The information Mattie will collect includes: pictures of the well, GPS point, pump information, and any accessibility issues (e.g. dogs, locked gate, etc.).
2. Mattie will measure groundwater levels of selected wells on March 15<sup>th</sup> with Bob and Marc.
3. Mattie will begin preparing report detailing the steps required to establish a more expansive monitoring network. The report will investigate the feasibility of a volunteer monitoring network compared to a monitoring network with trained dedicated staff. The report will also examine the possibility of including water quality sampling into the monitoring program by investigating funding options, local equipment and lab options, and different water quality parameters that would be useful to measure.
4. As part of the monitoring program, Mattie would also like develop an Excel database listing all the well log information for each well in Hood River County. Mattie would also like to make a geodatabase for all the wells which will have updated locations of the wells from participating landowners.

**BUDGET FOR OWRD HOLDBACK FUNDS (10% OF OVERALL OWRD BUDGET)**

The OWRD grant requires the State to hold back 10% of the grant (\$25K) until such time that the WPG completes its final report; therefore the County did not obligate that \$25K because we would likely be reimbursed in the next fiscal year and therefore it could not be applied to this fiscal year’s expenditures.

Although the original OWRD grant agreement stipulates that all OWRD funds must be spent by June 30, 2013, OWRD told us this week that we can apply to spend the final 10% after June 30, 2013. OWRD is potentially open to this because Reclamation’s study goes 10 months past OWRD’s. This last \$25K equals the OWRD funds that are yet to be allocated. The County has given permission for Mike to include the \$25K in next fiscal year’s budget despite some risk associated with expending dollars on Mattie and Niklas that would not be reimbursed if we did not get our final report done in time for some reason.

The table below is a potential budget prepared by Mattie and Mike for how to spend that last \$25k. These are essentially hours for Mattie to continue with OWRD grant administration and the groundwater monitoring program, as well as hours for Niklas to continue to work with Reclamation as they develop water resource model scenarios and perform their analysis.

Task	Budget
<b>Continue to Administer Groundwater Monitoring Network:</b> The Water Planning Technician will continue to organize the volunteer groundwater monitoring network and database that were initiated as part of the groundwater portion of the Water Planning Study. This information will be used in the GW model developed by BOR.	\$3,861
<b>OWRD Final Report:</b> The Technician and Project Manager will prepare the final grant report which will include detailed accounting and results from the BOR Basin Study.	\$9,925
<b>Facilitate and Solicit Input from the Water Planning Group:</b> The Technician will coordinate monthly meetings to discuss the BOR’s progress with the study. The Project Manager will lead these meetings and solicit and facilitate input from the WPG to pass on the BOR and incorporate into the Basin Study.	\$2,500
<b>Public Outreach:</b> The Technician will coordinate presentations for the local government, irrigation districts, soil and water conservation group, tribes, and other stakeholders. The Project Manager will give the presentations.	\$2,500
<b>WPG Administration:</b> The Technician will prepare meeting minutes for monthly meetings held, provide updates of the OWRD study and BOR study on the County’s website, and correspond with WPG members and stakeholders for any input given outside of presentations and meetings.	\$1,287
<b>Correspondence with the BOR:</b> The Technician and Project Manager will attend bi-monthly conference calls with the BOR for updates on their progress with the Water Resource model.	\$1,287
<b>Assist BOR with the Basin Water Resource Model:</b> The Project Manager will assist the BOR with developing the Water Resource model of the Basin. This includes ensuring that local government, irrigation districts, tribes, and other stakeholders have an input into the scenarios being analyzed.	\$3,032

**Total:** \$25,000

Question to the HRWPG is:

Applying to spend the money after June 30 does not lock it into any particular scope. Nonetheless, when applying to OWRD we should identify particular scope items. The table above is a recommendation prepared by Mike and Mattie. Other potential items include the possibility of funding Rachel Reagan for a bull trout temperature study. What, if anything, does the HRWPG want to spend the remaining funds on?

## **OTHER?**

- *Questions*
- *Concerns*
- *Comments*