Peer Review Summary Document

(08/23/2012)

Peer Review Plan

http://www.usgs.gov/peer_review/docs/klamath_off_project_datasets.pdf [56 KB PDF].

Title and Authorship of Information Product Disseminated

Hydrological Information Products for the Off-Project Water Program of the Klamath Basin Restoration Agreement, By Daniel T. Snyder.

Peer Reviewers' Expertise and Credentials

Peer Reviewer #1: Research Hydrologist in the U.S. Geological Survey (USGS) Oregon Water Science Center since 1990. Over 27 years of professional experience as a hydrologist and geologist. Holds a BS in Geology from Oregon State University and an MS in Geology from Portland State University. Areas of expertise include quantitative characterization and numerical simulation of regional-scale groundwater flow systems, quantification of groundwater and surface-water interactions, understanding the hydrologic response to climate change, and application of inverse modeling techniques. The Reviewer, who has extensive experience in the Klamath Basin, has conducted several basin-scale studies characterizing and modeling the regional groundwater system including for the upper Klamath Basin in Oregon and California which encompasses the area of the subject report.

Peer Reviewer #2: Hydrologist in the Oregon Water Resources Department (OWRD) South Central Regional Office since 1998. Over 14 years of professional experience as a hydrologist and licensed engineer. Holds a BS in Mechanical Engineering from Oregon State University and an MS in Engineering, with an emphasis in surface-water hydrology from the University of Washington. Areas of expertise include surface-water hydrology and quantification of streamflow. Reviewer has conducted numerous studies characterizing surface-water quantity including the analysis of streamflow and demands for the adjudication of water rights in the upper Klamath Basin in Oregon which encompasses the area of the subject information product.

Charge Submitted to Peer Reviewers

The reviewers were asked to make an objective evaluation of the research.

Summary of Peer Reviewers Comments

Reviewer #1 Summary

Reviewer #1's comments were strictly editorial, and the suggestions were incorporated.

Reviewer #2 Summary

Reviewer #2 reviewed the report twice. The second time after the authors addressed his concerns about the first draft of the manuscript. The following reflects Reviewer #2's comments from the first version and the follow-up version after authors' revisions.

1. Reviewer #2 noted that, based on his experience in the basin, streamflow statistics derived from historic record for many of the streams in the basin were unrealistic. The investigators re-ran the analysis and restricted the results to annual statistics using the complete basin area above the "pour point" (measurement point) along the stream. Also, some values of the streamflow statistics had substantial uncertainty, so the investigators provided 90-percent confidence intervals for the predictions, which did fall within the confidence intervals. The authors added text to caution the reader about the limitations in the analysis and added several paragraphs about the cause of the regression equation uncertainty, i.e., extensive groundwater contribution and few streamflow gaging stations to measure it.

2. After viewing the new predictions based on annual statistics, Reviewer #2 stated:

“I found the new annual based estimates exceedance estimates near the mouths of Sprague and Williamson Rivers to be plausible. However, many of the estimates at a smaller scale and in other groundwater dominated regions of the basin are less plausible. Specifically, I believe that streamflow exceedance estimates from the upper Sprague and Wood River are moderately to grossly underestimated, while streamflow statistics from the Sycan and Williamson River below Klamath Marsh are overestimated. For the upper Sprague and Wood River, the underestimation is probably due to difficulties in predicting groundwater dominated streamflow using regional regression analysis as I mentioned in my first review. For the Sycan River and upper Williamson River below their respective marshes, I believe the overestimated streamflow statistics is due to the difficulties in accounting for the effects of the marshes. Does the USGS analysis treat these marshes as natural areas or as irrigated lands, and how was the historical gage data modified to account for anthropogenic effects on the hydrology? The report does not provide details as to the consumptive use corrections to the gage data used in these or other areas.”

Author Response to:

“*Does the USGS analysis treat these marshes as natural areas or as irrigated lands, and how was the historical gage data modified to account for anthropogenic effects on the hydrology?*”: The adjustments made for consumptive use in the Sycan River and the upper Williamson River which were used in the regression equations from Risley and others (2008) were based on Oregon Water Resources Department procedures and data from Cooper (2002). The procedure is also described in Risley and others (2008, page 10). As described on pages 42-45 in Cooper (2002) the consumptive use was based on estimated actual crop consumptive use in each 8-digit Hydrologic Unit Code. Thus, I would assume that most of the upper Williamson and Sycan Marshes were not included in these estimates. Only areas of the marshes under crop consumptive use would have been included.

Author Response to:

“*The report does not provide details as to the consumptive use corrections to the gage data used in these or other areas*” A few sentences have been added to the text that reference the procedure for the consumptive use adjustment procedures described in Cooper (2002) and Risley and others (2008, page 10).

3. Reviewer # 2 stated:

For the Klamath Marsh, streamflow in the Williamson River ceases during the summer at the marsh outlet; yet the predicted 95 percent and low flow estimates are in the hundreds of

cubic feet per second. Unless the marsh is treated as irrigated lands that can be turned off (which is unlikely), I don't see the hydrologic mechanism by which these low flow statistics could be that high. Spring Creek flows are underestimated by about 250-300 cfs, again it's primarily groundwater discharge, which is difficult to capture with regional regression analysis. This may also be the cause of the overestimated Williamson River streamflow below Klamath Marsh.

Author Response:

Overestimation at the Williamson River (gage 11493500) is mostly due to regression model error (result of the lack of unregulated streamflow stations needed to create the equations). A portion of the overestimation would be due to the consumptive use adjustments. However, Cooper's (2002) historical estimates for Williamson River at 11493500 are all above the lower prediction intervals for the seven streamflow statistics if consumptive use adjustments are added to the estimates.

4. Reviewer #2:

I understand that the project scope only entails compiling existing "base-level" data sets, with minimal follow–up data interpretation or analysis. However, I think by excluding some interpretation or modification of the estimates in the context of the hydrologic setting or analysis from other studies limits the usefulness of the underlying data sets. Also, including the stream name and location in the GIS theme layer attributes would greatly improve ease of use for the dataset.

Author Response:

Pour point latitude/longitude coordinates have been added to all 72 subbasins in the GIS theme layer. The user will now be able to easily locate the subbasin with a browser: http://or.water.usgs.gov/map_browser.html.

References for citations above:

Cooper, R.M., 2002, Determining surface-water availability in Oregon: Oregon Water Resources Department Open-File Report SW 02-002, 157 p., accessed August 6, 2012 at http://www.oregon.gov/owrd/sw/docs/sw02-002.pdf.

Risley, J.R., Stonewall, Adam, and Haluska, T.L., 2008, Estimating flow-duration and low-flow frequency statistics for unregulated streams in Oregon: U.S. Geological Survey Scientific Investigations Report 2008–5126, 22 p. (Also available at: http://pubs.usgs.gov/sir/2008/5126.)

Dissemination

The published information product will be released in a USGS publication series and will be available at http://pubs.usgs.gov/.