Peer Review Summary Document

(6/20/2011)

Peer Review Plan

https://www.usgs.gov/atom/73893 [83.3 KB PDF].

Title and Authorship of Information Product Disseminated

Modeling Hydrodynamics, Water Temperature, and Water Quality in the Klamath River Upstream of Keno Dam, Oregon, 2006–09, by Annett B. Sullivan and Stewart A. Rounds.

Peer Reviewers Expertise and Credentials

Peer Reviewer #1 – PhD in Civil Engineering. Associate Professor of Civil and Environmental Engineering. Areas of interest include water quality and eutrophication modeling, wastewater treatment plant modeling, greenhouse gas emission estimation, tracer methods to measure the mixing and flushing of surface water bodies, environmental fluid dynamics, and predicting harmful algal blooms.

Peer Reviewer #2 – PhD in Civil and Environmental Engineering. Professor of Civil and Environmental Engineering. Area of expertise is in the modeling of surface water bodies, such as reservoirs, lakes and riverine systems for both hydrodynamics and water quality.

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 stated that data collection, model development, and model calibration, sensitivity, and scenario analysis for this model demonstrate that the model is suitable for use as part of the TMDL determination for the reach of Link and Klamath Rivers above Keno Dam and below Upper Klamath Lake. The reviewer had several suggestions for presentation of results, some of which were adopted by the authors. The reviewer had the following technical questions/suggestions:

- N/P ratios seem high. Authors responded that the measure ratios in the Klamath River are correct and that such ratios are expected for systems like the Klamath River.
- Denitrification rates are high. Authors pointed out that the values are similar to those used in other, similar studies and that the degree of anoxia in the Klamath River facilitates denitrification.
- Need additional goodness of fit measures. They were added.

Reviewer #2 Summary

Reviewer #2 stated that the model error statistics were good. The reviewer had several suggestions for improving presentation and clarity. Most of the reviewer's suggestions were incorporated. The reviewer had the following major technical concerns/comments:

- Considering that the model treats 100% of distributed tributaries as surface water, how was groundwater simulated? Authors responded that groundwater was modeled as a distributed tributary. Groundwater flow has been determined to be a minor component of total flow in this reach.

- Why were the Klamath Falls and South Suburban WWTP discharges set to 5% labile dissolved organic matter (LDOM) year-round? This seems very low for a WWTP discharge that would primarily be bacterial biomass. Also, a 95% refractory DOM for the Klamath Straits Drain seems high. Authors increased LDOM at both plants on the basis of the reviewer's comment, and responded that the 95% RDOM was based on 30-day BOD analyses.

- Light Extinction: Reviewer suggested a beta of 0.45 instead of 0.80. Also, the reviewer considered the value of the light extinction coefficient, 1.217 m^{-1}, to be too high and suggested comparing Secchi disk data to simulated light extinction. The authors did change beta to the suggested value, but saw little to no change from that adjustment. The authors noted that comparison of Secchi disk data to simulated light extinction in general indicated that the 1.217 m^{-1} value was valid.

- Mortality rate (AM) for diatoms and blue-green algae seems very high. Light extinction coefficient (ASAT) seems low. Authors responded that the AM rate was a typo which was corrected, and that ASAT was considered reasonable given the highly colored water (from dissolved organics) in the Keno Reach.

Dissemination

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