

Peer Review Plan

Klamath River Revised Natural Flow Study

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Originating Office: Bureau of Reclamation, Technical Service Center, Denver Federal Center, 6th and Kipling, Building 67, Denver, Colorado 80225-0007

Reclamation Contacts:

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Subject and Purpose:

The purpose of this project is to leverage current science, methods, and tools to develop new naturalized streamflow estimates for the Klamath River basin. Naturalized streamflow is defined as the streamflow that would have occurred in the absence of agricultural and other development (roads, railroads, municipalities, etc.) and water management. Estimates for this project are being developed using the historical period October 1980 through September 2020. The project consists of three phases, corresponding with geographic regions within the basin (Figure 1). Analyses and findings from the project are likely to inform future planning in the Klamath River basin. The Bureau of Reclamation (Reclamation) Technical Service Center (TSC), in collaboration with the Klamath Basin Area Office (KBAO), other federal agencies and stakeholders, have developed a scope of work (SOW) to estimate naturalized streamflow at several locations throughout the basin. The naturalized streamflow estimates dataset and documentation will be peer reviewed to ensure quality, transparency and agreement on scientific approaches used.

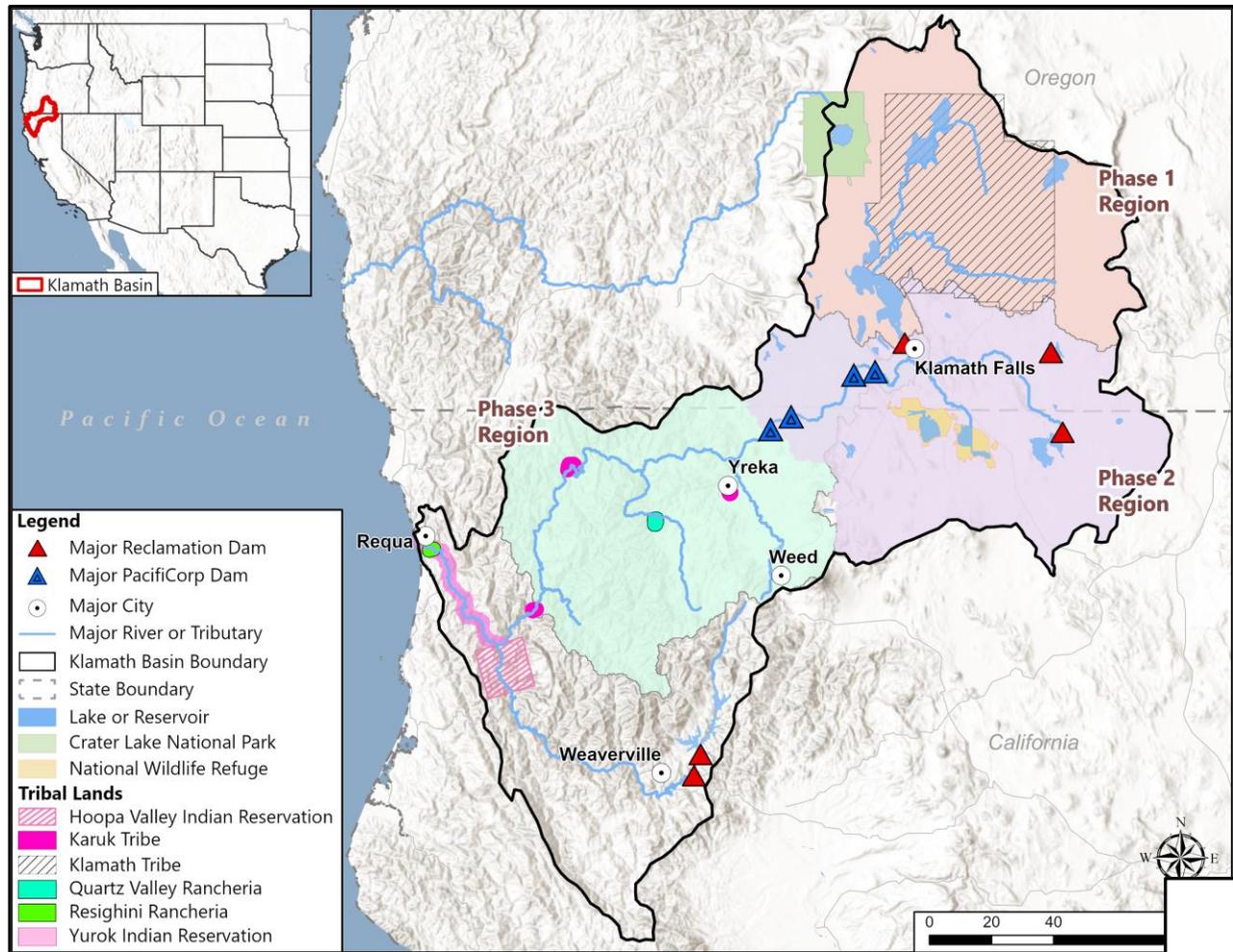


Figure 1. Three geographic phases of the Klamath River Natural Flow Study Project.

Impact of Dissemination:

The Klamath River Revised Natural Flow Study (Study) will be comprised of Scientific Information (SI) in the form of new data, models, and tools. Further, the Study will result in a scientific assessment (SA), where novel and state-of-science methods, tools, and analysis will be applied across numerous scientific areas (e.g. surface hydrology, groundwater modeling, river hydraulics, consumptive use estimation, water operations modeling) and synthesized in development of daily timestep natural streamflow estimates. This effort is not a routine implementation of known methods. The project team is not aware of previous or existing approaches that involve so many complex processes and where information is developed at this spatial and temporal scale.

In addition to the work resulting in an SA, natural streamflow estimates in the Klamath River basin have significant interagency interest with respect to Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, several native Tribes, Oregon Water Resources Department, and California Department of Water Resources, among potentially others. Additionally, this project involves several local and regional stakeholders, as part of the Klamath River Basin “Hydro Team”, which contributes to Klamath River basin Endangered Species Act (ESA) Section 7 consultation efforts and also has provided feedback on the scope of work for this project. This

effort may serve to inform future ESA Section 7 consultations, in addition to future studies of habitat suitability. Further, previous naturalized streamflow estimates in the Klamath River Basin have been highly scrutinized and reviewed by the National Research Council (National Academy of Sciences, 2008).

In summary, based on broad interest, the controversial nature of this topic, and the novel approaches being developed and synthesized in development of an SA resulting in daily timestep natural streamflow at multiple locations, this effort is thought to meet the definition of a highly influential scientific assessment (HISA) requiring peer review, as defined by the Reclamation Manual Peer Review of Scientific Information and Assessments Policy ([CMP P14](#)).

Peer Review Scope:

Because the study results are HISA, each of the three phases of work will require an external review (non-Reclamation staff) from subject matter experts in each of the six numerical modeling components. A complementary internal review will occur prior to each external review.

1. surface water hydrology,
2. groundwater hydrology,
3. surface water evaporation (reservoir evaporation),
4. evapotranspiration,
5. surface water hydraulics, and
6. water operations modeling.

Due to physically connecting existing numerical models and physical site characteristics, some modeling components included multiple phases. In this instance, one technical memorandum will summarize the modeling methodology, results, and conclusions. This study will produce eleven (11) technical memorandums. The first ten products will each produce a separate numerical modeling package (including input data, model parameters, and results):

1. Phase 1 Surface Hydrology Modeling and Analysis
2. Phases 2 & 3 Surface Hydrology Modeling and Analysis
3. Phases 1 & 2 Hydraulics Modeling and Analysis
4. Phases 1, 2 & 3 Evapotranspiration Modeling and Analysis
5. Phases 1, 2 & 3 Reservoir and Lake Evaporation Modeling and Analysis
6. Phases 1 & 2 Groundwater Modeling and Analysis
7. Phases 1 & 2 Riverware Water Operations Modeling and Analysis
8. Phase 3 Hydraulics Modeling and Analysis
9. Phase 3 Groundwater Modeling and Analysis
10. Phase 3 Riverware Water Operations Modeling and Analysis
11. Comprehensive Report including all phases and modeling efforts.

The independent external reviewers will be tasked with reviewing each technical memorandum including input data, model calibration methodology and results, final model parameters, model output files and any post-modeling analysis. Of particular interest are the assumptions made to simulate natural flow conditions in the early 1900s before the Klamath Irrigation Project was constructed, which necessitates the removal of post-project infrastructure (roads, drains, irrigation infrastructure, levees, etc.) from current data and models. Reviewers will be asked to provide comments solely on the SI being reviewed, and not on any agency decision or policy. Once the external peer reviews are complete, the document will be finalized. Local stakeholders and other

federal agencies will have the opportunity to comment on the study during periodic update meetings. Comments from stakeholders will not be accepted during the peer review and finalization process. Lastly, a draft comprehensive final report will summarize the findings of all six modeling components along with natural flow estimates. This document will undergo a rigorous external review by one or more independent (non-Reclamation) experts. Again, the review will focus on scientific integrity rather than agency decision or policy.

Peer review reports for each of the eleven documents listed above will be available on the U.S. Bureau of Reclamation Peer Review Agenda public website (<https://www.usbr.gov/main/qoi/peeragenda.html>) upon completion. These reports will include the peer review plan, peer reviewers' names, findings, and Reclamation's response.

Timing of Review:

SI from three project phases is expected to be externally reviewed. Phases generally correspond with geographic regions within the Klamath River basin; however, due to the use of existing models whose geographic domains do not necessarily correspond with the defined geographic regions, the terminology "phase" is used to distinguish these individual efforts. This information will be conveyed in detail to reviewers prior to their reviews. Individual external reviews will be conducted for each technical memorandum or model listed above. The anticipated review periods for each technical memorandum and model are 30 business days. TSC then has 30 business days to respond to review comments and discuss revisions with the external peer reviewer. Reports will be finalized upon completion of the external review.

Methodology of Review:

Review will be conducted by individuals who are subject matter experts in each field. The identities of the reviewers will be disclosed in the final Peer Review Report. Review findings/comments will be attributed to the individual TSC technical team or technical contact for each subject (listed below). However, the following general questions that will be asked for all disciplines:

1. Is the purpose of the work clear?
2. Are the products compelling, useful, reproduceable and relevant to stakeholders and decision makers?
3. Is the approach well-designed, executed, explained, and transparent?
4. Are the data and information appropriately cited?
5. Are the assumptions and limitations explicit and justified?
6. Is the documentation accurate, understandable, clearly structured, and neutral in tone?

The project team will conduct an orientation for the roster of reviewers across the review components to convey common goals and objectives for peer review to encourage consistency in the review processes. Review findings/comments and TSC responses will be summarized upon completion of each phase. In addition to external peer reviewers, the Klamath Basin Hydro Team will also have a defined period to comment on each phase of work. This schedule is yet to be determined and is dependent on the study schedule and Hydro Team availability. These comment periods will likely occur after external peer review and will not be available for the peer review team. The peer review process will not provide opportunities for public participation.

TSC Technical Contacts

- Surface Water Hydrology – Kristin Mikkelson, kmikkelson@usbr.gov, 303-445-3647
- Groundwater Hydrology – Ian Ferguson, iferguson@usbr.gov, 303-445-2513
- Surface Water Evaporation – Kristin Mikkelson, kmikkelson @usbr.gov, 303-445-2551
- Evapotranspiration – Mark Spears, jspears@usbr.gov, 303-445-2551
- Surface Water Hydraulics – Colin Byrne, cbyrne@usbr.gov, 303-445-2260
- Water Operations Modeling – Marketa McGuire, mmcguire@usbr.gov, 303-445-2455

Number of Peer Reviewers:

It is anticipated that 6-8 total peer reviewers will be utilized. Ideally, the same numerical modeling peer reviewer will be utilized for each of the three phases for all six subjects. However, prioritization will be given to subject matter experts who are knowledgeable of the basin and the tools being applied, and who are independent of the work being performed. Therefore, some reviewers may only be available for certain phases or may not qualify as independent from a particular project phase. Other reviewers may be required for the remaining phases.

Reviewer Selection Process:

The numerical model peer reviewers will have sufficient experience and expertise in one of these relevant topics: surface water hydrology, groundwater hydrology, surface water evaporation, evapotranspiration, surface water hydraulics, or water operations modeling. Peer reviewers will have education, professional experience, and peer recognition in their field, and will have contributed to advancing their field. Furthermore, the numerical modeling and the comprehensive final report reviewers should have a general understanding of the Klamath River basin geography, geology, water operations, and current water issues is preferred. Reclamation's TSC and KBAO are responsible for assembling the peer review team. The names and affiliations of the reviewers will be provided in the Peer Review Reports when published.

Delivery of findings:

The numerical modeling peer review team members will each digitally submit a report of their findings to his/her technical point of contact by the end of the review period via upload to the Microsoft Teams Project Folder. The technical lead will do the same for the comprehensive report reviews. At a minimum, these reports will include a brief description of findings and recommendations in a comment matrix. Reclamation would prefer the draft report with track changes and comments from the reviewer. The format will be communicated to each peer reviewer by the TSC technical contact. The report will be provided digitally to the TSC Technical Contact, TSC Technical Lead, as well as TSC & KBAO Project Managers.

Response to Peer Review:

At the conclusion of publishing each of the 11 products, the TSC Project Manager will submit a Peer Review Report to Reclamation's peer review agenda website (<http://www.usbr.gov/main/qoi/peeragenda.html>), which will summarize the findings of the peer reviewers to include comments, Reclamation's responses, actions the agency will undertake, and

the reasons the agency believes those actions will satisfy any key concerns or recommendations.

Federal Register Notice:

This peer review is not subject to the Federal Advisory Committee Act (FACA) because the review does not involve open meetings or committee chartering and reviewers are being asked to provide individual reviews on the subject matter. Reclamation is not seeking consensus advice from the reviewers as a group.