Peer Review Plan

Evaluating Water Temperature Modeling and Prediction in the Sacramento River Basin

Date:
January 23, 2025

Originating office:
Bureau of Reclamation, California – Great Basin Region, CVO-400

Reclamation roles:
Levi Johnson, Area Manager, Central Valley Operations Office, Project Sponsor

Peer Review Lead:
Technical Lead - Randi Field, Hydrologic Engineer, California – Great Basin Region, Bureau of Reclamation

Subject and Purpose:
Reclamation has undertaken a project for evaluating meteorological datasets development used in water temperature modeling predictions. A project objective is identifying areas which can potentially improve capabilities for stream temperature management in California's Sacramento River basin. Management of water resources in California requires modeling and prediction of water resources systems and associated environmental conditions. External partner agencies have increasingly expressed interest in the details of Reclamation's modeling in recent Biological Opinions and other documentation. Improving Reclamation's ability to communicate data, assumptions, data uncertainty and risk in warm, dry conditions through modeling will become more important in the future. It is imperative that Reclamation be able to offer clear assessments of its modeling capabilities and demonstrate strategic efforts to improve internal modeling processes.

Reclamation's Central Valley Operations (CVO) is a partner in the joint management of the Sacramento - San Joaquin River systems, which includes Shasta Lake and Dam. Reclamation operates Shasta Dam for multiple objectives, including regulating water temperature in the upper sixty river miles below Keswick Dam. Keswick Dam is the regulating reservoir which impounds water below Shasta Dam. The Temperature Control Device (TCD) structure at Shasta Dam enables control over the depths from which water releases are taken for meeting required temperature targets downstream for fishery purposes. Selective withdrawal release decisions are guided in part by downstream water temperature forecasts (up to eight months lead time). Water temperature forecasts are based on reservoir and stream temperature models which use climate projections from the National Oceanic and Atmospheric Administration (NOAA) Climate Prediction Center (CPC) coupled with historical meteorological datasets. Evaluating and improving forecasts is essential for developing an appropriate estimation of water temperature exceedance risk and mitigation of mortality of at-risk fish populations downriver of Shasta Dam. As an example, forecasts biased towards lower temperatures can underestimate the releases needed to compensate for warmer than expected conditions and risk exhaustion of cold-water pool resources, incurring temperature/fishery impacts. On the other hand, forecasts biased towards higher temperatures could mean cold water pool resources would be over-exploited, also causing fish egg mortality that could have been avoided. There is an urgent need for greater clarity and community understanding of the quality and skill of such projections, as well as new steps to begin to improve the models,

methods and datasets Reclamation applies to this management challenge.

Impact of Dissemination:

Under Reclamation policy CMP P14 Peer Review of Scientific Information and Assessments in fulfillment of the Final Information Quality Bulletin for Peer Review (70 FR 2664-2677) and implementation of the Information Quality Act (Pub. L. 106-554) the science informing Evaluating Water Temperature Modeling and Prediction in the Sacramento River Basin is determined to be Influential Scientific Information (ISI). Confidence or quality of water temperature modeling has been the past subjects of public debate, Biological Opinions, and litigation. A Peer Review Panel (PRP) will evaluate the methodology of developing meteorological inputs used in water temperature models which inform seasonal temperature management plans for the Sacramento River below Keswick Dam.

Peer Review Scope:

Meteorologic dataset development and its application to water temperature modeling are the subjects of this peer review. Peer reviewers will be asked to provide responses relative to the following questions:

1. Is the design and methodology used to generate meteorological forecasts reasonable and appropriate for the intended application of seasonal water temperature management planning?
2. Are available data sufficient for forecast development?
3. Does the documentation include adequate information for replication and translation to other river basins?

Reviewers are to provide comment solely on the scientific information being reviewed, and not on any agency decision or policy.

Timing of Review:

The peer review meeting is anticipated to be held in February 2025.

Methodology of Review:

Review will be conducted by a peer review panel of up to two individuals. The identities of the reviewers will be disclosed in the final Peer Review Report which will include peer review findings/comments.

Number of Peer Reviewers:

It is anticipated that two peer reviewers will be utilized as part of a peer review panel. The peer review panel members should have familiarity with seasonal meteorological translation, assessment of prediction skill and forecast performance, and familiarity with water temperature modeling.

Reviewer Selection Process:

Project leads will solicit individuals who have proficiency in the topic area to serve as peer reviewers. The peer reviewer panel members will have expertise in meteorology, hydrology, and water temperature modeling. Peer reviewers will have education, professional experience, peer recognition in their field, and will have contributed to their field of practice. The public will not be asked to nominate reviewers.

Delivery of findings:

The PRP will provide a consolidated report of the peer review panel's findings within 60 days after the completion of the peer review. At a minimum, the report will include a description of the peer review process, subject being reviewed, address questions asked in the peer review panel charge, findings, and recommendations of any of individual peer reviewers. The report will be provided digitally and as a hardcopy to Reclamation.

Response to Peer Review:

At the conclusion of receiving the PRP reports peer review, the Peer Review Lead will submit a final Peer Review Report to Reclamation's peer review website (http://www.usbr.gov/main/qoi/peeragenda.html), which will summarize the findings of the peer review, as well as Reclamation's response to the comment, actions the agency will undertake regarding the comment, and reasons the agency believes those actions will satisfy any key concerns or recommendations.

Federal Register Notice:

Federal Register notices will not be provided announcing the formation of a peer review team and completion of the final report.

Applicability of the Federal Advisory Committee Act (FACA):

This peer review is not subject to the Federal Advisory Committee Act (FACA) because the review does not involve open meetings or committee chartering. Reclamation is not seeking consensus advice from the reviewers as a group.

Agency contact:

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