

Peer Review Plan

Operational Reservoir Evaporation Estimates for Reclamation Reservoirs

Date:

March 3, 2026

Originating office:

Applied Hydrology Group 2, Technical Service Center, Bureau of Reclamation, Denver, CO, 80225

Reclamation roles:

Peer Review Coordinator: Kathleen Holman, Technical Service Center

Lead of scientific information: Kathleen Holman, Technical Service Center

Subject and Purpose:

With funding from the Bureau of Reclamation's (Reclamation) Research and Development (R&D) Office, Upper Colorado Basin Regional Office, and Oklahoma Texas Area Office, team members from the Technical Service Center (TSC) and Desert Research Institute (DRI) have developed a dataset of historical and near-real time estimates of daily reservoir evaporation rates and volumes at 247 Reclamation reservoirs. Estimates of evaporation rate are based on the Daily Lake Evaporation Model (DLEM; Zhao et al. 2024) forced with adjusted gridMET data (Abatzoglou 2013) and the Real-Time Mesoscale Analysis (RTMA) dataset (De Ponca et al. 2011) with a period of record that spans from January 1, 1980, to near-present (a three-day lag). Access to the dataset is possible through a DRI-hosted Google Earth Engine application page (<https://dri-apps.earthengine.app/view/bor-reservoir-evaporation>), with instructions for API access and retrieval available online (<https://docs.openwaterevap.net/>). The purpose of the dataset, the first of its kind, is to support Reclamation's mission of managing, developing, and protecting water resources in the West.

Impact of Dissemination:

Dissemination of the reservoir evaporation dataset and accompanying technical memorandum will have several important impacts. First, the dataset provides quantitative information on evaporation losses (rates and volumes) from 247 reservoirs, data that directly support water balance assessments, storage forecasting, and operational decision-making across Reclamation. Resource managers will be able to incorporate updated evaporation estimates into reservoir management models, improving allocation efficiency and planning. Second, making the methods and data publicly available enhances transparency in water accounting, enabling others to reproduce results or apply the methods and tools to additional reservoirs. This supports open science principles and fosters confidence in reported findings. Third, the dataset contributes to the broader understanding of evaporation processes across different climatic and hydrologic conditions. Researchers can use the data to better understand regional evaporation estimates, refine reservoir inflow estimates, or test new modeling approaches. Sharing the dataset promotes collaboration among federal, state, and local agencies as well as academic and private partners engaged in hydrologic monitoring and modeling. Finally, the dataset and technical memorandum can serve as references for training, teaching, and outreach, supporting development of best practices in evaporation estimation and data quality control.

This peer review involves influential scientific information based upon Reclamation Manual Policy CMP P14.

Timing of Review:

The period of review is expected to last from April through May 2026. The final peer review report is expected to be available on the Peer Review Agenda website by August 2026.

Scope of Review:

The scope of this review includes:

- Technical memorandum describing the model, methods, and application
- Two-page bulletin representing brief overview of technical memorandum that is suitable for decision makers

Reviewers should focus on the following three topics:

1. Fidelity of Model Application
Determine whether the peer-reviewed model has been applied as intended, including adherence to its documented assumptions, parameterizations, spatial and temporal scales, and input data requirements. The reviewer should evaluate whether any documented modifications or adaptations to the model are transparent and scientifically justified, and whether the implementation aligns with the scope and limitations outlined in the original peer-reviewed publication.
2. Dataset's Contribution Beyond Traditional Operational Techniques
Examine whether the dataset represents a meaningful advancement over conventional methods for estimating reservoir evaporation rate, such as Class A pans or empirical coefficients. The reviewer should consider improvements in physical realism, spatial or temporal resolution, and applicability across diverse hydrologic and climatic regimes. The reviewer should assess whether the dataset offers value for water resource management in the western U.S.
3. Alternative Models for Regional Application
Consider whether other modeling approaches (e.g., energy balance models, remote sensing-based methods, or machine learning frameworks) might offer advantages for estimating reservoir evaporation across the western U.S. The reviewer should consider the trade-offs between complexity, accuracy, data requirements, and scalability.

Methodology of Review:

Peer review will be conducted by an individual, where comments will be left in the technical memorandum. The identity of the reviewer will be disclosed on the report and in the final peer review report posted to the peer review website. Review findings/comments will be attributed to the associated reviewer.

Number of Peer Reviewers:

One external peer reviewer will review the scientific information.

Reviewer Selection Process:

The peer reviewer has professional experience in the field of surface hydrology, including evaporative demand, and in federal agency needs for water accounting. The public will not be asked to nominate reviewers.

Delivery of findings:

The peer reviewer will submit a digital copy of peer review comments that address one or more of the supplied reviewer questions. Comments should be submitted to the peer review lead.

Response to Peer Review:

At the conclusion of receiving peer review comments, 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 and list the comments provided by the reviewers, as well as author responses to all comments.

Federal Register Notice:

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

Agency contact:

Kathleen Holman, Applied Hydrology Group 2, Technical Service Center, Bureau of Reclamation, kholman@usbr.gov, 303-445-2571

References:

Abatzoglou, J.T. 2011. Development of Gridded Surface Meteorological Data for Ecological Applications and Modelling. *International Journal of Climatology* 33(1): 121–131.

De Ponca, M.S.F.V., G.S. Manikin, G. DiMego, et al. 2011. The Real-Time Mesoscale Analysis at NOAA's National Centers for Environmental Prediction: Current Status and Development. *Weather and Forecasting* 26(5): 593–612.

Zhao, B., J. Huntington, C. Pearson, et al. 2024. Developing a General Daily Lake Evaporation Model and Demonstrating Its Application in the State of Texas. *Water Resources Research* 60(3): e2023WR036181.