

Request for Proposals

Seasonal Forecasting to Support Drought Operations in the Potomac River Basin

Section for Cooperative Water Supply Operations on the Potomac

Interstate Commission on the Potomac River Basin

Preliminary Proposals Due March 1, 2022

REQUEST FOR PROPOSALS (RFP) OBJECTIVE

The Interstate Commission on the Potomac River Basin (ICPRB) Section for Cooperative Water Supply Operations on the Potomac (CO-OP) provides technical and managerial assistance in drought-related planning and operations for the Washington, DC, metropolitan area (WMA) cooperative water supply system. CO-OP seeks to form a collaboration with researchers at an academic institution to help advance its ability to provide this drought-related support. Grant funding in the amount of \$65,000 will be provided over a period of one year, with potential for a second year of funding depending on the scope of the proposal, not to exceed an additional \$65,000.

The objective of this RFP is to advance CO-OP's ability to forecast Potomac River flows one to twelve months into the future to help inform operational decisions related to drought. CO-OP planning and forecasting tools currently include the following:

- ***CO-OP's Water Supply Outlook (WSO) model.*** The WSO provides a monthly forecast of minimum daily river flow over the upcoming season (current month through October). The forecast is from a set of nonparametric regression models for minimum daily "natural" Potomac River flow¹, based on recent daily minimum river flow, accumulated precipitation, groundwater levels, and the Palmer Drought Severity Index for the basin.
- ***CO-OP's real-time automated Low Flow Forecast System (LFFS).*** The LFFS currently provides short-term hourly Potomac River flow forecasts that are used to inform decisions during drought operations. It is constructed in the Deltares' Flood Early Warning System (FEWS) software platform and currently uses the Chesapeake Bay Program (CBP) HSPF-based Phase 6 Watershed Model to provide flow forecasts, with data inputs including historical meteorological data from the North American Land Data Assimilation System (NLDAS) and National Weather Service (NWS) short-term precipitation and other meteorological forecasts, including forecasts from the Middle Atlantic River Forecast Center (MARFC), the Weather Prediction Center (WPC), and the Global Ensemble Forecast System (GEFS), and water withdrawal forecasts based on forecasts of air temperature and precipitation.
- ***CO-OP's Potomac Reservoir and River Simulation Model (PRRISM).*** PRRISM is a model of the WMA water supply system constructed in the ExtendSim software platform (by Imagine That Inc) that simulates at the daily timestep: Potomac River flows, reservoir inflows, reservoir operations, Potomac River withdrawals,

¹ Smith, J.A., 1991. LONG-RANGE STREAMFLOW FORECASTING USING NONPARAMETRIC REGRESSION 1. *JAWRA Journal of the American Water Resources Association*, 27(1), pp.39-46.

finished water transfers, upstream consumptive use, impact of state drought management decisions, river flow forecasts, and other processes which affect system operations and performance.

CO-OP invites proposals to enhance its ability to anticipate seasonal climate conditions and their effects on Potomac River flow. Proposals will be considered which accomplish this goal by any of the following: improving or replacing the WSO model with another tool demonstrating improved performance in the Potomac basin, evaluating the performance in the Potomac basin of seasonal meteorological forecast products suitable for input into the LFFS, replacing the CBP Phase 6 Watershed Model with a comparable tool with enhanced ability to simulate seasonal changes in baseflow from the upper Potomac basin’s fractured bedrock aquifers, developing a post-processing methodology for the LFFS that improves its performance, or by some other means.

KEY DATES	
Optional informational webinar by CO-OP staff	February 16, 2022
Preliminary (two-page) proposal due	March 1, 2022
Selection of top three preliminary proposals	March 23, 2022
Final proposal due	April 20, 2022
Announcement of award*	May 11, 2022
Grant period	September 1, 2022, through August 31, 2023, with potential additional funding for September 1, 2023 through August 31, 2024

PROPOSAL REQUIREMENTS AND REVIEW PROCESS

The proposals will be reviewed by a committee consisting of staff of ICPRB’s CO-OP Section and of the WMA water suppliers. Proposals will be ranked based on five criteria: i) relevance to needs of the CO-OP Section, ii) clarity of the description of the proposed work and work product, iii) soundness of proposed approach, iv) level of collaboration with CO-OP Section staff, and v) relevant experience of the investigator(s). There will be a two-step review process consisting of

- 1) Ranking of the preliminary (two-page) proposals by the review committee
- 2) Invitation to up to three research groups for submission of detailed proposals
- 3) Ranking of the detailed proposals by the review committee
- 4) Selection of the grantee and announcement of the grant award*

* If the review committee determines that no proposal meets its criteria, no grant will be awarded.

PROPOSAL INSTRUCTIONS AND FORMAT

Preliminary proposals should not exceed two pages in length and should include the following:

1. Proposal title
2. Names and positions of investigators, with copies of or hyperlinks to Curriculum Vitae
3. Description of approach
4. Proposed products

Up to three research groups submitting preliminary proposals will be invited to submit more detailed final proposals. Final proposals should include:

1. Proposal title
2. Names and positions of investigators
3. Proposal summary (no more than three sentences)
4. Description of technical approach, including proposed data sources, proposed modeling and/or analysis techniques or tools, and references to past work that informs the approach
5. End products of the research, which may include journal articles, a technical report, and/or analysis and/or modeling tools to be transferred to CO-OP
6. Plan for collaboration with CO-OP staff to ensure that there is an effective transfer of information on CO-OP flow forecasting needs, Potomac River physical and flow characteristics, and WMA water supply system characteristics and constraints
7. Project timeline

CONTACT INFORMATION

Proposals should be sent via email to coop@icprb.org. Please direct any questions you have to Dr. Alimatou Seck at aseck@icprb.org.

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