

Fiscal Year 2025 Competition Information Sheet - Early career award for exceptional research in Earth System Model Development and Application

Program Name

Modeling, Analysis, Predictions, and Projections (MAPP) Program.

Program Mission

The mission of the Modeling, Analysis, Predictions, and Projections (MAPP) Program is to enhance the Nation's capability to predict variability and change in Earth's climate system. The MAPP Program focuses on the coupling, integration, and application of Earth System models and analyses across NOAA, among partner agencies, and with the external research community. Primary objectives include: 1) improving Earth System models; 2) supporting an integrated Earth System analysis capability; 3) improving methodologies for global to regional scale climate analysis, predictions, and projections; and 4) developing climate modeling capabilities and applications relevant to decision makers based on climate analyses, predictions, and projections. MAPP sits within the Earth System Science and Modeling Division (ESSM) of the NOAA Office of Oceanic and Atmospheric Research (OAR) Climate Program Office (CPO).

Focus for FY 2025

Early Career Award for Exceptional Research in Earth System Model Development and Application

Funding for FY2025

Pending the availability of funds in FY 2025, the MAPP program anticipates a funding allocation of up to \$300,000 for this competition.

Proposals may be for up to four years, up to \$300,000/year. A total of one project may be funded.

Competition Information

NOAA's Fisheries, Ocean, Satellite, and Weather services as well as its Laboratories and Cooperative Institutes provide a wide range of critical climate information to the public, leveraging the agency's extensive in-situ and remote data holdings, modeling capabilities, communication and dissemination expertise, and scientific leadership. A strong external NOAA-affiliated R&D workforce is necessary to advance climate information across these mission areas.

This opportunity is motivated by the desire for NOAA to foster relationships with a new generation of exceptionally skilled scientists by providing stable support at a sufficient level and duration to enable awardees to develop research careers in collaboration with NOAA, and build a firm foundation for continued contributions to climate research associated with NOAA mission areas and facilities (e.g.,

operational centers, laboratories, science centers, etc.). Both NOAA's¹ and OAR's Strategic Plans² note the needs for and challenges in developing NOAA's next-generation workforce. OAR's Strategic Plan notes as one of three major impacts on its mission: "A workforce with interdisciplinary skill sets [that] will be increasingly valuable and sought by high-paying commercial organizations." Developing and then retaining relationships with individuals with these skill sets requires enhanced agency support. This is why one of OAR's three Strategic Approaches is to "Develop the next-generation workforce" and also why one of NOAA's operational priorities is "to attract, hire and develop a new generation of diverse professionals to accomplish its mission."

The awardees are expected to build a solid foundation for lifelong leadership in Earth system research. The award also welcomes innovative research ideas and seeks to cultivate diverse scientific leadership in climate and Earth system science and modeling.

NOAA has long been a leader in the advancement of climate research and services, and the development of a NOAA-affiliated workforce. However, there is a gap between the many available NOAA-associated fellowship, internship, and postdoc programs, and the NOAA career research and development workforce. This early career award intends to bridge that gap by enabling focused early-career support on NOAA mission areas relevant to MAPP activities. This solicitation builds on a long history of the Climate Program Office's support for education and innovation within the earth sciences.

In FY 2025, MAPP is soliciting proposals from early career researchers to foster innovative Earth System Modeling research. This award will support early-career scientists who have the potential to serve as research leaders and mentors to future scientists, and who are interested in focusing their research careers on Earth System Model development and application relevant to the NOAA mission. Applicants would be expected to propose a research plan centered around topics prioritized by the MAPP program, which include: advancing climate and Earth system models to better simulate climate variability and change, improving multi-annual to decadal climate prediction systems and products, and multi-decadal projections; and applying Earth system models to better understand, predict, and project drought, extreme heat, sea level change, and marine ecosystems.

MAPP hereby invites applications from outstanding researchers and scientists in the early stages of their careers in areas within the scope of the MAPP program. Work should leverage new or under-utilized observational datasets, modeling or assimilation-based techniques, and/or reanalysis data. Approaches using machine learning or other artificial intelligence techniques, or being able to address data that is sparse or unstructured are welcome.

Proposals should take into account the utility of research to stakeholders through documented criteria describing thresholds, metrics, and categorical criteria needed by stakeholders who make decisions related to the areas of extreme heat, water resources, and coastal inundation. Products that may be able to fill information gaps in the National Climate Assessment^{3,4} are encouraged. Focus on various timescales is welcome, although CPO's general focus is on multi-annual or longer timescales (except in the context of work associated with OAR-NMFS collaborations, and some drought work).

¹ https://www.noaa.gov/sites/default/files/2022-06/NOAA_FY2226_Strategic_Plan.pdf

² <https://research.noaa.gov/wp-content/uploads/2023/05/OAR-Strategy-2020-2026-14.pdf>

³ <https://nca2018.globalchange.gov/>

⁴ <https://science2017.globalchange.gov/>

Proposers should be able to demonstrate a connection with a collaborator at a NOAA federal entity (e.g., a lab, an operational center, an office) in their Letter of Intent, which may be developed in coordination with that collaborator. Proposals should include letters of support for the collaboration. MAPP is not able to provide support for creating new collaborations as part of this solicitation process.

Collaborators at NOAA institutions may be federal or Cooperative Institute employees. Full proposals will be required to involve a NOAA collaborator, and to fully demonstrate the relevance of the proposed research to one or more NOAA federal entities (e.g., a lab, an operational center, an office), MAPP's program activities, and NOAA's mission. Proposals will also need to articulate how the early career funding could foster a durable relationship between the proposer and NOAA throughout their career.

Under this award, non-NOAA (i.e., institutions outside NOAA, including CIs) researchers will receive grants for up to \$300K per year for up to 4 years to cover expenses articulated in the NOFO. NOAA collaborators may receive up to 20% of the total annual budget. It is anticipated that one proposal will be selected, and should focus on any of the MAPP research areas below:

1. Drought understanding, predictability, modeling, variability and change, and model-based monitoring
2. Marine ecosystem simulation, prediction, and projection focused on applications to NOAA's NMFS and/or Sanctuaries missions
3. Process-based Earth System Model development
4. Climate and Earth system model diagnosis in support of next-generation model development
5. Advancing climate projections and projections products and services, and the attribution of extreme events in the context of NOAA's attribution effort

This award is expected to be highly competitive and will enable early-career climate scientists to work on problems that advance NOAA climate modeling and related activities.

Proposers must meet all of the following eligibility requirements by the application deadline:

1. Proposers must have received their Ph.D. degree no more than 8 years before the full proposal application deadline of this solicitation.
2. The Principal Investigator must be employed in a research position at an eligible non-NOAA U.S. institution or organization. Applicants with tenure from academic institutions are not eligible for this award.
3. Postdoctoral researchers and scientists at non-NOAA federal laboratories are not eligible for this award.
4. It is expected that the primary support for the MAPP Early Career Scientist Award will be for the lead PI and their research efforts and team. Co-PIs are not allowed in the proposal, although research collaboration is recommended. Some support for NOAA collaborators is permitted, which could be up to 20% of the total annual funding.
5. Only one application is allowed to be submitted to this solicitation by each proposer. This award is open to anyone qualified according to the criteria above, including the recipients of other MAPP awards. However, the proposed research cannot be redundant with any work in an existing MAPP award. Applicants are eligible to submit proposals to other programs during the lifetime of this award.

The MAPP Early Career Award proposals should be prepared in accordance with the instructions given in the FY25 Early Career Competition NOFO. In addition, a statement of leadership (up to one page) in the

applicant's research area must be included in the proposal. The statement should articulate the past and current contributions of the applicant to the Earth's climate science and modeling community, which include but are not limited to cutting-edge research activities, involvement in academic committees and organizations, efforts in education and outreach, and diversity and inclusion. It should also address the anticipated future impacts of the proposed activities. The letter of support from the collaborating NOAA institution needs to be aligned with the priorities of the lab and the goals of the program. In the proposal, applicants should consider opportunities for visits, sabbaticals, internships, etc. that could be hosted by the NOAA collaborating institution to deepen connection between the applicant's research and team and the federal institution and its work.

All proposals will be evaluated through the same process and review criteria stated in the FY25 Early Career NOFO⁵. In the Stage I review process, peer panel reviewers will evaluate applications based on three criteria (including scientific merit, overall qualifications, and cost), which accounts for 75% of the final weight of the evaluation. Mail-in reviews will also be considered as part of the Stage I process. The statement of leadership will be considered an important component of the qualification evaluation. Stage II review accounts for 25% of the final weight and will assess the importance and relevance to the MAPP prioritized research topics.

Competition contact information: David Benson (david.benson@noaa.gov).

General Guidelines for FY 2025 MAPP proposal submission:

- Principal investigators submitting a proposal in response to this MAPP Announcement are required to follow the Letters of Intent (LOI) and Proposal preparation and submission guidelines described in the FY 2025 Early Career competition Notice of Federal Funding Opportunity announcement.
- Investigators must submit an LOI prior to developing and submitting a full proposal using the FY25 MAPP Letter of Intent submission form⁶; investigators unable to submit via the form should email their LOI to oar.cpo.mapp@noaa.gov. Investigators will be notified by the MAPP Program Competition Manager as to whether a full proposal is encouraged based on the LOI within four weeks of the LOI due date.
- Proposals must clearly identify in their summary which MAPP competition is being targeted (only one competition may be targeted by a given proposal).
- Administrative questions regarding the Notice of Federal Funding Opportunity (e.g. proposal formatting or submission guidelines) should be directed to Diane Brown (diane.brown@noaa.gov).

A webinar will be offered to potential applicants for background on the MAPP program and this solicitation soon after the publication of this announcement. For information on webinar timing and registration procedures please check the MAPP website⁷; prior to when the webinar is held, potential applicants can also sign-up to receive an email notification⁸.

⁵ <https://cpo.noaa.gov/Funding-Opportunities>

⁶ <https://forms.gle/6j34Ezta5QbLbDV7>

⁷

<https://cpo.noaa.gov/divisions-programs/earth-system-science-and-modeling-division/modeling-analysis-predictions-and-projections/>

⁸ <https://forms.gle/2KqfEH7f31Qj1VWD6>

Diversity and Inclusion

MAPP recognizes that it has an opportunity to support NOAA's and the community's commitment to diversity and inclusion by taking an intentional step that encourages program applicants to consider diversity and inclusion as part of their scientific projects. MAPP supports the goal of increasing the inclusion of underrepresented groups in NOAA-relevant modeling science. This action has the potential to make an impact on not only the diversity and inclusion in science at NOAA, but also beyond the agency. In your proposal, we encourage you to think about how your project can broaden the participation of underrepresented groups (e.g., gender, race, ethnicity, disability, geography, etc.). Examples could include but are not limited to, full participation of women, persons with disabilities, and other underrepresented minorities in science, technology, engineering, and mathematics (STEM). Opportunities that may engage students or early career scientists from underrepresented groups at different or earlier ages (e.g., even secondary) in the context of your proposed research are encouraged.

For further information on NOAA Indigenous Knowledge Guidance, please see [here](#).

Data Archiving and Computational Resources

Computational Resources

Computational resources on NOAA's high-performance computing platforms may be requested for research sponsored as a result of this solicitation. Proposals should indicate the availability of alternative computing resources should NOAA resources not be available for the project. Proposers who choose to request computational allocations on NOAA's platforms must include in their proposal a request describing the computational resources and data storage required, as well as a description of how they will port their methodology to the NOAA platforms. Proposers must submit an HPC Request Form⁹ with their proposal in order to apply for computational resources.

Questions regarding the use of NOAA's high-performance computing platforms should be directed to Dan Barrie (daniel.barrie@noaa.gov).

Data Management Guidance

The MAPP Program requires that all products and deliverables produced via solicitation will reside in the open access / open source domain, freely available to the public.

Public access to grant/contract-produced data will be enabled in one of the following ways (select one):

- Funding recipients are planning to submit data to NOAA National Centers for Environmental Information (NCEI), which will provide public access and archiving¹⁰. Point of Contact for NCEI is Nancy Ritchey (Nancy.Ritchey@noaa.gov)
- Data are to be submitted to an International Council for Science (ICSU) World Data System facility: <https://www.icsu-wds.org/community/membership/regular-members>)
- An existing publicly accessible online data server at the funded institution is to be used to host these data (describe in proposal).

⁹ https://cpo.noaa.gov/wp-content/uploads/2024/06/MAPP_FY25_HPC_Request_Form.docx

¹⁰ NCEI supports the creation of adequate metadata and data ingest into long term repository holdings using tools such as Send2NCEI (www.nodc.noaa.gov/s2n), for small volume, one-time only data collections) and Advanced Tracking and Resource tool for Archive Collections or ATRAC (<https://www.ncdc.noaa.gov/atrac/index.html>), for recurring and/or large volume data collections).

- An existing publicly accessible online “cloud” service is to be used to host the data (described in the proposal).

The Competition contact (above) is the responsible NOAA Official for questions regarding this guidance and for verifying the accessibility of data produced by funding recipients.