

Charge to Reviewers
NOAA Atlantic Oceanographic and
Meteorological Laboratory
5-Year Science Review
February 25-27, 2025

Purpose of the Review

The National Oceanic and Atmospheric Administration (NOAA)'s Office of Oceanic and Atmospheric Research (OAR) conducts independent peer reviews of each of its laboratories and programs every five years. The purpose of the reviews is:

- to evaluate the quality, relevance, and performance of the research conducted and sponsored by OAR laboratories and programs;
- to develop and implement recommendations to improve the quality, relevance and performance of OAR research;
- to strategically position the laboratory in its planning for future research and development.

The reviews comply with the requirements of [NOAA Administrative Order 216-115B: Research and Development in NOAA](#) and [OAR Circular 216-3: OAR Laboratory and Program Science Evaluations](#).

Criteria

The criteria for the review are quality, relevance, and performance, as defined below, consistent with NOAA Administrative Order 216-115B.

Quality is a measure of the novelty, soundness, accuracy, and reproducibility of a specific body of research. Indicators include publications, technology development, data contributions, and awards.

Relevance is a measure of how well a specific body of research supports NOAA's mission and the needs of users and the broader society.

Performance is a measure of effectiveness and efficiency. It includes an assessment of the organization's leadership, management, organizational culture, diversity/equity/inclusion/access, strategic planning, progress towards performance targets and milestones, efficiency in resource utilization, and transition of research to operations.

Scope of the Review

The scope of the review covers the research and activities conducted or sponsored by the laboratory over the last five years. OAR laboratories typically conduct research and development while OAR programs typically sponsor research and development, and conduct outreach and engagement.

Based on the findings from the review, OAR asks reviewers to look forward and provide recommendations to assist with strategic planning for work in the present and anticipated future environments. OAR also asks reviewers to identify tradeoffs - when recommending expansion of one or more activities or programs, reviewers should identify what activities or programs should OAR consider scaling back.

The criteria cover the quality of the research, its relevance to NOAA's mission and societal needs, and how the research is performed (leadership, management, strategic planning, progress towards performance targets). As such, while the review is focused on science, it also includes the management of the science, as outlined in the performance criterion. However, reviewers should not stray into evaluating detailed operations such as accounting and day to day management or providing feedback on draft strategic plans, which are covered in separate, internal, annual Operations & Management Reviews and other processes.

The review agenda is structured around the review questions described later in this document.

Proposed Schedule and Time Commitment for Reviewers

The review will be held in-person, February 25-27, 2025 at AOML in Miami, Florida. OAR will hold two teleconferences for the review panel in advance of the review to discuss the review process and answer any questions you may have. To ensure there is ample time for discussion during the review, many presentations will be pre-recorded and posted on the review website at least two weeks prior to the review. Panelists are expected to have reviewed these presentations ahead of the review to fully engage in the interactive panel discussions with staff and scientists during the review.

Each reviewer is asked to independently prepare their written evaluations and ensure their write-ups are particularly thorough for the review questions that they are assigned. Each review question must be assessed by at least two panel members. Reviewers will provide their evaluations to the review panel chair. The chair, a federal employee, will create a report summarizing the individual evaluations, due within 45 days of the review to OAR. The chair will not seek a consensus of the reviewers. OAR will send any technical comments within 14 days of receiving the draft report and the panel chair will send a final report no later than 30 days after that. The report will be posted on the lab/program website. A vice-chair will be appointed to fill in if the chair becomes unavailable.

Brief Background on Laboratory

NOAA's Atlantic Oceanographic & Meteorological Laboratory (AOML) is a federal research laboratory based in Miami, FL with a research portfolio encompassing ocean, coastal, and atmospheric studies. AOML's mission is to conduct and transition world-class Earth system research, with a focus on the Atlantic Ocean region, to inform: the accurate forecasting of extreme weather and ocean phenomena, the management of marine resources, and an understanding of climate change and associated impacts, thereby improving ocean and weather services for the region, the nation, and the world.

AOML opened in 1973 and included four research laboratories: Physical Oceanography, Sea-Air Interaction, Marine Geology & Geophysics, and Ocean Remote Sensing. The laboratories were later renamed as "divisions" and consolidated to Physical Oceanography, Hurricane Research, and Ocean Chemistry & Ecosystems. AOML research supports many of NOAA's statutes including weather research, forecasting, climate, conservation, and innovation, and 28 federal statutory authorities, including The Weather Research and Forecasting Innovation Act of 2017, National Climate Program Act of 1978, and The Coral Reef Conservation Act of 2000.

AOML partners with many NOAA offices and cooperative institutes, including the Cooperative Institute for Marine and Atmospheric Studies led by the University of Miami and the Northern

Gulf Institute led by Mississippi State University, to support NOAA's mission and improve prediction and management services for the nation. The workforce at AOML currently consists of 66 federal employees, 106 cooperative institute employees, and 8 contractors. This team works together to achieve AOML's vision of being the leader in Earth system research in the Atlantic Ocean region, providing trusted scientific data and knowledge to predict changes in weather, climate, oceans, and marine ecosystems.

Review Questions

As NOAA's Atlantic-focused research laboratory, what should AOML's role be in:

- 1. Collecting foundational observations and improving understanding of climate mean state and variability and associated impacts? How has our recent science contributed to achieving these objectives?**
 - 1.1. AOML is a leader in climate research, studying environmental effects associated with short- and long-term climate variability, such as the impacts of the slowing of the Atlantic thermohaline circulation. AOML researchers also evaluate the influence of current and future climate-related ocean phenomena on seasonal predictions and outlooks of tropical cyclone and tornado activity, heatwaves, floods, and droughts.
- 2. Improving our monitoring, understanding, and prediction of tropical cyclones and ocean phenomena as well as their broader impacts on extreme events and associated hazards? How has our recent science contributed to achieving these objectives?**
 - 2.1. AOML has played a unique role in collecting and evaluating atmospheric and oceanic observations during its annual Hurricane Field Program as well as through the deployment of year-round observing platforms from their many research cruises. AOML research has led to advancements in data assimilation techniques, optimizations in sampling and using both new and existing observations, improvements in identifying and understanding ocean phenomena and how they impact large-scale steering patterns and tropical cyclones, as well as transformations to our prediction system through developing, evaluating, and improving numerical models. Together, these efforts help further our monitoring, understanding, and prediction of tropical cyclones and ocean phenomena as well as their associated hazards such as wind gusts, flooding, and tornado outbreaks.
- 3. Understanding the distribution and impact of multiple stressors on marine ecosystems? How has our recent science contributed to achieving these objectives?**
 - 3.1. AOML has a long history of studying the marine and coastal environments of Florida, the Gulf of Mexico, and broader Atlantic region. This work has leveraged the scientific expertise of researchers at AOML in physical, biological, ecological, and chemical sciences. AOML is dedicated to conducting fundamental research, including lab- and field-based science and model simulations, to understand how our changing climate impacts economically and ecologically important ecosystems. As an example, AOML is a leader in studying how multiple stressors, such as temperature, pollution, disease, and ocean acidification, impact coral reef ecosystems.
- 4. Developing its work environment for the continued pursuit of world-class science, and**

building strong connections with communities and stakeholders to ensure broad access to science results?

- 4.1. AOML seeks to be innovative in developing strategies for successful recruitment and retention of quality personnel. AOML seeks to be a model of successful collaboration between federal employees and cooperative institute partners, and interactions between staff across a variety of career stages. Through innovative communication strategies and solution-based research, we are dedicated to providing access to our data, products, and services. AOML strives to conduct meaningful research that is shared broadly.

Recommendations

OAR requires reviewers to provide recommendations for how to improve the quality, relevance, and performance of the lab's moving into the future. OAR encourages recommendations on research areas to pursue more earnestly and research areas in which to scale back. Additionally, OAR welcomes recommendations on scientific approaches, strategies for pursuing opportunities or managing risks, data management, outreach, etc. OAR requests future-looking recommendations that are specific, actionable, concise, and reasonable in number. The laboratory will develop a response plan with actions to respond to the recommendations and will track progress. Past experience shows 5 to 20 recommendations to be a manageable number that can be implemented and tracked, so the review panel is encouraged to consider providing no more than approximately 20 recommendations total. Regardless of the number of recommendations, OAR is not seeking consensus advice from the reviewers, so individual reviewers do not need to agree with all of the recommendations.