Thank you for agreeing to serve as a reviewer of Letters of Intent (LOI) for the Weather Program Office (WPO) FY25 Air Quality Research and Forecasting (AQRF) competition. Below you will find additional information needed to complete the LOI review, including A) Purpose of the LOI review process, B) LOI reviewer instructions, and C) AQRF program team member contacts. The AQRF program objective and priorities and evaluation criteria are in the appendix.

**Please complete all LOI reviews and notify the AQRF program no later than COB, Wednesday, October 16.**

**A. Purpose of the LOI review process**

The purpose of the LOI review process is to provide preliminary feedback to Principal Investigators (PIs) before submitting a lengthy full grant proposal in hopes of focusing proposal development and selection activities on NOAA’s top priorities. Additionally, the purpose is to reduce the burden on PIs of writing lengthy proposals and on NOAA reviewers reviewing them in cases when a PI’s proposed activity is not well suited or least applicable to the NOAA priorities and objectives published in WPO’s FY25 Notice of Funding Opportunity (NOFO). Following the LOI review, WPO will respond to all PIs who submit an LOI either encouraging or discouraging a full proposal. Full applications will be encouraged only for LOIs deemed most relevant to the NOFO priorities and valuable to NOAA's mission. However, PIs who do not submit an LOI or who are not encouraged by NOAA to submit a proposal after review of their LOI will not be precluded from submitting a full proposal. PIs will be provided, upon request, a short synthesis of the factors from the review that led to the recommendation.

**B. LOI reviewer instructions**

1. **Do not** contact the PIs to ask any clarifying questions about the content. Instead, contact one of the AQRF competition team members at the bottom of the reviewer instructions page if you have questions.
2. Confirm you have access to the LOI scoresheet and are able to view all your assigned LOIs.
3. Familiarize yourself with the FY25 AQRF program objective and priorities and evaluation criteria listed in the Appendix. More detailed information about the FY25 AQRF competition, including applicant eligibility, all selection criteria, and other factors can be accessed from the following NOFO link: [NOAA-OAR-WPO-2025-28603](https://grants.gov/search-results-detail/356451)
4. Evaluate the value of an LOI for Importance/Relevanceand select a value rating (high, medium, low) from the pulldown menu that most corresponds to your evaluation of Importance/Relevance.
5. Evaluate the value of an LOI for Technical/Scientific Merit (e.g will the methods ensure success?) and select a value rating (high, medium, low) from the pulldown menu that most corresponds to your evaluation of Technical/Scientific Merit.
6. Record any high level comments upon which your determinations were based.
7. Select either “Encourage” or “Discourage” from the pulldown menu.
8. The WPO Program Manager will use your determination to inform a response to the PIs of: “Encourages submittal of full proposal”, or “Discourages submittal of full proposal”

**C. AQRF competition team member contacts**

| Lingyan XinWPO Synoptic Program Managerlingyan.xin@noaa.gov(240) 624-0141 | Linden WolfWPO Synoptic Program Coordinatorlinden.wolf@noaa.gov(240) 621-2527 |
| --- | --- |

**Appendix**

**Air Quality Research & Forecasting (AQRF) Program Objective**

Air quality has improved significantly in recent decades following passage of the Clean Air Act

in 1970. Yet, there are still many areas of the country exposed to unhealthy levels of air pollutants harming human health and damaging sensitive ecosystems. Notable examples during recent years include smoke emissions due to numerous wildland fires over large parts of western North America and high surface ozone episodes during heat waves across the eastern United States. To help the nation mitigate these impacts, NOAA works with the Environmental Protection Agency (EPA), state and local air quality agencies, academia, and the private sector to provide atmospheric composition and air quality forecast capabilities for the Nation through the National Air Quality Forecasting Capability (NAQFC).

The current NOAA operational science improvement needs for air quality predictions include:

1. improving emissions modeling (e.g. wildland fire smoke and dust, and timely updates of anthropogenic sources), meteorology (e.g. planetary boundary layer (PBL) height, cloudiness, and vertical transport), and initialization of atmospheric composition concentrations (model state) and emissions using coupled data assimilation (DA);
2. incorporating feedbacks of atmospheric composition on atmospheric physics and meteorological DA through coupled modeling and DA; and
3. improving computational efficiency of atmospheric composition transport, gas-phase chemistry, DA and prediction. Increased collaboration is desired in building the coupled UFS, with shared community atmospheric chemistry components, that NOAA uses for operational air quality applications and for operational weather applications.

Projects appropriate for this competition range from Readiness Level (RL) 5 to RL 8 and have

the potential to transition to operations at either NOAA or the weather enterprise within the next

3 to 5 years. The NOAA Readiness Levels are defined in the General Information Sheet.

For additional AQRF Program information, please review the supplemental Information Sheet

for the AQRF competition in the package associated with this announcement at

<https://www.grants.gov>.

**Air Quality Research & Forecasting (AQRF) Program Priorities**

Air quality forecasting involves the use of science and technology to predict the concentration of

air pollution in the atmosphere for a given location and time. Projects that have the potential to

improve both air quality prediction and research by incorporating scientific advances in chemistry modeling and inputs from the latest pollutant emission datasets will be considered. Applicants to this competition should clearly identify and address one or more of the following priorities in their proposal.

**Priority AQRF-1:** Development and evaluation of high-resolution (1-3 km) air quality forecast capabilities that are consistent with NOAA weather forecast models at these resolutions, including two-way coupled models that capture air quality-weather interactions. In addition, this priority encourages work focusing on representation of local phenomena such as fine-scale processes in coastal regions, over complex terrain, or in urban areas, especially those that take advantage of recent air quality field experiments.

**Priority AQRF-2:** Evaluate the National Air Quality Forecast Capability (NAQFC) system consisting of the UFS-based regional model coupled with an online Environmental Protection Agency (EPA) chemistry model for both the warm and cool seasons for likely occurrence of poor air quality episodes. Investigation to identify the key variables dictating AQ forecast (ozone and PM2.5) performance at the gray zone to cloud permitting weather model resolutions are encouraged. Process-oriented evaluations to investigate the causes of model biases in different assumptions/parameterizations, especially over complex terrains/water-land interface/urban areas with poor air quality.

**Priority AQRF-3:** Improved spatial and temporal estimates of anthropogenic and natural pollutant emissions, including smoke from wildland fires and small fires and other potential sources of model biases, using NOAA satellite remote sensing and other data sources and through improved representation of emission physics coupled to the land surface model.

**Priority AQRF-4:** Explore and quantify the potential value of ensemble model approaches, post processing and artificial intelligence to NOAA’s operational air quality forecasting guidance. Priority AQRF-5: Improved model accuracy using data assimilation of remotely-sensed products or in-situ observations, including emissions update through coupled data assimilation.

**Priority AQRF-6:** Development of verification software, methods, and techniques to ensure AQ forecast capabilities are performing to standards.

**Priority AQRF-7:** Optimizing chemistry processes to increase the computational efficiency, including but not limited to applying AI/ML methods to chemistry that can lead to a reduced number of species to be advected or limiting vertical layers to carry out chemical processes. Prioritizing chemical mechanisms based on relative impacts on prediction of essential NAQFC forecast fields.

**Evaluation Criteria**

**1. Importance/Relevance**

This criterion ascertains whether there is intrinsic value in the proposed work and/or relevance to NOAA, federal, regional, state, or local activities. The reviewers will consider the following questions in their assessment of this criterion:

(1) Does the proposal identify a clear problem or opportunity to be addressed that is highly relevant to the NOAA Program Objective and Priorities identified in the FY25 AQRF NOFO and program information sheet?

(2) Does the proposal identify and quantify the benefit or impact to the Program Priorities?

(3) Does the proposal identify an appropriate degree of collaboration with one or more potential NOAA or other operational units throughout the project? Are the proposed end-users identified and appropriate to the Program Priorities?

(4) Is the proposed work both relevant to and feasible to transition to an NWS or weather/water enterprise operational forecasting service capability within 2-5 years? Is the proposed starting Readiness Level in the appropriate range for the specific competition to which it is applying? If required, is the proposed path to operations realistic and achievable within the framework of existing NWS infrastructure and concepts of operations?

**2. Technical/Scientific Merit**

This criterion assesses whether the approach is technically sound and/or innovative, if the methods are appropriate, and whether there is a clear project schedule and deliverables. The reviewers will consider the following questions in their assessment of this criterion:

(1) Are the proposed methods and solutions technically sound and achievable?

(2) Will the proposed project improve technology, concepts, or methods that advance the field of study and eventually improve NOAA operations?

(3) Does the proposal employ novel concepts, approaches, or methods?