

## FY24 AC4 Program Information Sheet

### Program Name

Atmospheric Chemistry, Carbon Cycle and Climate (AC4) Program

### Program Mission

AC4 is a competitive research program that incorporates research on atmospheric chemistry and the carbon cycle. In collaboration with the NOAA Laboratories and the academic community, the AC4 program supports research to determine the processes governing atmospheric concentrations of trace gases and aerosols in the context of the Earth System. The program aims to contribute a process-level understanding of the Earth System through observation, modeling, analysis, and field studies to support the development and improvement of models, and to inform carbon and air pollution management efforts.

As a part of the Earth System Science and Modeling (ESSM) division, AC4 collaborates with other programs within the division, such as Earth's Radiation Budget (ERB), Climate Variability and Predictability (CVP), Modelling, Analysis, Predictions and Projections (MAPP) and Climate Observations and Monitoring (COM) to enhance our knowledge of the complex interactions and chemistry happening in the Earth's atmosphere. Furthermore, recognizing the necessity of interdisciplinary research and shared expertise to address the multifaceted challenges posed by climate change, AC4 fosters collaborations with various NOAA laboratories, Line Offices, cooperative institutes, academic institutions and other federal agencies. The Program also coordinates its sponsored projects with major national and international scientific bodies including the International Global Atmospheric Chemistry (IGAC) Project, and the U.S. Global Change Research Program (USGCRP). <http://cpo.noaa.gov/AC4>

### Focus for FY24

**Understanding urban air in a changing climate**

### Funding for FY24

It is anticipated that there will be \$800K available in FY24 for this competition. Proposals should budget for no more than \$450K total over 3 years.

### Competition Information

Multiple linkages connect air quality and climate change, none more so than in the urban atmosphere. Climate change, favoring more heat waves and episodes of stagnant air (often exacerbated by Urban Heat Islands), may deteriorate air quality (AQ) by increasing ozone and fine particulate matter (PM<sub>2.5</sub>) concentrations and high pollution episodes. A majority of U.S. cities have seen dramatic improvements in air quality due to emission reductions of air

pollutants, although in some cases tempered by the “climate penalty” - higher than expected air pollution levels because of the changing climate. In addition, fire-prone areas such as in the western US and those with unique geographical features (e.g. in intermountain valleys) remain vulnerable to AQ issues. Salt Lake City is an example of an urban area with such air quality challenges.

As greenhouse gases and air pollutants are emitted from common sources, there is a growing recognition that co-benefits could be achieved with targeted mitigation. Consequently, urban decision makers need a scientific basis to address their pressing air quality issues (e.g. [Utah's Division of Air Quality](#)) and to work towards reducing their greenhouse gas emissions.

Meanwhile, the scientific community continues to be interested in the emerging details of the evolving urban atmospheric composition, both in the context of changes to air quality and climate. A recent [report from NOAA's Climate Working Group](#) pointed to urban air quality as an area for NOAA to focus on. This interest from stakeholders and the scientific community has translated into an increase in measurements in several urban areas across the country to understand the chemical composition of urban air, particularly contribution from volatile consumer products (VCPs) and connections to the increasing effects of Urban Heat Island.

In order to continue improving our understanding of urban air composition and to inform mitigation strategies such as in the case of Salt Lake City's high summer ozone problem, the AC4 program invites proposals for data analysis focused on one or more of the following topics:

- Emission sources and atmospheric processes contributing to urban air quality challenges in Salt Lake City and other urban areas
- Influence of NH<sub>3</sub> on urban air quality
- Regional modeling that improve urban scale processes
- Urban monitoring collaboration with local communities with increased risk of the health impacts due to poor air quality on prototyping urban monitoring

The primary focus of this solicitation is data analysis and modeling that leverage existing and/or ongoing data collection to improve understanding of urban air composition. However, if the study area includes Utah and aligns with the planned NOAA Chemical Science Laboratory-led [Utah Summer Ozone Study \(USOS\)](#), new data collection could be supported. USOS will include deployment of mobile laboratories, ground sites and other research platforms to measure the spatial distribution and speciation of major ozone precursors (NO<sub>x</sub> and VOCs), together with additional chemical measurements and meteorological data in the Salt Lake City region. Additional measurements supported through this solicitation would broaden the understanding of summer air quality in Salt Lake City, especially beyond ozone exceedances. For PIs participating in USOS, a support letter from the NOAA Chemical Sciences Laboratory is required. While connections to [CPO's Climate Adaptation Partnerships \(CAP\)](#) such as Western Water Assessment Team and other urban-focused CAP groups are welcome, they are not required. For heat-focused proposals, connection to the [National Integrated Heat Health Information System \(NIHHIS\)](#) is also welcome but not required.

**General Guidelines for FY 2024 AC4 proposal submission:**

- Principal investigators submitting a proposal in response to this AC4 Announcement are required to follow the Letters of Intent (LOI) and Proposal preparation and submission guidelines described in the Climate Program Office FY 2024 Notice of Federal Funding Opportunity announcement.
- Investigators are strongly encouraged to submit an LOI (**by September 11, 2023**) prior to developing and submitting a full proposal using the FY24 AC4 [Letter of Intent submission form](#); investigators unable to submit via the (Google) form should email their LOI to [oar.cpo.ac4@noaa.gov](mailto:oar.cpo.ac4@noaa.gov)
- 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](mailto:diane.brown@noaa.gov)).

**Contact:**

Competition managers: Monika Kopacz ([monika.kopacz@noaa.gov](mailto:monika.kopacz@noaa.gov)) and Shiv Das ([shiv.das@noaa.gov](mailto:shiv.das@noaa.gov))

**Data Archiving**

Data Accessibility: The AC4 Program requires that public access to grant/contract-produced data be enabled in the following way:

Funding recipients will establish their own data hosting capability (describe in proposal)

Technical recommendations: There is no specific technical guidance; however, proposals are to describe their proposed approach. Use of open-standard formats and methods is encouraged.

Resources: Proposals are permitted to include the costs of data sharing or archiving in their budgets.