

## Program Information Sheet

### Program Name

Atmospheric Chemistry, Carbon Cycle and Climate: Long term trends in observations of atmospheric composition

### Program Mission

Program Mission: AC4 is a competitive research program formed in Fiscal Year 2013 that incorporates research on atmospheric chemistry and 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.

### Focus for FY19

A wealth of valuable information and scientific questions resides in the long-term records of atmospheric composition collected by for example the NOAA Global Monitoring Division's Global Greenhouse Gas Reference Network (GGGRN) as well as other atmospheric composition networks supported NOAA and other agencies such as the National Atmospheric Deposition Program (NADP), Clean Air Status and Trends Network (CASTNET) and others. These networks were established, among others, to monitor the state and long term changes of atmospheric composition. Over the years, certain features emerged in the records, which shed light on the large-scale atmospheric processes that control trace gas removal rates; feedback mechanisms that constrain patterns of carbon sources and sinks, as well as many others.

In FY19, the AC4 Program in NOAA's Climate Program Office solicits proposals that aim to explain various trends, patterns and extremes detectable in the existing long - term observational records.

Features that could be explored include, but are not limited to:

- factors influencing gradient of the long- term trends
- patterns, anomalies and extremes in long- term trends
- intra- and interannual variability and change
- changes in amplitude of seasonal cycle
- local or regional changes in the long- term trends

The most relevant proposals will be those making most use of network data and demonstrating the intrinsic value of long-term monitoring. Multi-year and multi-decade data sets will be given highest priority, but all time scales will be considered. Following recommendations from the recent National Academy of Science report on anthropogenic

methane emissions, proposals focusing on methane will be particularly welcome.

The use of complementary data sets is allowed and encouraged, including temporarily augmenting existing networks to demonstrate future expansion capabilities and/or to test how detection limits for trends can be lowered. Depending on the number of LOIs received, some proposals for network prototypes and Observing System Simulation Experiments (OSSEs) could be considered, following recommendations from the National Academy of Science report on the “Future of Atmospheric Chemistry.”

### **Funding for FY19**

It is anticipated that approximately \$1.2 million will be available for FY19 new starts for the AC4 competition.

### **Competition Information**

Projects are expected to last 1-3 years. Proposal budget should be approximately \$200,000 per year, not to exceed \$600,000 over 3 years.

### **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.