

Opportunity Title: EPA Long-Term Air Quality Simulations and Human Health Fellowship

Opportunity Reference Code: EPA-ORD-CEMM-AESMD-2020-03

Organization U.S. Environmental Protection Agency (EPA)

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A complete application consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. All transcripts must be in English or include an official English translation. Click [here](#) for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations. Click [here](#) for detailed information about recommendations.

All documents must be in English or include an official English translation.

Application Deadline 8/24/2020 3:00:00 PM Eastern Time Zone

Description ***Applications may be reviewed on a rolling-basis and this posting could close before the deadline.** Click [here](#) for information about the selection process.

EPA Office/Lab and Location: A research opportunity is available at the Environmental Protection Agency (EPA), Office of Research and Development (ORD), Center for Environmental Measurement and Modeling (CEMM), Atmospheric and Environmental Systems Modeling Division (AESMD) located in Research Triangle Park, North Carolina.

Research Project: The Community Multiscale Air Quality modeling system (CMAQ; <https://www.epa.gov/cmaq>) estimates atmospheric concentrations and deposition for numerous chemicals, including ozone, PM2.5 and its constituents, and deposition of important nitrogen and sulfur species CMAQ deposition values are used by EPA's EnviroAtlas and Critical Loads Data Mapper, NADP's Total Deposition maps, and to support many nutrient assessments included those for the Chesapeake Bay, Mississippi River Basin, Tampa Bay, and the Nooksack Fraser Transboundary region. Concentration values from CMAQ are also widely used to assess the benefits of emission reductions on human health (<https://www.cdc.gov/nceh/tracking/phase.htm>). Several multi-year simulations using the CMAQ model have been generated incrementally over the past several years using the best models and input data available at the time, Zhang et al. 2019. As a result, these decadal runs are comprised of simulations made with differing model versions, input data and methodologies. EPA is in the process of updating these simulations for 2002 – 2018.

This research project provides opportunities to collaborate with a team of scientists and regulators, offering a broad perspective of environmental



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management, on the evaluation and application of these model simulations for human and ecosystem health studies.

This research project leverages the state-of-the-science components of the Community Multiscale Air Quality (CMAQ) modeling systems to develop a consistent set of methodologies to estimate the US's air quality burden over a period of large emission reductions, from 2002 to 2018. This research will leverage recent developments in the latest National Emissions Inventory (NIE <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>) applied from 2002 to 2018 using historical activity, satellite and observational data. There will be opportunities to develop model and observation fusion techniques, use of state-of-the-science source apportionment techniques to estimate where emission reductions have been most effective at reducing nitrogen and sulfur deposition and how these sensitivities have changed over the simulation period, or the development of historical or future modeling scenarios depending on the participant's experience and interest.

Learning Objectives: The participant will have the opportunity to learn to run, analyze, and interpret highly detailed emissions and air quality model data, and may, as their interest dictates, gain experience with other analysis tools (e.g. the Remote Sensing Information Gateway; RSIG; <https://www.epa.gov/hesc/remote-sensing-information-gateway>).

This research training opportunity will provide the research participant with an opportunity to collaborate with an extensive team of atmospheric science and air quality experts, develop skills for evaluating and making improvements to critical emissions and air quality models, and publish novel environmental science research on a topic of high interest to the U.S. EPA and the wider environmental community.

Mentor(s): The mentor for this opportunity is Jesse Bash (bash.jesse@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: Summer/Fall 2020. All start dates are flexible and vary depending on numerous factors. Click [here](#) for detailed information about start dates.

Appointment Length: The appointment will initially be for one year and may be renewed up to four additional years upon EPA recommendation and subject to availability of funding.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience. Click [here](#) for detailed information about full-time stipends.

EPA Security Clearance: Completion of a successful background investigation by the Office of Personnel Management (OPM) is required for an applicant to be on-boarded at EPA.

ORISE Information: This program, administered by ORAU through its

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contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and EPA. Participants do not become employees of EPA, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

Questions: Please see the [FAQ section](#) of our website. After reading, if you have additional questions about the application process please email EPArpp@ornl.gov and include the reference code for this opportunity.

Qualifications The qualified candidate should be currently pursuing or have received a degree in one of the relevant fields. Degree must have been received within five years of the appointment start date.

Preferred skills:

- Familiarity with Linux-type computational tools (e.g. Python, Matlab, R, etc)
- Experience with Fortran programming language

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
 - **Chemistry and Materials Sciences** ([2](#))
 - **Earth and Geosciences** ([21](#))
 - **Engineering** ([27](#))
 - **Environmental and Marine Sciences** ([13](#))
 - **Mathematics and Statistics** ([2](#))
 - **Physics** ([2](#))
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).