**Opportunity Title:** Understanding and forecasting wildfire emissions impacts with modeling and data assimilation
**Opportunity Reference Code:** 0103-NPP-NOV23-ARC-EarthSci

**Organization** National Aeronautics and Space Administration (NASA)

**Reference Code** 0103-NPP-NOV23-ARC-EarthSci

**How to Apply** All applications must be submitted in Zintellect

**Application Deadline** 11/1/2023 6:00:59 PM Eastern Time Zone

**Description** **Description:**

During the past 20 years, western United States (U.S.) wildfires (WF) have increased in frequency and size. By 2050, the burned area in the Pacific Northwest is projected to increase by 78%. WF emissions contain particulate matter (PM) as well as a large variety of gas-phase chemical compounds: carbon monoxide (CO), reactive nitrogen species such as nitrogen oxides (NOx), nitrous acid (HONO), ammonia (NO3), nitric acid (HNO3), and volatile organic compounds (VOCs). In the presence of NOx, WF-based VOCs oxidize with hydroxide (OH) to produce secondary organic aerosols as well as tropospheric ozone (O3). We use chemical transport models (CTMs) as tools to understand the interaction of WF-emissions and local/regional air quality (AQ). ***This research opportunity (RO) seeks proposals that investigate the use of CTMs together with data assimilation (DA) of in situ and/or profiler measurements and remote/satellite retrievals with 'top-down' emissions estimation to better understand and forecast the impacts of WF emissions on AQ, human health, and the environment.***

This RO focuses on interfacing global and regional CTMs in a state-of-the-science regional, ensemble, atmospheric composition (AC) forecast/assimilation system with dynamic emissions estimation to study the impacts of WF-emissions on AQ. We are interested in proposals that address one or more of the following research areas:

- How to use *in situ* and/or remote observations to better understand and improve: WF-emissions estimates, WF-emissions transport, interaction of WF-emissions and local/regional AC, and/or impacts of WF-emissions AQ, human, and the environment;
- Theory-based improvements to the quantification of WF-emissions in global/regional CTMs;
- 'Top-down' emissions estimation methods for dynamic emissions estimation in coupled global/regional AC forecast/assimilation systems;
- Application of chemical DA in coupled global/regional AC forecast/assimilation systems with dynamic emissions estimation;
- Increasing the computational and storage efficiency for chemical DA in coupled global/regional forecast/assimilation systems; and
- Increasing the computational and storage efficiency for 'top-down' emissions estimation in coupled global/regional forecast/assimilation systems.

**Field of Science:** Earth Science

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**Advisors:**

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**Applications with citizens from Designated Countries will not be accepted at this time, unless they are Legal Permanent Residents of the United States.** A complete list of Designated Countries can be found at: https://www.nasa.gov/oiir/export-control.

Eligibility is currently open to:

- U.S. Citizens;
- U.S. Lawful Permanent Residents (LPR);
- Foreign Nationals eligible for an Exchange Visitor J-1 visa status; and,
- Applicants for LPR, asylees, or refugees in the U.S. at the time of application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status

**Eligibility Requirements**

- **Degree:** Doctoral Degree.