

**Opportunity Title:** Assessing Trends and Variability in Terrestrial Ecosystem

Photosynthesis

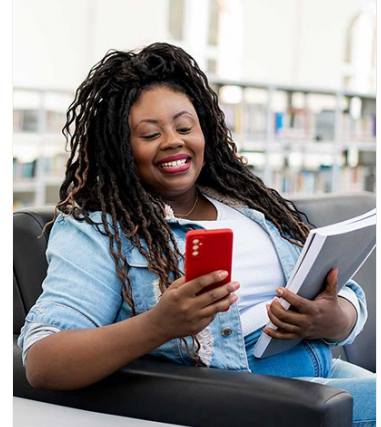
**Opportunity Reference Code:** 0171-NPP-NOV23-JPL-EarthSci

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

**Reference Code** 0171-NPP-NOV23-JPL-EarthSci

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

**Description** Assessing Trends and Variability in Terrestrial Ecosystem Photosynthesis and Carbon Uptake in Climate Sensitive Regions, JPL is seeking a postdoctoral fellow, mentored by Dr. Nicholas Parazoo, to investigate coupled carbon-water cycle interactions and bioclimatic controls on ecosystem productivity. The global terrestrial carbon sink, representing land uptake of atmospheric CO<sub>2</sub> by net ecosystem exchange (NEE), offsets one-third of the world's fossil fuel emissions. The Grand Challenge of Carbon Cycle Science is to understand how NEE will evolve under future climate change and how this will impact atmospheric CO<sub>2</sub> concentrations. Gross uptake of carbon by photosynthesis ("gross primary production" or GPP) is a primary driver of the carbon cycle and a major point of interaction with climate change at interannual time scales. Linking interannual variability of atmospheric CO<sub>2</sub> to GPP can provide insight about the NEE response to climate change. Climate change is expected to cause warmer springs and drier summers, which can increase GPP in the spring, but reduce peak growing season GPP. The CO<sub>2</sub> flux response to seasonal warming and drying is uncertain, but may increasingly depend on availability of liquid water in soils. Our ability to quantify and predict climate feedbacks to C-water cycle interactions requires methods for estimating net and component CO<sub>2</sub> flux response to seasonal warming, thawing, and drying, and determining the dependence on climate, phenology, and biome diversity at landscape, ecosystem, and regional scales. This requires focus on systematic, continental-scale sampling over multiple years and from multiple in situ, airborne, and remote sensing monitoring systems. One of the most pressing questions is how increased uptake due to earlier spring onset might offset summer drying induced CO<sub>2</sub> losses, and how these processes are coupled through C/water cycle interactions. The NPP fellow will have an opportunity to work with Dr. Parazoo and other scientists at JPL in the Earth Science Division and the Carbon Cycle and Ecosystems group (Drs. Charles Miller, Dave Schimel, Darren Drewry, Troy Magney), as well as Caltech (Christian Frankenberg, Philipp Kohler), to exploit an expanding set of multi-scale satellite (SCIAMACHY, GOSAT, GOME-2, OCO-2, TROPOMI), airborne (CARVE, ABoVE), and field (FluoNet, Ameriflux, PCN) vegetation, carbon and water cycle observations with state-of-the-art land and atmosphere models to investigate the response and feedback of seasonal phenology, gross and net CO<sub>2</sub> exchange, and atmospheric CO<sub>2</sub> to climate variability. Preferred qualifications: PhD in Ecology, Plant physiology, Biogeochemistry, Earth system science, or related field o Graduate level training in ecology and plant physiology; Graduate level training in statistics; Experience using tower, airborne, and spaceborne remote sensing datasets; Experience conducting ecological field work in remote locations. Experience with numerical modeling of land and atmospheric processes. Please contact Dr. Parazoo (818-354-2973, Nicholas.c.parazoo@jpl.nasa.gov) for more information



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**Location:**

Jet Propulsion Laboratory  
Pasadena, California

**Field of Science:**Earth Science

**Advisors:**

Nicholas Parazoo  
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9706727410

**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/oirr/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.