

Opportunity Title: Integrating Satellite Remote Sensing with a Demographic Dynamic Global Vegetation Model to Advance Carbon Cycle Science

Opportunity Reference Code: 0015-NPP-MAR24-GISS-EarthSci

Organization National Aeronautics and Space Administration (NASA)

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Application Deadline 3/1/2024 6:00:59 PM Eastern Time Zone

Description A key challenge in constraining uncertainty in land carbon dynamics is how to represent the vertical and horizontal spatial heterogeneity and community structure of vegetation canopies in dynamic global vegetation models (DGVMs) that couple with climate models. DGVMs that represent demography of vegetation communities -- the distribution of plants of different sizes -- offer a promising, still emerging computational framework. Satellite lidar data are now also emerging as a means to quantify observed vertical canopy structure. Our group pursues studies to incorporate such data into a demographic DGVM coupled to the NASA GISS Model Earth System Model. We use satellite data from the Moderate Resolution Imaging Spectroradiometer (MODIS), the Global Ecosystem Dynamics Investigation (GEDI), and other Earth observing missions.

Postdoctoral fellows are invited to propose research incorporating lidar observations of vegetation at the site, regional and/or global scales. Studies could involve, but are not limited to:

- (1) radiative transfer and albedo
- (2) plant allometry to constrain canopy structure, vegetation biomass, and radiative transfer metrics
- (3) development of new satellite lidar data products estimating vegetation demography or landscape structure
- (5) coupled climate-carbon cycle simulation experiments that may incorporate any of the above, including climate change, seasonality, fire dynamics.

Successful applicants should have experience with mathematical modeling, computer programming, and analyzing field and remote sensing datasets. Background in the following is highly desirable: Earth, Physical, and/or Computing Sciences, Carbon Cycle Science, advanced statistics, programming in a compiled language like C or FORTRAN95, and scripting with python or R.

Location:

Goddard Institute for Space Studies
New York City, New York

Field of Science:Earth Science

Advisors:

Nancy Y. Kiang
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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/oijr/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.