Overview

The National Socio-Environmental Synthesis Center (SESYNC) invites applications from a diverse array of scientists for a three-day workshop in February 2020 focused on how the National Ecological Observatory Network (NEON) and Airborne Observation Platform (AOP) data could be used in socio-environmental (S-E) synthesis and convergent research. The workshop will seek to address several systemic problems that currently limit convergent research that uses the highest remote sensing technology to study problems at the interface of ecology, land-change science, and social science.

Details

During this workshop, participants will develop and gain an enhanced understanding of NEON-AOP data and previously developed workflows and computational tools. They will also help scope future needs for workflow development and relevant data management/sharing considerations. Outcomes of the workshop will include the establishment of a shared vision for how NEON-AOP data and future space-based hyperspectral resources could be used in S-E synthesis.

The workshop will address the following problems:

1. With the increased availability of hyperspectral remote sensing, there needs to be a rapid growth in the number of people who understand data capabilities and workflows.
2. The capabilities of hyperspectral and LiDAR (Light Detection and Ranging) remote sensing must be explored in the context of socio-environmental synthesis that seeks to bring highly quantitative and advanced earth observations to a variety of research disciplines across the natural/biophysical and social sciences.
3. Methods for scaling NEON AOP footprints to regional and national scales will be necessary to draw general conclusions from AOP data with limited extent.

This preparatory activity will introduce participants to ways to plan for and respond to a future SESYNC request for proposals for interdisciplinary Pursuits that may use NEON-AOP data for S-E synthesis. The workshop will also prepare participants to respond to the National Science Foundation's (NSF) Macrosystems requiring the use of NEON data and to contribute to the development of social science applications relevant to National Aeronautics and Space Administration's (NASA) planned Surface Biology Geology mission.

Please find the agenda for this workshop [here](#).
Video recordings of the workshop's presentations are available [here](#). 

**Workshop Goals**

1. Expand the NEON AOP user community.
   a. Expand the number of people who understand data capabilities and workflows.
   b. Build networks of scientists engaged in designing and answering S-E synthesis questions advanced earth observations.
   c. Garner feedback on the best ways SESYNC can continue to expand the community.
2. Answer the question (Q1): What enables the use of NEON AOP for the study of socio-environmental systems? What limits its use?
3. Answer the question (Q2): What are the unique opportunities and challenges for using NEON AOP data to scale understanding of S-E systems from sites to regional and national scales?

**Distinguished Scholars**

![Dr. Jeff Atkins](image1.jpg)

**Dr. Jeff Atkins, Ecosystem Ecologist and Postdoctoral Fellow, Virginia Commonwealth University**

Jeff Atkins is an ecosystem ecologist and postdoctoral fellow at Virginia Commonwealth University where his research focuses on exploring the relationships between ecosystem structure and function. Specifically, he uses remote sensing techniques, including terrestrial LiDAR, to examine how scientists can more fully characterize the structure of ecosystems to better understand ecosystem function (e.g., productivity, resource efficiencies, and response to disturbance). He also co-hosts the science and ecology podcast, "Major Revisions," and writes online for *PLOS Ecology* and other outlets.

![Dr. Megan Cattau](image2.jpg)

**Dr. Megan Cattau, Assistant Professor, Boise State University**

Megan Cattau is an Assistant Professor in Human-Environment Systems at Boise State University, with a specialization in using big data approaches to answer theory- and management-relevant questions about
Dr. K. Dana Chadwick, Postdoctoral Researcher, Stanford University

Dana Chadwick is a postdoctoral researcher in Dr. Kate Maher's lab and an affiliate of Dr. Eoin Brodie. Much of her current work is based in the Upper East River Watershed near Crested Butte, Colorado. She focuses on utilizing remote sensing paired with intensive field campaigns in order to better understand landscape ecosystem ecology and biogeochemical processes. She believes that by improving our understanding of the interactions between the aboveground and belowground components of these systems we can better understand their functioning. In addition, by developing the ability to link soil and subsurface biogeochemical processes with remotely detectable components of the Earth system, we can develop a window into the subsurface. She was previously funded for this work through an NSF EAR Postdoctoral Fellowship and is now funded by an NSF Signals in the Soils grant.

She conducted her graduate work in the Earth System Science Department at Stanford University, under the advisement of Dr. Greg Asner, now at the Center for Global Discovery and Conservation Science at Arizona State University. During this work, she was supported by a NASA Earth and Space Science Fellowship.

Dr. Tristan Goulden, Science Lead for NEON’s Remote Sensing Team

Tristan is a Remote Sensing Scientist at NEON specializing in airborne remote sensing. He is the science lead for NEON’s Remote Sensing team, which focuses on algorithm development, documentation, collection, and processing of NEON’s remote sensing data products. His past research focus has been on characterizing uncertainty in LiDAR observations/processing and propagating the uncertainty into downstream data products. During his PhD, he focused on developing uncertainty models for topographic attributes (e.g., elevation, slope, and aspect) hydrological products, such as watershed boundaries, stream networks, as well as stream flow and erosion at the watershed scale. His past experience in LiDAR has included all aspects of the LiDAR workflow.
including, mission planning, airborne operations, processing of raw data, and development of higher level data products. During his graduate research, he applied these skills on LiDAR flights over several case study watersheds of study as well as some amazing LiDAR flights over the Canadian Rockies for monitoring change of alpine glaciers.

Dr. Yusuke Kuwayama, Fellow, Resources for the Future

Yusuke Kuwayama is a Fellow at Resources for the Future (RFF) in Washington, DC. His primary research field is natural resource economics and policy, with a focus on water resources and ecosystems. He is particularly interested in interdisciplinary approaches to addressing questions involving sustainable use and management of coupled human-natural systems, especially work that requires modeling human decision-making, hydrologic and ecological processes, and the connections between them. Kuwayama also currently serves as Director of the Consortium for the Valuation of Applications Benefits Linked with Earth Science (VALUABLES), a cooperative agreement between RFF and the NASA to carry out research, outreach, and communications activities relating to the societal value of information derived from Earth observations. He received his PhD in Agricultural and Applied Economics and MS in Economics from the University of Illinois at Urbana-Champaign, and an AB in Economics from Amherst College.

Dr. Donal O’Leary, Data Science Educator, National Ecological Observatory Network

Donal O’Leary is a data science educator with the National Ecological Observatory Network (NEON) in Boulder, Colorado. After 10 years of experience in outdoor leadership, Donal earned his PhD in Geographical Sciences from the University of Maryland, where he used satellite images and climate models to assess the impacts of seasonal- and decadal-scale climate change on national parks of the USA. Today, Donal gets to combine his passions for science, teaching, and the natural world by developing educational materials and teaching environmental data science workshops around the country.

Costs and Travel
The workshop will be held at SESYNC’s facilities in Annapolis, Maryland. SESYNC will provide funding for travel, lodging, and meals for 30 on-site participants. Portions of the workshop will be web-streamed [4] to facilitate access for additional remote participants.

**How to Apply**

The application period for this workshop is now closed.

**Event type:**
NEON AOP-Enabled Synthesis Workshop

**Event Attendance:**
Private Working Group

**Source URL:**

**Links**
[1] https://www.neonscience.org/
[4] https://www.youtube.com/playlist?list=PLIGFwrZq94y8Qi7QnShUhrTryzsja07UGb