SOCIO-ENVIRONMENTAL SCIENCE @ SESYNC

ANNAPOLIS, MARYLAND

About SESYNC

Because society's most critical environmental problems are rooted in the multifaceted and deeply interconnected relationships between humans and the natural ecosystems in which they live, they require the unique knowledge sets and perspectives of scientists from both the social and natural sciences. The **National Socio-Environmental Synthesis Center (SESYNC)** is dedicated to accelerating scientific discovery at the interface of human and ecological systems. We support new interdisciplinary collaborations that pursue data-driven solutions to pressing socio-environmental problems.

SESYNC focuses on a research approach called **"synthesis"** to produce fundamental knowledge about co-dependent human and natural systems. Synthesis brings together existing but disparate data, methods, theories, and tools in new and perhaps unexpected ways to reveal relationships or to generate novel insights. Synthesis is a highly varied effort, and its definition will change depending upon the lens of those who undertake it. However, in all cases, synthesis is a means for accelerating scientific understanding that is applicable across multiple places and scales.

SESYNC is funded by an award to the University of Maryland from the National Science Foundation.

Current & Recent Projects

- The development of a novel and timely strategy for sustainable freshwater management by integrating engineering and ecological approaches to climate resilience.

- A first-of-its-kind quantitative analysis linking a nationwide inventory of toxic releases and the socio-economic status of surrounding communities, revealing disproportionate distributions of environmental harm that have implications for environmental justice.

- An investigation of the institutional drivers and governance conditions of virtual freshwater appropriation associated with large-scale global land acquisitions.

- A survey of how weather patterns affect water availability—which largely determines crop yields and livestock production and hence food availability—and the creation of a policy instrument to inform drought adaptation responses in developing regions.

Media Inquiries

Contact Melissa Andreychek, SESYNC Communications Coordinator
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Margaret Palmer, PhD
SESYNC Executive Director, University of Maryland Distinguished University Professor
Expertise: Stream ecosystems, stream restoration, freshwater ecosystems & ecosystem services
Mini-bio: With a background in hydrology and ecology, Dr. Palmer is an international expert on the restoration of streams and rivers. She has worked extensively on the relationship between biodiversity and ecosystem processes, the biogeochemistry of streams and wetlands, and organism dispersal in aquatic ecosystems. Palmer is also known for her work at the interface of water science and policy, having served as a technical advisor and innovator to help build solution-focused teams that solve problems with social, legal, policy, and scientific aspects.

Noelle Beckman, PhD
SESYNC Postdoctoral Fellow
Expertise: Theoretical ecology, tropical plant ecology, spatial ecology
Mini-bio: Dr. Beckman uses a combination of quantitative and empirical approaches to investigate interactions between plants and their environment and examines the role of these interactions in limiting plant populations and maintaining biodiversity. Many of these interactions are disrupted by global change, and she examines the consequences of these disruptions for plant communities and ecosystem functions.

Elizabeth Daut, DVM, PhD
SESYNC Postdoctoral Fellow
Expertise: Wildlife trade & infectious diseases, wildlife conservation & rehabilitation, conservation medicine, NGOs
Mini-bio: Dr. Daut is a veterinarian with wildlife medicine and management experience in the U.S. and South America. She first became alarmed by illegal wildlife trade as a Peace Corps Volunteer in Ecuador, where she established and ran an environmental NGO for almost 10 years. Now, as a researcher, she uses quantitative and qualitative methodologies to investigate social and biological issues related to wildlife trade. Daut's current work investigates the risk of introducing infectious disease to native U.S. wildlife populations resulting from the importation of exotic and wild animals for the pet industry.

Jampel Dell'Angelo, PhD
SESYNC Postdoctoral Fellow
Expertise: Land & water grabbing, environmental conflicts, water conflicts, natural resource management, water governance, development
Mini-bio: Dr. Dell'Angelo conducts research on the institutional drivers and governance conditions of virtual freshwater appropriation associated with the global land rush. Prior to SESYNC, he was a postdoc at the Ostrom Workshop at Indiana University working on water governance in Kenya.

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Kristina Hopkins, PhD
SESYNC Postdoctoral Fellow
Expertise: Urban hydrology & stormwater management, water pollution in urban areas, sustainable stormwater management
Mini-bio: Dr. Hopkins' research interests straddle the fields of hydrology, land use planning, and political science. She is broadly interested in coupled human–natural systems, particularly as they relate to water management in cities. In her current work, Hopkins is characterizing how stormwater management strategies change over time and what socio-political factors facilitate transitions in management styles. This work will identify policies and governance structures that catalyze transitions towards resilient, sustainable stormwater management systems.

Kristal Jones, PhD
SESYNC Food Systems Research Fellow
Expertise: Agricultural development in sub-Saharan Africa, structure of U.S. agriculture, social theory about environmental change
Mini-bio: Dr. Jones' international work has focused on understanding the social dimensions of agricultural research for development in Francophone West Africa, particularly focused on changes in seed systems. An ongoing project assess the social and environmental impacts of the global food system on measures of food security and rural well-being. Her domestic work looks at changes in the social, economic and technical foundations of agricultural production in the United States, including land ownership structures and technological change.

Matthew LaFevor, PhD
SESYNC Postdoctoral Fellow
Expertise: Agriculture, environmental history, Mexico, geography, conservation, mountains
Mini-bio: Dr. LaFevor's research examines human–environment relationships, agriculture, environmental history, and natural resource management in Mexico, the Caribbean, and the larger Atlantic World. Research funding has been provided by the National Science Foundation (DDRI #1031676), Fulbright-Hays (IIE-Mellon Foundation), the Boren Fellowship for International Study, and the British Library Endangered Archives Programme, among other foundations.

Nicholas Magliocca, PhD
SESYNC Computational Research Fellow
Expertise: Land use change, synthesis methods, agent-based modeling, food security
Mini-bio: Dr. Magliocca's research uses agent-based models to investigate the dynamics of human–environment interactions and their consequences for environmental and economic sustainability. In particular, he studies the linkages between human decision making, land use choices, and the feedbacks from human modifications of the natural landscape.

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Joe Maher, PhD
SESYNC Computational Postdoctoral Fellow
Expertise: Environmental & energy economics, residential & commercial energy efficiency, tropical forest conservation policy, economic valuation of urban forests
Mini-bio: Dr. Maher is an economist who studies a broad range of forest policies, both at the global scale (to assess tropical forest protection) and at the local scale (to value services from urban trees). In addition, his work on the energy efficiency gap evaluates how technology investments reduce energy use in buildings. Maher's past work also includes non-market valuation studies of stream restorations, hike–bike trails, and public transit improvements.

Cynthia Wei, PhD
SESYNC Assistant Director of Education & Outreach
Expertise: Socio-environmental synthesis education, interdisciplinary environmental education, biology education, animal cognition
Mini-bio: Dr. Wei works to advance the teaching and learning of socio-environmental synthesis. She has worked at the National Science Foundation and the National Academy of Sciences on several national STEM education programs and initiatives related to biology education, climate change education, and community colleges, work which built on her experiences as a K–12 science teacher and college-level biology instructor. Dr. Wei has also conducted research on animal cognition, earning a dual-degree PhD in zoology and ecology, evolutionary biology, and behavior.

Jenny Zambrano, PhD
SESYNC Postdoctoral Fellow
Expertise: Plant tropical ecology, plant demography, forest fragmentation, ecological modeling
Mini-bio: Dr. Zambrano is interested in exploring the processes controling the dynamics of plant communities in changing environments. In past research, explored the effects of hunting on seedling recruitment on plants species dispersed by primates in the Colombian Amazon and conducted a study at Los Tuxtlas forest, Mexico, to investigate the effects of forest fragmentation on the dynamics of the late-successional tropical tree Poulsenia armata (Moraceae). Zambrano is currently exploring the effects of functional neighborhood, climate, and geographical location on tree performance.