



**YEAR 9 ANNUAL REPORT OF THE  
NATIONAL SOCIO-ENVIRONMENTAL SYNTHESIS CENTER**

Reporting on Activities from September 2019 to August 2020



[www.SESYNC.org](http://www.SESYNC.org)



## INTRODUCTION

SESYNC's mission is to foster synthetic, actionable scholarship related to the structure, functioning, and sustainability of socio-environmental (S-E) systems. SESYNC was founded on the premise that progress toward a sustainable future requires new knowledge that arises from close collaborations across many disciplines including, for example, the natural, social, and computational sciences and involving academia, federal and state agencies, and non-governmental organizations. To achieve this mission, SESYNC catalyzes a rich portfolio of synthesis activities and provides essential support services that have helped researchers, policymakers, and representatives of many different groups to work together to discover solutions to socio-environmental problems. In this way, we have fostered the production of actionable science. SESYNC works with the world's leading natural, social, and computational scientists who travel to its Annapolis facility. There they develop and utilize collaborative teamwork skills to advance transdisciplinary synthesis research to address the fundamental challenges posed by S-E problems.

SESYNC's diverse offerings of programs, processes, and training are designed to accelerate knowledge generation, build new communities, and educate and engage early career scholars and educators. By building new capacities among many communities, SESYNC works to lower the barriers to adopting unfamiliar synthesis methods, and to grow the synthesis process. We place a premium on flexibility and openness to new ideas from the community – not only topically but on methods of engagement and synthesis team building. We are actively engaged with all the teams that work at the Center and practice “gentle interventions” to help them overcome hurdles.

Over the course of this grant year, SESYNC leadership and staff worked to fulfil our commitment to core activities through Pursuits, Workshops, Foundations, and Fellowships – efforts that enable the Center to serve the needs of a diverse and growing community of users in a manner consistent with our mission.

## CAPACITY-BUILDING FOR S-E SYNTHESIS

**Early Career Research Training Program.** To reach a more expansive community of early-career scholars, SESYNC developed and launched a new Early-Career Researchers (ECR) Program. This program was designed to bring groups of 25-35 participants with various levels of research experience (ranging from PhD candidates to Assistant Professors as well as other early-career professional researchers) to SESYNC for short, intensive workshops. The workshops are thematically focused and aim to introduce participants to the fundamental theories and methods of convergence research, within the context of each theme.

This year, we piloted a 3-day workshop entitled *S-E Approaches to Watershed Management and Governance*. Six speakers from the fields of ecology, hydrology, governance, and policy introduced attendees to the epistemologies, methods, and approaches needed to conduct interdisciplinary research. The immersive experience provided opportunity for ECRs to expand their knowledge and skills to work in and lead interdisciplinary collaborations. Attendees also had opportunities to network and form new partnerships with other scholars from a mix of disciplinary expertise (44% natural scientist and 31% social scientist) and career experience (19% PhD Candidate, 46% Postdoctoral Fellows, 4% Assistant

Professors, and 19% professionals with equivalent experience). We found that 73% of the attendees are continuing to work with their new collaborators to generate new publications and proposals, including submissions to SESYNC'S Pursuit RFP. We would like to hold additional ECR workshops – preferably in person but online if necessary – but this depends on funding available.

**Postdoctoral Training.** SESYNC supports postdoctoral scholars for two-year fellowships. During this reporting period, we supported 16 postdocs from the 2018 and 2019 cohorts. We also leveraged external funding to support an additional postdoc in residence at SESYNC. These postdoctoral fellows conducted original synthesis research and participated in SESYNC's Socio-Environmental Immersion Program. Each postdoc has one or more collaborating mentors to support technical or novel aspects of their research and to help expand their professional networks. SESYNC facilitated these interactions by providing travel funds for the Fellow and mentor to visit each other.

The Socio-Environmental Immersion Program is designed to enhance interdisciplinarity and understanding of S-E synthesis and increase Fellows' capacity for working in teams and conducting actionable science. During this reporting period, three Immersion workshops focused on the theory, methods, research topics, and career opportunities in ecology, public health, and environmental policy respectively and a fourth one-day workshop taught skill building in scientific writing.

Drs. David Hawthorne and Christine Maietta served as the Fellows' on-site postdoctoral mentors and provided guidance and feedback on topics including preparing job applications, developing grant proposals and budgets, preparing effective research presentations, and building research networks. Additional opportunities designed to help Fellows build the full suite of professional skills needed to become successful scholars include: participating in the review panel for 2020-2021 Postdoctoral Fellow applicants; meeting with visiting scholars and seminar speakers; giving practice talks for conferences and interviews; gaining teaching experience through contributions to short courses and workshops; and attending a science communications workshop led by SESYNC Senior Communications Fellow Lisa Palmer.

**Graduate Student Training.** SESYNC offered the seventh *Graduate Student Workshop for Socio-Environmental Synthesis* in August 2019, which culminated in the release of the RFP for 7<sup>th</sup> cohort of Graduate Student Pursuits. During the workshop, thirty PhD students were introduced to training and skill-building opportunities in the areas of socio-environmental systems thinking, data-driven synthesis, team science, science communication, and interdisciplinary research design, and proposal development. The Graduate Pursuit program allows participants to continue to hone the above skills while leading and contributing to independent, interdisciplinary research projects in real-world (albeit well-supported) settings. Five new Graduate Pursuit teams were formally on-boarded in January 2020 as a result of the latest call, bringing the program total to 21 projects funded under this award. Leaders of the new Graduate Pursuit teams were invited to SESYNC in March 2020 for an additional specialized training focused on enhancing scientific leadership and project management capacities.

**Graduate Student Leaders Workshop.** This past year, SESYNC introduced two new initiatives aimed at increasing the number and scope of graduate students able to benefit from SESYNC's resources and training. The first of these was the *Graduate Leaders in Socio-Environmental Synthesis* workshop, held in January 2020. Unlike SESYNC's signature graduate student workshops, this workshop was not focused on the development of Graduate Pursuit proposals. Rather, this workshop introduced synthesis and data-driven concepts, theories, frameworks, methods, and skills from an individualized perspective. Students

learned synthesis tools and techniques to bring back to their home institutions, enhance their own graduate studies, and better address pressing S-E problems. This workshop was also the program's first to invite applications from both master's and PhD students. It stemmed from multiple requests over the years from master's students seeking to jump start synthesis training for an eventual PhD and from those wishing to develop such skills for a non-academic research position at an NGO, government agency, etc. Without a link to an RFP, the workshop better accommodates the shorter program period of master's degrees while also serving PhD students who may not be able to commit to a Pursuit. Due to overwhelming interest and demand, we hope to hold another *Graduate Leaders* workshop in early 2021.

**International Graduate Synthesis Education and Research Program.** SESYNC staff traveled in October 2019 with four University of Maryland graduate students to the Helmholtz Centre for the Environment in Leipzig, Germany. The Leipzig meeting built upon the success of a 2018 meeting in Leeds, continuing our ongoing partnership for synthesis research and education with the Helmholtz Centre and the University of Leeds. Core to this multi-institutional program is the immersive and hands-on design that balances synthesis and collaboration skills with cultural exchange, meta-learning, and deep mentorship. Students receive in real-time both practical context and theoretical grounding to better understand what they are doing or observing as a diverse team, and thus what actions they should take next to succeed. The goal is that students not only take away research products from the experience, but transferable knowledge of the synthesis process and a robust international community from which future collaborations may emerge. The third and final meeting will be at SESYNC.

**Short Courses.** SESYNC continues to offer a comprehensive set of short courses designed to strengthen professional skills and build capacity in the research community. While we originally had five short courses planned at our center in 2020, we have adjusted in light of the COVID-19 pandemic. The following short courses will be offered virtually in summer 2020:

- *Introduction to Social and Ecological Network Analysis:* This annual short course serves as an introduction to the theory and practice of Social and Ecological Network Analysis. This course is intended as a foundational course for anyone interested in adding network analysis to their analytical toolkit.
- *Introduction to Spatial Agent-Based Modeling (ABM):* This annual short course provides an introduction to the theory and practice of spatially-explicit ABM. Students learn the essential theoretical background and technical expertise needed to conceptualize, build, and analyze their first ABM.
- *Summer Institute on Cyberinfrastructure for Socio-Environmental Synthesis:* This annual short course offers participants hands-on instruction and project-focused coaching on software tools available through open-source licenses or widely available at most research institutions. The course combines lectures, hands-on computer labs, and project consultation designed to accelerate the adoption of cyber resources for all phases of data-driven research and dissemination. It is led by our cyberinfrastructure and data science team.

## IMPACT

**Socio-Environmental Science.** SESYNC has focused on using all of our resources to fully implement programs and processes that reflect our commitment to advancing the capacity of individuals

and teams to advance socio-environmental synthesis and science. Our continuing engagement cuts across numerous disciplines and impacts key areas — all consistent with our refined theory of change. We have challenged ourselves to advance understanding in new areas and to help participants in new ways. Iteration with SESYNC staff and detailed feedback from reviewers remains an essential element and has a high impact on those that apply for support, ultimately leading to stronger research projects. Our research support “practice” has continued to evolve and improve how we provide an integrated approach to learning the specific needs of each research team and to match our capacity to help accelerate the work that the community brings to the center. Based on our preliminary review of our ongoing evaluation, this effort has had a clear impact on teams over the past year.

During this reporting period, SESYNC committed staff and resources to pilot several programs designed to accelerate our interactions with early career researchers who want to increase their SE expertise and interdisciplinary skills. As detailed elsewhere in this report, we focused specifically on participants from graduate students to the assistant professor level. These different programs were extremely well received, and each was over-subscribed. For example, the Graduate Leaders Program received ~120 applicants for 30 openings including many MS students and the first Early Career Researchers workshop received ~80 applications for 26 spots. It was clear from interactions with participants across each of these workshops that there is a significant unmet need for this type of training and especially for structured opportunities for interdisciplinary networking. Participants consistently noted that such interdisciplinary opportunities are not being provided in more traditional academic settings.

SESYNC’s efforts to advance S-E modelling continued during this reporting period. Our ongoing partnership with Resources for the Future (RFF) has been fully implemented across three innovative SE-modeling Pursuits all led by early career researchers. Each has formed active modeling teams who have met at SESYNC and each team is developing several manuscripts that should be completed in the coming 6-12 months.

**A Focus on Interdisciplinary Process.** Disciplinary diversity within and among teams is clearly very high, however we continue to note that when participants are asked to self-characterize according to the disciplinary categories that NSF (and SESYNC) use, they report that these are somewhat confining. Many of our participants feel that they cut across several disciplinary lines, a trend which is increasingly common throughout science. In the demographic survey that all participants complete, they are asked to self-characterize themselves (e.g., natural scientist, social scientist, government, etc.), and in addition, we categorize participants as either "scholars" or "knowledge users" based upon their selection for “institutional status." Scholars (or "academics") are those within academic institutions as graduate/postdoc students and teaching or research faculty, and knowledge users are those within the policy, business/industry, government, or NGO/nonprofit sectors. Of those reporting demographic information from our core programs supported from this award, 19% of SESYNC participants come from outside academia and 65% of the 74 research teams reporting include knowledge users in their teams. Such sectoral diversity is key in the SESYNC model and helps ensure actionability.

As previously mentioned, all SESYNC participants are asked to self-characterize as falling into one of the following categories: natural scientist, social scientist, both natural and social scientist, computer scientist, policy, NGO, government, business/private sector, or other. Of the participants from *all* programs (Pursuits, Workshops, Foundations, and Short Courses) who responded to the self-characterization question (response rate = 83%), 436 chose natural scientist (34%), 321 chose social scientist (25%), 324 reported as both natural and social scientist (26%), and 14 chose computer scientist (1%). The remaining

participants self-reported as NGO, government, policy, or industry (98 individuals, 8%) or other (76 individuals, 6%).

Of those reporting from *just* our core synthesis research programs (Pursuits, Workshops, and Foundations), there were 784 academic scholars, 172 knowledge users, and 11 participants who classified as both. Of the core participants classified as knowledge users, 46% came from the NGO/non-profit sector, 47% from the government sector, and 7% from business or industry. Of the core participants classified as academic scholars, the disciplinary diversity of those responding to the demographic survey is illustrated below. Participants are asked to describe their primary disciplinary area of expertise, which is used to assign them to one of the following research domains, aligned roughly with NSF's research areas:

- Life sciences: 28%
- Geosciences: 18%
- Non-Economic Social Sciences: 26%
- Economics: 6%
- Computer Science and Engineering: 3%
- Policy: 6%
- Humanities: 4%
- Public Health: 4%
- Other (education, business, etc.): 5%

As is clear from these numbers, SESYNC research cuts across many disciplines, yet we continue to be struck by the depth and breadth of intellectual diversity among our projects. For example, a Graduate Student Pursuit exploring the role of narratives in socio-ecological system dynamics is co-led by a doctoral student whose focus is English literature and another who is a geographer. The students are examining how stories and narratives can bridge social and environmental systems and provide context for how natural resources are managed by examining the history of the oyster fishery in coastal Maine. As another example, the recently funded workshop *Adaptation, Optimality, and Risk Management: What Do the Human Evolutionary Sciences and the Climate Sciences Have to Offer Each Other?* will examine how scholarship on human evolution and adaptation might inform current strategies for climate adaptation. Finally, two of SESYNC's postdocs, environmental historians Dr. Merle Eisenberg and Dr. Lee Mordechai, have bridged qualitative and quantitative methods to re-evaluate our understanding of the Justinianic Plague's impacts, using data sources spanning historical texts, coins, and paleo-ecological pollen samples. A collaboration between Dr. Mordechai and disease ecologist Dr. Lauren White, another SESYNC postdoc, recently led to a PLOS One publication that modeled hypothesized transmission routes of this sixth century pandemic. During a time when the world is looking to historical pandemics to help us understand the current COVID-19 crisis, their research is producing particularly relevant insights for new audiences. Participants in these projects and others frequently remark that they would not have been able to engage with such seemingly distant, yet highly relevant, disciplines without SESYNC support.

Finally, we have also continued to impact other disciplines through work with Dr. Bethany Laursen of Michigan State University's Center for Interdisciplinarity (C4I). Dr. Laursen is collaborating with SESYNC's Dr. Nicole Motzer to conduct a formal evaluation of the interdisciplinary evaluation field and develop and test a new methodology and reproducible rubric for evaluating manuscripts produced by synthesis teams. The methodology seeks to determine the manuscripts' level of interdisciplinarity and integrative science and will yield further insights about impacts across disciplines. Thus far, this



collaboration has resulted in two Science of Team Science conference presentations, two manuscripts in development, and a curated, open-access database soon to be deposited to Harvard's Dataverse, titled: "Systematic review of the interdisciplinary evaluation literature from 2000-2019."

**Actionable Science.** Actionable scholarship is often under-rewarded within academia, and academic researchers often lack the training and experience needed to productively interact with knowledge users and to address public policy questions, as opposed to purely academic questions. SESYNC helps the academic community develop the policy skills, research questions, and partnerships needed to produce innovative actionable scholarship. We provide this support both through support for research groups such as those described above and through more targeted skills training. We provide policy education to our graduate student and postdoc participants via seminars on institutions, laws and regulations, and natural resource management applications. As a specific example, we provide a regular Policy Immersion unit as part of our Post-Doctoral Immersion Program, which includes a basic grounding in public policy issues, institutions, and approaches to collaboration between scientists and decision makers. It also includes a diverse set of speakers with deep practical knowledge of how science can matter to public discourse and decisions.

The SESYNC programs team has invested a significant amount of time to assist participants in identifying scholars and knowledge users (see definition in the next paragraph) that are needed to address their research questions. Disciplinary diversity within teams is a key component of the proposal evaluation process, and often, members of SESYNC's Scientific Review Committee provide participant suggestions to teams during the iteration phase of the proposal review process (prior to support) to both increase the disciplinary breadth of participants and to ensure the right expertise is represented on the team.

**Human Resources.** Through this reporting period (as of May 2020), SESYNC has supported 1521 total individual participants under this cooperative agreement, representing 116 initiated projects (Pursuits, Foundations, Workshops, and Short Courses). We received 56 qualified applications for postdoctoral fellowships in November 2019, as well as 28 proposals for team synthesis projects from the biannual Pursuit and Workshop RFP in September 2019, 8 proposals from the Graduate Student Pursuit RFP in October 2019, and 33 proposals for team synthesis projects from the biannual Pursuit and Workshop RFP in March 2020.

For those participants who filled out SESYNC's demographic survey through May 2020, the following percentages illustrate SESYNC's cumulative impact from this award on the development of human resources (from September 2016 through this reporting period). SESYNC's response rate for the demographic survey is 85% for this award.

Of those reporting, SESYNC has supported 588 men, 770 women, and 8 non-binary people (43%, 56%, 1% respectively; note that the non-binary option was added to our survey only in March 2019). Approximately 80% of participants are from the United States (representing 48 states and Washington D.C.) and 20% of participants are international (representing 45 countries).

As mentioned in the previous section, we support participants from a wide range of disciplines and institutions. When asked to self-characterize, reporting participants from all SESYNC programs (including Pursuits, Workshops, Foundations, and Short Courses), responded as follows: 436 chose natural scientist (34%), 321 chose social scientist (25%), 324 reported as both natural and social scientist

(26%), and 14 chose computer scientist (1%). The remaining participants self-reported as NGO, government, policy, or industry (98 individuals, 8%) or other (76 individuals, 6%).

The racial and ethnic diversity of all SESYNC participants on this award who responded to the question (78% response rate) is illustrated in the percentages below, versus All Biological Science Degrees, US Citizen and Permanent Resident (2012) from the National Science Board Science and Engineering Indicators in parentheses:

- White: 71% (67.6%)
- Asian or Pacific Islander: 11% (11.7%)
- Black: 5% (4.7%)
- Hispanic: 4% (5.8%)
- American Indian or Alaska Native: <1% (0.6%)
- Multi: 9% (Indicators category of “Other or Unknown Race or Ethnicity”: 9.6%)

SESYNC initiated a targeted effort to engage underrepresented communities in SE and interdisciplinary science during this reporting period. Working in conjunction with the Ecological Society of America (ESA) SEEDS program, Dr. Nicole Motzer led a team in a concerted effort to reach out to graduate students across a wide spectrum of diverse underrepresented communities in research institutions nationwide. A highly interactive workshop program was developed with the help of SESYNC postdoctoral fellows, which included SE skill building as well as sessions designed specifically to address the needs and challenges that students from underrepresented groups face in conducting research. Twenty-six applicants were accepted into the program from a pool of over 60. There was tremendous enthusiasm on the part of the applicants and a further confirmation that SESYNC was addressing an unmet need in the academic community. The planned workshop was cancelled as a result of the COVID-19 crisis; however, we are now in the process of transitioning it to a virtual format (see further details in the “Changes and Problems” section). Of the students in this program who completed a demographic survey (response rate = 84%), 34% self-identified their ethnicity as Hispanic and 67% self-identified as a race other than white. 70% of participating students are women.

**Societal Impact.** A core aspect of SESYNC’s mission is to foster actionable scholarship.

Actionable scholarship is research with the potential to inform decisions within government, business, and households; improve the design or implementation of public policies; influence public or private sector strategies; and inform planning and behaviors that affect the environment. SESYNC takes a deliberate approach to fostering actionable research. Many of our synthesis teams directly engage non-academics who we refer to as “knowledge users.” Knowledge users from the business community, government agencies, and the NGO sector enrich our scholarship in a variety of ways. They help frame research questions that emphasize solutions to socio-environmental problems, stimulate creativity by asking different kinds of questions, provide guidance on policies and institutions affecting environmental decision-making, and help communicate the work to broader audiences.

Interaction with knowledge users occurs across our programs and throughout our engagement with teams. From the proposal solicitation to proposal reviews and to facilitation and support of research teams, SESYNC actively encourages the engagement of non-academic experts in its work. We help recruit these participants and work with teams to integrate policy, institutional, and natural resource management insights into their research plans. Other teams undertake projects that potential knowledge users have identified as important to our mission. Participants from over 75 non-academic institutions have come



through the center during the first four years of this award. Of those reporting demographic information from our core programs supported from this award, 19% of SESYNC participants come from outside academia and 65% of the 74 reporting research teams include knowledge users.

Non-academic knowledge users are also represented on both the External Advisory Board (e.g. RAND Corporation, NOAA, Walton Family Foundation) and the Scientific Review Committee (e.g., Union of Concerned Scientists, U.S. Government Accountability Office, U.S. Army Corps of Engineers, U.S. Geological Survey). SESYNC embraces a spectrum of actionable scholarship, from fundamental research needed before more applied research can move forward, to research on broad, global socio-environmental issues, to research that informs more specific policy questions.

The following are current examples of policy-relevant actionable scholarship supported by SESYNC:

- *Foundation Group: Food Waste and the Environment.* This project focuses on the land, water, energy, and other resources used in the production and distribution of food, and implications of food waste for the sustainability of those resources. The overall objective is to define and measure the ecological and environmental impacts of food loss and waste across regions within the U.S. food system, taking into consideration all sources of impacts –from input sourcing in agricultural production through landfill disposal of waste across types of foods. A key goal is to identify the most cost-effective food waste reduction efforts under public and private initiatives. The research team includes representatives from the U.S. EPA, Microsoft, and NGOs seeking practical food waste reduction solutions. Team members are also in regular contact with the USDA’s Director for Sustainable Development to share new results from the project.
- *Pursuit: New Scenarios and Models for Climate Engineering.* This group is exploring the role of new technologies, such as carbon capture and solar radiation management, to address climate risks, with a particular focus on the social and political implications of such technologies. The group is addressing a current gap in climate models that attempt to incorporate such technologies in climate scenario planning: it is producing the first set of scenarios and models that integrate both social and environmental aspects of climate engineering technologies and that help policymakers understand potential interactions between climate engineering technologies and existing mitigation efforts. The group is international in composition with most participants involved in national and multi-lateral climate modeling initiatives to support policy deliberation. The team is working with Climate Interactive, the developers of the widely-used En-ROADS climate simulation tool, with aims of informing future iterations of the En-ROADS model. In order to help make their new scenarios engaging and relevant to policymakers, they have also engaged science-fiction writers and storytellers as core members of the team.
- *Graduate Pursuit: Socio-Environmental Analysis to Improve Offshore Aquaculture and Policy.* This graduate student team is developing tools to appropriately expand offshore (deep marine) aquaculture operations. The team is developing an aquaculture site suitability tool that includes both social and ecological elements. The work is meant to pave the way for an integrated deep marine aquaculture regulatory system that reflects conflicts and tradeoffs related to this currently under-developed food production sector.
- *Pursuit: Pesticides and Pollinators.* To date, most analyses of conservation practices to protect economically and ecologically valuable pollinator populations do not consider

pesticide use on the landscape. This group is taking advantage of existing public data sets on pesticide use, pesticide toxicity, and land use to identify potential toxicity to key pollinator populations and ‘hotspots’ of exposure in agro-ecosystems. The project team includes participants from the US Department of Agriculture and US Geological Survey, and their work will allow conservation agencies to better select sites and conservation practices. For example, the team recently released their [Beescape tool](#), which helps beekeepers and land managers assess the quality of their landscapes for supporting both managed honeybees and wild bees. Outcomes of this project have been shared with beekeeper associations and state pollinator task forces across the country.

## DISSEMINATION OF RESULTS

During this reporting period, our communications team has expanded in effort and size to enhance the output and reach of SESYNC’s research communications. These efforts have included expanding our team, adopting a new communications focus, enhancing our monthly newsletters, creating new video content, increasing promotion of our postdocs’ work, and writing new feature pieces.

**Growing Our Team.** In the past year, SESYNC has expanded its communication team with two new hires. Last August, Alaina Gallagher joined us full-time to fill the vacant Science Communications Coordinator position, and Erin Duffy joined us as an Assistant splitting her time between the Communications and Business teams. With additional staff on board, we have been able to increase and diversify our communications activities. For example, this year we have written more articles and press releases, developed new types of content for the newsletter, and dedicated more time to social media content.

**Shaping SESYNC’s Legacy.** During this reporting period, SESYNC has started shifting much of our communications’ focus to produce long-lasting resources that will help accelerate interdisciplinary socio-environmental (S-E) research. We want to ensure that SESYNC’s impact on the research community extends beyond our doors; thus, we are in the midst of developing an online collection of tools and resources intended to guide individuals through the process of engaging in interdisciplinary science. Building on the lessons that we have learned since opening our doors, as well as the literature published and techniques employed across the S-E community, we hope to give others the tools needed to confidently conduct their own interdisciplinary work at all scales—whether it be starting their own research center, building a bridge between departments, or initiating a research project with a peer whose work resides in another discipline. Products (e.g., infographics, interviews, journal articles, videos, etc.) will cover topics that include important S-E research categories, foundational disciplines, and processes for successful interdisciplinary collaboration.

**Communications Capacity-Building.** Over this past year, SESYNC senior fellow Lisa Palmer led communication strategy seminars with SESYNC research teams. One example of this work was facilitating communication seminars with the Diverse Pathways to Nourishment Pursuit which resulted in a policy brief. Two other synthesis teams also signed the brief, and it was presented to an international consortium at an FAO meeting. Lisa Palmer also gave seminars to SESYNC postdocs on storytelling, interacting with journalists, and developing a one-on-one communications strategy. We also continued providing support for groups utilizing SESYNC’s Communications Toolkit, which was

developed during the last reporting period and helps teams build their own capacity by implementing a communications strategy throughout their research process.

**Highlighting Notable Achievements.** Recognizing that our monthly newsletter is one of the strongest tools we have to connect with the larger SESYNC community, we have enhanced the newsletters' content and scope. For example, we have started incorporating more blogs and news items, especially those that feature our postdocs' writing and including more content, graphics, and images. These changes have resulted in newsletters that are more engaging and that better portray the range of activities happening at the Center. Our newsletter currently reaches over 5,000 people each month.

**Videos.** Our multimedia specialist Elizabeth Herzfeldt-Kamprath continues to produce videos and films highlighting SESYNC's research and processes. During this reporting period, Herzfeldt-Kamprath developed [an animation](#) answering common questions about our travel policies to help our researchers navigate processes for booking travel arrangements, submitting paperwork, and filing reimbursements. Herzfeldt-Kamprath and Senior Fellow Lisa Palmer also developed several [communication tutorial videos](#) to pair with the existing communications toolkit. These videos are designed to help teams form key components of their communications strategy, including identifying their audience, translating research into a story, and preparing a concise message.

**Feature Writing.** We have also made an effort to produce more writing featuring SESYNC programs for our website. Examples include Lisa Palmer's [article](#) on the Immersion Program and postdoc experience, as well as spotlights on some of our seminar speakers and their research—ranging from modern insights into ancient plagues; to interpretations of natural history; to winter weather whiplash.

**Digital Presence.** We have continued to maintain a strong web and social media presence during this year of the award. To date in the current grant year, the SESYNC website received over 62,000 visits. SESYNC's social media channels—which include Facebook, Twitter, YouTube, and LinkedIn—have also been extremely successful tools for reaching and engaging new audiences within the scholarly community. Audiences for our social media channels have all grown during the past year. From May 2019 to May 2020, Twitter followers increased from 5,440 to 6,446 and our Facebook community grew from 1,275 to 1,352 followers. The SESYNC YouTube channel has grown to 3,385 subscribers from 1,883, and our videos have received a combined total of 380,393 views. We increased our activity on LinkedIn during this reporting period, and now have 545 followers.

**Articles Featured in National Media Outlets.** During this reporting period, the research of SESYNC postdocs has been featured in several major national media outlets. In September 2019, the [New York Times](#) interviewed former postdoc Christopher Field about his article in [Ecology Letters](#), suggesting that some coastal bird populations are resilient to hurricanes. In December 2019, the work of postdocs Merle Eisenberg and Lee Mordechai on the Justinianic Plague was featured in several publications, including [CNN](#), [USA Today](#), [The Telegraph](#), [New York Post](#), [Smithsonian](#), and others. Multimedia specialist Elizabeth Herzfeldt-Kamprath created a [graphical abstract](#) to help amplify their research. Eisenberg also wrote an Op-Ed for the [Washington Post](#) and was interviewed on [CNN International](#) about parallels drawn between the plague and recent COVID-19 pandemic. In April 2020, research that former postdoc Christopher Trisos started while at SESYNC on the effect of climate change on biodiversity was featured in the [New York Times](#).

## MAJOR ACTIVITIES

**Supported Research Projects.** SESYNC granted support to numerous teams during this reporting period. While we list those here, many have been unable to begin their work at the Center due to the COVID-19 crisis (see more information under the “Changes and Problems” section). The following new projects were granted support during this award period:

- *Pursuit Cohort 20: Collaborative & Interdisciplinary Team-Based Research Projects* Granted support in September 2019:
- 2019C20-004: How does a historical perspective inform ecosystem management targets, goals, and outcomes? PIs: Andrew Trant & Loren McClenachan
- 2019C20-008: The missing link: incorporating the role of biological diversity into projections of ecosystem services. PIs: Sarah Weiskopf & Isabel Rosa
- 2019C20-013: Predictive modeling of the relationships among infrastructure, resource extraction, and environmental governance in Latin American forests. PIs: Anthony Bebbington & Rebecca Ray
- 2019C20-016: Perception versus Reality: How the Consequences of Eutrophication Impact Subsistence Fishery Communities around Lake Victoria. PIs: Jessica Corman & Amber Roegner
- 2019C20-017: Characterizing FEW system typologies across the continental U.S. for informed FEW research. PIs: Rebecca Muenich & Rebecca Hale
- 2019C20-021: Developing a community platform to map global dams, reservoirs, and river barriers. PIs: Bernhard Lehner & Michele Thieme
- 2019C20-024: Energy-Water Nexus Analysis of Solar Energy Industry. PIs: Ilke Celik and Jiquan Chen
- 2019C20-028: The ecological consequences of declining nitrogen concentration in plants worldwide. PIs: Andrew Elmore & Rachel Mason

*Pursuit Cohort 21: Collaborative & Interdisciplinary Team-Based Research Projects* Granted support in January 2020:

- 2019C21-002: The impact of climate-related natural disasters on human health. PIs: Christopher Golden & Ayesha Mahmud
- 2019C21-004: Socio-environmental Impacts of Large Hydropower Dams Across the Global South. PIs: Maria Claudia Lopez, Emilio Moran, & Sergio Villamayor-Tomas
- 2019C21-011: Past answers to current concerns: Historical cases of navigating socio-environmental stress. PIs: John Haldon & Lee Mordechai

*Graduate Student Pursuits Cohort 7:* Granted support in February 2020:

- 2019GS7-002: A socio-environmental approach to improve offshore aquaculture and policy: Gulf of Mexico Case Study. PIs: Nicole Barbour & Amanda Guthrie
- 2019GS7-003: Is Your Project just water or Just Water: Environmental Justice in Stream Restoration. PIs: Lucy Andrews & Jessica Balerna
- 2019GS7-004: Pushed to the Edge: A Socio-Environmental Analysis of Climate Gentrification along the East Coast of the United States. PIs: Kelsea Best, Md Sariful Islam, & Zeynab Jouzi

- 2019GS7-005: Using decision making models to design effective policy for natural climate solutions: A case study of agroforestry in West Africa. PIs: Zoe Hastings & Millie Chapman
- 2019GS7-006: Financial Opacity and Challenges to Forest Governance in Indonesia and Malaysia. PIs: Jonathan Sullivan & Alice Lépiessier

*Workshops* Granted support throughout 2019 and 2020:

- 2019W-086: Aesthetic perspectives on environmental problems: Quantifying the distribution, purpose, and impact of environmental public art across the United States. PIs: Se Jong Cho, Christopher Field, & Bianca Lopez.
- 2019W-087: Workshop on the potential of urban nature to support sustainability in Latin America: a synthesis from a socio-environmental perspective. PIs: Camilo Ordóñez-Barona, Tahia Devisscher, & José Soto
- 2019W-088: Synthesizing Research on Pastoral Governance of Common-Pool Resources. PIs: Lance Robinson & Mark Moritz
- 2019W-089: Co-generating a system model to improve opportunities for proactive management of the Batrachochytrium salamandrivorans (Bsal) threat in North America. PIs: Evan Campbell Grant & Riley Bernard
- 2019W-090: Planning Workshop for Counter Climates: Petro-Infrastructure and Indigenous land, water, and atmosphere protection in Canada and the American Midwest. PIs: Zoe Todd & Ozayr Saloojee
- 2020W-091: Graduate Leaders in S-E Synthesis Workshop. SESYNC-led.
- 2020W-092: S-E Early-Career Researchers Program: S-E Approaches to Watershed Management and Governance Workshop. SESYNC-led.
- 2020W-093: Enhancing Graduate Sustainability Leadership Skills with Socio-Environmental Synthesis. PIs: Nicole Motzer, Aleta Rudeen Weller, & Kristi Kremers.
- 2020W-094: Diversity, Equity, and Inclusion in S-E Synthesis Research Workshop. SESYNC-led in collaboration with the SEEDS program of the Ecological Society of America
- 2020W-095: People, Land, and Ecosystems: Leveraging NEON for S-E Synthesis Workshop. SESYNC-led.
- 2020W-096: Understanding the consequences of changing socio-ecological systems for human-wildlife coexistence in the Americas. PIs: Sofia Nanni & Tara Teel
- 2020W-097: Bringing West Nile virus forecasting approaches together to better serve stakeholders in a changing environment. PIs: Alexander Sasha Keyel & Rebecca Smith
- 2020W-098: Governing Nutrient Pollution Beyond Farmers. PIs: David Kanter & Zdravka Tzankova
- 2020W-099: Adaptation, Optimality, and Risk Management: What do the Human Evolutionary Sciences and the Climate Sciences Have to Offer Each Other? PIs: Anne Pisor & James Holland Jones

*Foundations:*

Granted support in fall 2019:

2019F-013: Unimplemented Development. PI: Dana Graef

- 2019F-014: Foundations of Socio-Environmental Research – Authors’ workshop for a compilation of classic and contemporary writings tracing the development of socio-environmental research. PIs: Simone Pulver & William Burnside
- 2019F-015: Rivershift: A global analysis of oligotrophication trends in rivers and their ecological consequences. PIs: Carles Ibáñez & Siobhan Fennessy

Additional Proposal Solicitations. In addition to supporting the projects listed above, we announced our spring RFP for team-based collaborative research projects in February 2020. Our Pursuit and Workshop RFP invited proposals focused on the following themes:

- Any Pressing Socio-Environmental Problem
- Global Change & Health
- Socio-Environmental Implications of Large-Scale Infrastructure Projects
- Environmental Dynamics of Food Systems
- Transformative Technologies
- Demographic Shifts & Environmental Impacts
- NEON-Enabled Socio-Environmental Synthesis

Pursuit and Workshop proposals for this RFP were due on March 30 and underwent review by our Scientific Review Committee during a late May panel. Final decisions regarding next steps and iteration with proposal leads will take place later this summer as we gain greater certainty regarding the progression of the COVID-19 pandemic. At this point, we do expect to support a limited number of new team projects from this RFP. This will be the 22 cohort of SESYNC Pursuits and Workshops.

Additionally, we had planned to announce our 8 RFP for Graduate Student Pursuits in March 2020 but made the decision to delay this solicitation due to the COVID-19 pandemic (further details provided under the section on Changes/Problems).