

Center for Biodiversity and Conservation

Progress Update Fall 2021

Dear CBC Friends and Colleagues,

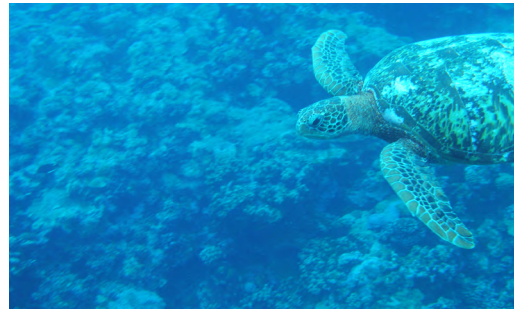
Understanding life on Earth and how to sustain it for the future is the fundamental challenge of our time. For almost 30 years, the Center for Biodiversity and Conservation (CBC) has been advancing research, strengthening human capacity, and connecting people to knowledge—and to each other—to help the Museum meet this challenge.

Despite another challenging season, our small team at the CBC has had an outsized and influential role in conservation science, education and capacity development, and decision-making.



News, Awards, and Appointments

Following a remarkable career at the Museum spanning 25 years, **Dr. Eleanor Sterling**, Jaffe Chief Conservation Scientist at the CBC, will step down from her position next year to join the University of Hawai'i (UH) at Mānoa as Director of the Hawai'i Institute of Marine Biology in the School of Ocean and Earth Science and Technology. Eleanor's vision, research, and commitment to making conservation more interdisciplinary, equitable, and effective have had an indelible influence on the CBC and the field of conservation. She has also made significant contributions to the Museum's efforts to communicate conservation science to the public through her curation of five major exhibitions and participation in numerous public programs over the years.



Dr. Mary Blair, Director of Biodiversity Informatics Research, and collaborators have been granted [new funding under NASA's Ecological Forecasting Program](#) to deepen and expand our current NASA-funded collaboration with the Columbia Biodiversity Observation Network on species distributions.

Dr. Suzanne Macey, Biodiversity Scientist and Manager of the Network of Conservation Educators and Practitioners (NCEP), has been awarded a [new five-year Research Coordination Network grant from the National Science Foundation \(NSF\)](#) to advance an open platform and open educational materials that promote systems thinking, digital literacy, and problem-solving skills in undergraduate science students, with a focus on tropical ecology.

Dr. Alex Moore, CBC postdoctoral fellow and a co-leader of our mentoring programs in past years, was recently appointed Presidential Postdoctoral Research Fellow at the High Meadows Environmental Institute at Princeton University, and will start next year as Assistant Professor at the University of British Columbia.

The work of the Center for Biodiversity and Conservation brings strong evidence from multiple sources of knowledge and perspectives to bear on complex conservation problems and to foster collaboration on robust and equitable solutions. Below are selected updates on our work from the last few months.

Our research illuminates the interconnections between humans and the rest of biodiversity.

Our work advances efforts to predict the movements of key endangered species as habitats and threats shift due to a changing climate. Using Wallace, new software co-developed by CBC, Dr. Blair and collaborators have completed climate change projections for the range of the critically endangered Cao Vit gibbon. The species is projected to have an overall loss in total area of suitable habitat as well as a loss in the amount of suitable habitat in protected areas, confirming that climate change presents a potentially severe threat to its long-term persistence. [Our research results have led partners at Fauna and Flora International to include future climatic suitability in plans for habitat restoration and population re-establishment efforts for this critically endangered species.](#)

The results of this work also emphasize the need to strengthen the capacity of national and regional conservation and land-use planning agency staff to assess and address climate change impacts on range-restricted endangered species in the Vietnam-China transboundary region. Results will soon be published as part of a special issue edited by Dr. Blair with colleagues from Vietnam and China for the journal *Frontiers of Biogeography* on “Transboundary Conservation Under Climate Change.” Co-editor of the special issue and long-time collaborator [Dr. Minh Le presented these results to Vietnam’s Ministry of Natural Resources and the Environment, and in response they have added climate change studies for a suite of priority species to Vietnam’s National Biodiversity Strategy 2030-2050.](#)



Cao Vit gibbon mother with her baby.
Photo: Fauna & Flora International-Vietnam

Maxent software for species distribution modeling, co-developed and hosted by the CBC, continues to be used for high-profile biodiversity research around the globe—and has now been integrated into the Google Earth Engine environment, with the potential to reach an even broader set of users. The original publication for this software has been cited by 14,200 other studies and our new release from 2017 has already been cited 850 times. Notable new uses of this software include predictions of the diversity and distribution of rhinolophid bats in Asia that carry novel coronaviruses; climate change impacts on malaria diseases in Brazil's urban areas; and citizen-science based models of cetacean habitat preference in the Arabian/Persian Gulf.

Despite setbacks to international field work due to the pandemic, research in squid biodiversity has continued to move forward thanks to an active cephalopod research community online. CBC Biodiversity Scientist Dr. Samantha Cheng and collaborators published new observations of a never-before described mating behavior in male bigfin reef squid. After connecting through a chance conversation on social media, Sam and collaborators realized they had observed the same behavior in this reef squid species —thousands of miles and many years apart. Their observations show the male investigating a potential nest before the female lays her eggs, a type of paternal care behavior has not been described before in cephalopods. Their work was published in *Ecology* and featured in *National Geographic*. The team now aims to bring together a working group on reef squid diversity and behavior. [Our work demonstrates how international collaborations make it possible to conduct more robust research on widespread species.](#)

As field work resumed closer to home this summer, the CBC partnered with the State University of New York (SUNY) College of Environmental Science and Forestry on a project investigating timber rattlesnake road crossings in Orange County, NY, where the species is considered endangered. The project involved placing 30 trail cameras along a key mile of roadway, set up to record an image every minute. The CBC coordinated a team of staff, staff volunteers, and Columbia University students who set up the cameras and checked them every two weeks during the summer. Images are being analyzed using machine learning models to detect rattlesnakes during the fall, and the work is expected to provide useful recommendations for similar projects throughout the country.



ANIMALS | NEWS

Male squid help choose a home for their mate, first-ever study shows

Bigfin reef squid may engage in paternal care, a practice more often seen in monogamous vertebrates, such as birds.

We are creating evidence, resources, and spaces to train and empower conservationists everywhere.

In everything we do, we continue to prioritize open education and tools, and the creation of inclusive environments so citizens, students, and all professionals can pursue their careers and engage in contributing solutions.

Dr. Sterling was a co-author on a new [study](#) investigating how different forms of governance influence conservation outcomes. The research team studied the outcomes of 169 conservation projects around the world—primarily across Africa, Asia and Latin America—and took into account a range of projects from restoring national forests in Taiwan to maintaining sustainable fisheries in Norway. They found that conservation initiatives under “local” control were associated with a much higher proportion of positive outcomes for both human wellbeing and conservation, and identified key factors for successful stewardship. [The review’s findings suggest that a primary pathway to effective, long-term conservation lies in empowering and supporting environmental stewardship by Indigenous peoples and local communities.](#)

Dr. Cheng and 26 coral reef scientists from around the world published a [landmark analysis](#) of the state of progress towards gender and economic diversity and representation in coral reef science in *Frontiers in Marine Science*. The study examined patterns in authorship in coral reef science since 2003 and found that representation of female researchers and researchers from non-OECD nations continues to be low and has stagnated despite increasing attention and calls for improvement. [Since coral reefs are at the forefront of climate change they need diverse solutions to survive, and the study provides several recommendations for ramping up efforts to increase gender and geographic representation in research teams.](#)



As this report was being prepared, our 12th annual conference for students and early-career professionals—the Marshall M. Weinberg Student Conference on Conservation Science–New York—was underway and already shaping up to be another great success, despite the constraints imposed by the pandemic. The CBC team again adapted all aspects of the Weinberg Conference to an online virtual format, including presentations and dedicated mentoring and mentoring cafés. Over four days, the CBC anticipates engaging over 200 participants from 38 countries and 25 states, and over 45 mentors. This year’s plenary speaker, Dr. Kristina Douglass from Pennsylvania State University, opened the Weinberg Conference, sharing a compelling presentation about how archaeology can inform our approaches to conservation by telling the stories of how ancient peoples shaped landscapes, responded to past climate change, and sustained livelihoods over centuries and millennia—and how research can be a participatory and community-building endeavor. [A new addition to this year’s Weinberg Conference agenda is a panel of Conference alumni discussing diverse paths into conservation work and how the Conference influenced their careers.](#)

During the 2020–2021 academic year CBC staff mentored 35 interns, volunteers, and students through Museum programs (such as the Science Research Mentoring Program, Research Experiences for Undergraduates, and the Richard Gilder Graduate School) as well as other university programs. Mentees worked on a variety of projects including methods for monitoring rare turtle species at Black Rock Forest, using machine learning for coyote habitat assessments in New York City, and genomic approaches to support primate conservation. Mentoring efforts continue to fuel success as former mentees advance in their careers. A few highlights: former mentee Hannah Sinclair graduated from Medgar Evers College and secured a position as a fisheries wildlife observer in Hawai’i; Dr. Rae Wynn–Grant, former CBC postdoctoral fellow, launched a podcast with PBS Nature entitled “Going Wild;” and former CBC Helen Fellow Mali’o Kodis completed a Master’s degree and is now at the Environmental Defense Fund helping to run their Climate Corps Fellowship program.

We put high-quality, relevant evidence into the hands of managers and policy-makers.

The CBC continues to demonstrate leadership in evidence synthesis both regionally and globally. Our collaboration with the United States Agency for International Development (USAID) is entering its second year. Led by Dr. Cheng, the project team has trained multiple USAID Missions around the world on how to better gather and use evidence, and are leading syntheses of evidence on a number of topics with USAID's Washington, D.C. offices and the Colombia USAID Mission.

We are generating key evidence to evaluate responses to climate change. As part of the CBC's Evidence Initiative and in our capacity as the only United States-based center in the global Collaboration for Environmental Evidence (CEE) we are partnering with Conservation International to produce a systematic map of the evidence on the links between "natural climate solutions" and climate change mitigation outcomes. There is increasing awareness that *how* we mitigate and adapt to climate change can have significant consequences for biodiversity, both positive and negative; the project is investigating key questions around this topic to ascertain the effectiveness of climate strategies and their impact on biodiversity and human wellbeing. The project is being led by Dr. Cheng and should produce its first results early in the spring.


What evidence exists on the links between natural climate solutions and climate change mitigation outcomes in forest, agricultural, and grassland landscapes in tropical regions?

What evidence examines climate change mitigation together with effects on biodiversity and ecosystems, and human wellbeing?

Lithium exploration and expansion has continued in the Andean region, centered on the saline wetlands that support unique biodiversity adapted to the extreme environments. As electronics and car companies seek to provide assurance to customers regarding the environmental sustainability and social responsibility of their supply chains for the components of rechargeable batteries, governments and local companies are convening stakeholders to discuss best practices and engage local communities. CBC Associate Director Dr. Felicity Arengo and an international team of collaborators are recognized for expertise in this social-ecological system, and as a result we have been invited to participate in a range of forums organized by government institutions, NGOs, and the private sector, and are providing multiple types of scientific guidance.

In May, the CBC was accepted as a member of the United Nations Economic and Social Council. In early September, CBC Director Dr. Ana Porzecanski and Dr. Sterling represented the Museum at the World Conservation Congress in Marseille, France. This international forum, convened every four years, brings together several thousand leaders and decision-makers from government, civil society, Indigenous peoples, business, and academia to guide environmental policy and harness the solutions nature offers to global challenges. The Congress included an Indigenous Peoples' Summit, a Global Youth Summit, and a CEO Summit as well as exchange sessions on seven Congress themes. Over 1,500 official Members of the International Union for the Conservation of Nature, including the CBC, debated and voted on 150 Motions with a strong focus on post-COVID recovery, the links between the biodiversity and climate crises, and the role and rights of indigenous peoples in conservation. The assembly also elected new leadership and set the nature conservation agenda for the next decade. [Through these and other efforts, we continue to engage in the global arena to advance conservation policy at multiple scales.](#)





As the lingering COVID-19 pandemic and rising climate change impacts have made clear this past season, we are in an unsustainable relationship with nature—one that continues to generate social, economic, and health inequities within and between our societies. Managing these linked social and environmental challenges requires the engagement of citizens and professionals with the knowledge, skills, and attitudes to understand and engage with complex problems, and who can contribute diverse viewpoints and experiences. We are privileged to be leading innovative, transformative work that moves the conservation field forward and reveals new approaches and solutions for the complex conservation challenges of the 21st century.

We thank you deeply for your partnership in our work. At this moment of global challenge and uncertainty, your support and generosity enable the Museum to continue its important and far-reaching conservation efforts.



Ana Porzecanski, Ph.D.
Director