



CCSS

Center for Conservation
Social Sciences

ANNUAL REPORT 2019

FEATURED TOPICS:

Protecting New York's Deer

Supporting Flooding Resilience

Conserving Andean Bears

Enabling Transition to Solar Energy

Building Partnerships with
Indigenous Tribes in Malaysia



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ANNUAL REPORT 2019

PURPOSE OF REPORT

This 2019 annual report provides an overview of recent research, teaching, and outreach activities of the CCSS. The report is designed to reflect the work, interests, and capabilities of the CCSS. Publications listed in this report are available for download on the CCSS website: <https://ccss.dnr.cals.cornell.edu> or may be requested by emailing ccss@cornell.edu.

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INTRODUCTION

HDRU TO CCSS

In 2018, the Human Dimensions Research Unit (HDRU) at Cornell University became the Cornell Center for Conservation Social Sciences (CCSS). The HDRU had a long and productive track record of externally funded research and publications, teaching undergraduate and graduate students, and outreach and consultation to effect positive change in conservation and environmental management practices. Designation as the CCSS acknowledged that the group's long-term comprehensive focus on the human dimensions of natural resource management had effectively expanded since its inception in the 1970s to include a broader array of problems and methods.

The CCSS strives to expand the understanding of academicians, students, natural resources agency staff, non-governmental organizations and policy makers about the interactions of social and ecological systems. We apply theory and empirical findings to real-world, contemporary problems. Our research outcomes, which include empirical data, conceptual frameworks, and theoretical insights, are reported at conferences and in peer-reviewed journals, books, policy briefs, outreach publications, and reports of various types. CCSS research is used by a wide array of decision makers and natural resource practitioners, especially those in state and federal agencies, to develop, implement, and evaluate environmental policies and management approaches.

CCSS faculty and staff also contribute to the teaching and outreach functions of the College of Agriculture and Life Sciences and the Department of Natural Resources. We advise both undergraduate and graduate students, oversee internship and experiential learning programs, and teach courses concerning various aspects of the environment including sociology, policy, and planning.

While all CCSS faculty and academic staff engage in outreach, three of our faculty have Extension appointments from which we serve citizens of New York State and beyond.

CCSS AFFILIATIONS

The CCSS and cooperators comprise dozens of faculty, staff, graduate assistants, and undergraduate student technicians. Research and outreach programs are supported by grants and contracts from federal and state agencies, nongovernmental organizations, foundations, Cornell Cooperative Extension, and the Cornell University Agricultural Experiment Station. For 2019, the 5 primary CCSS faculty were PIs or co-PIs on projects with more than \$5 million in funding.

CCSS graduate faculty hold membership in the graduate fields of Natural Resources, Development Sociology, Public Affairs, Global Development, and Water Resources. In 2019, graduate faculty committee members for CCSS graduate students came from a variety of departments: Earth and Atmospheric Sciences, Communication, Design and Environmental Analysis, Development Sociology, City and Regional Planning, Applied Economics and Management, Natural Resources and others.

The CCSS has earned an international reputation in the conservation social sciences. The oldest unit of its kind, the CCSS's history dates from the early 1970s. The success of the CCSS has been greatly enhanced by a partnership of approximately 40 years with the NYS Department of Environmental Conservation's Division of Fish, Wildlife, and Marine Resources and a number of federal and state partners.



CCSS AT A GLANCE

In 2019 CCSS had:

28 Peer-reviewed Publications

5 CCSS Publication Series Reports

5 Core Faculty

6 Affiliated Faculty

5 Staff

13 Graduate Students

11 Undergraduate Researchers and Interns

9 Course Offerings

FEATURED STORIES

The stories in this section highlight five ongoing areas of work for the CCSS and their impacts.



CC Image courtesy of Stephen Yang / The Solutions Project, via 100% Campaign on Flickr.



FEATURED STORY

PROTECTING NEW YORK'S WHITE-TAILED DEER

The New York State Department of Environmental Conservation is working to keep chronic wasting disease out of New York.

Chronic Wasting Disease (CWD) is a fatal prion disease that affects animals in the cervid family (deer, elk, moose, and reindeer) and is closely related to “mad cow” disease. In states where CWD is firmly established, as many as 50 percent of adult male deer are infected, and the disease fatality rate for infected animals is 100 percent.

CWD is known to exist in 26 states and three Canadian provinces, and states with high incidence of CWD have seen declines in hunting. White-tailed deer hunting in New York accounts for \$1.5 billion dollars in economic value each year, much of it in rural areas, so state officials are committed to keeping CWD out of New York. For over 50 years, CCSS has partnered with New York State’s Department of Environmental Conservation (DEC) to provide understanding of the human dimension of wildlife management, and it continues to provide crucial social science understanding as the state works to combat CWD.

CWD OUTBREAK AND RAPID RESPONSE

Scientists suspect that CWD spreads via contaminated bodily fluids, either directly or through the environment, though there is still great uncertainty about how this occurs. Although there are no established cases of CWD spreading to humans, because of the disease’s similarity to mad cow, the Centers for Disease Control recommends that no one eat meat from an animal with CWD.

In 2005, New York State detected CWD in seven white-tailed deer in Oneida County and acted swiftly. Because state agencies responsible for food safety,

agriculture, health, and natural resources were aware of the devastating impacts of CWD in other states, they had been closely monitoring for the disease, and had developed a rapid-response plan to stop the spread. State and federal officials culled 19 captive deer and as many as 300 wild deer to determine disease prevalence and distribution and to prevent the disease from spreading.

In addition to destroying potentially infected deer, the state initiated mandatory hunting regulations, which included requiring hunters to bring all deer taken within a containment zone to a DEC check station for examination. The state also required certain waste parts of the carcasses to be disposed of in landfills, rather than left in the wild — the CWD-infected prions in a dead animal can bind to plants and soil and remain there for years. Animals that feed from these areas can become infected.

The rapid response seems to have worked: there have been no further detections of CWD in New York animals since 2005.

SOCIAL AND BIOLOGICAL INFORMATION LEADS TO BETTER DECISION-MAKING

In some states that have detected CWD, natural resource managers have struggled to implement response plans because of limited science on the disease, difficulty in communicating uncertainty around it, and opposition from hunters and property owners. Rich Stedman, Professor in the Department of Natural Resources, became involved in research in Wisconsin in 2002 when CWD hit that state. The

level of uncertainty about the disease — particularly about whether it's safe to eat CWD-infected meat — combined with aggressive attempts by the state to cull the herd contributed to a backlash from hunters. Along with Stedman, Bill Siemer, CCSS Research Associate, and Bruce Lauber, CCSS Director and Senior Research Associate in the Department of Natural Resources, are working to combat CWD.

“When Wisconsin detected CWD, it was framed as a public health issue, but in reality, we still don't know whether CWD is a danger to humans. Even with so much uncertainty about the disease, the management agency went in very heavy-handed and there was no social science research on how people were likely to react. They did not react well, and trust in the state's ability to manage the disease and the deer herd really eroded,” Stedman said.

New York State officials were aware of those concerns, and they worked with CCSS researchers to develop effective management strategies and aid productive communication between stakeholders and the state.

After the outbreak in 2005, CCSS and DEC jointly developed a “rapid response” survey to assess hunters' attitudes about CWD, and what effect the disease's discovery had on hunters' plans to take deer that fall. The survey's results showed that hunters were more aware of CWD than the general public, and that the presence of CWD would not change hunters' plans or hunting sites. The survey also found that hunters trusted Cornell Cooperative Extension (CCE) as a source of information on CWD; CCE was more trusted than any state or federal agency, though all of the agencies were perceived as more trustworthy than not.

“These sort of social science insights are not just about trying to educate the public, they're also about improving management strategies themselves,” Stedman said.

LONG-TERM COLLABORATION TO PROTECT NEW YORK'S NATURAL RESOURCES

In 2018, DEC, New York State Department of Agriculture and Markets, and Cornell's College of Veterinary Medicine completed an interagency risk minimization plan, with three primary goals: to keep CWD-infected animals and materials out of New York; to prevent exposure of white-tailed deer and moose to infectious material; and to increase public understanding of CWD risk to deer and potential risk to humans.

The risk minimization plan includes three elements that depend on hunters' behavior. Two of them are only advisory — asking hunters to use synthetic deer lures, rather than natural, urine-based lures; and asking

hunters to dispose of deer carcasses in a landfill, rather than leaving them in the wild.

The third element is regulatory. In 2005, DEC forbade hunters from bringing full deer carcasses or intact heads from certain states with known CWD-infected populations. But starting in 2019, and stemming from the risk minimization plan, DEC forbade full deer carcasses from anywhere outside New York. Hunters can still bring in deboned meat, cleaned hides, and cleaned skullcaps, among other things.

“Not all states conduct adequate surveillance testing to know whether CWD is present in their deer or elk,” said Jeremy Hurst, Big Game Unit Leader for DEC's Division of Fish & Wildlife. “It certainly does require hunters to do a little more work in the field, or at least, more planning ahead of time, but it's safer for New York deer.”

CCSS conducted a survey of hunters in fall 2019 to better understand their behavior, assess their knowledge about CWD, and gauge their perceptions of DEC's recommendations and regulations. Preliminary results suggest that many hunters are not taking DEC-recommended actions to prevent CWD and don't consider the disease a threat to New York. A substantial minority of hunters are not confident that DEC's recommended actions would reduce the risk of CWD entering the state. Communication about the danger CWD could pose to New York's deer, and about the effectiveness of recommended actions could help increase compliance in the future.

“Deer are a public trust resource that DEC is managing on behalf of the people of New York State,” Siemer said. “They provide cultural value, economic value, and natural resource value. They're a special species that can cause great harm and provide great benefits; appropriate management is key for preserving not just white-tailed deer, but the forest ecology of New York.”



CC Image courtesy of John Carr at U. S. Fish and Wildlife Service on Flickr



FEATURED STORY

SUPPORTING FLOODING RESILIENCE IN LAKE ONTARIO COMMUNITIES

Lake Ontario communities need help responding to increased flooding and building long-term resiliency to the changing climate.

CC Image courtesy of Staff Sgt. Ryan Campbell via the U.S. Air National Guard on Flickr

In December 2016, the International Joint Commission (IJC), which oversees shared water resources along the U.S. and Canadian border, changed the way water levels and flows are regulated in Lake Ontario and the St. Lawrence River. The following spring, communities around Lake Ontario suffered the worst flooding recorded in 100 years.

Shoreline property owners blamed the new system, Plan 2014, and called for its repeal. The IJC pointed to record rainfall and an unusually warm winter, arguing that the flooding would have occurred regardless. Climate change is expected to worsen the frequency and intensity of flooding events, making it even more important for communities, individuals, and governments to predict and respond to flooding.

Bruce Lauber, CCSS Director and Senior Research Associate in the Department of Natural Resources, and Rich Stedman, Professor in the Department of Natural Resources, are working in coordination with Scott Steinschneider, Assistant Professor of Biological and Environmental Engineering, and Mary Austerman, Great Lakes Coastal Community Development Specialist for New York Sea Grant, to assess the effects of flooding and develop resources to enable communities around Lake Ontario to better predict and respond to future flood events. The work is part of CCSS's commitment to help communities develop resilience to environmental shifts in an era of climate change.

PLAN 2014 AIMS TO BALANCE HUMAN NEEDS AND THE ENVIRONMENT

The IJC developed Plan 2014 to reintroduce some of the natural variability in lake levels that was eliminated under the previous management plan adopted in the 1950s. Plan 2014 aimed to protect lakeshore communities on both sides of the border and mitigate flood risk, while also restoring the health and diversity of coastal wetlands. Healthy wetlands can help protect human habitats against flooding and storm surges, they act as a nursery for many lake-dwelling species, and they're an important carbon sink.

"Regulating water levels always involves juggling a variety of interests: commerce, navigation, recreation, ecological considerations, hydropower, and flooding protection," Lauber said. "To avoid high water levels in Lake Ontario, you can let out more water. But if you let out too much then you start getting flooding in Montreal. Balancing the needs of the lakes as well as risk of flooding in other places is always difficult."

There is a tradeoff between allowing more variability in Lake Ontario and protecting New York coastal communities from flooding: more frequent high lake levels do increase flooding risk. Even before Plan 2014 went into effect, some coastal property owners from Wayne County reached out to Cornell University, expressing concern about the potential for the new plan to increase flooding risks on their properties. In the fall of 2016, Steinschneider began writing proposals to study flooding issues on the lake, but by early spring 2017, it became clear that Lake Ontario was going to flood.

RAPID-RESPONSE SURVEY ASSESSES RECORD-BREAKING FLOODING IN 2017

April and May of 2017 saw the heaviest rainfall ever recorded in the communities surrounding Lake Ontario, and the first half of 2017 was the wettest since 1942. In addition, the previous winter was unusually warm, so upstream precipitation, which normally would have been frozen into snowpack, had already run into the lakes, raising levels above normal before the spring rains even began.

Steinschneider, Stedman, and Austerman developed a rapid-response online survey for lakeshore property owners to measure the impact of flooding along the shoreline. The survey focused on the causes and drivers of flooding, measured inundation and erosion, and asked for self-assessment of damages. The purpose of this data collection was to inform models that could better predict future flood risks.

“We asked folks who lived along the shoreline, ‘What do you need to respond to these flood events better?’ One of the major feedback points we got was, ‘If we had better forecasting of when the flooding was going to happen, with longer lead times, that would really help us,” Steinschneider said.

DEVELOPMENT OF A FLOOD TOOL TO SUPPORT COASTAL COMMUNITIES

The researchers began work on the Flood Tool — a quantitative flood risk evaluation model to help vulnerable communities along Lake Ontario. Steinschneider and his graduate student Kyla Semmendinger developed models of lake activity to forecast the likelihood of damaging flood events across the shoreline. Lauber and Stedman conducted social science research, including interviews and focus groups, to design the tool in a way that would enable property owners, community planners, and government officials to make informed decisions about potential flood-related damage.

“Our goal was to produce a tool that would show, along the shoreline in fine resolution, where there would be elevated risk of inundation over the next few weeks to a month,” Steinschneider said. “It’s like a Google Earth map that you can see visually in color shading.”

In summer and fall of 2019, Lauber and Stedman conducted focus groups with local officials to demonstrate the tool and ask for feedback. Flooding concerns remained high, as the lake flooded again in 2019 — the second time in three years that shoreline communities saw record-breaking floods. Focus group participants agreed that such a tool would be useful, but they also expressed distrust that the information would be accurate.

“They weren’t expecting to have these record floods in two of the last three years, so it made them question all of the information they were getting,” Lauber said.

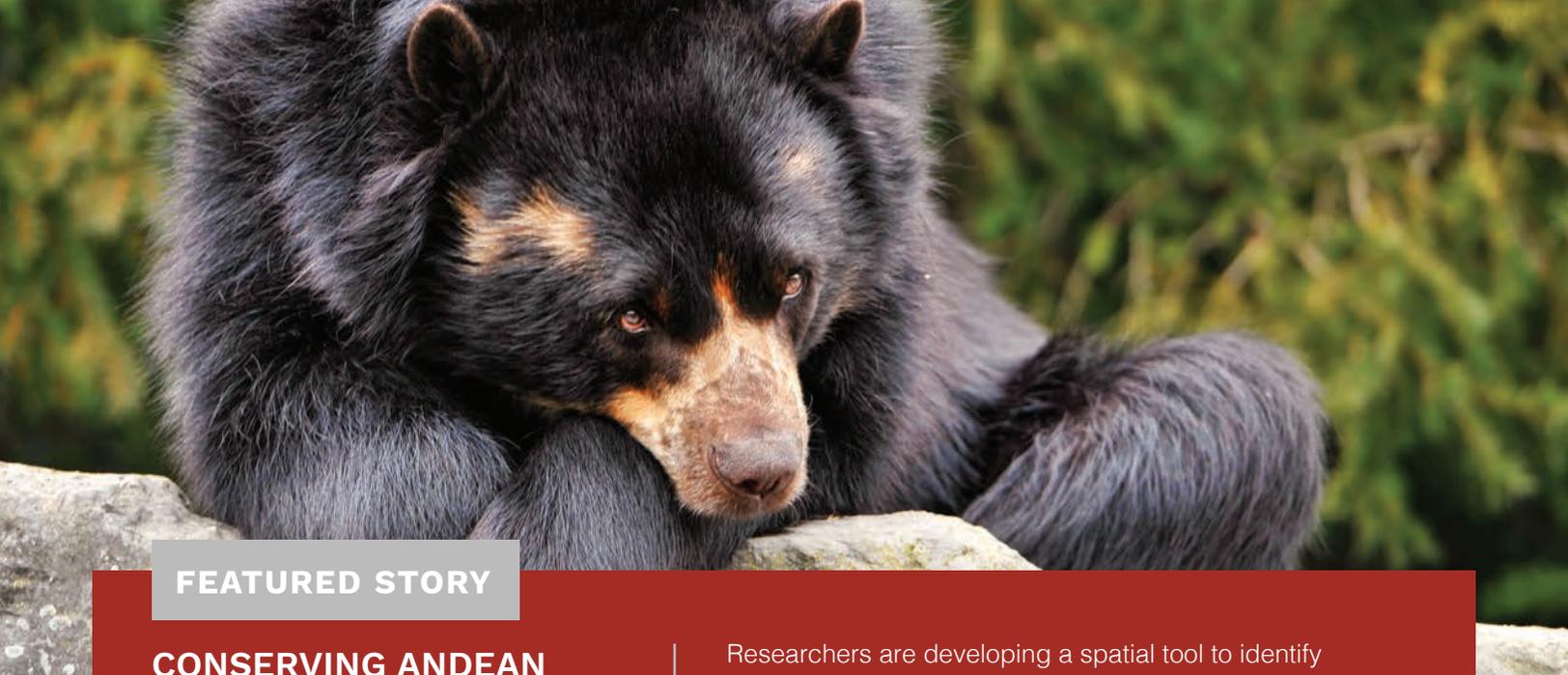
CCSS AND NEW YORK STATE SUPPORTING LONG-TERM FLOOD RESILIENCE

Municipalities along Lake Ontario clearly need help coping with increased flooding risk and developing long-term resiliency to the changing climate. The New York Climate Smart Communities (CSC) program offers competitive grants that can increase a community’s resilience to droughts and floods. In a New York Sea Grant-funded project launched in 2020, Steinschneider and CCSS researchers hope to support municipalities in applying for such grants.

The state requires municipalities to demonstrate need for their proposed projects based on scientific assessments of future climate risk. By providing communities with an improved Flood Tool and doing social science research to assess barriers that might prevent them from participating in the program, the research team can make these state resources more readily available to Lake Ontario communities.

“My hope is that our work will help communities avoid some of the social and economic damages that occur from flooding along Lake Ontario. That we’ll see communities taking steps and making decisions based in part on our work that will help them avoid flooding damage,” Lauber said.





FEATURED STORY

CONSERVING ANDEAN BEARS IN SOUTH AMERICA

Researchers are developing a spatial tool to identify “hotspots” for conflict between people and Andean bears.

CC Image courtesy of Tambako the Jaguar on Flickr.

The Andean or spectacled bear, *Tremarctos ornatus*, is the only bear found in South America; the species lives within the Andes Mountains range of Bolivia, Colombia, Ecuador, Peru, and Venezuela. Threatened by habitat loss and persecution by humans, there are only an estimated 2,000 Andean bears still living in the wild. By 2030, the Andean bear population is projected to decline by another 30 percent.

To protect their bear populations, the government of Ecuador in 2013 designated an Andean bear corridor and conservation program. Cornell researchers led by Angela Fuller, Leader of the New York Cooperative Fish and Wildlife Research Unit and Associate Professor of Natural Resources, have been supporting Ecuador’s conservation efforts for almost a decade. CCSS researchers have recently engaged the project to provide insight about the human element of wildlife conservation: what do the humans who live in that corridor value and need? What adaptations can be made to ensure that the area remains good habitat for both bears and humans?

HUMAN VALUES MAPPING

Researchers are developing a Spatial Risk Tool that identifies “hotspots” with high potential for bear-human conflict, to aid humans in making management decisions that can minimize these conflicts, such as where to graze livestock, where to plant crops, and where to promote ecotourism. Fuller’s work to date has focused on gathering ecological data about the bears to estimate bear abundance and connectivity. CCSS researchers Rich Stedman, Professor of Natural

Resources, and Santiago Garcia, a Ph.D. student under Stedman and Fuller, are focusing on the human needs and values in the same region.

In summer of 2019, Garcia collected 48 participatory maps from individuals living in Northwestern Pichincha, in the Andean bear corridor of Ecuador. He focused on small farming communities with populations of about 50-200 people. In the region, agriculture and livestock account for more than a third of total income (much higher in some areas), making bear conflict an issue that affects humans’ financial resources, food security, and personal safety.

Participants used tablets to designate on maps of their region which areas were important to them for livestock grazing, crops, wildlife, water resources, tourism, spiritual needs, and many other values. Participants also mapped areas where they had seen bears, or experienced conflict with bears, such as livestock killing or crop raiding. Using those data, along with ecological data, Garcia is creating maps to identify areas with higher or lower potential for human-bear conflict.

INFORMING MANAGEMENT DECISIONS

The purpose of the maps is to inform decision-making at every level: from government policymakers considering conservation projects to individual farmers determining where to plant or graze.

“If your activities are in a hotspot that’s a key element for Andean bears and there’s other land nearby that might also be a good location, a community member

could potentially shift these activities to the other area,” Garcia explained. “In reverse, maybe there’s an area that’s not as perfect for the bears — but still very good — but has low human use. You could designate that area for preservation. The idea is to not privilege the bear while totally ignoring the people, or vice versa.”

Another purpose of the tool is to help the human populations benefit from living with the bears, rather than just competing with them. Andean bears are an umbrella species: protecting them provides a cascading benefit to hundreds of other species who share their habitat, including a rich diversity of birds and plants. Within the past decade, several communities in the region have experienced steady growth in ecotourism ventures focused on the Andean bear and on bird watching.

“There are some communities that have seen success with bear-watching and bird-watching, and these people have become very proactive in promoting conservation, because they see that it doesn’t just benefit the bears; it also benefits them,” Garcia said.

SUPPORTING SUSTAINABLE AGRICULTURE

Residents mapped both their current land uses and their desired future land uses, providing insight on how potential expansion of agricultural or livestock production could interplay with bear conservation strategies. Residents identified where key agricultural crops are grown, and they shared their first-hand knowledge about which crops are most susceptible to bear raiding. This information, combined with ecological data, could help inform farmers’ decisions about where to plant specific crops to avoid raiding.

For example, maize and sugarcane seem to be favorites of the Andean bear. Farmers in the corridor have reduced maize cultivation in favor of other crops to avoid human-bear conflicts, but the Spatial Risk Tool could help farmers see where they can safely plant maize, a staple crop for the region. On the other hand, vegetables like peas, carrots, and potatoes seem to be less appealing to the bears; increasing cultivation of these crops could reduce bear-human conflict while also improving nutrition among subsistence farmers.

In addition to adjusting the location of vulnerable crops and planting a greater variety of vegetables not favored by the bears, CCSS researchers aim to help farmers in the region explore non-lethal methods to reduce crop damage, such as promoting fencing, and protecting habitat for the bears.



Images courtesy of Santiago Garcia, Cornell University.

A MODEL FOR OTHER REGIONS

The designated Andean bear corridor is 55,000 hectares, and the CCSS mapping project covers just under 40 percent of the corridor. But researchers hope that the techniques they’re developing through this project could serve as a model for other communities within the Andean bear corridor, as well as other countries that host the bears. By developing spatial risk maps that draw from both ecological data and human values, communities can protect their livelihoods, reinforce their food systems, and support conservation.

Initial funding for this project came from the Cornell Atkinson Center for Sustainability, and current funding comes from Cornell’s School of Integrative Plant Science (SIPS) and from the government of Ecuador’s SENESCYT program.



FEATURED STORY

ENABLING TRANSITION TO SOLAR ENERGY

Rural communities where large solar farms are proposed frequently believe that their voices are not valued in the process.

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In 2019, the New York State legislature passed the Climate Leadership and Community Protection Act, which set aggressive targets to reduce greenhouse gas emissions by 85 percent by 2050. To achieve such an ambitious goal, the state is relying on dramatic expansions of renewable energy infrastructure, including industrial-scale wind and, most recently, solar.

But siting such infrastructure is frequently a hard sell, as the communities where facilities are proposed fear the loss of agricultural land, open space, potentially reduced property values, or changes in the character of their communities.

CCSS researchers are working to understand the social issues involved in converting rural lands to solar farms in New York State. Specifically, they're focusing on how local residents respond to large siting proposals and what adaptations state or industry leaders could consider to make such proposals more palatable.

A NARRATIVE OF “RURAL SACRIFICE”

When state officials and solar developers communicate about large-scale solar facilities, they frequently do so via the lens of global climate change, and the urgent need for humans to reduce greenhouse gas emissions. But when the communities where facilities are proposed talk about it, they do so within a narrative of “rural sacrifice.”

“Most of this energy is scaled to go directly into the transmission wires to go straight Downstate. So there’s a feeling that, ‘we’re going to wreck the landscape of Upstate New York for not very much money so downstate people can have cheaper power.’ People

in communities where these facilities are proposed frequently express frustration with a feeling of power imbalance. That their voices and preferences are not as valued in the process,” said Rich Stedman, Professor in the Department of Natural Resources. “As nice as rooftop and small-scale community solar is, it’s not going to be enough to meet these emissions-reduction targets; it will require utility-scale solar. I think energy development, writ-large, has the capacity to transform the rural landscape of New York.”

Wind facilities can sometimes maintain the possibility of agriculture on the land, for co-siting with livestock grazing or hay production, for example. But the nature of solar energy infrastructure is such that land is covered by panels. The loss of useable land for agriculture is a big concern in many communities. Farmers rely on rented land, as well as their own land, to raise crops and graze livestock. But solar developers offer landowners three times the rate they receive from renting to farmers, setting up tensions around who wins and who loses when solar projects are built.

UNDERSTANDING ATTITUDES ABOUT SOLAR

Roberta Nilson, a Ph.D. student working with Stedman, has been studying local media and town meetings and conducting interviews with local government officials about proposed utility-scale renewable projects. The goal is to better understand residents’ experiences and perceptions of large-scale solar development, and to share that information with policymakers who could then adapt proposals or incentives. The research is supported by a USDA Hatch grant.

Nilson and Stedman are also creating a mail survey for three regions of New York: in agricultural regions of Western and Northern New York, where large-scale solar facilities are currently proposed, and in and around Albany, to measure differences in how urban and rural New Yorkers view solar development. The surveys are scheduled to go out later in 2020.

Residents will be asked about what drives their thinking on proposed solar projects, their perceptions of how such projects would impact their towns, as well as more general questions about their perceptions of climate change and support or opposition to a variety of energy policies. Residents will also be asked about political affiliation, to see whether partisanship influences their thinking on the science of climate change, and any of the policies proposed to mitigate it.

“There’s a lot of research to show that climate change is a very politically polarized issue, so when things are proposed that would address climate change, those projects also become politically polarized,” Nilson said. “We would like to be able to measure this and talk about it in a more informed way.”

LESSONS FROM FRACKING

Stedman has conducted extensive research on attitudes about fracking in New York and Pennsylvania. As with solar and wind, proposals to site hydraulic fracturing have also faced significant community opposition. New York enacted a ban on fracking because the practice engendered so much opposition, while Pennsylvania has allowed thousands of gas wells to be drilled.

Fracking in Pennsylvania has produced significant economic benefits for landowners, which encouraged others to join in. On the other hand, very few industrial-scale solar projects have actually been sited, leaving other landowners less sure about whether such projects will really benefit them. Fracking facilities also produced economic benefit for surrounding communities, both in creating jobs and from workers in “man camps” pumping money into local economies. Solar facilities won’t require as many workers, reducing the economic incentive that might encourage communities to support such installations.

“That leads to this potential issue where people who already are big landowners are the ones who are going to get the most benefit,” Nilson said.

ENVIRONMENTAL JUSTICE

That issue — who will benefit and who will lose in an energy transition, or from a failure to transition — undergirds the concept of environmental justice. CCSS researchers are exploring how solar-siting decisions interplay with key environmental justice concerns:

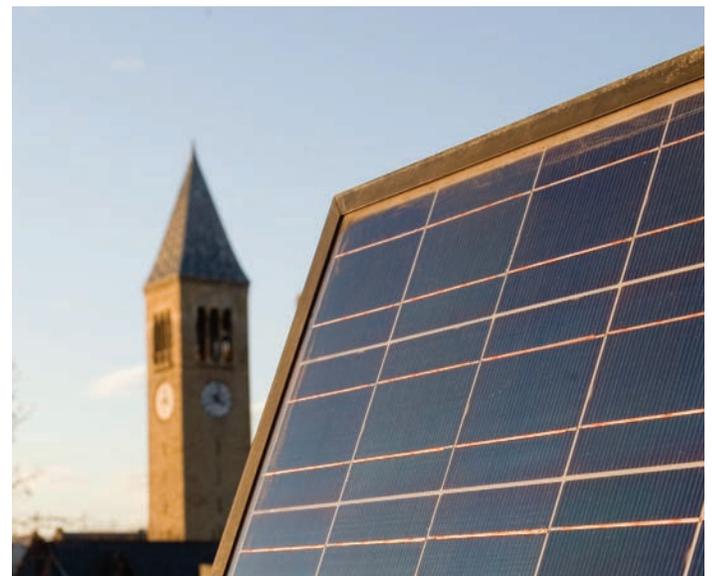
First, there are questions of how costs and benefits from an energy choice will be distributed. For example, if a community houses a coal-fired power plant, they are paying a cost in lower air quality and human health, but they are also receiving a benefit in local jobs. Closing that plant and installing large-scale solar would improve air quality and health, but likely cost jobs. Would residents support that trade? What incentives or supports could mitigate that transition?

A second set of questions is less about outcomes and more about the decision-making process. In 2011, New York State changed its siting and review process for large-scale energy development; previously, local town boards and cities made decisions about project siting. Now, the state conducts those reviews. The change has made the review and siting process more predictable and efficient for energy developers, but has left many local officials feeling powerless. Is the state going to honor local towns’ decisions about their zoning and comprehensive plans? Will local officials’ voices be considered?

Finally, different social groups and how they are affected by decision making need to be recognized. For the communities where solar facilities are proposed, the “Upstate vs. Downstate” narrative is how people describe this concern. New York State policymakers also must consider who will be most negatively impacted by not transitioning away from fossil fuels, including communities who bear the health burdens of living near fossil fuel infrastructure, and everyone who will be impacted by climate change.

“There’s no free lunch,” Stedman said. “Whether we put these facilities on prime farm land, vacant, fallow land, forested land, — there’s no single best place to put these, so the costs and benefits of where it goes have to be considered even-handedly. That’s the kind of information we’re trying to produce, and then it’ll be up to the state to decide how to use that information to be better neighbors.”

Image courtesy of Cornell Photo library.





FEATURED STORY

BUILDING PARTNERSHIPS WITH INDIGENOUS TRIBES IN MALAYSIA

Information and communication technologies enable indigenous communities to learn about and advocate for development that accords with their values.

Images courtesy of Shorna Allred, Cornell University

The Global Citizenship and Sustainability Program at Cornell was founded to enable student learning while bringing university resources to bear in partnership with local communities, to address issues of climate resilience and sustainability. The program centers around an innovative teaching model that includes a fall semester preparatory course, a winter break, 3-week trip to Malaysian Borneo to live and work among indigenous people in tropical rain-forested areas, and a spring semester course to assess, reflect, and produce deliverables back to the Malaysian communities.

The program is led by Shorna Allred, Associate Director of CCSS and Associate Professor in the Department of Natural Resources, in collaboration with Amy Kuo Somchanhmvong, Associate Director of Cornell's Public Service Center. Allred began developing the course in 2012 and visited Malaysia several times to establish relationships with colleagues at a partner university, the Institute of Social Informatics and Technological Innovations at Universiti Malaysia Sarawak (UNIMAS), and with community leaders of the Penan village, an indigenous community in Long Lamai that had been partnering with UNIMAS for many years prior. Cornell students began traveling to Malaysia in 2014.

“Even though Malaysia is no longer a colonized country, there are still vestiges of colonialism all over,” Allred said. “We’re trying to turn that on its head and ask, how can university partnerships work in a mutually beneficial way, where we’re privileging the knowledge that the communities bring and what they have in mind, and we are wrapping our community service learning needs around that process. Our first priority is

to listen and to learn and think about how we can truly form a partnership of mutuality and reciprocity.”

PRIVILEGING THE KNOWLEDGE THAT COMMUNITIES BRING

Each January, 10-12 Cornell students travel to Malaysia and conduct research in teams with students from UNIMAS. In 2018, the program expanded to include Malaysian students from University College Technology Sarawak (UCTS), partnering with the indigenous Iban people in Bawang Assan and Machan. Student projects are developed in discussions with community leaders, and they’re based on what local communities believe deserves attention.

Some of the projects developed so far include digitizing and preserving Penan nomadic culture, understanding community preferences about electricity, recording the sounds of the Long Lamai jungle to track biodiversity, and transitioning a community computer center to adjust for residents’ preference for mobile phones.

Students also conduct extensive interviews with Penan and Iban people, to learn about cultural practices that promote sustainability and resilience; these isolated and remote areas of Malaysia are of global ecological importance and are highly vulnerable to the impacts of climate change. The Penan people, for example, were a formerly nomadic tribe that settled and began practicing agriculture in the 1960s, but the Penan elders still have a strong connection to nomadic practices, such as not over-harvesting, so as to leave vegetation a chance to regrow, and practicing communal decision-making.

“The way we entered into conversation about climate change adaptation is actually through culture. What we’re discovering is that culture plays a really strong role in conservation of resources, and cultural resources are very much tied to sustainability, to the relationship with the rainforest and with nature,” Allred said. “They utilize their resources in a sustainable way because their survival really depended on stewardship of natural resources, and on preserving relationships within and among tribes.”

For indigenous communities, preserving these cultural practices will be crucial in adapting to climate change. For the rest of the world, learning from practices that value sustainability and egalitarian decision-making may be key to mitigating climate change.

STUDENT CROSS-CULTURAL SERVICE LEARNING

Benjamin Mirin, a graduate student in natural resources, conducted research on bioacoustics and the anthropology of sound. With input from the community, he arranged a recording expedition into the jungles around Long Lamai and recorded a 14-hour soundscape of the jungle. Community members helped Mirin identify all the species they were hearing, to create a record of the jungle’s biodiversity. He’s now produced a 30-page book to accompany the soundtrack, with photos and written information in both English and Penan languages. He hopes the project will inspire future generations of Penan people to remain close to nature and inspire others to value and preserve global biodiversity.

“Indigenous communities and Western researchers can easily exist in different worlds, but the key to conservation is building relationships. Protecting the environment is a continuous endeavor on behalf of a planet we all share, and our efforts will have greater impact if we find common ground among our human experiences,” Mirin said.

Franklin George is a graduate student in computer and social sciences at UNIMAS, and native Penan. He’s been involved in a dozen projects with the Penan people, including a master’s project to preserve Oroo’, the Penan sign language, which is “at the verge of extinction,” he said. Franklin speaks Oroo’ but his advisor does not, so Franklin acts as a translator as well as a social scientist. In addition to recording the language, Franklin is involved in a project developing a game and app to teach Oroo’, in an effort to inspire younger generations to learn the language. The collaboration with Cornell students has helped Franklin develop his capacity for presentation and teamwork, he said.

“The community has a breadth of knowledge about their past, their way of life, and the forest,” Franklin said. “The universities, students and faculty, have systematic

ways of doing documentation. It makes for a perfect collaboration.”

CONNECTIVITY ENABLES SELF-DETERMINATION

Gary Loh Chee Wyai, currently a Senior Lecturer and Researcher in Information and Communications Technology at UCTS, first began collaborating with the Penan community in 2007 when he was still working as an IT project manager at UNIMAS, because of a student who was Penan. The Malaysian government provided grants to implement computing Telecentres in remote rural communities and Gary oversaw the establishment of one in the Penan village of Long Lamai. He’s now working on launching others in the Iban communities at Bawang assan and Machan. Gary was vital in helping establish relationships between Cornell and indigenous communities. The combination of Cornell academics’ expertise in social science, with UNIMAS and UCTS faculty expertise in computing makes for a powerful collaboration, he said.

Information and communication technologies enable rural and indigenous communities to learn about and advocate for development of their communities that accords with indigenous values like sustainability, adaptability, and egalitarianism. Student learning projects are built around these principles, as well. Student research that involves documenting and digitizing indigenous languages or practices, for example, are designed to enable indigenous ownership of research products.

“The technology allows us to broaden the audience for this information, but it also allows these communities to control the messaging about themselves,” Allred said. “These communities just started formal education back in the 60s, yet they have a vast knowledge about their resources and communities that spans many decades. There’s this narrative that they’re anti-development or anti-progress, but that’s not at all how they see themselves. They’re pro-indigenous development.”

For more information on the Global Citizenship and Sustainability Program, go to: <https://psc.cornell.edu/global-citizenship-and-sustainability>



CCSS PEOPLE

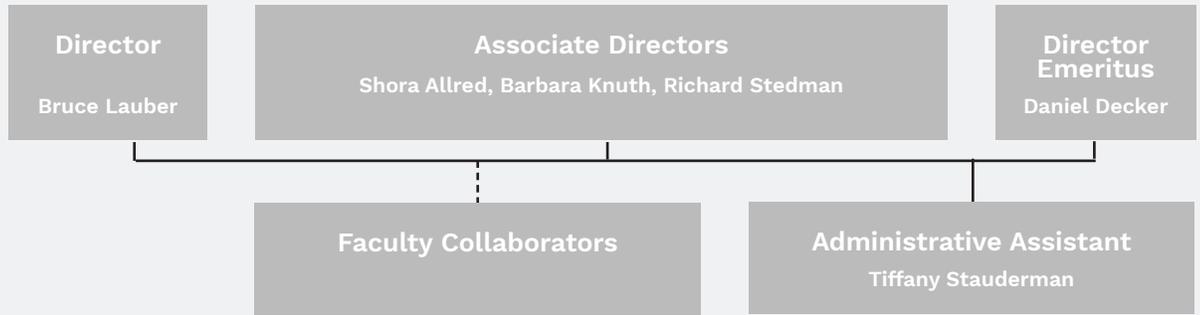
The success of the CCSS depends on its faculty, staff, and graduate students – and the people who collaborate with us.



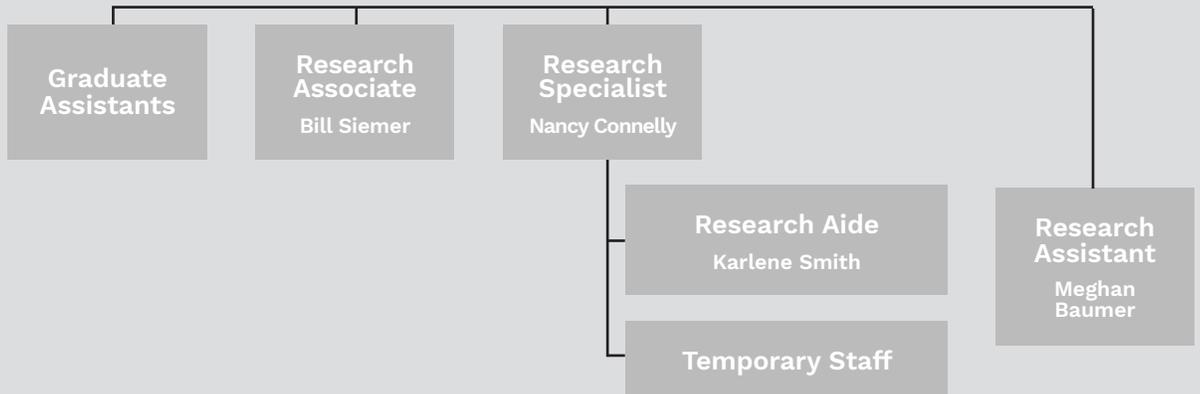
Image courtesy of Santiago Garcia, Cornell University.

FACULTY AND STAFF

SUPERVISORS OF CCSS ACTIVITIES



PROJECT STAFF



CENTER FOR CONSERVATION SOCIAL SCIENCES ORGANIZATIONAL CHART

CORE FACULTY (as of January 2020)

T. Bruce Lauber, Senior Research Associate and CCSS Director

Specializations: Risk management and communication related to fisheries management; invasive species management; conflict and collaboration in natural resource management; stakeholder engagement in decision making; Great Lakes.

Shorna B. Allred, Associate Professor, House Professor and Dean (Alice Cook House), and CCSS Associate Director

Specializations: Human dimensions of natural resource management; natural resource policy; community-based methods, community resilience, and environmental attitudes and behavior with emphasis on forest and water resources.

Barbara A. Knuth, Professor and CCSS Associate Director; Dean of the Graduate School

Specializations: Risk communication and risk perception related to chemical contaminants in fish; ecosystem-based approaches to fisheries management; Great Lakes and marine fisheries policy and management.

Richard C. Stedman, Professor and CCSS Associate Director

Specializations: Sense of place; community resilience; impacts of social and environmental change on wildlife recreation and community; risk and policy; environmental attitudes and behaviors; community-based resource management; landowner attitudes and behaviors; coupled human/ecological systems.

Daniel J. Decker, Professor Emeritus and CCSS Director Emeritus

Specializations: Integration of human dimensions insights into wildlife management decision making, policy, planning, and practice; stakeholder involvement in wildlife management.



Image courtesy of U.S. Department of Agriculture on Flickr.

AFFILIATED FACULTY (as of January 2020)

Paul D. Curtis, Professor and Department Extension Leader

Specializations: Resolving conflicts between people and wildlife; citizen participation in decision making; outreach and policy education.

Heidi Kretser, Adjunct Assistant Professor, Conservation Social Scientist - Americas, Wildlife Conservation Society

Specializations: Land-use development and patterns; how human activities in rural landscapes influence wildlife and human-wildlife conflicts; how communities, groups of actors in a conservation issue, or a single organization move from process and discussion of an issue to on-the-ground conservation impacts.

Katherine A. McComas, Vice Provost for Engagement and Land-Grant Affairs and Professor, Department of Communication

Specializations: Risk, science, and environmental communication; community involvement and public participation; trust and credibility related to science communication.

Jeff Niederdeppe, Associate Professor, Department of Communication

Specializations: Health and environmental communication; public communication campaigns; public opinion and social policy.

Amanda D. Rodewald, Professor, Department of Natural Resources and Director of Conservation Science, Cornell Lab of Ornithology

Specializations: Wildlife population and community ecology; conservation biology; landscape ecology; socioecological interactions in tropical working landscapes; forest management; urban ecology.

Keith Tidball, Senior Extension Associate, Assistant Director Cornell Cooperative Extension (Environment and Natural Resources)

Specializations: Anthropology of social-ecological systems; therapeutic attributes of nature and outdoor recreation among returning combatants and survivors of traumatic events; food motivations in hunter and angler recruitment, retention, and reactivation; citizen science in angling and hunting communities of practice.

CENTER STAFF (as of January 2020)

Meghan S. Baumer, Research Assistant

Specializations: Environmental psychology; environmental education; volunteer management; human dimensions training program assistance.

Nancy A. Connelly, Research Specialist

Specializations: Incorporating human dimensions perspectives in natural resources management; risk perception and communication related to fisheries management; survey research methods.

William F. Siemer, Research Associate

Specializations: Motivations and satisfactions associated with wildlife-dependent recreation; program evaluation; risk perceptions associated with human-wildlife conflicts; understanding wildlife acceptance capacity.

Karlene K. Smith, Research Aide

Specializations: Survey implementation; interviewing; database management; content analysis.

Tiffany Stauderman, Administrative Assistant

Specializations: Center office management; website maintenance; administrative assistance.

GRADUATE STUDENTS (as of January 2020)

Gloria Blaise, Gates Millennium Fellow

Specializations: Socio-ecological systems; community-based agroforestry outcomes, and community development; environmental education in developing countries.

Santiago Garcia

Specializations: Leadership; governance; conflict resolution skills; strategic organizational planning and management; fundraising and donor development; biodiversity conservation; human dimensions in natural resources; ecosystem services; climate change and community-based adaptation; REDD+.

James Goetz

Specializations: Political ecology of natural resource and protected area management. Social and environmental outcomes of payments for ecosystem services. Participative, adaptive conservation planning and management.

Frieda Kay

Specializations: Human dimensions of natural resources management; comparative energy transitions; stakeholder engagement; climate planning and infrastructure resilience; information transfer and solutions sharing.

Deanna Kreinheder

Specializations: Human dimensions in natural resources; wildlife disease; governance; communication campaigns; behavioral change.

Sarah Naiman, National Science Foundation Fellow

Specializations: The application of sense of place and theory to predict pro-environmental behaviors; social psychology.

Roberta Nilson

Specializations: Rural studies; public policy; energy; natural resource dependent communities; public engagement.

Shashank Poudel

Specializations: Large carnivore monitoring and conservation in human dominated landscapes; human leopard conflict; leveraging communication and outreach for human wildlife conflict mitigation; designing capacity building program for protected area staffs and local communities; social survey for conservation.

Candice Reeves

Specializations: Business solutions in natural resource management for agricultural sustainability; strategic organizational planning and management; human dimensions in natural resources.

Alexandra Sholk

Specializations: Conflict mediation and facilitation around environmental issues; implementation of conservation management plans; environmental justice; public engagement; educational outreach.

Rex Ukaejifo

Specializations: Examining climate adaptation policies and strategies in agricultural livelihoods in Sarawak, Malaysian Borneo.

GRADUATE STUDENTS RECEIVING DEGREES IN 2019

Dylan Bugden

Ph.D. Natural Resources (R. Stedman, advisor). Social Movements and Mass Partisanship: Convergent Identities, Centrifugal Forces, and the Case of Climate Activism.

Ted Lawrence

Ph.D. Natural Resources (R. Stedman, advisor). Globalized Agriculture as a Driving Force of Change to Maya Community-Managed Landscapes across Yucatán, México.

Carrie Simon

M.S. Natural Resources (B. Knuth, advisor).

Gretchen Worth

M.P.S. International Agriculture and Rural Development (S. Allred, advisor). Finding the Way: Engaged Cultural Mapping Methods in Heritage Conservation Projects.

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CCSS COLLABORATORS

CCSS collaborates with a wide variety of organizations, universities, and governments (recent examples listed). Without the assistance of these and other collaborators, much of the work we do would not be possible.



GOVERNMENT

City of Binghamton, FL Fish and Wildlife Conservation, Great Lakes Consortium for Fish Consumption Advisories, Great Lakes Fishery Commission, Hudson River Estuary Program, National Academy of Science, National Park Service, National Science Foundation, Michigan DNR, MN Department of Health, NY Sea Grant, NYS DEC, TN Wildlife Resource Agency, US Environmental Protection Agency, US Fish and Wildlife Service, US Forest Service, US Geological Survey, USDA National Institute of Food and Agriculture

PRIVATE/PUBLIC ORGANIZATIONS

Albany Pine Bush Preserve Commission, Association of Fish and Wildlife Agencies, Avangrid, Center for Nonprofit Strategies, Dutch Research Institute for Transitions, Ontario Ministry of Natural Resources and Environment, NYS Energy Research & Development Authority, Ruffed Grouse Society, Science and Resilience Institute at Jamaica Bay, Stockholm Resilience Centre, Wildlife Conservation Society, Wildlife Management Institute

UNIVERSITIES

Columbia University, Michigan State University, Montana State University, North Carolina State University, Stockholm University, The Ohio State University, University College of Technology Sarawak, Universiti Malaysia Sarawak, University of Edinburgh, University of Alberta, University of Maine, University of Massachusetts, Virginia Tech, Yale University

CORNELL UNIVERSITY

Atkinson Center for a Sustainable Future, Charles H. Dyson School of Applied Economics and Management, Community and Regional Development Institute, Cornell Cooperative Extension, Cornell Institute for Climate Smart Solutions, Cornell Laboratory of Ornithology, Cornell Southeast Asia Program, Cornell Survey Research Institute, Cornell University Agricultural Experiment Station, Office of Engagement Initiatives, Public Service Center

Departments of: Biological and Environmental Engineering, Civil Engineering, Communication, Development Sociology, Earth and Atmospheric Sciences, History of Art and Visual Studies, Landscape Architecture and Natural Resources

PUBLICATIONS

In 2019, the CCSS produced 28 peer-reviewed journal articles and 7 other publications.

2019 CCSS PEER-REVIEWED JOURNAL ARTICLES

- Allred, S. B. & Gary, G. (2019). Riparian landowner decision-making in the context of flooding: An application of the theory of planned behavior. *Environment, Systems, and Decisions*, 39, 396-408. <https://doi.org/10.1007/s10669-019-09735-1>.
- Armstrong, A., & Stedman, R. C. (2019). Understanding local environmental concern: The importance of place. *Rural Sociology*, 84(1), 93. <https://doi.org/10.1111/ruso.12215>
- Armstrong, A., Stedman, R. C., & Tucker, G. (2019). Beyond “us and them”: Why do landowners disagree about local water pollution? *Society & Natural Resources*, 32(11), 1200–1221. <https://doi.org/10.1080/08941920.2019.1620390>
- Briggs, L., Krasny, M., & Stedman, R. C. (2019). Exploring youth development through an environmental education program for rural indigenous women. *Journal of Environmental Education*, 50(1), 37–51. <https://doi.org/10.1080/00958964.2018.1502137>
- Bugden, D., & Stedman, R. C. (2019a). A synthetic view of acceptance and engagement with smart meters in the United States. *Energy Research & Social Science*, 47, 137–145. <https://doi.org/10.1016/j.erss.2018.08.025>
- Bugden, D., & Stedman, R. C. (2019b). Place and behavior: The role of accessibility. *Journal of Environmental Psychology*, 63, 109–117. <https://doi.org/10.1016/j.jenvp.2019.04.008>
- Bugden, D., & Stedman, R. C. (2019c). Rural landowners, energy leasing, and patterns of risk and inequality in the shale gas industry. *Rural Sociology*, 84(3), 459. <https://doi.org/10.1111/ruso.12236>
- Connelly, N. A., Lauber, T. B., McCann, P. J., Niederdeppe, J., & Knuth, B. A. (2019). Estimated exposure to mercury from fish consumption among women anglers of childbearing age in the Great Lakes region. *Environmental Research*, 171, 11–17. <https://doi.org/10.1016/j.envres.2019.01.005>
- Decker, D. J., Forstchen, A. B., Siemer, W. F., Smith, C. A., Frohlich, R. K., Schiavone, M. V., Lederle, P. E., & Pomeranz, E. F. (2019). Moving the paradigm from stakeholders to beneficiaries in wildlife management. *The Journal of Wildlife Management*, 83(3), 513–518. <https://doi.org/10.1002/jwmg.21625>
- Di Masso, A., Williams, D. R., Raymond, C. M., Buchecker, M., Degenhardt, B., Devine-Wright, P., Hertzog, A., Lewicka, M., Manzo, L., Shahrad, A., Stedman, R., Verbrugge, L., & von Wirth, T. (2019). Between fixities and flows: Navigating place attachments in an increasingly mobile world. *Journal of Environmental Psychology*, 61, 125–133. <https://doi.org/10.1016/j.jenvp.2019.01.006>
- Elser, J. L., Lindell, C. A., Steensma, K. M. M., Curtis, P. D., Leigh, D. K., Siemer, W. F., Boulanger, J. R., & Shwiff, S. A. (2019). Measuring bird damage to three fruit crops: A comparison of grower and field estimates. *Crop Protection*, 123, 1–4. <https://doi.org/10.1016/j.cropro.2019.05.010>
- Enqvist, J. P., Campbell, L. K., Stedman, R. C., & Svendsen, E. S. (2019). Place meanings on the urban waterfront: A typology of stewardships. *Sustainability Science*, 3, 589. <https://doi.org/10.1007/s11625-019-00660-5>
- Floress, K., Huff, E. S., Snyder, S. A., Koshollek, A., Butler, S. & Allred, S. B. (2019). Factors associated with family forest owner actions: A vote-count meta-analysis. *Landscape and Urban Planning*, 188, 19–29. <https://doi.org/10.1016/j.landurbplan.2018.08.024>
- Fownes, J. & Allred, S. B. (2019). Testing the influence of recent weather on perceptions of personal experience with climate change and extreme weather in New York State. *Weather, Climate, and Society*, 11, 143–157. <https://doi.org/10.1175/WCAS-D-17-0107.1>
- Greenberg, P., & Bugden, D. (2019). Energy consumption boomtowns in the United States: Community responses to a cryptocurrency boom. *Energy Research & Social Science*, 50, 162–167. <https://doi.org/10.1016/j.erss.2018.12.005>
- Higuera, P. E., Metcalf, A. L., Miller, C., Buma, B., McWethy, D. B., Metcalf, E. C., Ratajczak, Z., Nelson, C. R., Chaffin, B. C., Stedman, R. C., McCaffrey, S., Schoennagel, T., Harvey, B. J., Hood, S. M., Schultz, C. A., Black, A. E., Campbell, D., Haggerty, J. H., Keane, R. E., ... Virapongse, A. (2019). Integrating subjective and objective dimensions of resilience in fire-prone landscapes. *BioScience*, 69(5), 379–388. <https://doi.org/10.1093/biosci/biz030>

- Ingalls, M. L., Kohout, A., & Stedman, R. C. (2019). When places collide: Power, conflict and meaning at Malheur. *Sustainability Science*, 14(3), 625–638. <https://doi.org/10.1007/s11625-019-00689-6>
- Knuth, B. A. (2019). Politically-relevant fisheries science: Reflections on the work of Henry Regier, or, lessons from the sassy scientist. *Aquatic Ecosystem Health & Management*, 22(3), 258–262. <https://doi.org/10.1080/14634988.2019.1652533>
- Lawrence, T. J., Morreale, S. J., & Stedman, R. C. (2019). Distant political-economic forces and global-to-local pathway to impacts on forests of Ejido landscapes across Yucatán, México. *Land Degradation & Development*, 30(17), 2021–2032. <https://doi.org/10.1002/ldr.3400>
- Lawrence, T. J., Stedman, R. C., Morreale, S. J., & Taylor, S. R. (2019). Rethinking landscape conservation: Linking globalized agriculture to changes to indigenous community-managed landscapes. *Tropical Conservation Science*, 12, 1940082919889503. <https://doi.org/10.1177/1940082919889503>
- Masterson, V. A., Enqvist, J. P., Stedman, R. C., & Tengo, M. (2019). Sense of place in social-ecological systems: From theory to empirics. *Sustainability Science*, 3, 555. <https://doi.org/10.1007/s11625-019-00695-8>
- McWethy, D. B., Schoennagel, T., Higuera, P. E., Krawchuk, M., Harvey, B. J., Metcalf, E. C., Schultz, C., Miller, C., Metcalf, A. L., Buma, B., Virapongse, A., Kulig, J. C., Stedman, R. C., Ratajczak, Z., Nelson, C. R., & Kolden, C. (2019). Rethinking resilience to wildfire. *Nature Sustainability*, 2(9), 797–804. <https://doi.org/10.1038/s41893-019-0353-8>
- Niederdeppe, J., Connelly, N. A., Lauber, T. B. & Knuth, B.A. (2019). Effects of a personal narrative in messages designed to promote healthy fish consumption among women of childbearing age. *Health Communication*, 34, 825–837. <https://doi.org/10.1080/10410236.2018.1437526>
- Nourani, S. W., Decker, D. J. & Krasny, M. E. (2019). Extension as a multilevel bridging organization: Supporting networked environmental governance. *Journal of Extension*, 57(5), FEA2.
- Robinson, K. F., Fuller, A. K., Stedman, R. C., Siemer, W. F., & Decker, D. J. (2019). Integration of social and ecological sciences for natural resource decision making: Challenges and opportunities. *Environmental Management*, 5, 565. <https://doi.org/10.1007/s00267-019-01141-2>
- Stedman, R. C., Connelly, N. A., Heberlein, T. A., Decker, D. J., & Allred, S. B. (2019). The End of the (research) world as we know it? Understanding and coping with declining response rates to mail surveys. *Society & Natural Resources*, 32(10), 1139–1154. <https://doi.org/10.1080/08941920.2019.1587127>
- Steinschneider, S., Styler, A., Stedman, R., & Austerman, M. (2019). A rapid response survey to characterize the impacts of the 2017 high water event on Lake Ontario. *Journal of the American Water Resources Association*, 55(4), 1065–1079. <https://doi.org/10.1111/1752-1688.12750>
- Wall, J., Köse, Ç., Köse, N., Okan, T., Aksoy, E., Jarvis, D. & Allred, S. (2019). The role of traditional livelihood practices and local ethnobotanical knowledge in mitigating chestnut disease and pest severity in Turkey. *Forests* 10, 571. <https://doi.org/10.3390/f10070571>.

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OTHER CCSS PUBLICATIONS

- Clarke, C. E., Budgen, D., Evensen, D. T. N., Stedman, R. C., Boudet, H. S., & Jacquet, J. B. (2019). Communicating about climate change, natural gas development, and “fracking”: U.S. and international perspectives. In *Oxford Research Encyclopedia, Climate Science*. Oxford University Press.
- Connelly, N. A., Lauber, T. B., Stedman, R. C., & Kretser, H. (2019). *Public awareness of and attitudes toward moose in New York State*. (CCSS Publication Series 19-5). Ithaca, NY. Dept. of Natural Resources, College of Agriculture and Life Sciences, Cornell University. Retrieved from <https://ecommons.cornell.edu/bitstream/handle/1813/69631/CCSS%2019-5%20Moose%20Empire%20Poll%20report%20final.pdf?sequence=2&isAllowed=y>
- Decker, D. J., Forstchen, A. B., Schiavone, M. V., Pomeranz, E. F., King, R., & Benedict, Jr., R. J. (2019). An eye toward ethics. *The Wildlife Professional*, May/June, 28–31.
- Decker, D. J., Siemer, W. F., Pomeranz, E. F., Forstchen, A. B., Schiavone, M. V., Baumer, M. S., Smith, C. A., Riley, S. J., & Lederle, P. E. (2019). *Identifying habits and practices of effective fish and wildlife management professionals*. (CCSS Publication Series 19-3). Ithaca, NY. Dept. of Natural Resources, College of Agriculture and Life Sciences, Cornell University. Retrieved from <https://ecommons.cornell.edu/bitstream/handle/1813/69577/Habits%20and%20practices%20of%20effective%20fish%20and%20wildlife%20professionals%20CCSS%20Report%2019-3%20%20Jan%202020.pdf?sequence=2&isAllowed=y>
- Lauber, T. B. & Stedman, R. C. (2019). *Quality and extent of partnership involvement in Climate Science Centers in the Northeast, South Central, and Pacific Islands regions*. (CCSS Publication Series 19-1). Ithaca, NY. Dept. of Natural Resources, College of Agriculture and Life Sciences, Cornell University. Retrieved from <https://ecommons.cornell.edu/bitstream/handle/1813/65618/CCSS%20Report%2019-1.pdf?sequence=2&isAllowed=y>
- Siemer, W. F., Lauber, T. B., Stedman, R. C. & Decker, D. J. (2019). *Understanding local residents’ bear population preferences: Results from a survey in Upstate New York*. (CCSS Publication Series 19-2). Ithaca, NY. Dept. of Natural Resources, College of Agriculture and Life Sciences, Cornell University. Retrieved from [https://ecommons.cornell.edu/bitstream/handle/1813/66624/CCSS%20Report%2019-2%20Understanding%20residents%20bear%20population%20preferences%206_27_19%20\(1\).pdf?sequence=2&isAllowed=y](https://ecommons.cornell.edu/bitstream/handle/1813/66624/CCSS%20Report%2019-2%20Understanding%20residents%20bear%20population%20preferences%206_27_19%20(1).pdf?sequence=2&isAllowed=y)
- Siemer, W. F., Stedman, R. C., & Lauber, T. B. (2019). *Local residents’ deer population preferences: Results from a 2019 survey of 8 Wildlife Management Unit Aggregates*. (CCSS Publication Series 19-4). Ithaca, NY. Dept. of Natural Resources, College of Agriculture and Life Sciences, Cornell University. Retrieved from <https://ecommons.cornell.edu/bitstream/handle/1813/69485/CCSS%20Report%2019-4.pdf?sequence=2&isAllowed=y>



CCSS FUNDING

In 2019, CCSS faculty were PIs or co-PIs on grants and contracts with more than \$5 million in funding.

CCSS FUNDED PROJECTS ACTIVE IN 2019

- Anderson, C. L., Stedman, R. Bitar, E., & Cowen, E. Planning grant: Engineering research center for sustainable energy smart solutions. National Science Foundation. 2018-2020.
- Allred, S. & Michener J. Toxic inequality: Environmental justice in America. Engaged Cornell. 2019-2020.
- Allred, S., Peters, S., Horrigan, P., Kiely, R. & Hargraves, M. Participatory evaluation of the Rust to Green University-Community Partnership. Cornell University, Office of Engagement Initiatives. 2018-2019.
- Ault, T., Allred, S., Chatrchyan, A., & Stroock, A. Integrating climate, crop, and cloud computing data in the Caribbean to improve drought resilience. Atkinson Center for a Sustainable Future—Academic Venture Funds. 2018-2020.
- Catanzaro, P., Markowski-Lindsay, M., Bell, K., Kittredge, D., Markowitz, E. Leahy, J., Butler, B., & Allred, S.B. Understanding and informing family forest owner decisions of land transfer to enhance the viability and competitiveness of our forested landscapes. USDA NIFA. 2015-2020.
- Chatrchyan, A., DeGaetano, A., Hoffman, M., Allred, S., Krasny, M., & Bunting-Howarth K. Climate Master Volunteers: Supporting the work of climate change adaptation, mitigation, and community resilience at the local level. USDA NIFA. 2017-2020.
- Cowen, E. A., Daziano, R., Schultze, R., & Stedman, R. C. Achieving the hype: Leveraging storage to turn smart meters into a smart service system. National Science Foundation. 2016-2020.
- Fuller, A. & Stedman, R. C. Spatial risk mapping of sustainable food systems threatened by conflicts with Andean Bears in the Western Ecuadorian Andes. Toward Sustainability Foundation. 2018-2019.
- Fuller, A., Stedman, R. C. & Gilbert, M. Living with Leopards: Implications of human-leopard interaction on food security and public health in the foothills of the Himalayas. Atkinson Center for a Sustainable Future, Academic Venture Fund. 2019-2021.
- Kraft, C., Stedman, R. C. & Bugden, D. E. Proposal to support active learning in CALS. Proposal to support active learning in Introduction to Environmental Science and Sustainability and Society and Natural Resources. Cornell University, College of Agriculture and Life Sciences. 2018-2019.
- Lauber, T. B. Communication to promote recovery of an important species for agriculture: perceptions of risks and benefits of bats. Cornell University College of Agriculture and Life Sciences Agricultural Experiment Station. 2017-2020.
- Lauber, T. B., Austen, D. & Stedman, R. C. NCCWSC-CSC five year reviews – assessing the science, partner engagement, and utility for natural resources conservation. U.S. Geological Survey. 2015-2019.
- McComas, K., Lauber, T. B. & Kretser, H. Promoting conservation of a risk-laden species using One Health risk messaging: The case of White Nose Syndrome in bats. Cornell University Institute for the Social Sciences. 2017-2019.
- McGowan, K. & Allred, S. Penan of Borneo and the Hedda Morrison collection. Cornell University Library. 2018-2020.
- Stedman, R. C., Ifft, J., and Kay, D. L. Understanding barriers and opportunities for renewable energy transitions in New York State. Cornell University College of Agriculture and Life Sciences Agricultural Experiment Station. 2016-2020.
- Stedman, R. C., Allred, S. B., Decker, D. J. & Lauber, T. B. Collaborative research in the human dimension of wildlife management. NYS Department of Environmental Conservation. 2016-2021.
- Stedman, R. C. Understanding angler behaviors that influence the spread of aquatic invasive species. University of Illinois at Urbana-Champaign. 2018-2020.
- Steinschneider, S. & Stedman, R. C. Climate-smart flood risk planning for coastal communities on Lake Ontario. New York Sea Grant Institute. 2018-2020.
- Walter, T., DeGaetano, A., & Stedman, R. C. Testing online nutrient management decision support tool. Cornell University Agricultural Experiment Station Federal Formula (Hatch). 2018-2020.



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CCSS

Center for Conservation
Social Sciences

2019 ANNUAL REPORT

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