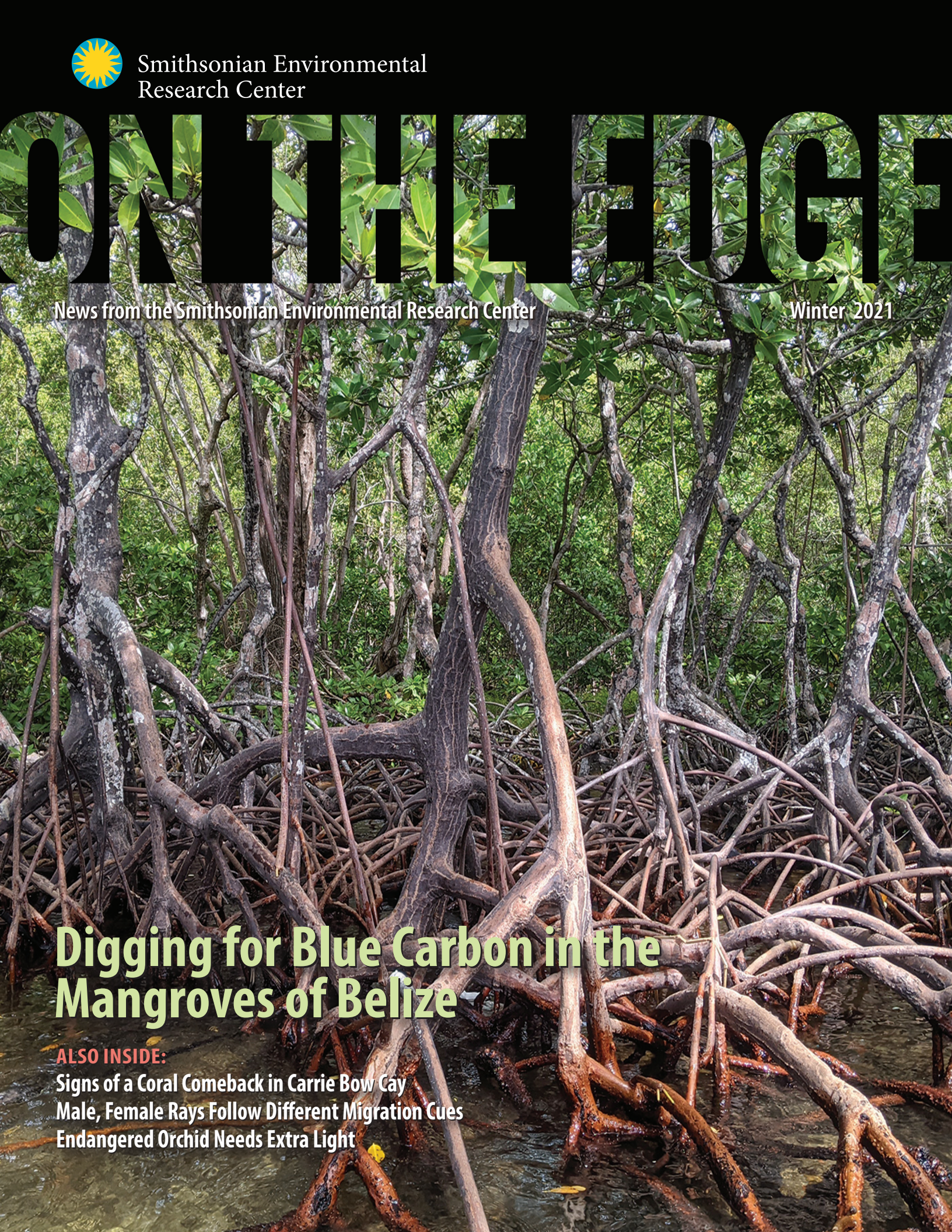
Smithsonian Environmental Research Center

ON THE EDGE

News from the Smithsonian Environmental Research Center

Winter 2021



Digging for Blue Carbon in the Mangroves of Belize

ALSO INSIDE:

Signs of a Coral Comeback in Carrie Bow Cay

Male, Female Rays Follow Different Migration Cues

Endangered Orchid Needs Extra Light

THE DIRECTOR'S LETTER:

The Buried Treasure of Blue Carbon

If you leaf through the pages of this newsletter, you might notice some of our ecologists have spent a lot of time in Belize lately. (I'm a little jealous, I'll admit.) That isn't unusual for our scientists. The Smithsonian has operated a field station in Belize since 1972, on the tiny island of Carrie Bow Cay, perched atop the Mesoamerican Barrier Reef, second largest in the world. But recently, the Central American nation has become a key player in a much larger story.

Aerial view of Carrie Bow Cay, Belize. (Credit: Zachary Foltz, Smithsonian Marine Station)

Belize is claiming its place on the global climate stage—and it's offering an example for the rest of the world to follow.

Despite emitting less than 0.01% of the world's greenhouse gas emissions, the Belize government is embracing climate change mitigation. Much of its strategy focuses on preserving and managing its forests. In particular, its mangrove forests, which can lock away millions of tons of carbon.

At SERC, we're fortunate to be part of that story. SERC scientist emerita Candy Feller devoted her career of over 30 years to exploring and conserving mangroves all over the world. Her research tracked ongoing threats to mangroves, and how they respond to hurricanes, climate change and pollution. She did much of her field work on Belize's mangrove island of Twin Cays, near Carrie Bow Cay.

Continuing Dr. Feller's work, this fall SERC marine biologist Jonathan Lefcheck and other Smithsonian researchers spent a month trekking through the nation's mangroves side by side with Belizean scientists. The project is called the **Belize Blue Carbon Project**. *Blue carbon* refers to the carbon that coastal and marine ecosystems store—as opposed to the more well-known carbon stored on land.

Over the last decade, blue carbon has slowly gained recognition for its potential to mitigate climate change. On a per area basis, coastal blue carbon ecosystems are nature's most efficient carbon sinks. But there are plenty of uncertainties. Mangroves are just one blue carbon ecosystem. So are seagrasses, tidal marshes, and even microbial mats on the Arabian Peninsula. Each one can sequester vastly different amounts of carbon. Even among mangroves, there's diversity.

The mission of the Belize Blue Carbon team was to get a clearer picture of exactly how much carbon Belize's mangroves have the potential to store. Only then can the nation develop an accurate strategy for mitigating climate change.

Blue carbon also came into the global spotlight this November, at the United Nations Climate Change Conference, or "COP26" for short. SERC deputy director Pat Megonigal and others released a special Blue Carbon report in advance of the conference. It took a deeper look at whether an even wider pool of ocean environments deserve inclusion in blue carbon strategies, like kelp forests or phytoplankton.

Blue carbon alone won't solve climate change, or keep us under the warming threshold of 1.5 degrees Celsius the world began shooting for with the Paris Climate Agreement. There's no single silver bullet. But that's the beauty of the moment we're in now. To reach a sustainable future, the world needs to embrace multiple ideas and strategies. And that means there's a place for everyone at the table.

– ANSON "TUCK" HINES, SERC DIRECTOR

Top, L-R: Red mangroves on the water, supported by their aerial prop roots. (Credit: John Parker/SERC); Field station at Carrie Bow Cay, Belize. (Credit: John Parker/SERC); Scientists Kevin Novelo (left) and Reynel Blanco take a soil core sample in Belize. (Credit: Jonathan Lefcheck/SERC) Bottom, L-R: Candy Feller in Belize, during an electronic field trip. (Credit: SERC); Jonathan Lefcheck pauses for a selfie while doing mangrove field work in Belize.

Cover Photo: Red mangroves stretch out their aerial prop roots from a Belizean shoreline. (Credit: Hannah Morrissette/ Smithsonian Marine Station)

RESEARCH DISCOVERIES

FOR ONE ENDANGERED ORCHID, A LITTLE LIGHT GOES A LONG WAY

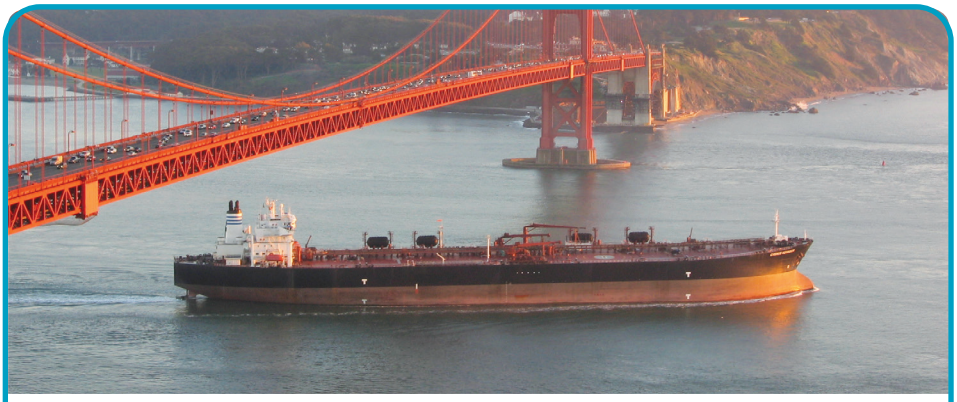
BY KRISTEN GOODHUE

A small-whorled pogonia orchid, **Isotria medeoloides,** *at Fort A.P. Hill in Virginia. (Credit: Melissa McCormick/SERC)*

The small-whorled pogonia, *Isotria medeoloides*, is threatened at the federal level and endangered in almost every U.S. state where it occurs. But in a study published this fall, SERC ecologists Dennis Whigham, Melissa McCormick and Hope Brooks discovered extra light can sustain struggling populations and support the fungi the orchid requires.

They evaluated canopy thinning at two Virginia sites. At Fort A.P. Hill, they removed some small understory trees and shrubs, and *Isotria* abundance tripled at those sites. At Prince William Forest Park, a large red maple died, creating a natural thinning experiment. Here, *Isotria* abundance increased from 2 to almost 80. But most amazing, the abundance of the fungus *Isotria* needs increased nearly 1,000-fold. The ecologists think organic matter from the dead tree fueled increased fungal abundance. Continued long-term experiments will help determine the most effect measures to assure the orchid's survival.

Link to study: https://www.mdpi.com/2223-7747/10/9/1924



Massive ships like this cargo ship can unwittingly carry invasive species in the ballast water tanks in their hulls. (Credit: SERC Marine Invasions Lab)

THESE SIX EXPORTS MAY BE KEY TO PREDICTING MARINE INVASIONS RISK

BY KRISTEN GOODHUE

Trade keeps the global economy running. But when massive ships ferry U.S. goods across the sea, they can also unwittingly bring invasive species back, in ballast water discharged from tanks in their hulls.

Ecologists Danielle Verna, Mark Minton and Greg Ruiz devised a way to use trade info to our advantage. Examining nine years of data from San Francisco Bay, they identified the top exports bringing in the most ballast water based on ship type. They fell into six categories of bulk goods: petroleum and oil products, coal, iron ore, scrap metal, wastepaper and rice. While other regions may differ, analyzing trade offers a valuable way to estimate invasion risk, since some places don't collect ballast water data. Meanwhile, as treatment systems become more widespread, overall risk should decrease despite increases in ballast water delivery.

Link to study: https://www.frontiersin.org/articles/10.3389/fmars.2021.638955/full

UNDERWATER "SQUIDPOPS" CAPTURE DIVERSITY IN THE CARIBBEAN FOOD WEB

BY KRISTEN GOODHUE

Fish sculpt their habitats by what they eat, so knowing who's eating what is crucial for preserving coastal ecosystems. On the island of Carrie Bow Cay, Belize, scientists with the Smithsonian's Marine Global Earth Observatory discovered different fish dominate feeding activity in different habitats.

A yellowhead wrasse snags a bite of a squidpop, while other wrasse swim nearby. (Credit: Smithsonian Marine Global Earth Observatory)

During a five-year project, ecologists planted dozens of "squidpops"—dried squid meat on a stake—underwater and checked how many remained after 24 hours. During one year they also collected video. In a new paper led by SERC's Carmen Ritter, they reported two wrasse species grabbed most squid in outer forereefs. Snappers dominated mangrove feeding, while three species—a wrasse, a snapper and a grunt—dominated inner patch reefs. While this study offered a snapshot of just one Caribbean island, it highlights the need to conserve multiple species, to ensure each habitat continues to thrive.

Link to study:
https://www.frontiersin.org/articles/10.3389/fmars.2021.742907/full

Digging for Blue Carbon in Belize's Mangroves

BY KRISTEN GOODHUE

Mangrove forests try the grit—and grace—of even the most seasoned field ecologist. Flies. Heat. Mazes of trip hazards, from roots and dwarf mangroves jutting aboveground. Suction-cup mud that can pull researchers in up to their thighs.

"If you're not careful, you can sink," warned Hannah Morrissette, a postdoc with the Smithsonian Marine Station. Morrissette has explored mangroves in the Dominican Republic and Belize. She's developed a healthy respect not just for their obstacles, but what they can offer society. "Trying to put a value on these is almost impossible, because of the breadth of their services," she said.

It's true: When it comes to protecting coastal economies and drinking up carbon, few ecosystems can compete with mangroves. But few ecosystems make scientists work harder to get the data to prove it.

"I would say, as somebody who's six foot four, that mangroves are a short person's game," said Jonathan Lefcheck, a marine biologist with the Smithsonian Environmental Research Center.

Morrissette and Lefcheck were part of a larger team that journeyed through Belize this September. Dubbed the "Belize Blue Carbon Team," they joined dozens of Belizean scientists to visit nine mangrove forests in under a month. Their mission: Bolster Belize's efforts to fight climate change, by uncovering how much carbon its mangrove forests can lock away.

RISING AGAINST THE TIDE

At first glance, Belize isn't a country the world would expect to be a leader on fixing climate. The Central American nation is responsible for less than 0.01% of the world's greenhouse gas emissions. Belize didn't create the problem. But it's suffering some of the worst effects.

"Our economy is strongly tied to the environment, to tourism, to fisheries," said Nadia Bood, a marine scientist with World Wildlife Fund's Mesoamerica office. "Even agriculture, along our coasts. At the same time, most of our coastal area is low-lying, so it's very susceptible to small changes in sea levels."

Hurricanes exact their seasonal toll as well. The usual stats—lost lives, lost homes, flooded roads—don't capture the full cost. Ruined crops mean ruined livelihoods. Polluted sediment that storms wash out to sea can smother coral reefs and seagrasses, jeopardizing tourism and fisheries.

Furthermore, emissions-cutting strategies that wealthier countries rely on—like fuel-efficient cars—aren't options in Belize.

"We're getting all of the old cars that don't pass the emissions tests anymore in the U.S. or in Mexico," said Ninon Martinez, a marine monitoring specialist with the University of Belize Environmental Research Institute. Even if most Belizeans could access Priuses, she pointed out, they wouldn't get far. Smaller cars don't work well in a nation where even major cities still have dirt roads.

Still, Belize remains determined to lead by example. The country signed the Paris Climate Agreement in 2015, along with nearly 200 other nations. As part of that agreement, they committed to adopting climate mitigation measures, called "nationally determined contributions."

And Belize has one gem that's making the world take notice: Mangroves.

Mangroves—semi-aquatic trees that grow thick along tropical coasts—are masters at storing carbon. Some estimates peg them as up to four times as good per hectare as other tropical forests. They're a key part of Belize's climate change strategy. Belize already has nearly 13,000 hectares of mangroves under

Top to bottom: Hannah Morrissette poses with a stack of soil samples from the mangroves, some of the roughly 1,300 she's analyzing for carbon stocks from the Belize Blue Carbon trip. (Credit: Jonathan Lefcheck/SERC); Houses in Placencia, Belize, where the scientists stayed for one night. (Credit: Jonathan Lefcheck/SERC); Scientists Gilbert Andrews (right) and Tre Mckoy take a soil sample from a mangrove forest. (Credit: Hannah Morrissette/Smithsonian Marine Station); Background: Tiny fish dart among mangrove prop roots, which provide valuable underwater habitat and sustain the local economy. (Credit: Jonathan Lefcheck/SERC)

federal protection. By 2030, they aim to protect 12,000 more hectares, and restore at least another 4,000 hectares.

But for most Belizeans on the coast, storing carbon is just one more perk to an ecosystem they're already determined to protect.

"Fishermen know the mangroves are important for fisheries," Martinez said. "People in coastal communities, every single community we visited, said, the mangroves are protecting our shoreline. We need to leave it there. And they want to help with preserving them."

A MONTH IN THE MANGROVES

The Belize government knew it was sitting on a treasure trove of "blue carbon"—the carbon mangroves and other aquatic ecosystems store. But for their climate reports, they needed more accurate national estimates. Right now, the best option is a single estimate that covers all Central America: 949 metric tons per hectare.

"The in-country estimates are really important," said Steve Canty, a biologist with the National Museum of Natural History and lead principal investigator for the Smithsonian side of the project. "What the team found out is, mangroves that were only 100 meters away from each other, the sediments, the conditions, were really different....Had we used regional or global estimates, we're probably going to be quite inaccurate."

The project started when The Pew Charitable Trusts, as part of its effort to help countries include mangroves and other coastal wetlands in their national climate plans, began working with the government of Belize and the World Wildlife Fund. That's when the Smithsonian got involved, along with Silvestrum Climate Associates. They teamed up with the University of Belize Environmental Research Institute, along with several other Belize agencies and NGOs, for a month-long mangrove survey in Belize.

Originally, the scientists planned to make the trip in spring 2021. But they decided to wait until September, so as many members as possible could get COVID vaccines. Even then they took extra safety measures. Each member had to show a negative COVID test within 48 hours of beginning field work, as well as take daily temperature tests.

L-R: Ninon Martinez and Galento Galvez of the University of Belize take a soil core with Lisa Beers of Silvestrum Climate Associates and an unidentified scientist off-camera. (Credit: Jonathan Lefcheck/SERC)

"We wanted to make sure nothing could stop us once we were there, so we had to take every precaution," said Morrissette.

The team began their surveys in Belize City. From there, they travelled north and then south of the city, covering nine forests. The Smithsonian and Silvestrum helped train Belizean scientists to collect mangrove samples for carbon analysis. Local experts like Martinez and Bood organized all the in-country logistics, including housing, research permits and engaging the various partners involved. They also helped the team adapt when storms kept them from their originally planned sites.

"They knew these systems," Lefcheck said. "Sometimes the weather was a little bit dicey, so we had to on the fly say, okay, well we can't make it there today because it's just too far and we're worried about storms, but we could maybe hit up this site that's closer."

Most of mangroves' carbon wealth isn't in the trees, but in the roots and soil. According to the regional estimate for Central America, over 90% of mangroves' carbon storage is belowground. So besides tree measurements, the team took 12 soil cores from every site, pulling several samples at various depths from each core.

Those soil samples—roughly 1,300 total—are in a lab at the Smithsonian Environmental Research Center with Morrissette now. It's her job to analyze them for blue carbon, so Belize can incorporate that data into its next climate change report in 2025.

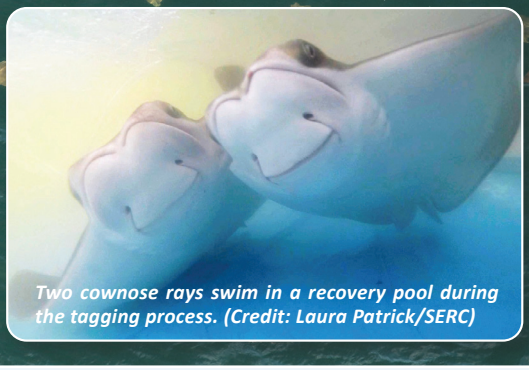
Meanwhile, back in Belize, Martinez and Bood are brainstorming next steps. Martinez hopes local scientists can expand the mangrove surveys, to capture even more of the country's mangrove diversity. As one of its climate action items, the country aims to complete an on-site assessment of mangroves' belowground carbon stocks by 2022. Bood is working on engaging the government and private landowners in conserving more natural systems to fight climate change.

"We are only one country. We can only do so much," said Bood. Even if every country acted now, she said, Belize would still feel the impacts. "But if we act at a local level to try and protect and enhance these ecosystems that currently exist, they could at least buy us time in terms of having to protect our life, our livelihood, our infrastructure, our homes, our economies."

L-R: Mangroves' above-water prop roots are one feature that helps them survive in flooded, low-oxygen environments. (Credit: Jonathan Lefcheck/SERC); Front to back: Tre Mckoy of the Belize Forest Department, Kent Garbutt of the Belize Coastal Zone Management Authority & Institute, and Jonathan Lefcheck of the Smithsonian Environmental Research Center. (Credit: Tre Mckoy); Nadia Bood, a marine scientist with World Wildlife Fund, pauses for a selfie in the mangrove forests. (Credit: Nadia Bood)

Male, Female Cownose Rays Migrate to Different Rhythms

BY MARISSA SANDOVAL



Two cownose rays swim in a recovery pool during the tagging process. (Credit: Laura Patrick/SERC)

Every winter, the Chesapeake's cownose rays flock to Cape Canaveral, Florida, completing a mass migration spanning over 800 miles. Come spring, they return north. But female and male rays don't always follow the same cues when deciding when to migrate.

In a new study published this September in *Ecosphere*, researchers led by SERC's Chuck Bangley and Matt Ogburn, and Robert Fisher at the Virginia Institute of Marine Science (VIMS), pinpointed which signals cue the rays to depart their summer and winter homes. They discovered male and female rays may respond to different prompts to leave their winter habitat in Florida and travel *north*. However, both sexes seem to follow the same cues when travelling *south*—though climate change may affect their future travel plans.

MISUNDERSTOOD MIGRANTS

Cownose rays get their name from their square faces that look like a cow's snout. They can reach widths of over three feet, with tails nearly twice the length of their kite-shaped bodies.

"They've been villainized and disliked by fishermen, because when a fisherman runs into a big school, that's a whole lot of bycatch to pick out of the net," said Bangley, lead author and a former SERC postdoc now at Dalhousie University. "But at the same time, cownose rays are popular aquarium animals. They look like they're smiling."

No one knew exactly where the Chesapeake rays came from each year, until SERC and VIMS discovered their winter habitat in Cape Canaveral in 2018.

Their discoveries could have crucial implications for the rays' future. Cownose rays are particularly vulnerable to climate change and hunting due to their prolonged life histories. They can live for over 20 years. But with an average of six years to reach maturity, if they are overharvested it would take the population a long time to recover.

"Bowhunting is a big concern since it's not regulated," said Michelle Edwards, a former SERC intern on the project. "Since the rays travel as schools, they may be easier to target, allowing some hunters to take a lot of rays out at once."

To help protect their numbers, Maryland is drafting what could be the first cownose ray fishery management plan on the U.S. East Coast.

WHY AND WHERE RAYS MIGRATE

For this study, the team tracked 51 cownose rays—38 females and 13 males. They outfitted the rays with special "acoustic telemetry" tags, which emit high-frequency pings that receivers can pick up when the rays swim nearby. Hundreds of receivers dot the Atlantic Coast as part of the Atlantic Cooperative Telemetry Network, allowing scientists to track rays all along the Eastern Seaboard.

Over a two-year period, the researchers discovered male and female departure times when leaving the Chesapeake were most closely tied to temperature.

However, in spring, males and females don't leave Florida at the same time. Researchers think sea surface temperature again prompts female rays to head north. But males' timing aligns better with recurring calendar days, suggesting they might be using internal physiological cues.

After leaving Florida, the female rays—many of them pregnant—arrive first in the Chesapeake in early June. They're seeking a shallow tributary to give birth, where it's relatively safe for their young.

A couple weeks after females reach the bay, males come up for mating season. This means that once a female gives birth, it's not long before her gestation period begins all over again. Mature females can be pregnant over 11 months of the year!

However, with warming waters, the temperature cues rays follow might prompt some itinerary shifts.

"We're interested in the effects of climate change on the cownose rays," said Ogburn. "We think that if it warms up earlier in the season and stays warmer, the animals might stay in the bay for a longer period of time."

But there's another possibility: Warming global temperatures may push rays even further north, to cooler regions of the ocean. Further research will determine how cownose rays will respond. But if Option B proves true, it will be increasingly important to make sure these schools of slippery predators stay protected.

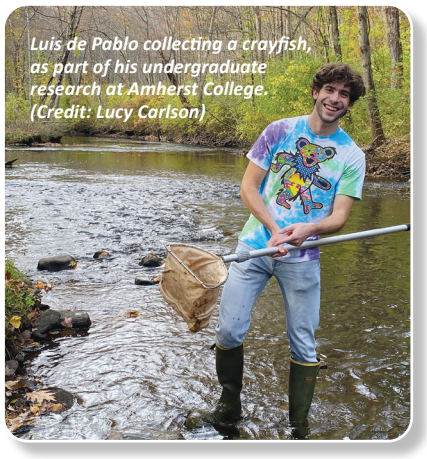
LINK TO RESEARCH PAPER IN ECOSPHERE:

https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecs2.3743

Top: Migration of a massive school of cownose rays. (Credit: Florida Fish and Wildlife Conservation Commission); Center, L-R: SERC marine ecologist Matt Ogburn (front) and intern Claire Mueller search for bull sharks and cownose rays near Fort Pierce, Florida. (Credit: Jay Fleming/Smithsonian); Cownose rays are migratory animals that come into the Chesapeake in summer and swim to Florida for the winter. (Credit: Jay Fleming/Smithsonian)

Stony Corals BY KRISTEN GOODHUE

STAGING A COMEBACK IN BELIZE



Luis de Pablo collecting a crayfish, as part of his undergraduate research at Amherst College. (Credit: Lucy Carlson)

Caribbean corals have been through a rough few decades. Climate change is already whittling them away, and harmful algal growth — fueled by nutrient pollution and the loss of algae-grazing fish and sea urchins — has worsened their plight. But off the island of Carrie Bow Cay in Belize, biologists discovered signs of a comeback. Stony coral on the island's outer rings—known as *forereefs*—more than doubled in just five years.

"Stony corals are your reef-building corals. Those are the ecosystem builders," said Luis de Pablo, lead author of the new study published in *Scientific Reports*. "Those are what create the reef habitat, and those are the ones that we're really concerned about."

Mix of staghorn coral, soft corals and macroalgae from Tobacco Reef in Carrie Bow Cay. This is one of many photos de Pablo and CoralNet analyzed to document coral recovery. (Credit: Smithsonian Marine Global Earth Observatory)

Carrie Bow Cay is part of the Mesoamerican Reef, the largest barrier reef in the western hemisphere. From 2014 through 2019, scientists with the Smithsonian's Marine Global Earth Observatory (MarineGEO) took nearly a thousand underwater photos off its shores as part of their surveys.

De Pablo, now a senior at Amherst College, began the project as a 2019 intern with MarineGEO at the Smithsonian Environmental Research Center. His mentor, Jonathan Lefcheck, knew those photos contained a wealth of data about coral health. But analyzing hundreds of photos was a daunting enterprise.

"He could have sat there and scored all the images himself. Would he have finished in a summer? Maybe, maybe not," Lefcheck said.

Instead, they used a program called CoralNet developed by Smithsonian Tropical Research Institute scientist David Kline and colleagues in 2011. De Pablo taught it to identify groups of organisms or terrain, like stony corals, soft corals, macroalgae or sand.

They discovered on the outer forereefs, stony coral coverage doubled from 6% to 13%. Fast-growing species led the charge, like staghorn corals or finger-like *Porites* corals. Lefcheck speculates that the forereefs, with cleaner water and more fish to graze algae, provided an ideal environment for fast-growing corals to thrive.

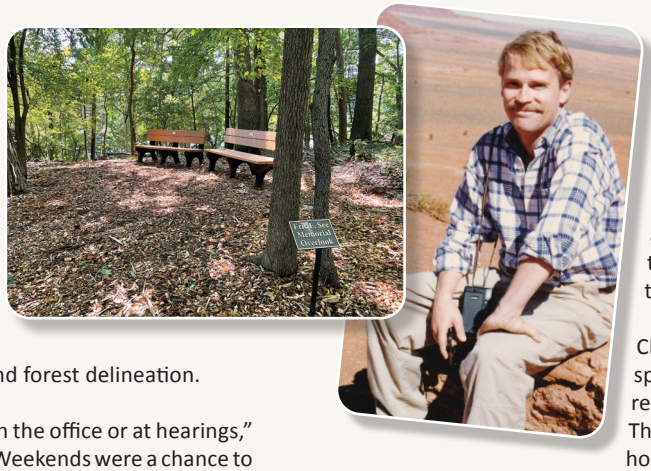
Marine protected areas could also be giving them a boost. Belize has created several marine reserves, where fishing is limited or prohibited. Carrie Bow sits inside one of them, and could be benefiting from the safety net.

"I think it's a very hopeful thing, that if we make the right protections and we enforce them properly, then ecosystems can recover," de Pablo said.

Link to full article:
https://www.nature.com/articles/s41598-021-96799-2

Donor Spotlight: Penny Chalkley, close friends honor Eric E. See with memorial overlook at SERC BY PENNY CHALKLEY AND KRISTEN GOODHUE

Eric See loved the outdoors. As a graduate of the University of Virginia with a degree in environmental studies, followed by a master's from the Yale School of Forestry, his career path never shifted. While at the Maryland Department of Natural Resources, he did field surveys for the 1970s Upland Natural Areas study and delineated tidal wetlands. He later worked as an environmental planner with Anne Arundel County before moving to the private sector, where eventually he had his own consulting firm specializing in wetlands and forest delineation.



"Eric loved the field workdays over time spent in the office or at hearings," said his longtime companion, Penny Chalkley. "Weekends were a chance to get out and explore local parks and trails. Every vacation included natural areas throughout the country. He never lost his quest for information and was a voracious reader and fountain of history knowledge."

After his death in December 2020, Chalkley and Eric's close friends looked for a fitting way to honor his memory. They chose SERC for their memorial tribute because they felt a new scenic overlook was the kind of place he would love most.

"After we selected the perfect spot, the staff at SERC did everything to make the installation go quickly and effortlessly," Chalkley said. "My thanks to Christine Buckley and the team at SERC."

Chalkley said that Eric enjoyed spending time on his own, either reading or exploring the outdoors. The two new benches placed in his honor sit on a hill just off the trail connecting SERC's Java History and Discovery Trails. Here, visitors can step off the beaten path and capture a few moments of quiet and solitude.

Above L -R: Two benches at the new memorial overlook dedicated to Eric See. (Credit: Christine Buckley/SERC); Eric See at Monument Valley. (Credit: Penny Chalkley)

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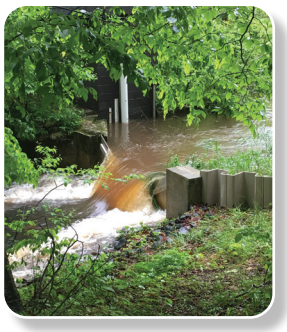
Coming Soon:

2022 VIRTUAL EARTH OPTIMISM LECTURES

Get ready for a new year of free science talks! SERC's 2022 series will be all online, with speakers from the Smithsonian and across the country. Lectures run every third Tuesday of the month at 7pm ET, January through October. Learn more at https://serc.si.edu/visit/eveninglectures.



THE KEYS TO CUTTING MERCURY POLLUTION: A VICTORY IN PROGRESS

Tuesday, January 18 • 7pm ET

Speaker: Dr. Cynthia Gilmour, SERC senior scientist

Once a widespread environmental threat, mercury pollution is now falling in many places across the country. What decisions made this possible, and how do we keep the momentum going? Cynthia Gilmour, head of SERC's Microbial Ecology Lab, has spent decades studying the journeys mercury makes from the atmosphere to our waterways and seafood. At the Smithsonian Environmental Research Center's first Earth Optimism lecture of the year, she'll illustrate how state and federal policies have helped clean mercury out of the air. She'll also reveal the latest SERC research on how to remove mercury–and its neurotoxic cousin, methylmercury—from wetlands and streams.

THE GREEN IN THE BLUE: THE COMEBACK OF THE CHESAPEAKE'S UNDERWATER GRASSES AND WHAT IT MEANS FOR THE BAY

Tuesday, February 15 • 7pm ET

Speaker: Dr. Jonathan Lefcheck, SERC research scientist

Over the last century, the mid-Atlantic's underwater grasses have gone from one disaster to another: from wasting disease to hurricanes to nutrient pollution. But in the past few years, the Chesapeake Bay and Eastern Shore have witnessed some astounding comebacks. In our February Earth Optimism talk, join SERC marine ecologist Jonathan Lefcheck for a tour of seagrass resurgence throughout the region. He'll dive deeper into what's behind the recoveries, highlight the new life and other benefits that are returning with them, what to expect in the future, and how you can get involved through new citizen science initiatives. Discover how seagrasses are laying the foundation for a healthier, more bountiful Bay.

Left: Stream weir, where SERC monitors mercury and other pollutants. (Credit: SERC); Right: A flounder in a bed of eelgrass. (Credit: NOAA)

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ON THE EDGE

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