

CANOPY

FALL 2020

THE POWER OF THE PARK
THE HEALING ROLE OF NATURE,
ESPECIALLY IN OUR CITIES AND SUBURBS,
HAS NEVER BEEN CLEARER

Page 24

Yale SCHOOL OF THE ENVIRONMENT

Alumni and Friends:

This issue of *Canopy* shows examples of how our School and our alumni community are remaining strong, productive, and impactful during remarkable times. You will see through our stories here the incredible resilience of our community, with a continued focus on our mission of knowledge and leadership for a sustainable future.

This fall, we here at the School have been teaching, learning, and studying in the field, laboratory, classroom, and even our homes. Our forestry students were able to spend two months of intensive field study while living at Yale-Myers and taking classes remotely at the School – one of the advantages of our hybrid (in-person and online) courses this fall. Other students were able to take in-person courses at the School, with many hearty (and hardy) souls learning in outdoor tents all the way until mid-November. Still others engaged in their studies from abroad, enrolling from 17 different time zones across the planet. Through it all, I have been so inspired by the character and dedication of YSE's students, faculty, and staff.

The role for environmental leaders is becoming ever clearer. The pandemic sweeping across our world reinforces the strong need for science. We need science for the development of sensitive monitoring systems to perceive crucial changes in society and the environment, for learning about emerging challenges, and for developing solutions embedded in human and environmental health and justice. Pandemics, climate change, and biodiversity loss all impact vulnerable communities disproportionately, and we need knowledgeable analysts and advocates to vigorously address these inequities. The extreme political polarization that has become ever more evident in our society underscores the need for leaders who can articulate the value of sustainable solutions in ways that are compelling across these divides and lay a foundation for collaboration. In short, the world needs our alumni more than ever, as scholars and leaders.

As the new year approaches, I have great optimism because of the smart, committed members of our community of alumni, faculty, staff, students, and friends. Stay well, and stay connected to us and to one another!



Indy

CANOPY

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The road to the Yale Camp at Great Mountain Forest, ablaze with the colors of a New England autumn.

JULIA LUCKETT

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Let the Sun Shine

To replace an aging propane generator, the Yale Camp at Great Mountain Forest in Canaan, Connecticut, has installed a solar array system to power the seven-acre camp's cabins and lodge. The system, funded by a generous endowment established by the Childs family, will also provide learning opportunities for YSE students interested in renewable energy.



Brodersen Awarded \$2.5M For Plant Science Research

Craig Brodersen, associate professor of plant physiological ecology, has been awarded \$2.5 million from the newly established Howard and Maryam Newman Family Plant Research Fund. The gift, made by 1969 Yale College graduate Howard Newman and his wife Maryam, will support Brodersen's research in plant biology and physiology and his collaborative work with the Salk Institute's Harnessing Plants Initiative, a research organization which seeks to optimize plants' ability to absorb and store carbon.

The two major research projects being funded by this gift will focus on suberin accumulation and cellular architecture, biochemistry, and photosynthetic optimization in the cells of plant leaves.

Fellows and Future Environmental Leaders

Katie Pofahl '21 MEM and Ashley Stewart '21 MEM were named 2020 Switzer Environmental Fellows. The prestigious fellowship program supports environmental leaders for the 21st century who have the ability, determination, and integrity to effect positive change. Pofahl came to YSE after several years as a community outreach manager at an accredited land trust in California. She continues to engage with work in the American West at YSE through the Ucross High Plains Stewardship Initiative. Stewart spent more than a decade as an environmental engineer and project manager with an emphasis on water management. At YSE, she is conducting research on equity and environmental decision-making that involves marginalized groups with an emphasis on the Black community.

Yale Faculty Make 'Highly Cited Researchers'

Five YSE faculty members were included on Clarivate Analytics' 2020 Highly Cited Researchers, an annual list that identifies scientists who have demonstrated significant influence through publication of papers over the past decade.

Michelle Bell, the Mary E. Pinchot Professor of Environmental Health; Mark Bradford, professor of soils and ecosystem ecology; Karen Seto, the Frederick C. Hixon Professor of Geography and Urbanization Science; Peter Raymond, professor of ecosystem ecology; and Anthony Leiserowitz, director of the Yale Program on Climate Change Communication, all made the list, which includes more than 50 faculty researchers from across Yale.

Menachem Elimelech and Walter Jetz, who have secondary appointments at YSE, were also named to the list.

NEWS & NOTES

Issues of Equity in the Department of the Interior

"Discrimination, racism, and cultural exclusion have been a part of the fabric of the Department of Interior (DOI) for more than a century and a half," reads the opening statement from Dorceta Taylor '85 MFS, '91 PhD at a Sept. 14 hearing of the U.S. House Committee on Natural Resources Subcommittee on Oversight and Investigations. Taylor, an environmental justice expert who joined the YSE faculty this year as a full professor, laid out the troubled history of the DOI and its operating units, while also recommending broader recruitment efforts and diversifying the workplace — particularly in leadership roles. "No one group can solve these issues," Taylor says, "but we need diverse voices if we're going to find the right solutions."

Bell Elected to National Academy of Medicine

Michelle Bell, the Mary E. Pinchot Professor of Environmental Health, was elected to the National Academy of Medicine (NAM), one of the highest honors in the fields of health and medicine. Bell, who directs the EPA-funded SEARCH (Solutions for Energy, Air, Climate, and Health) Center at YSE, focuses her research on how human health is affected by environmental conditions, including air pollution, weather, and climate change, and also examines environmental justice. "It's a great honor," says Bell. "It's particularly humbling to be chosen at a time when there is growing recognition of the work performed by those in the public health field — work that is improving and saving lives."

YPCCC Head Wins Schneider Award

Anthony Leiserowitz, the founder and director of the Yale Program on Climate Change Communication (YPCCC), received Climate One's Stephen H. Schneider Award for Outstanding Climate Science Communication for his scientific contributions and effective communication on the growing issue of climate change. Leiserowitz is an expert on the public perception of climate change and environmental beliefs, attitudes, and behavior, conducting research on the global, national, and local scales. Edward Maibach, director of YPCCC's partner organization, George Mason University's Center for Climate Change Communication, was also named a recipient of this year's award. An initiative of the Commonwealth Club of California, the nation's oldest and largest public affairs forum, Climate One is a leadership dialogue on energy, the economy, and the environment.



Learning Al fresco

Students were welcomed back to campus for the fall semester — with a few pandemic-related changes. While indoor classrooms in Kroon Hall were adapted to allow for social distancing, a number of classes were held in a tent on the lawn south of Kroon, all the way through the middle of November.



Agricultural activity is the leading cause of emission of nitrous oxide, accounting for 70 percent of global human-derived N₂O emissions over the past decade.

RESEARCH UPDATES

Nitrous Oxide Emissions Increasing at ‘Devastating’ Rate

The term “greenhouse gas” is often used interchangeably with carbon dioxide, due to its prevalence in our atmosphere and the well-established historical “Keeling curve” showing its increase. Indeed, CO₂ is estimated to be more than 80 percent of all greenhouse gas emissions. But another greenhouse gas, nitrous oxide (N₂O), has far more impact on a molecule-by-molecule basis.

And, according to a recent study, N₂O emissions are increasing at a “devastating” rate, faster than predictions introduced by the Intergovernmental Panel on Climate Change.

In a paper published in *Nature*, a large, multinational team of researchers associated with the Global Carbon Project — including Peter Raymond, professor of ecosystem ecology at Yale School of the Environment, and YSE postdoctoral fellow Taylor Maavara — provides a more complete picture of global N₂O emissions. The researchers found strong increases in N₂O emissions in emerging economies — particularly Brazil, China and India — due in large part to agricultural activity, the cause of nearly 70 percent of global human-derived N₂O emissions over the past decade.

“Nitrous oxide is often seen as the third most important greenhouse gas” behind carbon dioxide and methane, says Maavara. “Not as

much attention is paid to nitrous oxide, but it’s extremely important.” In addition to being an ozone depleting chemical, nitrous oxide, she explains, can take more than a century to completely break down in the atmosphere and has a climate warming potential nearly 300 times higher than carbon dioxide.

And as populations grow and more food is needed, the researchers predict that N₂O emissions will continue to grow if not mitigated.

“It’s going to be difficult because we need food,” says Maavara, who suggests more sustainable practices, such as better management practices for farming that focus on more precise timing and applications of fertilizer.

Food Consumption in India’s Urban Areas

The world’s population is shifting to cities — by 2050, an estimated 2.3 million more people will be living in urban areas. In India, this demographic shift appears to be putting a strain on food systems.

PhD students Bhartendu Pandey and Meredith Reba and YSE Professor Karen Seto conducted a comprehensive study, published in *Scientific Reports*, that looked at how urbanization influences both quantity and diversity of food consumption in India. The researchers found that variations in food consumption were likely due to income, not urbanization; that market access, infrastructure, and societal norms have more influence on food consumption than urbanization; and that any effect that urbanization has on food consumption is indirect and multidimensional.

Pandemic Changing U.S. West Attitudes

Rural communities, particularly in the American West, traditionally hold more anti-government attitudes. A team of YSE researchers, led by associate professor Justin Farrell, recently found that the COVID-19 pandemic is changing that dynamic.

In a representative study of residents in rural counties in the West, the researchers found significant bipartisan support for several “big government” interventions to support rural recovery, including federal relief spending on unemployment benefits, healthcare, housing, small businesses, and individual stimulus payments.

“We are only beginning to understand the social, economic, and environmental impacts of the COVID-19 pandemic,” Farrell says, “but our new survey suggests that a realignment of political preferences is taking place.”

The Wealth of Oceans

To understand the value of the world’s oceans, we must look past the traditional metrics such as the gross domestic product, says a team of researchers led by Knobloch Family Professor of Natural Resource Economics Eli Fenichel.

In a paper, “National Accounting for the Ocean and Ocean Economy,” the researchers lay out new systems of national accounting that include sustainability indicators like ocean production, changes in the value of ocean assets, and ocean income. These new measurements, the researchers say, enable governments to calculate the return on investment for improving ocean governance, and could potentially create jobs and reinforce food security and regional stability.

“The ocean has great value in its biodiversity, as well as other benefits it provides humans,” Fenichel says. “Diminishing the quality of oceans decreases the quality of life and ultimately, national wealth.”

How to Make Paper Recycling Greener

The environmental benefits of recycling might seem obvious, but a new study contends that recycling of certain materials — specifically paper — can’t reach its full potential unless it is powered by renewable energy.

A study published in *Nature Sustainability*, co-authored by postdoctoral associate Stijn van Ewijk of the YSE Center for Industrial Ecology, found that if all wastepaper was recycled, by 2050, greenhouse gas emissions from paper recycling would actually *increase* by 10 percent. With a switch from fossil fuels to renewables, the researchers estimate that emissions would reduce by 96 percent.

“Recycling alone isn’t going to help us reach our climate goals; we need renewable energy,” van Ewijk says.



Paper recycling using renewable energy sources could reduce emissions by as much as 96 percent, researchers say.



The Outsider's Advantage

Dr. Dorceta Taylor '85 MFS, '91 PhD, who joined the YSE faculty in July as a full professor, on why she was excited to return to Yale and her kinship with the celebrated environmentalist Rachel Carson.

BY CARA MCDONOUGH

Dorceta Taylor thinks often about Rachel Carson.

Initially trained as a zoologist like Taylor, Carson went on to become a famed writer authoring the landmark book “Silent Spring” about the environmental impacts of pesticides and other harmful chemicals in 1962 — as well as a tireless environmental advocate.

“She used the freedom that comes from being overlooked, and she turned that on its head. She was able to apply the lens of an outsider,” Taylor says, noting Carson’s influence in what was then a man’s world.

Taylor has experienced some of the same in her career. And, like Carson, she has taken advantage of being an outsider in her field, making connections that others might miss.

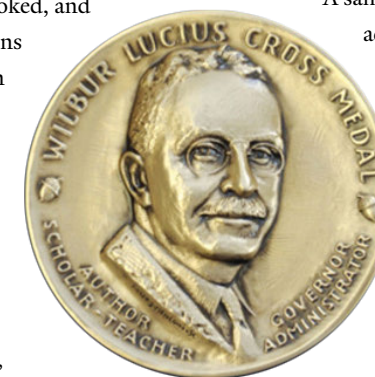
She’s been making those connections for as long as she can recall.

“My earliest memories are of myself in the outdoors,” she says, remembering her childhood in Jamaica. “Enjoying the garden, being curious about the flowers. Being curious and watching things grow.”

This passion for observation has undoubtedly played a role in her storied career as an environmental scholar and activist. And, since returning to Yale this year as a full professor — she earned her Master of Forest Science at YSE in 1985 and a joint doctoral degree from the School and the department of sociology in 1991 — Taylor is taking the opportunity to observe, connect and contemplate solutions at the university as well as in the city of New Haven and beyond.

Teaching “Poverty, Environment, and Inequality” online this spring, she’ll highlight her interdisciplinary approach to environmental thought and policymaking — including a keen focus on urban and rural issues like food insecurity — while continuing her tireless work fostering institutional diversity within the field.

A sampling of her striking achievements and accompanying accolades illustrates a life dedicated to intersecting themes in the world of conservation: She authored several influential books, including the award-winning “The Environment and People In American Cities”; her well-known 2014 study on diversity in environmental organizations (uncovering a startling lack thereof) brought about needed reflection and tangible change; she received the 2020 Wilbur Lucius Cross Medal by the Yale Graduate School, as well as the 2020 Women in Sustainability Cross Sector Award from Envision Charlotte and Wells Fargo; AARP recently recognized her as a leader helping to carry on Martin Luther King Jr.’s legacy; and, in 2018, she received the Rachel Carson Award from Audubon Women in Conservation.



FEARLESS ATTITUDES AND UNCONVENTIONAL PATHWAYS

Yet when she began her academic career, Taylor’s interests — the connections and ethical quandaries she observed when she considered the natural world and the people who inhabited it — didn’t necessarily fit within the traditional confines of “environmentalism” or even have a name. She studied zoology and botany while looking for ways to incorporate human behavior and impacts more fully into these disciplines.

ILLUSTRATION BY SAM HADLEY

“I’m one of those people who just never really quite fit perfectly in a single disciplinary box. I was very convinced that there was a field to be developed around inequalities and the environment. So, nothing could really stop me from exploring those possibilities.”

“I’m one of those people who just never really quite fit perfectly in a single disciplinary box,” she says. “I was very convinced that there was a field to be developed around inequalities and the environment. So nothing could really stop me from exploring those possibilities.”

She remembers professors suggesting the joint course of study might be a foolhardy step — while at the same time encouraging her way of thinking. That’s something she appreciates about Yale and one of the reasons she was excited to return. “When I was a student, I really appreciated being in a student body where students were not afraid to really think big, outside the box.”

The university, she says, has been supportive of her academic goals, which include blending an understanding of the environment, inequality, and workforce dynamics, but also history, sociology, theory, and political mobilization. And the city of New Haven — and the state of Connecticut as a whole — provides vibrant context for studying the real-world implications of these issues, as Taylor did during her tenure at the University of Michigan, where she was prior to joining YSE in July of 2020.

“Connecticut is one of those states where really a lot more work can be done around the nexus of equity, environment, climate, health — all of those things are there to bring together,” she says.

Being at YSE also means pursuing meaningful connections with thought leaders whose specialties align with her own, redefining “typical” courses of study all over again as she did as a student. Taylor is excited about the prospect of partnering with professors like Narasimha Rao, who examines links among energy systems, human development, and climate change, including studying inequality and climate policy.

Taylor also heads the Doris Duke Conservation Scholars Program and the Environmental Fellows Program, both of which help students historically underrepresented in college environmental programs

pursue careers in the sector. And she says that when it comes to diversity — including ensuring equity and representation in academics and the workplace — we’re past the time for talk.

“People love to talk about it, and I say, ‘Do something about it,’” she says. “When people say they want diversity, I say, ‘How much is your diversity budget?’ We don’t really need to spend that much more time talking about what’s an obvious problem.”

The concrete steps toward a more diverse workforce, including wage equity, well-paying internships for students of color and low-income students, advertising jobs to diverse applicant pools, and hiring people of color are the vehicles for change, she asserts. Attending another webinar on diversity is not enough.

“The two programs I run set out to identify very talented students of color early on and say to them, ‘There is a place for you in this field. There are pathways through which you can excel.’”

Taylor’s own pathway was unconventional, and that helped shape her fearless attitude.

“Being both Black and female, it is easy to be dismissed,” she says. “But when people don’t expect much, it can give you an advantage. In my life, I have trained myself to look for those openings.”

The sentiment brings Carson to mind once again. “She moved across barriers and lines and she was undaunted and unapologetic,” Taylor says.

That’s Taylor’s way, too, allowing ideas to flourish in bold, new ways, whether exploring lush island vegetation or bustling city life.

“It’s the ability to make those observations where other people might see them as mundane and make connections and understand them,” she says. “My environmental outlook comes out of that ability to observe and translate complex ideas in a way that other people can see the connections.”

LAND AND BELONGING



Doctoral candidate Paul Burow uses an ethnographic approach to understanding the complicated dynamics behind land use in the American West — hoping to translate his observations into a blueprint for effective collaboration that advances the sovereignty of Indigenous peoples.

BY DYLAN WALSH '11 MEM

Since Paul Burow enrolled in the Yale School of the Environment as a Ph.D. student in 2016, he has been exploring a palimpsest of claims to land in the American West. He is focused specifically on the Walker River Basin along the Nevada-California border and on three groups with disparate and often conflicting interpretations of the land's value: Indigenous tribes, ranchers, and federal land managers from the U.S. Forest Service.

"The land-use politics in this area, and around this tree [the pinyon pine], are quite complicated," says Burow, a combined-degree doctoral candidate in the Yale School of the Environment and the department of anthropology. "That's what my dissertation is trying to get at."

At the center of Burow's research are four "nonhuman figures," as he puts it: pinyon pine, sage grouse, cattle, and wheatgrass. For the Paiute of the Walker River Basin, pinyon pine anchors their view of the landscape — it is the species that informs much of their interaction with the natural world. For ranchers, pinyon can be competition to plants that cattle use as forage, and they have historically sought removal of the trees and replanted with non-native crested wheatgrass.

"Ranchers simply have a different orientation toward trees," Burow says. "For them, cattle are at the center of the landscape." Meanwhile, these landscapes have also experienced a decline in the iconic sage grouse, and arresting the decline of sage grouse through the eradication of pinyon forests has been a core goal of local land management agencies for the past 25 years. The explosive spread of invasive cheatgrass threatens all three of these interests — and it's the knotty and fragile relationship among these four things that interests Burow.

"Paul is examining the issue of who — people, plants, and animals — is seen as 'belonging' in the U.S. West and who isn't," says YSE Professor



Environmental monitors check levels of California's Mono Lake for its annual April reading.

Michael Dove, one of Burow's thesis advisors. "And the perception of something as belonging or not has enormous implications for environmental conservation."

Archival research and personal interviews help Burow shed light on this issue of belonging, but the methodological foundation of his work is ethnography. He has spent months shadowing Forest Service employees; he has logged countless hours from a desk in their Bridgeport, California, office; he has attended staff meetings; and he has hiked with rangers to observe the assessment of public land. He has spent months with members of the Paiute tribe, as well, sitting with them in their homes, collecting traditional plants with them, harvesting pine nuts, and embarking on a pilgrimage-like walk to Yosemite.

"This is the value of ethnography," Burow says. "You wrap yourself in the daily work and routines of a group of people and, that way, start to see the world as they do."

Burow's desire to understand competing interests in the Walker River Basin springs from the confluence of personal history and professional experience. As a kid from Sacramento, Burow had a deep family connection to the wilderness of eastern California; he spent summers hiking and backpacking less than 30 miles from the Walker River, near the Carson River, where his family owns a cabin.

Burow ultimately hopes to translate the findings of his research into more complementary and inclusive land management practices. One way to do this is to move beyond the statutory process of "consultation," by which federal agencies must discuss their management plans with Indigenous groups. "These consultations are of questionable value when not treated seriously," Burow says. "They're generally treated as a box to check." Instead, he'd like to see the widespread establishment of genuine

partnerships, with Indigenous groups allowed to manage public lands beyond the borders of their reservation. One example of this at work is the Yakama Nation of eastern Washington, which has been contracted by the Forest Service to reduce fire risk on lands adjacent to its reservation. What if the Paiute nations were given similar powers in managing pinyon forest?

"In the end, a tremendous amount of knowledge exists in these communities," Burow says. "That's something we've failed to heed in land management, but there is an opportunity to revitalize."

This past March, COVID-19 put the brakes on Burow's work. While waiting for the pandemic to abate, he has worked with his thesis advisor YSE Associate Professor Justin Farrell and YSE doctoral student Kathryn McConnell on the Rural West Covid Project. Funded by a National Science Foundation rapid response grant, the project investigates how rural communities in 11 Western states are grappling with COVID-19. The first survey, from the summer, asked a broad range of questions about the effects of the virus on daily life and on trust in government institutions;

a second survey, planned to run soon, will ask officials in local government about the repercussions they've experienced in their communities.

As of this fall, though, Burow began working in the archives and focusing on his dissertation again. He aims to return to ethnography — "the opposite of social distancing" — next year, during which he'll spend much of his time with ranchers. His graduation is set for 2023.

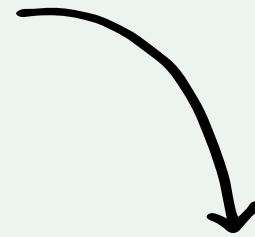
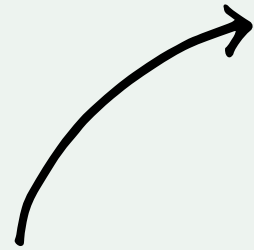
That date signals to Burow neither the end of something old nor the beginning of something new. "My commitment to this place and its people and issues is lifelong," he says. "My hope is that this research opens up opportunities to reintroduce the kinds of management practices seen on this land for thousands of years — and that, by doing this, the sovereignty of Indigenous nations will be respected." ❁



Maturing bristlecone pine cones in the Ancient Bristlecone Pine Forest in California's White Mountains.



URBAN FOREST



CONNECTION,

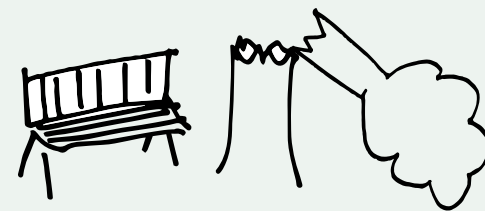
GROWTH AND CHANGE



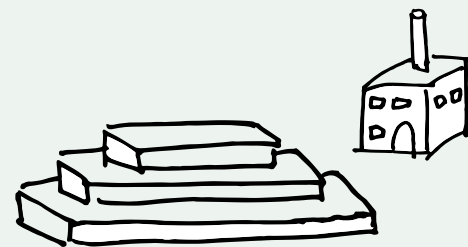
NEW TREES

Alumnus startup looks to reimagine the urban tree lifecycle with “reforestation hubs.”

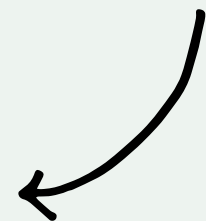
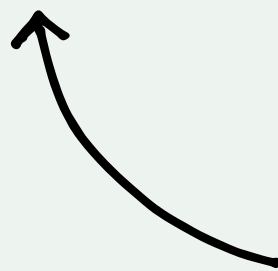
BY JOSH ANUSEWICZ



WOOD WASTE



WOOD MATERIAL



When Ben Christensen '20 MEM set out to establish a company that would reimagine the urban tree lifecycle — and help combat climate change in the process — he was inspired by the role of the plant tissue cambium, which supports the secondary growth of trunks, branches, stems, and roots to make a tree healthy and full.

Thus, Cambium Carbon was born.

“Cambium, within a tree, is about connection and growth,” says Christensen. “Those are two things we see our company being able to do. We want to connect the dots and facilitate growth across the system.”

The company is aiming to build “reforestation hubs,” a first-of-its-kind private-public partnership that restores city forests across the U.S. The company is creating funds to plant trees in urban natural areas

by valuing their benefits — like the raw wood material they provide and their ability to absorb carbon dioxide — to help turn the tide of urban forest loss. Today fallen trees are often chipped for low-grade application or hauled to a landfill at significant cost; Cambium Carbon is working to build systems for processing that wasted material into higher-quality wood products that can subsidize future tree-planting efforts.

Researchers say the supply is there. A 2019 report from the U.S. Forest Service estimates that annual urban woody biomass loss totals about 46 million tons of sellable wood with a potential value of more than \$700 million. Cambium Carbon sees opportunity in the current inefficiency and aims to create a sustainable cycle by closing the resource loop, working with stakeholders at each step — from parks departments and arborists who manage urban trees to local millers and makers who craft wood products and on to established tree-planting programs.

One key to success will be understanding the needs of individual cities. Most cities in the U.S. have gaps in their urban forestry system — a city like Detroit has thousands of dead trees it's unable to remove due to financial constraints, while a city like Honolulu suffers from a lack of space to dispose of wood waste. And if wood was provided to local millers and makers, very few have the resources to create a large-scale manufacturing operation, as most focus on small-scale, high-end products.

Identifying where each city's gaps are, Christensen highlights, is critical.

“We're not trying to steamroll in; there are too many similar programs that have failed because they didn't have community buy-in,” he says. “We need to listen. We want to work with partners who understand their city inside and out. We want to be an external catalyst that can provide resources along the way to help them grow.”

Right now, Cambium Carbon is identifying municipalities



Christensen (left) created Cambium Carbon's model to value wood waste (center), turn that wood into quality wood products like cutting boards (right), and use the revenue from those goods to fund tree-planting efforts.



across the country to form a cohort of pilot cities for initial analysis — a requirement of a substantial grant Cambium Carbon received from The Nature Conservancy earlier this year, in partnership with tree-planting nonprofit The Arbor Day Foundation. Marisa Repka '20 MEM, Cambium Carbon's city partnership lead, says they've received letters of interest from over 30 diverse cities, some of which have structures in place for organic waste processing and tree planting and some that are looking to establish stronger systems.

"We've even seen interest from small cities, which has us thinking about the potential for regional programs," adds Repka. "We're realizing this can work on a lot of different scales. It's exciting."

One city that has led the way in wood utilization is Baltimore, which has a dedicated wood waste recovery yard and has created a robust marketplace to sell wood products. Private entities, like Urban Wood Economy, supplement the city agencies and local stakeholders within Baltimore to strengthen the efforts.

Jeff Carroll, co-founder and principal at Urban Wood Economy, has worked with

Cambium Carbon and sees them becoming a "significant player" in this space.

"They're an implementor," says Carroll. "They're actually providing the services and the resources where there are pieces missing in the chain. And even though they're newcomers, they're leveraging established connections in the wood business." Carroll envisions Cambium Carbon being able to work in varying capacities — from overseeing individual tasks such as sales and distribution or tree planting to developing and operating the entire process in cities most in need.

The goals are lofty for the fledgling startup, which Christensen conceived during an internship with the World Resources Institute in 2019, where he worked on federal carbon removal policy. Taking his recently developed modeling skills from YSE lecturer Daniel Gross's '92 BA, '98 MBA/MEM class on renewable energy project finance, he developed a national model that prioritizes federal spending for natural climate solutions. Realizing the need for innovative financing and community impact, he started developing the "reforestation hubs" model that has become core to Cambium Carbon.

After bringing in his friend and classmate Repka, who had just completed a policy internship with Honolulu's Office of Climate Change, Sustainability, and Resiliency, Christensen began seeking initial funding from individual investors to launch Cambium Carbon. The project then won funding from the Sobotka Seed Stage Venture Program and a Climate Change Innovation Seed Grant from the Yale Center for Business and the Environment, which positioned Cambium Carbon to earn critical support as a member of the fall 2019 Accelerator cohort of the Tsai Center for Innovative Thinking at Yale.

To succeed, though, Cambium Carbon will have to become self-sustainable financially. Christensen and Repka — who were recently named to 2021 Forbes' "30 Under 30" list for social impact — are confident the need is there, particularly at a time when budgets for trees and natural areas in cities are dwindling.

"It's a hard time across the country," Christensen says. "We're here to solve real problems. We can help cities save money, reduce waste, create jobs, fight climate change — there's a lot of exciting potential." ♣

LEADING AT THE LOCAL LEVEL

While progress in addressing climate change seems to have stalled at the national level in recent years, there are those who are working at the local level to fill the gap. Meet four alumnae who are using the leadership skills they honed at YSE to have a positive impact in their communities, their states, and their regions.

BY EMMA JOHNSON '20 MEM

PACIFIC NORTHWEST



Aja DeCoteau '07 is pictured on the Oregon side of the Columbia River at Rooster Rock State Park located east of Corbett.

“WE’VE BEEN ADAPTING TO A CHANGING CLIMATE SINCE TIME IMMEMORIAL. WE NOW SEE MORE ALIGNMENT WITH OTHERS IN HOW WE MANAGE OUR TRIBAL RESOURCES FOR FUTURE GENERATIONS.”

Aja DeCoteau, '07 MEM

The Pacific Northwest is salmon land, especially for Indigenous nations. Salmon is central to the work of the Columbia River Inter-Tribal Fish Commission (CRITFC), where Aja DeCoteau is watershed department manager.

Formed in 1977, CRITFC is a group of four tribes in the Columbia River basin — the Yakama, Umatilla, Warm Springs, and Nez Perce nations — advocating for tribal treaty rights. As DeCoteau explained, “Salmon is what our organization is about and who we are as a people.” By returning fish to rivers, protecting tribal fishing rights, and supporting tribal fisherpeople, the commission works across science, policy, and religion to protect traditional ways of life.

A core piece of CRITFC’s work is collecting scientific data. From estuary research and genetics work to climate modeling, their researchers are studying salmon and their land to better prepare for predicted climate shifts.

DeCoteau’s biggest project is updating CRITFC’s Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of the Salmon) plan, an innovative, 25-year project following the salmon’s life cycle that ends this year. Climate change will be at the forefront of the new plan. The tribes have always been climate leaders because “we’ve been adapting to a changing climate since time immemorial,” DeCoteau remarked. “We now see more alignment with others in how we manage our tribal resources for future generations.”

CRITFC’s work extends throughout the Columbia River basin, joining 15 other tribes and even Indigenous nations in Canada to advocate for a voice in the Columbia River Treaty renewal in 2024. Collectively, DeCoteau hopes the commission will join the U.S. and Canadian governments to discuss the future of dams on the Columbia River.

Beyond CRITFC, DeCoteau is a board member at Earthjustice, where “her expertise in tribal natural resource management provides critically important insights and experience to staff and board members alike,” says N. Bruce Duthu, fellow board member and Native American studies professor at Dartmouth College.

As DeCoteau thinks about what’s next for CRITFC, she says, “The greatest strategy for looking at climate change is to look at the youth.” She hopes to empower tribal youth so they can lead everyone to a brighter future.

JOSEPH EASTBURN

“IT’S IMPORTANT FOR US TO TAKE ON CASES THAT WILL MAKE A CHANGE NOT ONLY OUR CLIENTS, BUT HOPEFULLY FOR OTHER PEOPLE ACROSS THE LOCAL AREA, STATE, OR EVEN ACROSS THE FIFTH CIRCUIT.”



Margaret “Maggie” Barnes ’18 is pictured in Tom Lea Park just north of downtown El Paso, Texas. In the background is the Sierra De Juarez mountain range.

SOUTHWEST

Margaret Barnes, '18 MEM

In 2019, the El Paso Independent School District closed two Hispanic elementary schools, forcing the students to relocate to schools near industrial activity and major highways. On behalf of the relocated students’ parents, Texas RioGrande Legal Aid (TRLA) is suing the district for violating the students’ civil rights. Representing the parents is TRLA attorney Margaret Barnes. TRLA is the largest legal aid provider in Texas, serving thousands of clients annually in more than 45 practice areas.

Barnes joined TRLA after she completed the joint Master of Environmental Management (MEM) and J.D. program at Yale School of the Environment and Vermont Law School. Like in the El Paso schools’ case, the environment is just one of many issues Barnes addresses in her work.

“It’s important for us to take on cases that will make a change not only for our clients, but hopefully for other people across the local area, state, or even across the Fifth Circuit,” Barnes says.

Barnes has seen this ripple effect play out in other cases that TRLA has handled, such as a 2019 settlement requiring Formosa Plastics to pay \$50 million for violating the Clean Water Act in Lavaca Bay, which is southwest of Houston and leads into the Gulf of Mexico. This money will go into regional environmental mitigation projects.

TRLA doesn’t work alone. “A lot of our cases allow us to partner with other people to see how our cases fit in with the larger picture,” Barnes says. “We communicate with other people doing environmental justice work in Texas and in the region ... and, if possible, work to support each other in our legal work.”

Barnes arrived at this work at TRLA after getting the chance to delve into different types of law while pursuing her joint degree. An extra year of internships and interdisciplinary classes helped set her on her current legal path, in which she hopes to work on pollution prevention to protect communities in the future.

CHRIST CHAVEZ

“THE REALITY IS THAT WE NEED CLIMATE ACTION AT EVERY LEVEL, AND WE NEED TO TAKE ADVANTAGE OF OPPORTUNITIES WHERE WE CAN EFFECT CHANGE.”

MIDWEST

Chelsea Chandler '10 is pictured at Plowshares & Prairie Farm near Argyle, Wisconsin. Chandler runs the farm with her husband Scott Laeser '08.

Chelsea Chandler, '10 MEM

From advocating for renewable energy to practicing regenerative agriculture, Chelsea Chandler is pushing Wisconsin to be a climate leader. She is the climate solutions director at Clean Wisconsin, a nonprofit whose mission is to fight for clean air and water in the state. Chandler is tasked with advocating for climate solutions at every level possible.

“The reality is that we need climate action at every level, and we need to take advantage of opportunities where we can effect change,” says Chandler. “If we aren’t seeing urgent action at the federal level, then states and regions can step up and be the model for what other states or the country can adopt.”

Although she hasn’t been in her role long, Chandler is already protecting one of Wisconsin’s most effective programs: Focus on Energy, the statewide energy efficiency program. By helping people buy efficient lightbulbs or tune up their grain dryers, Focus on Energy has been an enormous success. “Evaluations of the program have consistently shown huge returns for the investments,” Chandler says. After facing historic funding cuts, Chandler is advocating for additional support so Wisconsin can be as energy efficient as possible.

Amber Meyer Smith, vice president of programs and government relations at Clean Wisconsin, notes that Chandler’s “knowledge, practicality, and passion for climate change issues makes her a great fit to lead the organization’s state and regional efforts.”

“She can bring together the details and science of climate change and use that to engage people to speak up on this critical topic,” Smith says.

In addition to being an advocate for Wisconsin’s environment, Chandler is also a farmer, running Plowshares & Prairie Farm with her husband, Scott Laeser '08 MEM. The farm is “a living laboratory” that gives Chandler the chance to put policies into practice. “My husband and I were able to implement a lot of the solutions that we are advocating for in our office jobs,” she says.

LAUREN JUSTICE

NORTHEAST

“THE MORE COMMUNITIES THAT ARE BEING BRAVE, THE BETTER IT IS FOR EVERY COMMUNITY. AS MORE CITIES ADDRESS RACISM, OTHERS CAN LEARN FROM SUCCESSES AND MISTAKES.”



Zoraya Hightower '15 is pictured at the "Salmon Hole" area of the Winooski River, a famed Vermont fishing spot near Burlington.

Zoraya Hightower, '15 MEM

When Zoraya Hightower moved to Burlington, Vermont, in 2016, she knew she wanted to connect to her new community through local government. She first served on the development review board before deciding to run for city council.

Hightower won her race for Ward 1 councilor and is the first woman of color to serve on Burlington's city council. Despite only serving in the role since April, she's already an active councilor — serving on four committees and a new task force investigating school resource officers.

One of those committees, public safety, is usually not among the most active, Hightower notes. Then, on May 25, George Floyd was murdered by police officers in Minneapolis, setting off an ongoing national movement for racial justice. In Burlington, Hightower has led the charge. She introduced a successful resolution on racial justice in June in collaboration with other councilors, the advocacy organization Vermont Racial Justice Alliance, and local citizens. The resolution declares racism a public health crisis, reduces the police force by 30 percent, and creates an apology and reparations task force, among other anti-racism measures.

Since then, Hightower was elected chair of a ten-person joint committee uniting the council's public safety committee and the citizen-run police commission and has started turning plans into action. The joint committee will examine what Burlington citizens want public safety to look like and will assess practices at the Burlington Police Department.

Hightower's hope is that Burlington can be at the forefront of city-level racial justice work. "The more communities that are being brave," she says, "the better it is for every community. As more cities address racism, others can learn from successes and mistakes."

Leading the way will be difficult, but, as Hightower points out, "that doesn't mean it shouldn't be done. Why can't we be first?"

ANDY DUBACK



Georgia Silvera Seamans shares her enthusiasm for bird watching with a young park goer in New York City's Sara D. Roosevelt Park before the pandemic.

The Power of the Park

Longtime advocates for public parks, four YSE alumni discuss how urban and suburban green spaces have served as sanctuaries during the pandemic — although access to them is not always equitable.

BY GEOFFREY GILLER '14 MESC

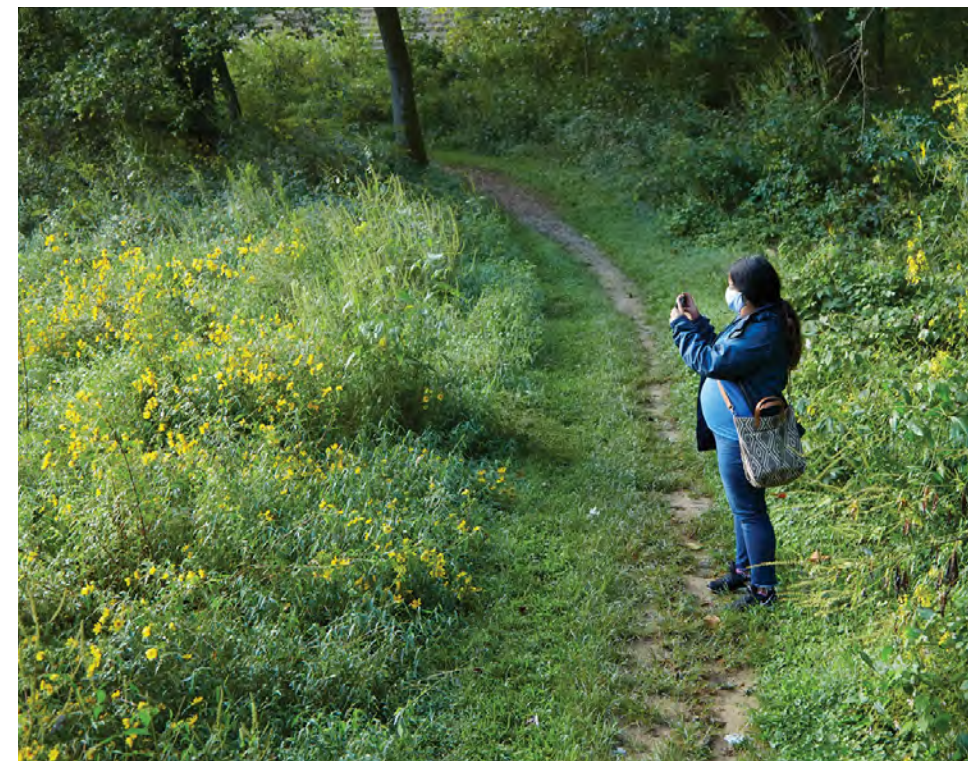
The health benefits of nature are as myriad as they are well established. Study after study has demonstrated a dizzying array of benefits to being in parks, green spaces, forests, and the great outdoors: better mental health, improved brain development in children and brain function in adults, lowered risk of chronic diseases like diabetes, and a general reduction in mortality. A much-cited 1984 study published in *Science* found that surgical patients who could see trees from their hospital beds recovered faster than those who could not.

In the middle of a global health crisis, the healing role of nature, especially in densely populated cities, has become even clearer. Dr. Georgia Silvera Seamans '01 MEM has long been a proponent of nature which, she says, can be found in more places than you might think. It's not just a quiet forest path (though New York City, where Silvera Seamans has lived and worked for over a decade, has plenty of those, too); nature can also be found on a leafy street or in some shrubbery at the corner of a block. Even the ability to look out a window and see some greenery was a blessing during the pandemic, says Silvera Seamans. During the spring 2020 lockdown in New York City, she spent a lot of time sitting on a chair in her apartment looking out at the oak trees that fill her building's plaza.



Georgia Silvera Seamans, '01 MEM (top), pictured here in New York City's Sara D. Roosevelt Park, has long been a proponent of nature, which, she says, can be found in more places than you might think.

Daniel Jones '84 BA, '06 MF, founder of The Parklands of Floyd's Fork, a series of interconnected parks stretching along more than 20 miles of creek outside Louisville, Kentucky, says the parks have seen a spike in visitors during the pandemic.



Parks and public green spaces have served as sanctuaries to many people during the pandemic, providing a place to exercise, explore, and connect with nature and each other while socially distancing. Images provided by The Parklands of Floyds Fork

Silvera Seamans lives a few blocks from Washington Square Park in Manhattan and runs Washington Square Park Eco Projects, an organization she started with the goal of monitoring plants and animals in the park, educating visitors about the park’s flora and fauna, and advocating for biodiversity. Like most New Yorkers, she stayed home during much of early spring, when the coronavirus was raging through the city and, as she says, “the thought of being next to another person felt sort of like a death sentence.” But once she felt comfortable venturing outside again, she was grateful to have easy access to substantive green space. Unfortunately for many people in New York City and across America, such easy access isn’t the norm. The wealthier and better-educated a person is, the better their access. People from economically and socially disenfranchised groups (in which people of color are disproportionately represented) tend to have more limited access. “In a pandemic that affects poor people of color more aggressively, it seems like those populations should have access to green space, which we know has a lot of great health benefits,” Silvera Seamans says.

According to a report by the New York City-based Natural Areas Conservancy, homebound, stressed, and anxious Americans flocked to urban parks across the country as lockdowns lifted this spring and

summer, underscoring both the importance of parks and the need for more equitable access. Interviews with visitors cited parks and open spaces as the few places to escape the pandemic’s various stresses. “Environmental justice communities have been talking about this issue of parks equity for a really long time,” Silvera Seamans says. “This year it came onto the scene in a major way. It feels like every other webinar in the parks world is about park equity and tree canopy cover equity.”

GATEWAYS TO NATURE

Dr. Daniel Jones ’84 BA, ’06 MF — who founded The Parklands of Floyds Fork, a series of interconnected parks stretching along more than 20 miles of creek outside Louisville — saw a spike in visitors to his parks. By early October of this year, The Parklands had welcomed as many visitors as it had in all of 2019. “[Parks] are just as important as infrastructure,” Jones says, right up there with sewers, water lines, and roads. And as people continue to move to cities from rural areas, parks become ever more important. “If you don’t build good green infrastructure, you’re not going to build livable cities.”

Jones views the increased park use at The Parklands and across America as a faint silver lining of the COVID-19 crisis. He cites another board member who would talk about “building the habits of park use.”

Jones’s own park habit was built while he was growing up in Louisville, and he hopes The Parklands will inculcate others. “If you can entice [people] out,” Jones says, then the outdoors can “work its magic.” He views The Parklands in some ways as a “gateway park,” one that might bridge the gap between the city or the suburbs and larger, wilder natural areas. One way that can happen, Jones says, is by showing people that nature “is a place where they can be relaxed.” Jones says that kids from the city or the suburbs don’t always have opportunities to be familiar with nature; when they’re brought to The Parklands, they’ll sometimes nervously ask about alligators or tigers. But within a few hours, the same kid asking about fearsome wildlife might be excitedly holding a snake.

It’s worth noting that parks aren’t just a boon to human residents. “Parks and other kinds of green spaces in cities are kind of essential for having any form of substantial biodiversity in urban areas,” says Max Lambert ’13 MEd, ’18 PhD, who studies urban evolution at UC Berkeley. Parks can be refuges from the disruptive sounds and lights of the city for animals, he says, just as they are for humans. And when wildlife benefits, so do humans: Studies have shown that parks and urban spaces with higher biodiversity also have a stronger effect on human health and well-being. “It’s actually something about having more species that makes humans happier,” Lambert says.

HEART AND LUNGS OF THE COMMUNITY

During the protests across the country this summer after the murder of George Floyd, parks took on yet another role. Silvera Seamans says she was heartened to see how Washington Square Park became a natural gathering point, a place where protestors could come together as a large group to make their voices heard. In Manhattan, “Washington Square Park was like ground zero for Black Lives Matter protests,” she says. “It was really wonderful to see the park used as this public square.”

Olivia Glenn ’03 MEM, the former director of parks and forestry for the state of New Jersey and now its deputy commissioner for environmental justice and equity, has a similar take. “Parks are platforms of democracy,” she says. “Parks are shared spaces, they’re common spaces, they’re there for the public good. They’re also the heart and lungs of our community.”

From the practical perspective of physical space for social distancing or increased air flow that the outdoors provides, it’s logical that people have been seeking out parks during the pandemic. But there’s surely something deeper that compels people, in times of stress, to seek out nature. Silvera Seamans and others sometimes refer to nature as Vitamin N. Most of us may not know or understand the ways that standing beneath a tree can make us happier and healthier. But something fundamental within our bodies knows, and when that vital nutrient is lacking, it compels us to seek it out. 🌿

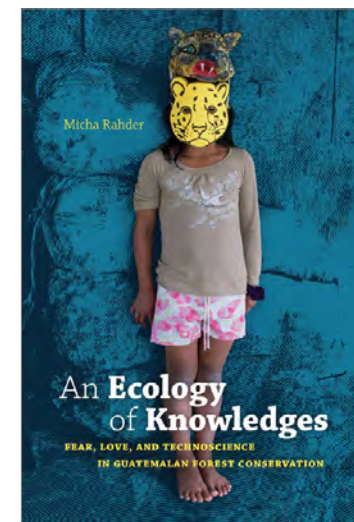


Jonathan Padwe immersed himself in the Jarai community to write *“Disturbed Forests, Fragmented Memories.”*



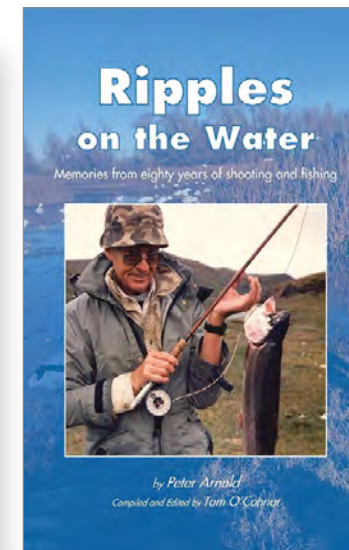
Disturbed Forests, Fragmented Memories

By Jonathan Padwe
University of Washington Press
Jonathan Padwe '01 MESC, '11 PhD offers an immersive look at the Cambodian village of Tang Kadon in his gripping book. This is a story about survivors: the rice hill farmers of the Jarai ethnic minority who lived through the American invasion during the Vietnam War and were relocated to the “killing fields” of the Khmer Rouge regime. Yet, when they returned to their homeland, they rebuilt a diverse and thriving agricultural system. Padwe ties their dramatic story to the story of the land itself, touching on timely issues in anthropology and political ecology. The book deeply explores the region of the Jarai, both the land and its people, focusing on their history of harsh treatment by outsiders. Their past, Padwe asserts, lives on through the land.



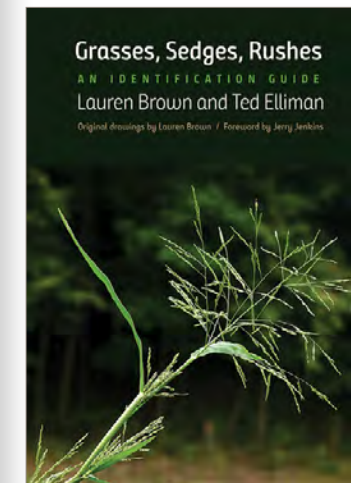
An Ecology of Knowledges: Fear, Love and Technoscience in Guatemalan Forest Conservation

By Micha Rahder
Duke University Press
Micha Rahder '08 MESC explores how volatile cultural issues, politics, and rampant deforestation have shaped conservation practices in the Maya Biosphere Reserve (MBR), the largest protected area in Central America. The book examines the way individuals with vastly different backgrounds and goals — from residents to conservationists to those working at NGOs — provide what Rahder terms an “ecology of knowledge” in the region, often causing a clash of competing interests, but also yielding successful interventions. “Since I wrote the book, many of its key themes have been increasing in importance domestically, as well as in Guatemala,” Rahder says.



Ripples on the water: Memories from eighty years of shooting and fishing

By Peter Arnold
Peter Arnold (publisher)
As the title indicates, this is a narrative that spans decades — not to mention two continents. Peter Arnold '50 BS, '51 MF has gathered a compilation of stories, letters, and contributions from friends that serves as a true testament to the outdoors life as experienced throughout his adventurous career and retirement. After earning his master of forestry degree from Yale, Arnold began his international career, with posts in Australia and South America — including four years in Ecuador as a forestry advisor to its government. At 96 years old, Arnold is a humble author, noting that he had a good time writing about some happy and not-so-happy outdoor experiences, and hoping that others would enjoy reading about them.



Grasses, Sedges and Rushes: An Identification Guide

By Lauren Brown and Ted Elliman
Yale University Press
This easy-to-use guide — an updated, amended version of Lauren Brown's original guide to grasses, published in 1979 — features almost 150 entries, including drawings and color photos, and details on how the plants, including species that are ecologically important and often difficult to identify, have been used throughout history. Brown '73 MFS, one of the first 30 women to graduate from the School, co-authored the book with Ted Elliman '85 MES, and the duo worked with Yale Press Senior Executive Editor Jean Thomson Black '75 MFS. “Even when I took (the course) Local Flora with the late Tom Siccama in 1973, these species were ignored on our field trips, yet they're all around us,” Brown says. “Ted, Jean and I hope that the book will help people enjoy these diverse and beautiful plants.”

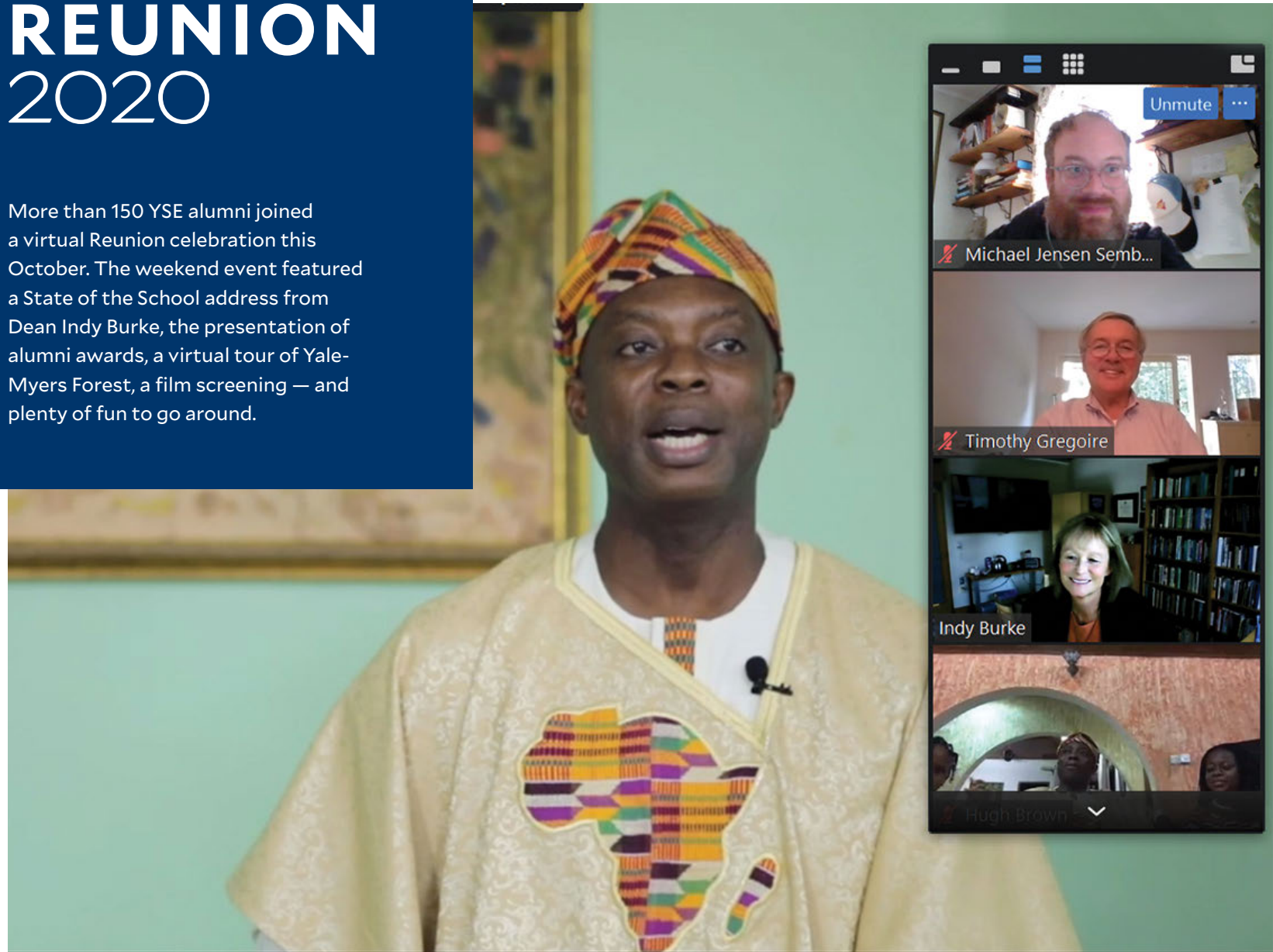


A Better Planet: 40 Big Ideas for a Sustainable Future

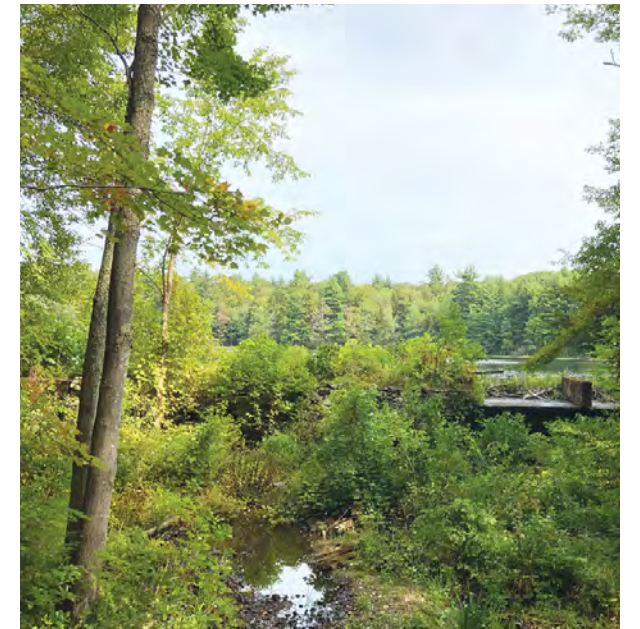
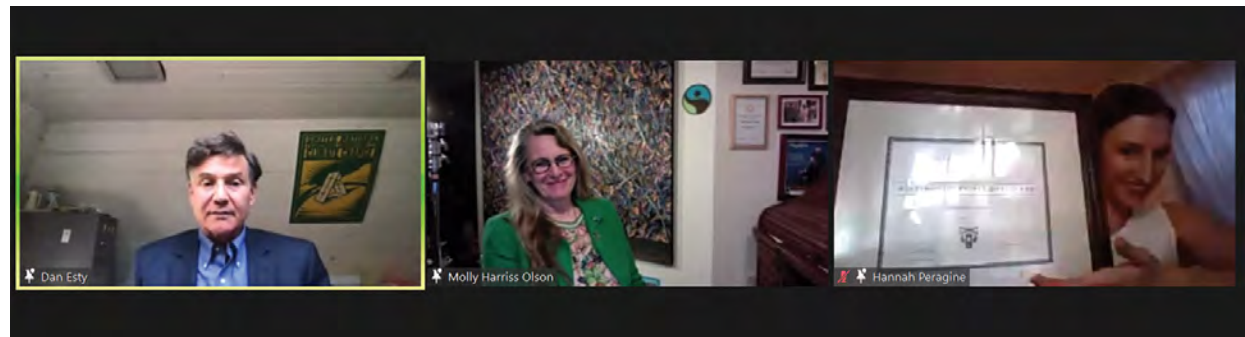
By Daniel Esty
Yale University Press
Now out in paperback, this compilation of essays — authored by environmental thought leaders from across the political spectrum and edited by Daniel Esty, Hillhouse Professor of Environmental Law and Policy — looks beyond the partisan disagreements that often frame discussions about the environment. “As the nation moves from an intense focus on politics to a new moment centered on policy, I think society will be looking for ideas that can address critical challenges, including climate change and the other dimensions of the ‘sustainability imperative’ that we now plainly face,” Esty says. “A Better Planet brings together, from a wide range of perspectives and disciplines, fresh thinking and creative ideas about how to move this agenda forward.”

REUNION 2020

More than 150 YSE alumni joined a virtual Reunion celebration this October. The weekend event featured a State of the School address from Dean Indy Burke, the presentation of alumni awards, a virtual tour of Yale-Myers Forest, a film screening — and plenty of fun to go around.



Hugh Brown '10 MF (above) accepts the Prospect Street Award, which recognizes a graduate of the last decade who embodies the spirit of YSE by having applied their education, energy and enthusiasm and demonstrated leadership, innovation and creativity to make a significant impact in their field.





Page 31 (top): Forester and botanist Laura Green '18 MF and film crew atop the Morse Reservoir dam, part of the virtual tour.

Page 31 (top right): Morse Reservoir dry-stacked stone dam.

Page 31 (bottom): Joe Orefice '09 MF, lecturer and director of forest & agricultural operations, shows off the new camp buildings for the virtual tour of Yale-Myers Forest, available on the YSE website.

Above: Forest Fellows Rosa Goldman '19 MF (on bank) and Jess Lloyd '20 MF (on bridge) enjoy a quiet moment above Branch Brook during the filming of the virtual tour of Yale-Myers Forest.

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PHOTOS COURTESY OF YSE OFFICE OF DEVELOPMENT AND ALUMNI

REUNION 2020 AWARD RECIPIENTS



DISTINGUISHED ALUMNI AWARD

Susan Shen '80 MFS

When Shen began working for the World Bank as a consultant, one of her first assignments was assessing a potential environmental management fund in Bhutan, affording her a rare glimpse of the country's mountainous beauty and exotic wildlife.

That project was just one in a long line Shen has overseen across Asia, focused on the nexus between the environment, inclusion, and social and rural development. In China, she led long-term engagement in the forestry sector which introduced many innovative practices that were adopted by the government, including work with the China-World Bank-GEF Nature Reserve Management Project for panda conservation.

Shen is now a senior project manager who hopes to train the next generation of environmentally-conscious leaders. "I teach them conservation is more than just protecting trees, for example," she says. "You need to be able to work with people, for people."



DISTINGUISHED ALUMNI AWARD

Molly Harriss Olson '85 MES

When Olson attended YSE, it was virtually unheard of to study economics as part of one's environmental education, as she had done as an undergrad at the University of California, Santa Cruz. Today, it's more common to measure the actual value of ecosystem services using reliable data to design a better global economic system that doesn't rely on waste production or worker exploitation for growth.

In her current role as CEO of Fairtrade Australia & New Zealand, Olson recognizes the necessity of overhauling the structures that underpin commerce. For example, Olson sees a silver lining to the global impact of the COVID-19 pandemic.

"We're going to align our economic investments in the recovery with our sustainable development goals," says Olson. "We can invest in the things that will help us achieve those targets in measurable ways. It has the potential to be the kind of transformation that the world really needs."



DISTINGUISHED SERVICE AWARD

Jean Thomson Black '75 MFS

To some, publishing is referred to as an "accidental profession," with no defined one path to enter the field. For Black, a broad science background and some old-fashioned pluck did the trick.

In the decades since entering the field, Black has cemented her status as a preeminent publisher in the sciences, becoming the first full-time science editor at Yale University Press in 1990 and working up to her current role as senior executive editor in 2014. The publishing program in science, medicine and environmental issues she helped establish has published books from some of the biggest names in the sciences, including Nobel Laureates and winners of the Tyler Prize and Blue Planet Prize.

"This work is very invigorating — always something new and exciting, an interesting new author to publish or a new idea to help bring to fruition," Black says.



PROSPECT STREET AWARD

Hugh Brown '10 MF

As an undergraduate in Ghana, Brown had his sights set on working for the country's Environmental Protection Agency. Instead, he was assigned to the country's Forestry Commission.

After a few months, he was hooked. "I was attracted by the magnificence and beauty of the tropical rainforest, and I knew I wanted to be a forester," he says.

Brown is now the director of operations for Ghana's Forestry Commission, overseeing commercial forest plantation development and landscape restoration across the country. Currently, about 450,000 hectares are being rehabilitated under his guidance, which will help to meet major global and continental conservation goals.

The work has its challenges and designing effective solutions to those challenges calls for engagement with multiple stakeholders — including politicians and others with diverse interests and levels of influence.

"Landscape restoration is a team sport," Brown notes.

A Wild Welcome

The incoming Class of 2022 was welcomed to the YSE community this fall — some in-person, some virtually — at our annual orientation program, MODs. Though unable to gather together, the new students were encouraged to make an introduction by sharing photos of themselves interacting with the natural world.



- 1 **UB Qiu** visited a glacier while completing a study abroad sustainability program in Iceland
- 2 **Logan Emlet** fully submerged himself in catching naura (crawdads) in Vanuatu
- 3 **Erica Hellen** checked in on a cattle herd at Free Union Grass Farm, a livestock farm she co-founded in Virginia
- 4 **Desmond Owuoth** visited The Waterfront Karen, an eco-friendly shopping and cultural center in Nairobi, Kenya
- 5 **Emily McInerney** monitored biodiversity as a Peace Corps volunteer in the Sierra Gorda Biosphere Reserve in Mexico
- 6 **Yulan Lu** had a perfect view of Tanzania's Ngorongoro Conservation Area during a three-day wildlife management field trip
- 7 **Logan Billet** shows off a newly laid wood frog egg mass in a pond in Indiana's Yellowwood State Forest
- 8 **Nenha Young** enjoyed a familiar hike at the Flat Rock Brook Nature Center in her native Englewood, N.J.
- 9 **Jonathan Gewirtzman** was out for a paddle on Lows Lake in New York's Adirondack Mountains
- 10 **Will Weinberg** takes a break from marking timber in California's Jackson Demonstration State Forest
- 11 **Alexandra Morrison** collected oil residues from the Exxon Valdez oil spill in Prince William Sound, Alaska
- 12 **Cloe Dickson** wore the proper attire for a hike to the 14,199-foot summit of Mount Yale in Colorado's Sawatch Range
- 13 **Danyan Leng** discovered a mossy skull while studying birds in Alaska's Denali National Park

A NEW FOUNDATION FOR U.S. FOREST POLICY

Rich Guldin, recipient of the Society of American Foresters' prestigious Sir William Schlich Award, is eager to talk about how forest research can inform smart forest policy.

BY KEVIN DENNEHY

By the time Richard Guldin '76 MFS, '79 PhD took over the U.S. Forest Service's Forest Inventory and Analysis (FIA) program in the mid-1990s, it had become stagnant and ineffective. That was a problem because, as the nation's forest census for nearly 70 years, the program helped guide state and national policies and priorities. Over the next several years, Guldin helped reinvent the program, integrating new sampling designs, field procedures, and innovative software to create an annual inventory that has become a global model. This integration of forest science, research, and policy typifies Guldin's career and, in October, earned him the Society of American Foresters' prestigious Sir William Schlich Award. We caught up with Guldin to discuss advances in forest management worldwide and the ways that forest research can inform smart forest policy.

YOU OVERSAW THE REINVENTION OF THE U.S. FOREST INVENTORY PROGRAM. HOW CRITICAL WAS THAT TO PROMOTING GOOD POLICY?

When I came to Washington in 1996, there were many concerns that the forest inventory was slow. For example, it used to be that we'd send all of our forest inventory crews to Maine, where they'd measure the 6,000 or 7,000 plots in Maine. Then the crews moved to Vermont and New Hampshire and measured there, then down to Connecticut and Massachusetts, then over to New York. So, it was taking 15 to 17 years until they would get back to Maine again. In the meantime, forests were changing, particularly in the southern United States where things grow faster, but we were only conducting an inventory every 10 to 12 years. That was simply unacceptable to state agencies, industry interests, and

NGOs. To everyone. And in turn, they were continually bickering with one another over what the forest conditions *were*. So much so that they never really got around to, well, what are we going to *do* about them? The transformation of that program to an annual inventory in which we were able to collect data in each state every year was a tremendous breakthrough.

HOW HAS AN ACCURATE CENSUS IMPROVED FOREST POLICY?

Now we have among the most conservative industry leaders talking with, say, the Sierra Club, the Friends of the Earth, and others they might not even have gotten into the same room with in the mid-'90s. Now they're at the table talking about the importance of this information to them and their practices and their decision-making, even though the policy options they're contemplating might be hugely different. But all of their policy options are at least starting with this understanding of the current condition of America's forests that we can all agree on.

For instance, this has been vital to improving the forest carbon estimates that are central to greenhouse gas reporting and a whole host of other activities. It also helped improve global reporting on forest sustainability, improving policymaking in countries around the world — a point highlighted in the Schlich Award.

And so to me, my role there was to help empower the inventory program leaders to obliterate [the old] foundation and begin laying a new foundation from scratch. And in my view, we've laid an extremely solid foundation for the 21st century of inventories of America's forests. And now others are building on top of that foundation a wide variety of applications and tools that can provide policymakers with the information they need to make better decisions. And I'm really proud of that. ♣



Rich Guldin admires the scenery of the String Lake Trail in Grand Teton National Park, Wyoming.



CANOPY

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