

School of the Environment 2021–2022



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School of the
Environment
2021–2022

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CALENDAR

The following dates are subject to change as the University makes decisions regarding the 2021–2022 academic year. Changes will be posted online on the School of the Environment’s website.

FALL 2021

Aug. 6	F	Virtual orientation for international students
Aug. 9	M	Orientation for new students Online course registration opens
Aug. 9–26	M–TH	MODS (“Field Modules”) for new students
Aug. 30	M	Academic orientation
Aug. 31	T	Online course registration closes
Sept. 1	W	Fall-term classes begin, 8 a.m. Add/Drop period begins
Sept. 6	M	Labor Day; classes do not meet
Sept. 14	T	Add/Drop period ends
Oct. 19	T	October recess begins, 11 p.m.
Oct. 25	M	Classes resume, 8 a.m.
Oct. 29	F	Midterm
Nov. 19	F	November recess begins, 5 p.m.
Nov. 29	M	Classes resume, 8 a.m.
Dec. 10	F	Last day of classes
Dec. 13–16	M–TH	Reading period
Dec. 17–22	F–W	Final examinations
Dec. 22	F	Fall term ends, winter recess begins, 5 p.m.

SPRING 2022

Jan. 3	M	Fall-term grades due
Jan. 4	T	Online course registration opens
Jan. 17	M	Online course registration closes Martin Luther King Jr. Day; offices closed
Jan. 18	T	Spring-term classes begin, 8 a.m. Add/Drop period begins
Jan. 28	F	Add/Drop period ends
Mar. 11	F	Midterm Spring recess begins, 5 p.m.
Mar. 28	M	Classes resume, 8 a.m.
Apr. 29	F	Classes end, reading period begins, 5 p.m.
May 6–11	F–W	Final examinations
May 11	W	Spring term ends, 5 p.m.
May 13	F	Spring-term grades due for graduating students
May 23	M	University Commencement
May 31	T	Spring-term grades due for continuing students

THE PRESIDENT AND FELLOWS OF YALE UNIVERSITY

President

Peter Salovey, A.B., A.M., Ph.D.

Fellows

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Her Honor the Lieutenant Governor of Connecticut, *ex officio*

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Michael James Cavanagh, B.A., J.D., Philadelphia, Pennsylvania

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Reiko Ann Miura-Ko, B.S., Ph.D., Menlo Park, California (*June 2025*)

Carlos Roberto Moreno, B.A., J.D., Los Angeles, California (*June 2026*)

Emmett John Rice, Jr., B.A., M.B.A., Bethesda, Maryland

Joshua Linder Steiner, B.A., M.St., New York, New York

David Li Ming Sze, B.A., M.B.A., Hillsborough, California

Annette Thomas, S.B., Ph.D., Cambridge, England (*June 2022*)

David Anthony Thomas, B.A., M.A., M.A., Ph.D., Atlanta, Georgia (*June 2027*)

Kathleen Elizabeth Walsh, B.A., M.P.H., Boston, Massachusetts (*June 2023*)

Michael James Warren, B.A., B.A., Washington, D.C. (*June 2024*)

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Vice President for Global Strategy

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Vice President for Communications

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Vice President for Human Resources

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Marian R. Chertow, M.P.P.M., Ph.D., Associate Professor of Industrial Environmental Management; Associate Professor, School of Management; Director, Program on Solid Waste Policy; and Director, Center for Industrial Ecology (on leave, spring 2022)

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Donna Rochelle Williams, Financial Assistant, Business Office

A MESSAGE FROM THE DEAN

Since its founding in 1900, our School has been at the forefront of environmental and forest science and scholarship, training generations of leaders who have tackled the challenges of their time. Today we continue to build on this rich legacy by providing research, teaching, and public engagement aimed at creating a more sustainable world.

On July 1, 2020, we changed our name from the Yale School of Forestry & Environmental Studies to the Yale School of the Environment. At the same time, we established the Forest School at the Yale School of the Environment in recognition of our founding mission and the continued importance of forestry.

This is a historic time for our School and, I believe, a vitally important one. Our faculty, students, and alumni are working on a wide scope of urgent and important issues – including climate change, clean energy policy, ecosystem science and biogeochemistry, hydrology, urban science, green chemistry, and environmental justice, among many others. Our alumni – 5,300 and counting – are tackling the increasingly complex environmental, social, and economic challenges of the twenty-first century in all corners of the world. They work in NGOs, government, business, academia, law, public health, and communications. They also maintain vital connections to the School; our alumni network provides valuable mentorship and support to our students as they prepare for their own professional challenges. As the Yale School of the Environment (YSE), we will be accurately communicating the breadth and depth of our scholarship, research, impact, and mission.

At the same time, it was extremely important to me that we reaffirm our commitment to forest science and global ecosystem management. The teaching and study of forestry remain a core strength of our School. We will continue to teach all of our students the principles of natural resource management through the innovative research and sustainable practice occurring at our nearly 11,000 acres of actively managed forests, and to provide them opportunities to study these forests and those around the world. As Professor Mark Ashton, who serves as the first senior associate dean of forests, wrote, our forestry program is strong now and will only get stronger.

We also launch this new era in our School's history with new faculty members. In 2019 Gerald Torres, an acclaimed global scholar of environmental law, critical race theory, and federal Indian law, was appointed full professor of environmental justice. In 2020 Dorceta Taylor '85 M.F.S., '91 Ph.D., joined our faculty as professor of environmental justice – a truly momentous occasion for our School. You simply cannot find more qualified experts in the field of environmental justice than Professors Taylor and Torres. Yuan Yao also joined the faculty as an assistant professor of industrial ecology and sustainable systems. In addition to her research examining the environmental and economic impacts of emerging technologies and industrial processes, she is dedicated to developing online educational materials to engage with diverse student populations and enhance the public literacy of sustainability. In 2021 two new professors joined the YSE faculty: Assistant Professor Luke Sanford, whose research examines environmental stewardship from a political science perspective, and Associate Professor Nyeema Harris, a wildlife ecologist.

There are many other signs of our hard work and forward momentum, including hosting our first New Horizons in Conservation conference, founded by Professor Taylor and organized by Yale's Justice, Equity, Diversity, and Sustainability Initiative.

A \$100 million gift to Yale from FedEx is helping to support a new Center for Natural Carbon Capture, which will focus on developing natural solutions for reducing atmospheric carbon. The FedEx funding will help support the creation of two new professorships, as well as doctoral and postdoctoral fellowships at YSE.

Since its founding, this School has demonstrated the willingness and strength to adapt to the evolving challenges facing our world. I have never felt more confident about how well poised we are to fulfill our mission of providing knowledge and leadership for a sustainable future. The work that we do here is vital to meeting the many global environmental challenges we are currently facing and will face in the future.

Our vision statement says it all: we aim to provide knowledge and leadership for a sustainable future. We invite you to be a part of this work.

Ingrid C. "Indy" Burke
Carl W. Knobloch, Jr. Dean
School of the Environment

SCHOOL MISSION

The Yale School of the Environment aspires to lead the world toward a sustainable future with cutting-edge research, teaching, and public engagement on society's evolving and urgent environmental challenges.

Our mission is grounded in seven fundamental values:

Excellence We promote and engage in pathbreaking science, policy, and business models that build on a fundamental commitment to analytic rigor, data, intellectual integrity, and excellence.

Leadership We attract outstanding students nationally and internationally and offer a pioneering curriculum that imparts the knowledge and skills needed to be a twenty-first-century environmental leader in a range of professions.

Sustainability We generate knowledge that will advance thinking and understanding across the various dimensions of sustainability.

Community We offer a community that finds strength in its collegiality, diversity, independence, and commitment to excellence and lifelong learning.

Diversity We celebrate our differences and identify pathways to a sustainable future that respects diverse values including equity, liberty, and civil discourse.

Collaboration We foster collaborative learning, professional skill development, and problem solving—and we strengthen our scholarship, teaching, policy work, and outreach through partnerships across the University and beyond.

Responsibility We encourage environmental stewardship and responsible behavior on campus and beyond.

In pursuit of our mission, we:

- Build on more than a century of work bringing science-based strategies, ethical considerations, and conservation practices to natural resource management.
- Utilize systems thinking and approach problems from interdisciplinary perspectives.
- Integrate theory and practice—and provide innovative solutions to society's most pressing environmental problems.
- Address environmental challenges at multiple scales from local to global and multiple settings from urban to rural and from managed to wild—including working lands and landscapes.
- Draw on the depth of resources at Yale and its network of alumni that extends across the world.
- Create opportunities for research and policy application as well as professional development through a structure of faculty-led centers and programs.
- Provide a neutral forum to convene conversations on difficult issues that are critical to progress on sustainability.

- Bring heightened focus to the most significant threats to a sustainable future, including climate change, the corresponding need for clean energy, and the increasing stresses on our natural resources.

HISTORY OF THE SCHOOL OF THE ENVIRONMENT

The School was established in 1900 as “The Yale Forest School” with a founding gift from the family of Gifford Pinchot, B.A. 1889, LL.D. 1925, a pioneer in the conservation movement who would later become the first head of the U.S. Forest Service. Through Pinchot’s vision and the work of the Forest School, Yale led the way in creating a new model of forest management and natural resource conservation, educating many of the nation’s first foresters—a vanguard of professionals who shaped our modern understanding of conservation, environmental education, and public lands. In fact, during its first four decades, the School would produce the first four U.S. Forest Service chiefs.

Over the past century, the School has grown from a more narrowly focused forestry program to an international institution with a diverse array of students from across the world graduating each year. In 1972, in recognition of its increased scope, the School changed its name to the Yale School of Forestry & Environmental Studies.

Then, on July 1, 2020, the School again changed its name to the Yale School of the Environment (YSE) to better reflect its established role as a leader in environmental scholarship and practice.

At the same time, the School established the Forest School at the Yale School of the Environment in recognition of its founding mission and because the teaching and study of forestry and forest science remain a core strength of the School. YSE students learn the principles of natural resource management through the innovative research and sustainable practice occurring at the School’s nearly 11,000 acres of actively managed forests, and YSE is committed to providing students multiple opportunities to study these forests and those around the world.

In addition to forest science and management, research and teaching at Yale School of the Environment now cover a broad range of other areas: ecology, ecosystems, and biodiversity; environmental management and social ecology in developing societies; global change science and policy; health and environment; industrial environmental management; policy, economics, and law; urban science, environmental planning, design, and values; coastal watershed systems; and environmental justice.

The School has more than 5,300 living alumni who are working across the world on a range of environmental challenges. They work in NGOs, government, business, academia, law, public health, and communications, among numerous other sectors and disciplines.

Over the past two decades, the School has strengthened its connections within the wider Yale community and with external partners. The School has introduced joint programs with Yale Law School and with the Yale Schools of Engineering & Applied Science, Management, Public Health, and Architecture, as well as with partner universities including Pace Law School, Vermont Law School, and Tsinghua University in China.

During the 1990s, the School established and invested in a range of new centers and programs to expand its work beyond faculty research and classroom learning. The nearly twenty centers and programs, along with other emerging initiatives, have created dynamic foci for scholarship, research, student learning, and outreach to alumni and the wider professional communities on critical issues, such as tropical forestry, environmental communication, and industrial ecology, among many others.

In 2017 the School unveiled an ambitious new Strategic Plan. Among the plan's critical goals was the development of new curricula that track the School's current and evolving strengths; increased programs and hiring to address environmental equity and diversity issues; a new emphasis on research and training in environmental communication; and expanded interdisciplinary research. In the three years since, the School has adopted a new curriculum for the Master of Environmental Management program, which places more emphasis on subject specialization while maintaining its signature flexibility; introduced the Yale Center for Environmental Communication; and created the Yale Environmental Dialogue, an initiative that has engaged environmental leaders from a wide range of disciplines and sectors to inject new ideas and fresh energy into the national conversation on environmental policy. The School also is continuing to develop and strengthen strategic initiatives focused on environmental data, urban science, and environmental health and justice.

The School's faculty and students have also become more diverse and representative of the wider world, convening from a range of professional, cultural, and sociological backgrounds. In 2020 the School welcomed to the faculty Dorceta Taylor and Gerald Torres, two of the country's preeminent scholars in the field of environmental justice, and Yuan Yao joined the faculty as an assistant professor of industrial ecology and sustainability systems. This year, Luke Sanford, whose research examines environmental stewardship from a political science perspective, joined the YSE faculty as assistant professor of environmental policy and governance. His skills in using empirical and statistical data strengthen the School's emphasis on using environmental data science in all areas of focus.

A \$100 million gift to Yale from FedEx is helping to support a new Center for Natural Carbon Capture, which will focus on developing natural solutions for reducing atmospheric carbon. The center, a key aspect of Yale's broader Planetary Solutions Project, will support and accelerate research across academic disciplines. The FedEx funding will also help support the creation of two new professorships as well as doctoral and postdoctoral fellowships at YSE. The Environmental Leadership and Training Initiative (ELTI) will also receive support through this gift. Housed within the Forest School, ELTI supports the efforts of people to design and implement an array of land use practices and initiatives that conserve and restore tropical forests and native tree cover.

"At a time of global crisis for the planet," says Indy Burke, Carl W. Knobloch, Jr. Dean, "our faculty, students, and alumni are working with colleagues throughout Yale on a wide scope of urgent and important issues – issues that include climate change, clean energy policy, urban science, green chemistry, forestry, and environmental justice, among many others."

LEADERSHIP FOR SUSTAINABILITY

Through its scholarship, teaching, practice, and power to convene, the Yale School of the Environment (YSE) is a leader in the development and implementation of sustainable practices locally and globally. The School creates new knowledge in the science of sustainability and new methods of applying that knowledge to environmental management and sustainable development, including the restoration of degraded environments.

On the Yale campus, the School has stepped up as a model in the sustainable use of resources and materials and has helped develop strategies and programs to achieve sustainability goals campuswide. In 2016 Yale committed to becoming carbon neutral by 2050. The University formed a task force to review and propose ambitious goals for reducing emissions, with a specific charge to explore how Yale could achieve net-zero carbon emissions. YSE's Kroon Hall is the most energy-efficient building on campus. The Yale Carbon Charge, an initiative born in a YSE classroom and developed in part by YSE faculty and students, has grown into a first-of-its-kind campuswide effort to reduce energy use through the use of internal carbon pricing.

In 2019 the University created a new multidisciplinary laboratory, the Yale University Carbon Containment Lab, which is developing and supporting innovative, scalable solutions to the climate challenge. And Yale's new Center for Natural Carbon Capture, recently established with a \$100 million grant from FedEx, will focus on developing interventions that enhance the Earth's natural abilities to store carbon through biological and geological processes, and other methods that model natural processes. The interdisciplinary center is part of the University's broader Planetary Solutions Project.

Since its inception, the School has been working on the sustainable management of forests across the world – for biological diversity, for natural resource production, and most recently, for carbon storage. For more than twenty years, the YSE-based Urban Resources Initiative (URI) has promoted community-based land stewardship, urban forestry, and green job training in the city of New Haven. Each year, YSE students and faculty work with landowners in northeastern Connecticut to promote sustainable forestry practices as part of the Quiet Corner Initiative. Many YSE students work as research assistants at the Yale Office of Sustainability, on projects ranging from sustainable materials management to climate resilience, all of which directly support the University's Sustainability Plan 2025.

For students, classroom learning often extends into local communities, where students have helped officials with climate resilience and adaptation strategies, green infrastructure development, and sustainable land stewardship and resource management plans. Their work has addressed a sweeping array of complex environmental challenges from dealing with lead-contaminated water in Flint, Michigan, to endangered species conservation in China. Our alumni also continue this commitment to sustainability in all its forms through their leadership in ongoing academic research, major corporate initiatives, government programs, and the nonprofit sector.

MASTER'S DEGREE PROGRAMS

Two-Year Master's Degree Programs

The School of the Environment offers four two-year master's degrees: the professionally oriented Master of Environmental Management (M.E.M.) and the Master of Forestry (M.F.), and the research-oriented Master of Environmental Science (M.E.Sc.) and Master of Forest Science (M.F.S.). The M.F. and M.F.S. programs are administered within the Yale Forest School. All the master's degree programs vary in their level of prescription, but all are sufficiently flexible to accommodate the diverse academic backgrounds, professional experiences, and career aspirations of a large and vibrant student body. The program curricula draw from more than 200 courses taught by more than fifty YSE faculty, as well as from courses taught elsewhere at Yale. Each student's course of study is customized through consultation with a faculty adviser who guides the student's learning experience from the first week at Yale until graduation. The master's degree programs require a minimum of two years in residence, 48 credits of course work at Yale, a summer internship or research experience, and completion of the Training Modules in Technical Skills prior to the student's first term (see below).

MASTER OF ENVIRONMENTAL MANAGEMENT

The Master of Environmental Management curriculum draws from course work in the natural and social sciences and focuses on the complex relationships among science, management, and policy. The purpose of the program is to provide students with an in-depth understanding of natural and social systems that can be applied to environmental and natural resource problem solving in a policy or management context. In addition to course work, students are expected to hone their capacities as leaders and managers through summer internships, professional skills courses, and other opportunities.

The M.E.M. curriculum requires students to focus on an area of specialization, while still offering the flexibility to tailor their course programming in a way that exposes them to other disciplines and subject areas. This structure assures that students develop both depth and breadth in their course study. Students can choose from more than 100 courses offered by YSE faculty and have access to an even larger number of courses from across Yale University. All M.E.M. students take the fall Perspectives course (ENV 553), demonstrate interdisciplinary conversancy through either taking or satisfying waiver requirements for four 1.5-credit Foundational Knowledge courses (ENV 511, ENV 512, ENV 521, and ENV 522), and complete a Capstone course or project. They round out their experience with general electives and a selection of at least four of eight Professional Skills Modules.

Specializations are designed to ensure that students obtain sufficient depth in their chosen area of study. The specializations are:

1. Business and the Environment
2. Climate Change Science and Solutions
3. Ecosystem Management and Conservation
4. Energy and the Environment

5. Environmental Policy Analysis
6. Industrial Ecology and Green Chemistry
7. People, Equity, and the Environment
8. Urban
9. Water Resources Science and Management

Specialization requirements account for 18 of the 48 total credits required for the M.E.M. degree, made up of two core courses and four electives, and it is possible to add a second specialization. Students will be asked to choose their specialization at the end of their first term of study, and this specialization will be listed on their transcript upon completion. Students may also propose a self-designed specialization path in collaboration with a faculty adviser and the senior associate dean of academic affairs.

MASTER OF FORESTRY

The Master of Forestry program trains professionals for the protection, management, and restoration of native forests and woodlands and associated human-made forest ecosystems (urban trees, agroforests, plantations); and for mediating and resolving the conflicting values of society that concern forests and associated ecosystems. Since 1900, the Master of Forestry program has provided leadership in the education of professional foresters. It is the oldest continuing forestry program in the Western Hemisphere. Almost all the early foresters in North America had their roots at Yale, including Aldo Leopold, M.F. 1909, and nine of the first twelve chiefs of the USDA Forest Service.

Master of Forestry graduates have pursued a variety of professional opportunities in forestry. Most start as general practitioners in management and with experience move through management to become policy makers and organizers. Some graduates use the degree as preparation for advanced study in doctoral programs.

The broad objective of the two-year M.F. program is realized by requiring a multidisciplinary suite of formal course work coupled with a progressive synthesis of knowledge in a significant project. Course work is supplemented through an array of local, regional, national, and international field trips to witness the practice of forestry in diverse settings. Real-world professional experience is provided through the Yale Forest and summer internships at a wide variety of resource management and policy organizations. Opportunities to engage in discussion with forest leaders are provided through workshops, meetings with visiting speakers of national and international repute, and involvement in the School's programs such as the Yale Forest Forum, the Forests Dialogue, the Tropical Resources Institute, and the Urban Resources Initiative.

The teaching objectives of the M.F. program are (1) to integrate knowledge about forests, natural resources, and society to form a sound basis for making management decisions; (2) to provide electives and other educational opportunities to specialize by focusing on a particular land use or management issue concerning forest ecosystem management; and (3) to provide opportunities for independent problem solving, critical thinking, and self-development. Students take a mixture of natural, social, and quantitative science courses, culminating in the second year with courses in integrated resource management and leadership. Flexibility in the choice of courses within the core curriculum as well as choice of electives allows each student to tailor the program to a desired specialization. Sample specializations have included community development

and social forestry; protected areas management; extension and education; consulting forestry; business; watershed health and restoration; tropical forest management; agroforestry; and industrial forest management.

The Master of Forestry degree is accredited by the Society of American Foresters (SAF). A minimum of two full years in residence and sixteen full courses (48 credits) is required for completion of this program.

MASTER OF ENVIRONMENTAL SCIENCE/MASTER OF FOREST SCIENCE

The Master of Environmental Science and the Master of Forest Science degree programs are expressly designed for students wishing to conduct research that contributes to basic and applied knowledge in any of the fields taught at YSE, such as ecology, hydrology, social ecology, economics, industrial ecology, or policy. These degrees are intended to facilitate a deeper disciplinary focus than the Management degrees, while allowing students the flexibility in course election that will allow them to meet diverse educational goals. The Master of Environmental Science is intended for students who wish to work broadly in different fields of environmental science. The Master of Forest Science is intended for students who wish to work in forest-related topics.

The course of study for both degrees includes formalized School-level training in the philosophy and practice of science. Training is provided through key courses in combination with extended project research and disciplinary and nondisciplinary electives. The scientific research required for this degree will be conducted in close collaboration with a YSE faculty adviser. *Therefore students must have a commitment from a faculty adviser before being admitted to these degree programs.* The Master of Environmental Science and Master of Forest Science programs require the student to produce a “scholarly product.” This product may take the form of a traditional master’s thesis or a paper(s) submitted to a refereed journal.

TRAINING MODULES IN TECHNICAL SKILLS (MODS)

All incoming master’s students participate in MODS, shorthand for Field Modules, which introduce the students to a basic understanding of field data, the basis for all environmental science and policy. MODS will take place during August of 2021, with students rotating between different modules over the course of three weeks. MODS plans may be adjusted if pandemic conditions change public health guidance. Participating in MODS is a graduation requirement and an important opportunity to engage with classmates and build relationships.

One-Year Midcareer Master’s Degree Program

The midcareer M.F. (Master of Forestry), which is not accepting applicants at this time, is a degree program intended to permit forest managers to build on their work experience in order to acquire skills that will enable them to pursue their career goals more effectively. To this end, those admitted into the program must have at least seven years of directly relevant professional experience in forestry that is sufficient to provide a corpus of experiential learning equivalent to one year of academic study at YSE. Applicants must detail their career work experience so that the admissions committee

may fairly judge each applicant's work record in light of this requirement. Relevant work experience is not the sole criterion for admission into this degree program; the breadth of prior academic training is also considered, and those applicants who are better prepared (see Preparation for Admission, in the chapter Admissions: Master's Degree Programs) are more likely to succeed in this competitive admission process.

The midcareer degree program is not appropriate for those seeking to make an abrupt career change, nor is it suitable for those who have acquired seven or more years of work experience that is tangentially related to forest management. Normally, voluntary service will not be considered equivalent to career experience needed for acceptance into this degree program.

The curricula for the one-year midcareer Master of Forestry degree program is less structured than the curricula for the two-year programs. Attendance at the Training Modules (see Training Modules in Technical Skills, above) is expected, and the successful completion of 30 credits of course work and independent study is required. One academic year in residence is normally expected, as is initial enrollment at the start of the fall term.

Five-Year Program for Yale College and Yale-NUS College Students

The School of the Environment offers joint-degree, five-year options that culminate in a baccalaureate and master's degree intended for students who want to pursue careers in an environmental field. The joint-degree option is available to all undergraduates in Yale College and to environmental studies majors at Yale-NUS College. The program provides well-prepared students with accelerated graduate training in environmental science, management, and policy. Eligible students may apply for either a Master of Environmental Management (M.E.M.) or Master of Environmental Science (M.E.Sc.) degree. The program is built on careful integration of a student's undergraduate curriculum with graduate requirements. Graduates have become highly successful leaders within governments, corporations, nonprofit organizations, and academia.

Yale students interested in the five-year joint-degree program should apply to the program at the end of the fall term of their senior year, or in the two years immediately following graduation. Applicants interested in applying to the M.E.Sc. should make an appointment to talk to the YSE Office of Admissions at admissions.yse@yale.edu prior to applying.

Joint Master's Degree Programs

The School of the Environment supports several curricula that work concurrently toward two degrees from different academic units of Yale University. Opportunities for development of joint-degree programs exist with the School of Architecture, Divinity School, Law School, School of Management, School of Public Health, School of Engineering & Applied Science, the Graduate School of Arts and Sciences' Global Affairs program coordinated through the Jackson Institute for Global Affairs, the International and Development Economics program of the Graduate School's Department of Economics, and three programs offered by the Graduate School and coordinated through the MacMillan Center (African Studies, East Asian Studies, and

European and Russian Studies). Joint-degree programs with Pace Law School and Vermont Law School constitute additional options. Applicants are urged to apply to both units at the same time. All of these programs are subject to the following general guidelines.

Applicants must apply to, and be accepted by, both units of the University according to normal admissions procedures. A minimum of one and one-half years (three terms) and 36 credits is required at the School of the Environment. For successful integration of the two programs, it is recommended that students spend a complete academic year (two terms) at one school, the following academic year at the other school, and then split the final year between the two schools.

Upon successful completion of the formal joint-degree program, the student will be awarded one of the four YSE master's degrees, together with the joint degree. The joint-degree programs, sponsoring Yale academic units, and associated residency requirements (which are in addition to the three-term requirement of YSE) are as follows:

1. School of Architecture: Master of Architecture I (five terms); Master of Architecture II (three terms).
2. Divinity School: Master of Arts in Religion (three terms); Master of Divinity (five terms).
3. Schools of law (Yale Law School, Pace Law School, and Vermont Law School): Juris Doctor (five terms).
4. School of Management: Master of Business Administration (three terms).
5. School of Public Health: Master of Public Health (three terms).
6. School of Engineering & Applied Science (Graduate School of Arts and Sciences): Master of Science (two terms).
7. Global Affairs (Graduate School of Arts and Sciences): Master of Arts (three terms).
8. Department of Economics, International Development and Economics program (Graduate School of Arts and Sciences): Master of Arts (two to three terms).
9. African Studies (Graduate School of Arts and Sciences): Master of Arts (three terms).
10. East Asian Studies (Graduate School of Arts and Sciences): Master of Arts (three terms).
11. European and Russian Studies (Graduate School of Arts and Sciences): Master of Arts (three terms).

To view specific requirements for each joint-degree program, visit www.environment.yale.edu/academics/degrees. For additional questions about these joint-degree programs, please contact the YSE Office of Admissions at info.yse@yale.edu or 800.825.0330.

JOINT-DEGREE PROGRAM WITH TSINGHUA UNIVERSITY

YSE offers a three-year joint-degree program with Tsinghua University School of Environment in China. This program consists of one and one-half years (three terms) at Tsinghua working toward a Master of Environmental Engineering and one and

one-half years (three terms) at Yale working toward a Master of Environmental Management, Master of Environmental Science, Master of Forestry, or Master of Forest Science. Students who begin their program at YSE will spend one year (two terms) at YSE, followed by one and one-half years (three terms) at Tsinghua, and then conclude their program with one-half year (one term) at YSE. Students who begin their program at Tsinghua will spend one year (two terms) at Tsinghua, one and one-half years (three terms) at YSE, and then conclude their program with one-half year (one term) at Tsinghua.

Applicants must apply to, and be accepted by, both YSE and Tsinghua University under normal admissions procedures. For questions about this joint-degree program, please contact the YSE Office of Admissions at info.yse@yale.edu or 800.825.0330.

Part-Time Program

Students who wish to obtain a degree through the part-time option must complete the same curriculum as full-time students. Students must complete two part-time terms to equal a full-time term regardless of meeting credit requirements. Students must enroll for at least two courses per term and must complete the degree requirements within four years of matriculation. Part-time tuition will be \$11,550 per term for the academic year 2021–2022. (Midcareer students: please contact Admissions for part-time tuition rates.)

Special Students

For those who do not wish to pursue a degree program, YSE offers the option of special-student status. Special students may be registered for a period as short as one term and may enroll in a minimum of one course or elect to take a full load of four courses per term. Please note that international applicants who are not coming through a preestablished Memorandum of Understanding between a partner university and Yale University will likely not be able to participate in the special-student program. Special students may not be eligible to participate in the summer Training Modules in Technical Skills. Under normal circumstances, no one may hold special-student status for more than one academic year. No degree or certificate is granted for special-student course work. Students will receive official transcripts of course work completed. For information on tuition for special students, see the chapter Tuition, Fees, and Other Expenses.

Special students wishing to matriculate in a degree program after completing courses will need to apply and be admitted through the YSE admission process described in the chapter Admissions: Master's Degree Programs. Course credits earned while in special-student status will not be applied toward any degree credit requirements, and any fees paid while in attendance as a special student will not be applied toward degree tuition requirements.

DOCTORAL DEGREE PROGRAM

The Doctor of Philosophy (Ph.D.) degree is conferred through the Yale Graduate School of Arts and Sciences. Work toward this doctoral degree is directed by the Environment department of the Graduate School, which is composed of the faculty of the School of the Environment. Doctoral work is concentrated in areas of faculty research, which currently encompass the following broad foci: agroforestry; biodiversity conservation; biostatistics and biometry; climate science; community ecology; ecosystems ecology; ecosystems management; energy and the environment; environmental and resource policy; environmental anthropology; environmental biophysics and meteorology; environmental chemistry; environmental ethics; environmental governance; environmental health risk assessment; environmental history; environmental law and politics; environmental management and social ecology in developing countries; forest ecology; green chemistry and engineering; hydrology; industrial ecology; industrial environmental management; plant physiology and anatomy; pollution management; population ecology; resource economics; silviculture; social ecology; stand development, tropical ecology, and conservation; sustainable development; urban ecology; urban geography; urban land cover change; urban planning; and water resource management.

Requirements for the Doctoral Degree

All courses listed in this bulletin are open to students working toward the doctoral degree. Additional courses are available in other departments – e.g., Anthropology; Chemistry; Earth and Planetary Sciences; Ecology and Evolutionary Biology; Economics; Management; Mathematics; Molecular, Cellular, and Developmental Biology; Political Science; Sociology; and Statistics and Data Science – and are listed in the bulletin of the Graduate School.

A doctoral committee will be appointed for each student no later than the student's second term in the program. The committee consists of a minimum of two faculty members from the Yale University community. When appropriate for their research areas, students are encouraged to suggest committee members from other universities or institutions. Doctoral students work under the supervision of their doctoral committees. The committee should be chaired or co-chaired by a YSE ladder faculty member.

Students are required to take the Doctoral Student Seminar (ENV 900) during the first year of their program.

Two Honors grades must be achieved before a student is eligible to sit for the qualifying examination. In addition, students are expected to serve four terms (10 hours per week) as teaching fellows, in partial fulfillment of their doctoral training.

A written and oral qualifying examination is required upon completion of the course requirements. Students are expected to take the examination by the end of their second year, although this can be extended to the third year in cases with appropriate extenuating circumstances. At the time of the qualifying examination, the student must present a prospectus of the research work proposed for the dissertation. Successful

completion of the qualifying examination and submission of the prospectus will result in admission to candidacy.

The director of doctoral studies (DDS) of the School serves as director of graduate studies for the Environment department of the Graduate School, administers the doctoral program, and may be consulted if questions arise.

Before beginning work, the student must secure approval from the student's committee and the DDS for a proposed program of study and for the general plan of the dissertation. Appropriate advanced work is required. Courses chosen should form a coherent plan of study and should support research work for the proposed dissertation.

The dissertation should demonstrate the student's mastery of the chosen field of study as well as the ability to do independent scholarly work and to formulate conclusions that may modify or enlarge previous knowledge.

Candidates must present themselves for the oral defense of the dissertation at such time and place as the student, the DDS, and the committee determine. Upon completion of the dissertation, the candidate must make unbound copies of the dissertation available to the faculty. Copies of the approved dissertation must be submitted to the Graduate School.

Combined Doctoral Degree

DEPARTMENT OF ANTHROPOLOGY

The School of the Environment offers a combined doctoral degree with Yale's Department of Anthropology. The purpose of the degree is threefold: it combines (1) the disciplinary identity and strengths of the Anthropology department with the interdisciplinary character and possibilities of YSE, especially in terms of bridging the social and natural sciences; (2) the strengths in ecological and environmental studies of YSE with the social science strengths of the Anthropology department; and (3) the Anthropology department's strengths in theory with the emphasis within YSE on linking theory with policy and practice. The combined doctoral degree offers its graduates great flexibility when entering the marketplace. They can represent themselves as anthropologists and/or environmental scientists, as theoreticians and/or practitioners. They have the credentials to apply for policy-oriented positions with international institutions, as well as academic positions in teaching and research. The academic program of each student in the combined-degree program is to some extent tailored specifically to that student's particular history, interests, and needs, but all combined-degree students are expected to follow the program's general guidelines.

Prospective combined-degree students must initially apply either to Anthropology or to the doctoral program in Environment (not both) and check the combined-degree box on the application form. Students should communicate with faculty in both programs during the year prior to application, and they should apply to the program where their credentials and faculty contacts offer the greatest chance of admission. The program is extremely competitive, accepting one or two students per year out of dozens who apply. (Note: most successful applicants to YSE hold a prior master's degree.)

Once a student is accepted in either Environment or Anthropology, the application file is sent to the second department for consideration. A positive decision at this point

amounts to acceptance into the combined-degree program. (A negative decision, which is rare in any case, does not affect the student's prior admission into the first program.) Students admitted into the combined-degree program will be allocated to the department to which they initially applied as their primary administrative home, but they will enter Yale as members of the combined-degree program. A student who does not apply to the combined-degree program at the time of their initial application to Yale may still apply after matriculating at Yale, but this should be done as soon as possible in their first term on campus.

Detailed guidelines for the combined-degree program can be found on the YSE website at <http://environment.yale.edu/doctoral/degrees/combined-anthropology>. The program coordinators are Michael Dove (YSE) and Kalyanakrishnan Sivaramakrishnan (Anthropology).

NEW YORK BOTANICAL GARDEN

The School of the Environment offers a combined doctoral degree with the New York Botanical Garden, which is funded by the Lewis B. Cullman Fellowship. The objective is to train biological scientists to use an interdisciplinary approach to solving problems associated with tropical environments.

Areas of study include agroforestry and forest management, ecosystem analysis, economic botany, economic evaluation of tropical resources, ethnobotany, plant biodiversity and conservation, social processes affecting management of natural resources, tropical field studies, and tropical silviculture.

For more information about the combined doctoral degree, please contact the director of doctoral studies at 203.432.5146.

SUBJECTS OF INSTRUCTION

Courses offered by the School of the Environment are described below. The letters “a” and “b” following the course numbers indicate fall- and spring-term courses, respectively. The letter “E” following a course number indicates an online course. Courses with bracketed titles will not be offered during the 2021–2022 academic year.

In addition to offering courses in the traditional classroom setting, the School of the Environment in recent years has made a growing commitment to providing quality education through online learning. As part of this initiative, the School introduced a series of courses that “flip” the typical classroom model. These courses allow students to watch lectures online while still providing an opportunity for weekly personal interactions with YSE faculty. The digital format helps the instructors incorporate multimedia resources that are difficult to use in the classroom and enables more time for discussion, questions, and/or group work during student-instructor interactions.

Project courses involve individually assigned advanced field or laboratory work, or literature review, on topics of special interest to the student; credits and hours for these projects are determined for each student in consultation with the instructor.

Courses throughout the University are generally open to students enrolled in the School of the Environment, subject to limitations on class size and requirements for prerequisites.

Course Descriptions

At YSE, new courses are often added after this bulletin is printed; and spring 2022 courses have not yet been scheduled. Our website at <https://environment.yale.edu/courses> will have an updated list, as well as a list of environmental courses available in other departments at Yale. See also Yale Course Search at <https://courses.yale.edu>.

ENV 511a, Ecological Foundations for Environmental Managers

Kealoha Freidenburg

This course gives students a fundamental mechanistic understanding about the way abiotic (e.g., climate) and biotic (e.g., resources, competitors, predators) factors determine pattern in the distribution and abundance of species. Students learn how individuals within a species cope with changing environmental conditions by altering their behavior, making physiological adjustments, and changing the allocation of resources among survival, growth, and reproduction. Students learn how populations of species coexist within communities and how species interactions within communities can drive ecosystem functioning. Students also learn how ecologists use scientific insight to deal with emerging environmental problems such as protecting biodiversity, understanding the consequences of habitat loss on species diversity, and forecasting the effects of global climate change on species population viability and geographic distribution. 1½ Course cr

ENV 512a, Microeconomic Foundations for Environmental Managers

Stephanie Weber

This six-week course provides an introduction to microeconomic analysis and its application to environmental policy. Students study how markets work to allocate scarce resources. This includes consideration of how individuals and firms

make decisions, and how policy analysts seek to quantify the benefits and costs of consumption and production. We consider the conditions under which markets are beneficial to society and when they fail. We see that market failure arises frequently in the context of environmental and natural resource management. The last part of the course focuses on the design of environmental and natural resource policies to address such market failures. The course is designed to cover basic knowledge of economics analysis and prepare students for ENV 834 and other more advanced offerings. 1½ Course cr

ENV 521a, Physical Science Foundations for Environmental Managers

Shimon Anisfeld

This required foundational course provides students with the physical science basics that they need in order to understand and manage environmental problems. The course draws on the following disciplines: climatology, environmental chemistry, geology, hydrology, meteorology, oceanography, and soil science. Focus is on understanding both the underlying concepts and how they apply to real-world environmental challenges. Useful both as a freestanding course and as a gateway to a wide spectrum of intermediate and advanced courses. 1½ Course cr

ENV 522a, Social Science Foundations for Environmental Managers Amity Doolittle

The environmental social sciences shed light on how humans define, perceive, understand, manage, and otherwise influence the environment. Insights into the cultural, institutional, political-economic, and historic drivers of human actions are needed to describe and understand human-environment interactions as well as to move toward long-lasting and flexible responses to socio-environmental change. This basic knowledge course is designed to introduce students to a range of social science disciplines that are engaged in understanding the relationships between nature and society. Explicit focus is on how to mobilize the insights gained from environmental social sciences for natural resource management. 1½ Course cr

ENV 550a, Natural Science Research Methods William Lauenroth

The course prepares students to design and execute an intensive research project. It covers elementary principles and philosophy of science; research planning, including preparation, criticism, and oral presentation of study plans; communicating research findings; limitations of research techniques; the structure of research organizations; and professional scientific ethics. 3 Course cr

ENV 551a, Qualitative Social Science Research Methods Amity Doolittle

This course is designed to provide a broad introduction to issues of qualitative research methods and design. The course is intended for both doctoral students who are in the beginning stage of their dissertation research, as well as master's students developing research proposals for their thesis projects with a focus on understanding the nexus of human-environment issues. The course covers the basic techniques of designing qualitative research and for collecting, interpreting, and analyzing qualitative data. We explore three interrelated dimensions of research: theoretical foundations of science and research, specific methods available to researchers for data collection and analysis, and the application and practice of research methods—all with a strong emphasis on the relationship between people and natural resources. The final product for this course is a research proposal. 3 Course cr

ENV 553a, Perspectives: Environmental Leadership Peter Boyd

The course is intended to offer a common experience and exposure to the variety of perspectives represented by YSE faculty and guest experts on the challenges and opportunities of environmental management. This year's theme is Environmental Leadership, and over the term we create and foster a leadership toolkit and systems-thinking appreciation that enable first-year M.E.M. students to map out and maximize an impactful path through Yale, their careers, and their lives. 3 Course cr

ENV 592a, Documentary Film Workshop Charles Musser

This workshop in audiovisual scholarship explores ways to present research through the moving image. Students work within a Public Humanities framework to make a documentary that draws on their disciplinary fields of study. Designed to fulfill requirements for the M.A. with a concentration in Public Humanities. 3 Course cr

ENV 594a, Global Carbon Cycle A. Scott Denning

People are currently mining millions of years' worth of stored photosynthetic carbon from the solid Earth and transferring it to the atmosphere, where it is profoundly changing the chemistry, physics, and biology of the atmosphere, land, and oceans. Exchanges with the oceans and land surface have been modified substantially, so that currently only about half of anthropogenic emissions remain in the atmosphere. These "carbon sinks" are poorly understood, contributing a great deal of uncertainty to future climate. We consider biogeochemical and transport processes in land ecosystems, the oceans, and atmosphere as well as anthropogenic emissions. We conclude with a study of changes in carbon cycling in the past and future, including predictions by coupled Earth System Models. 3 Course cr

ENV 595a, Yale Environment Review Matthew Kotchen

The *Yale Environment Review* is a student-run publication that aims to increase access to the latest developments in environmental studies. We aim to shed light on cutting-edge environmental research through summaries, analysis, and interviews. During this 1-credit course, students produce one or two articles on subjects of their choosing for publication on the *YER* website. Please refer to our Canvas page for an overview of the different types of content that *YER* produces. Students receive coaching to improve their writing skills, and their work goes through a rigorous editing process. Participation in *Yale Environment Review* helps students sharpen their writing skills and familiarize themselves with science communication, and it provides a platform to showcase their expertise. Enrollment is limited to sixteen, and the class is selected through an application process. Application instructions can be found on our Canvas page. Please email environment.review@yale.edu with any questions. *Class meets five to six times throughout the term, dates to be announced. An information session will be held on a date to be determined.*

ENV 602a, Ecosystems and Landscapes Mark Bradford

Concepts and their application in ecosystem and landscape ecology. Topics covered include biogeochemical cycling, food web interactions, biodiversity, and the abiotic and biotic controls that act on them. The course emphasizes how to integrate this knowledge to understand and manage ecosystem budgets. 3 Course cr

ENV 603a, Environmental Data Visualization and Communication

Simon Queenborough and Jennifer Marlon

Welcome to the Information Age! It is now much easier to generate and access more data than ever before. Yet, our ability to manage, analyze, understand, and communicate all this data is extremely limited. Visualization is a powerful means of enhancing our abilities to learn from data and to communicate results to others, especially when informed by insights into human behavior and social systems. Developing the quantitative skills necessary for analyzing data is important, but for addressing complex and often urgent environmental problems that involve diverse audiences, understanding how to communicate effectively with data is equally essential for researchers, policy makers, and the public alike. This course is for students who wish to gain an understanding of the principles, tools, and techniques needed to communicate effectively with data. Classes consist of short lectures about principles of design, data preparation, and visual communication; discussions about examples from the news and scientific literature; guest lectures; peer critiques; and hands-on individual and collaborative group activities. Throughout the term, we use Excel, PowerPoint, R, Tableau, and other tools to develop visualizations using diverse datasets. Students also work with a dataset of their own choice or from a partner organization to develop a final project consisting of a poster, infographic, report, dashboard, story map, or related product. Enrollment is limited and application is required. 3 Course cr

ENV 604a, Social Entrepreneurship in Public Health Teresa Chahine

This is a case-based course about innovation and entrepreneurship for health equity, including racial equity and other drivers of health. COVID-19 has brought to light for many the complexities in drivers of health, and the role of entrepreneurship and cross-sectoral collaboration in eliminating health disparities. We examine cases of entrepreneurship for health equity in the United States and globally, using a research-based framework to analyze the role of innovation and design thinking, resource mobilization, financial viability, cross-disciplinary collaboration, and systems strengthening. 1½ Course cr

ENV 605a, Environmental Risk Communication Andrew Schwarz

Risk communication is a critical but often overlooked part of how organizations identify and manage risks. Risk communication can help people take seriously risks that they might otherwise ignore (e.g., to wear a seatbelt or bicycle helmet, check for radon in their homes, evacuate from a coming hurricane). Risk communication can also provide reassurance when data indicate that a risk is not serious. Effective risk communication enables environmental professionals to communicate information in a way that is understood and accepted by different stakeholders (e.g., the public, industry, government leaders, etc.) and allows the participation of these stakeholders in risk management decisions. This course provides an overview of the theory and practice of effective communication about environmental and health risks to diverse stakeholders. Students are expected to actively participate in class discussions, drawing upon assigned readings, lectures, and videos. 3 Course cr

ENV 606a, Methods in Climate Change and Health Research Kai Chen

Climate change is recognized as one of the greatest public health challenges of the twenty-first century. This course takes multidisciplinary approaches to identify, assess, quantify, and project public health impacts of climate change and of measures

to address climate change. It first introduces the fundamental principles of health impact assessment and gives a brief overview of the public health approaches to address climate change. Then it applies advanced data analysis methodologies in environmental epidemiology, including time-series analysis, spatial epidemiology, and vulnerability assessment, to characterize the present climate–health (exposure–response) relationships and to identify vulnerable populations. This course discusses key concepts of scenario-based climate projections and their applications in projecting future health impacts, evaluating health co-benefits of climate mitigation policies, and assessing climate change adaptation measures. Emphasis is placed on hands-on computer lab exercises with real-data examples and R scripts. 3 Course cr

ENV 617a, Real-World Environmental Data Science Sarah McGowan and
Elena Grewal

The goal of this course is to provide students with a foundational understanding of what it takes to perform environmental data work in a practical, professional setting. To make sound policy decisions, we need data, and the reality is that data is often messy, difficult to find, and incomplete. In order to effectively leverage the data, students need to be able to troubleshoot when there is a problem. We focus on understanding the mechanics and nuances of working with messy data in the professional setting, not teaching statistics. We provide a high-level explanation of methods, what they tell us, and how they are useful, and then focus on implementation. 3 Course cr

ENV 618a, Anthropology of Smallholder Agriculture in Developing Countries
Carol Carpenter

The premise of this course is that small-scale agriculture, its distinctive economic character, and its ecology shape each other in important ways. The course explores smallholder farming in the developing world through ethnographies. 3 Course cr

ENV 619a, Philosophical Environmental Ethics Stephen Latham

This is a philosophical introduction to environmental ethics. The course introduces students to the basic contours of the field and to a small number of special philosophical problems within the field. No philosophical background is required or expected. Readings are posted on Canvas and consist almost entirely of contemporary essays by philosophers and environmentalists. The total reading load averages about three philosophy papers weekly—roughly sixty pages. Readings avoid environmental ethics topics that are treated in other Yale courses: e.g., religion and ecology, indigenous views of ecology, and all but a very little bit of environmental justice. 3 Course cr

ENV 633a, Critical Race Theory Gerald Torres

This class studies critical race theory from its origins to its current expression. Understanding the deep interconnections between race and law, and how race and law are co-constitutive, is the project of critical race theory. One of the central claims of critical race theory is that racial subordination is not a deviation from the liberal legal ideal but is, unfortunately, part of its expression. We focus on the origins of the critique that is central to the development of the theory and contrast its analysis with conventional analytic frameworks on race and American law and society. Because it is a positive theory but also driven by a normative vision, we explore the possibility of transforming the relationship between law and racial power. The law is not the only site of critical race theory; it has had a significant impact on other disciplines in the social sciences. We examine those impacts as well. 3 Course cr

ENV 641a, Market-Based Mechanisms for Water Management Sarah Kruse and David Pilz

This is an online course with remote, live instruction, designed to teach students the essential theoretical components and practical application of using voluntary water rights transactions to reallocate water to environmental purposes. The course primarily focuses on environmental water transactions (EWTs) in the context of water law in the western United States, though the riparian doctrine and other water management regimes are also discussed. Historically, water law and policy in the western United States prioritized irrigation and other economic uses that required diverting water from rivers, often leaving important ecosystems with zero or very little water to support in-situ values. EWTs are an increasingly utilized market-based mechanism for rebalancing water use, and they also provide a template for reallocating water supply to help society adapt to a rapidly changing climate. 3 Course cr

ENV 645a, Urbanization, Global Change, and Sustainability Karen Seto

Urbanization and associated changes in human activities on the land (*land use*) and in the physical attributes of Earth's surface (*land cover*) have profound environmental consequences. Aggregated globally, these effects constitute some of the most significant human impacts on the functioning of Earth as a system. This course examines the interactions and relationships between urbanization and global change at local, regional, and global scales with an emphasis on the biophysical aspects of urbanization. Topics include urbanization in the context of global land use change, habitat and biodiversity loss, modification of surface energy balance and the urban heat island, climate change and impacts on urban areas, urban biogeochemistry, and urbanization as a component of sustainability. Emphasis is on management of urban areas *worldwide* or at national scales for planetary sustainability. 3 Course cr

ENV 646a, Foundations of Agriculture and Environment Stephen Wood

Agricultural systems have a profound impact on the environment, but also depend on environmental processes—such as climate and nutrient cycling—for continued productivity. Because of this two-way relationship, there has been a growing integration of environmental and agricultural sciences over the past several decades with growing recognition that designing and implementing agricultural systems that minimize environmental harm and benefit people is necessary to sustainable development. This course provides foundational knowledge of how agricultural and environmental systems are linked. The goal is to provide theoretical understanding of the important environmental and human processes, as well as practical experience interpreting these processes and applying them to real-world scenarios. 3 Course cr

ENV 654a, Structure, Function, and Development of Trees Graeme Berlyn

This course focuses on two aspects of plant life: (1) basic processes that drive plant development, such as seed formation, germination, seedling establishment, maturation, and senescence; and (2) basic structure and function of plants (such as root systems, leaf formation and development, height, and diameter growth). Differences between different groups of seed plants are analyzed from structural, functional, ecological, and evolutionary standpoints. Special attention is given to woody plants and their importance in the biosphere and human life. Coverage includes tropical, temperate, and boreal trees. Plant biology is discussed in the context of physiological and structural adaptations in terms of strength, storage, and water and solute transport. 3 Course cr

ENV 660a, Forest Dynamics Marlyse Duguid

This course introduces the study of forest stand dynamics—how forest structures and compositions change over time with growth and disturbances. Understanding the dynamic nature of forest stands is important for creating and maintaining a variety of critical ecosystem services sustainably and synergistically, including sustainable supplies of wood products, biodiversity and wildlife habitats, water, fire protection, and others. Through readings, lectures, discussions, and field trips we explore forest development processes and pathways, concentrating on the driving mechanisms and emergent properties including natural and human disturbances. We make use of New England forests as living laboratories while discussing how similar forest patterns and processes are played out throughout the temperate, tropical, and boreal worlds. This course is a core component of the M.F. degree but is explicitly designed to be accessible to anyone interested in an in-depth exploration of forest ecosystems. 3 Course cr

ENV 671a, Temperate Woody Plant Taxonomy and Dendrology Marlyse Duguid

Dendrology literally translates as “the study of trees” and integrates morphology, phenology, ecology, biogeography, and the natural history of tree species. In this course students learn how to identify more than 120 individual species of woody plants using common morphological and ecological traits used for field identification. Dendrology is by nature context-specific, so this course has a focus on North American forest species, primarily of eastern North America. In addition, we use phylogenetic systematics as the structure for understanding taxonomy and the evolutionary history and relationships between species. Enrollment limited to thirteen. 3 Course cr

ENV 679a, Plant Ecophysiology Craig Brodersen

This course focuses on the physiological ecology of plants and their interaction with the biotic and abiotic environment, understood through the lens of first principles. We use a quantitative approach to demonstrate the linkages between photosynthesis, growth, and carbon allocation at the tissue and whole plant level, which can then be scaled up to forests and ecosystems. We also focus on specific physiological and anatomical adaptations plants use to survive in the many varied habitats on Earth. The laboratory component of this course (ENV 679L) involves the theory, programming, and deployment of micrometeorological equipment to monitor environmental conditions in the field, as well as methods for measuring photosynthesis and growth in the greenhouse and field. Enrollment limited to twenty-four. 3 Course cr

ENV 692a, Science and Practice of Temperate Agroforestry Joseph Orefice

This course explores the science and practices of temperate agroforestry, covering current knowledge of agroforestry science and shedding light on the myths and assumptions that have yet to be tested regarding the integration of trees in agricultural systems. The course begins with an overview of modern agriculture to help us better understand why agroforestry systems have potential to improve the sustainability of farming systems. We also cover the social science regarding agroforestry and why it has not been widely adopted. Silvopasture and forest farming systems are the primary focus, but windbreaks, alley cropping, and riparian forest buffers are also covered. The field of agroforestry has struggled with the promotion of hypothetical practices; this course introduces students to real-world production agroforestry systems and helps them better contribute to financially viable and environmentally sound agricultural operations. 3 Course cr

ENV 701a, Climate Change Policy and Economics Robert Mendelsohn

The seminar reviews the economic and scientific framework and the facts that underlie efficient mitigation and adaptation decisions concerning climate change. The course then focuses on the key uncertainties and value judgments that make managing climate change complicated and controversial. Prerequisites: econometrics and relevant courses in economics. 3 Course cr

ENV 704a, Workshop on Remote Sensing and Photogrammetry with Drones

Xuhui Lee

A workshop that explores the current state and future outlook of remote sensing with unmanned aerial vehicles (UAVs or drones) for environmental monitoring. UAV-based remote sensing is a rapidly developing field in environmental science and technology. Versatile and inexpensive, it has the potential to offer solutions in a wide range of applications, such as forestry inventory, precision agriculture, flood hazard assessment, pollution monitoring, and land surveys. The class meets once a week for three hours. The workshop is divided into three parts: (1) reviewing the state of the technology on UAV types, sensor configurations, and data acquisition methods; (2) exploring GIS and remote-sensing software tools for analyzing super-high-resolution spectral data acquired by fixed-wing drones; (3) cross-validating drone products against Lidar data and satellite imagery. Students may also have the opportunity to participate in drone flight missions. Data analysis, presentation, literature critique, field trips. Prerequisite: ENV 726 or equivalent experience.

ENV 705a, Current Topics in Global Climate Change A. Scott Denning

People are currently mining millions of years' worth of stored photosynthetic carbon from the solid Earth and transferring it to the atmosphere, where it is profoundly changing the chemistry, physics, and biology of the atmosphere, land, and oceans. Exchanges with the oceans and land surface have been modified substantially, so that currently only about half of anthropogenic emissions remain in the atmosphere. These "carbon sinks" are poorly understood, contributing a great deal of uncertainty to future climate. We consider biogeochemical and transport processes in land ecosystems, the oceans, and atmosphere as well as anthropogenic emissions. We conclude with a study of changes in carbon cycling in the past and future, including predictions by coupled Earth System Models. 3 Course cr

ENV 707a, Introduction to Environmental Chemistry Gaboury Benoit

Introduction to environmental chemistry and to the nature and behavior of environmental pollutants, including chemical, biological, and physical processes. The fundamental classes of chemical reactions in the environment; critical analysis of chemical data; sampling techniques; analytical methods; natural biogeochemical controls on environmental chemistry. Case studies examine contaminants of special interest such as acid precipitation, nutrients, and sewage. Prerequisite: college-level general chemistry. 3 Course cr

ENV 712a, Water Management Shimon Anisfeld

An exploration of water management at scales ranging from local to global. The course looks at multiple dimensions of the water crisis, including both human and ecosystem impacts; quantity and quality issues; and engineering, legal, economic, and behavioral solutions. Theory is illustrated through a variety of case studies. Topics covered include global water resources; flooding; water scarcity; residential, agricultural, and industrial water use; water and health; water justice; impacts of climate change

and land use change; storm water management; dams and other technologies for water management; human impacts on aquatic ecosystems; water and energy; water economics; water rights; water conflict and cooperation. 4 Course cr

ENV 723a, Wetlands Ecology, Conservation, and Management Kealoha Freidenburg
Wetlands are ubiquitous. Collectively they cover 370,000 square miles in the United States and globally encompass more than five million square miles. Most points on a map are less than one kilometer from the nearest wetland. Yet wetlands are nearly invisible to most people. In this course we explore wetlands in all of their dimensions, including the critical services they provide to other systems, the rich biodiversity they harbor, and their impact on global climate. Additionally, wetlands are linchpin environments for scientific policy and regulation. The overarching aim of the course is to connect what we know about wetlands from a scientific perspective to the ways in which wetlands matter for people. 3 Course cr

ENV 724a, Watershed Cycles and Processes James Saiers
Everyone lives in a watershed, an area of land that funnels rainfall and snowmelt to a stream, river, lake, or section of coastline. This course examines watershed processes that affect, or are affected by, the stocks, flows, and quality of freshwater. It also surveys challenges faced by watershed managers, while emphasizing the science that informs their choices. By drawing from the fields of hydrology, ecology, and chemistry, the course begins by investigating cycles that govern the fates of water, nutrients, carbon, and pollutants within watersheds. This basic knowledge underpins watershed management decisions that are, for example, intended to safeguard drinking-water quality, ensure sustainable freshwater consumption, and preserve ecosystem services that depend on healthy riparian corridors. In coordination with treatments of watershed functions, the course explores the impacts of anthropogenic stresses on freshwater flows, water quality, and the ecology of sensitive watershed ecosystems. The course also covers measurements, models, and other tools used in watershed assessment and case studies of science-based watershed planning and adaptive management. 3 Course cr

ENV 728a, Introduction to Statistics and Data Analysis in the Environmental Sciences Jonathan Reuning-Scherer
An introduction to statistics and data analysis with emphasis on practical applications in the environmental sciences. Includes graphical analysis, common probability distributions, hypothesis testing, confidence intervals, and linear regression. The second part of the course introduces the topics of multiple regression and ANOVA that are typically not covered in an introductory class such as AP statistics. There are weekly problem sets using Minitab, SPSS, or R, as well as a final project. This course is a prerequisite for other statistics courses offered through YSE, and it presents statistical methods used in many Yale courses in both the natural and social sciences. Three hours lecture. 3 Course cr

ENV 738a, Wildlife Movement Ecology Nyeema Harris
On a crowded planet, wildlife must navigate myriad externalities coupled with intrinsic life history characteristics that influence their movement patterns. Students evaluate this crucial animal behavior at different temporal and spatial scales using theoretical, empirical, and experimental approaches as well as draw connections to human societies and landscape histories. 3 Course cr

ENV 747a, Global Communication Skills William Vance

This course helps students to sharpen their language and strategy in professional communication. Course topics include accent reduction, language accuracy, writing styles, presentation skills, meeting leadership, barriers to communication, and types of persuasion in multicultural contexts. We first address aspects of intelligibility, exploring how improved word choices and speech clarity affect audience understanding. We then look at the problem of comprehension and discuss strategies for increasing the student's ability to listen accurately and read efficiently. We also examine common difficulties and cultural differences in the arrangement of information, use of evidence, and academic argumentation. Several sessions are devoted to specific skills, such as negotiating agreements and writing research reports. The course meets for lecture (two hours), and students attend a weekly small-group practicum (one hour). The practicum allows students to reinforce new communicative behaviors in oral and written assignments, while receiving feedback from peers and the instructor. As students polish their skills, they improve their ability to express ideas and to interact in both academic and professional contexts. Enrollment limited to fifteen. 3 Course cr

ENV 750a, Writing the World Verlyn Klinkenborg

This is a practical writing course meant to develop the student's skills as a writer. But its real subject is perception and the writer's authority – the relationship between what you notice in the world around you and what, culturally speaking, you are allowed to notice. What you write during the term is driven entirely by your own interest and attention. How you write is the question at hand. We explore the overlapping habitats of language – present and past – and the natural environment. And, to a lesser extent, we explore the character of persuasion in environmental themes. Every member of the class writes every week, and we all read what everyone writes every week. It makes no difference whether you are a would-be journalist, scientist, environmental advocate, or policy maker. The goal is to rework your writing and sharpen your perceptions, both sensory and intellectual. Enrollment limited to fifteen. 3 Course cr

ENV 753a, Regression Modeling of Ecological and Environmental Data

Timothy Gregoire

This course in applied statistics assists scientific researchers in the analysis and interpretation of observational and field data. After considering the notion of a random variable, the statistical properties of linear transformations and linear combinations of random data are established. This serves as a foundation for the major topics of the course, which explore the estimation and fitting of linear and nonlinear regression models to observed data. Three hours lecture. Statistical computing with R, weekly problem exercises. Prerequisite: a course in introductory statistics. 3 Course cr

ENV 756a, Modeling Geographic Objects Charles Tomlin

This course offers a broad and practical introduction to the nature and use of drawing-based (vector) geographic information systems (GIS) for the preparation, interpretation, and presentation of digital cartographic data. In contrast to ENV 755, the course is oriented more toward discrete objects in geographical space (e.g., water bodies, land parcels, or structures) than the qualities of that space itself (e.g., proximity, density, or interspersion). Three hours lecture, problem sets. No previous experience is required. 3 Course cr

ENV 757a, Data Exploration and Analysis Ethan Meyers

Survey of statistical methods: plots, transformations, regression, analysis of variance, clustering, principal components, contingency tables, and time series analysis. The R computing language and web data sources are used. 3 Course cr

ENV 759a, Power, Knowledge, and the Environment: Social Science Theory and Method Michael Dove

Course on the social scientific contributions to environmental and natural resource issues, emphasizing equity, politics, and knowledge. Section I, introduction to the course. Section II, disaster and environmental perturbation: the social science of emerging diseases; and the social origins of disaster. Section III, boundaries: cost and benefit in the Green Revolution; riverine restoration; and aspirational infrastructure. Section IV, methods: working within development projects, and rapid appraisal and consultancies. Section V, local communities, resources, and (under)development: representing the poor, development discourse, and indigenous peoples and knowledge. This is a core M.E.M. specialization course in YSE and a core course in the combined YSE/Anthropology doctoral degree program. Enrollment capped. 3 Course cr

ENV 764a, Sociology of Sacred Values: Modernity, Ecology, and Policy Justin Farrell

This course equips students to understand how moral culture shapes all environmental issues and management, driving even the most basic decisions that on the surface may appear to be entirely obvious, rational, or scientific. Modern people and modern institutions are propelled toward certain ends and possibilities that are inescapably rooted in questions of human culture about who we are, what we should do, and why it all matters. The first half of the course draws on theoretical readings from sociology, philosophy, and religious studies to understand the ubiquity of sacred codes and how they work, with an emphasis on late modernity, rationality, capitalism, and the sacred/profane. The second half of the course introduces recent case studies to see in practice how moral values are embedded in environmental work, including policy making, advocacy, the free market, scientific research, race and class, death and extinction, ecotourism, and more. Cultivating a lens to see culture and moral values in all things will improve students' applied work in all sectors. 3 Course cr

ENV 773a, Air Pollution Control Drew Gentner

An overview of air quality problems worldwide with a focus on emissions, chemistry, transport, and other processes that govern dynamic behavior in the atmosphere. Quantitative assessment of the determining factors of air pollution (e.g., transportation and other combustion-related sources, chemical transformations), climate change, photochemical "smog," pollutant measurement techniques, and air quality management strategies. 3 Course cr

ENV 775a, Federal Indian Law Gerald Torres

This course covers the basics of federal Indian law. It does not address the substantive content of tribal law. Tribal law is a specialized study arising from the exercise of the legal authority that the tribes retain. This course is designed to lay the groundwork for a deep understanding of what kinds of sovereignty Indian nations may exercise within the framework of our legal system. Normally, courses of this type begin with a historical exploration of the foundations of the relations between Indian and non-Indian peoples. Instead, we begin with questions that are current and sketch out, roughly, where we are now. Typically, we start with cases pending before or recently decided by the Supreme Court. We use the Marshall Trilogy to build from

the present back to the origins to see how the doctrines reflect the positive aspects of the legal expression of contact between Europe and the native nations of the Western hemisphere as well as the more malign aspects. We do not neglect the history—it proves critical for understanding the ways in which federal Indian law is *sui generis* in domestic jurisprudence—but we see how that history is always haunted by the specter of colonialism, extra-legality, and finally international legal norms. Self-scheduled examination or paper option. Students are required to attend the first day of class.
3 Course cr

ENV 777a, Water Quality Control Jaehong Kim

Study of the preparation of water for domestic and other uses and the treatment of wastewater for recycling or discharge to the environment. Topics include processes for removal of organics and inorganics, regulation of dissolved oxygen, and techniques such as ion exchange, electro dialysis, reverse osmosis, activated carbon adsorption, and biological methods. 3 Course cr

ENV 793a, Climate Change, Societal Collapse, and Resilience Harvey Weiss

Collapse documented in the archaeological and early historical records of the Old and New Worlds, including Mesopotamia, Mesoamerica, the Andes, and Europe. Analysis of politico-economic vulnerabilities, resiliencies, and adaptations in the face of abrupt climate change, anthropogenic environmental degradation, resource depletion, “barbarian” incursions, or class conflict. 3 Course cr

ENV 803a, Green Markets: Voluntary and Information Approaches to Environmental Management Matthew Kotchen

Two observations provide motivation for this seminar. First, voluntary- and information-based approaches to environmental management are becoming increasingly common. Environmental managers should thus be familiar with the approaches, along with their advantages and limitations. Second, students, advocates, and managers are often searching for ways outside of formal regulatory contexts to promote more pro-environmental behavior. There exists a sizable academic literature on the subject, but rarely is it covered in courses on environmental management. The seminar is based on critical readings of original research papers with an eye toward real-world application. We consider both theoretical and empirical studies. In addition to focusing on results, students learn about how different research methods are appropriate for answering different types of questions. Readings span economics, psychology, and political science. Classes are, for the most part, based on structured discussion, rotating responsibility for presentation and critique. A preliminary list of topics to be covered includes: Public Disclosure Strategies for Pollution Control; Behavioral Responses to Environmental and Resource Information; Conservation Behavior Part I: “Doing One’s Part”; Conservation Behavior Part II: “Doing More than One’s Part”; Eco-labeling; Voluntary Environmental Programs; Corporate Social Responsibility and the Environment; Insights of Behavioral Economics and Psychology. Students with prior experience in economics and/or statistics are given priority for enrollment. 1½ Course cr

ENV 804a, Economics of Natural Resources Robert Mendelsohn

Linking of abstract economic concepts to concrete policy and management decisions. Application of theoretical tools of economics to global warming, pollution control, fisheries, water management, forestry, recreation, and mining. 3 Course cr

ENV 805a, Seminar on Environmental and Natural Resource Economics

Kenneth Gillingham and Matthew Kotchen

This seminar is based on outside speakers and internal student/faculty presentations oriented toward original research in the field of environmental and natural resource economics and policy. Presentations are aimed at the doctoral level, but interested master's students may enroll with permission of the instructors. 1½ Course cr

ENV 807a, Business and Environment: Management and Strategy Marian Chertow

This survey course focuses on the policy and business logic for making environmental issues and sustainability a core focus of corporate strategy and management. Students are asked to analyze when and how sustainability leadership can translate into competitive advantage by helping to cut costs, reduce risk, drive growth, and promote brand identity and intangible value. The course combines lectures, case studies, and class discussions on management theory and tools, the legal and regulatory frameworks that shape the business-environment interface, and the evolving role of business in society, including how to deal with a world of diverse stakeholders, increasing transparency, and rising expectations related to corporate environmental, social, and governance (ESG) performance. Self-scheduled examination. 3 Course cr

ENV 814a, Energy Systems Analysis Narasimha Rao

This lecture course offers a systems analysis approach to describe and explain the basics of energy systems, including all forms of energy (fossil and renewable), all sectors/activities of energy production/conversion, and all energy end uses, irrespective of the form of market transaction (commercial or noncommercial) or form of technology (traditional as well as novel advanced concepts) deployed. Students gain a comprehensive theoretical and empirical knowledge base from which to analyze energy-environmental issues as well as to participate effectively in policy debates. Special attention is given to introducing students to formal methods used to analyze energy systems or individual energy projects and also to discussing traditionally less-researched elements of energy systems (energy use in developing countries; energy densities and urban energy use; income, gender, and lifestyle differences in energy end-use patterns) in addition to currently dominant energy issues such as climate change. Active student participation is required, including completion of problem sets. Participation in extra-credit skill development exercises (presentations, fact-finding missions, etc.) is encouraged. Invited outside speakers complement topics covered in class. 3 Course cr

ENV 816a, Electric Utilities: An Industry in Transition Lawrence Reilly

The U.S. electric utility industry is a \$400 billion business with capital expenditures on the order of \$100 billion per year to replace aging infrastructure, implement new technologies, and meet new regulatory requirements. A reliable electricity infrastructure is essential for the U.S. economy and the health and safety of its citizens. The electric industry also has a significant impact on the environment. In the United States, electric power generation is responsible for about 40 percent of human-caused emissions of carbon dioxide, the primary greenhouse gas. Electric utilities in the United States are at a crossroads. Technological innovations, improving economics, and regulatory incentives provide a transformational opportunity to implement demand-side resources and distributed energy technologies that will both lower emissions and improve service to customers. Such significant changes could, however, disrupt existing utility business models and therefore may not be fully supported by incumbent utilities. This course

focuses on the issues, challenges, risks, and trade-offs associated with moving the U.S. utility industry toward a cleaner, more sustainable energy future. We explore how utilities are regulated and how economic factors and regulatory policies influence outcomes and opportunities to align customer, environmental, and utility shareholder interests to craft win-win-win solutions. 3 Course cr

ENV 817a, Urban, Suburban, and Regional Planning Practice David Kooris
Our cities, towns, and regions represent the cumulative impact of planning policies implemented at multiple scales over the past century. This course explores the dynamic trends facing the United States and its communities and the evolution in planning practice that is occurring at the local and regional scale to address them. It looks at both suburban and urban approaches. The recent deep recession, climate change, and a lack of social cohesion call for a new triple bottom-line approach to decision-making for our future. Existing policies and governance structures are not always well suited for the new challenges and opportunities that we face. Local, state, and the national government are, to varying degrees, crafting new solutions to the challenges of urban and suburban America. 3 Course cr

ENV 822a, Strategic Communication: Delivering Effective Presentations Taly Reich
The focus of this half-term course is to increase students' competencies in oral communication and presentation. Developing and executing effective communication strategies is essential in a variety of business settings. Business leaders are often expected to present their message with confidence and clarity to employees, clients, partners, investors, and the public. This highly interactive, practical course helps students develop confidence in public speaking through weekly presentations and assignments, lectures and discussions, guest speakers, simulated activities, and filmed feedback. Students are given the opportunity to present both individually and as part of a team. We explore the essentials of communication strategy and persuasion: audience analysis, message construction, communicator credibility, and delivery. Students at all levels of mastery of public speaking will benefit from this course. Limited enrollment. YSE students must submit a statement of interest to the instructor. Students are required to attend the first class session in order to remain enrolled in or bid for the course. 1½ Course cr

ENV 824a, Environmental Law and Policy Robert Klee
This course provides an introduction to the legal requirements and policy underpinnings of the basic U.S. environmental laws, including the Clean Air Act, Clean Water Act, and various statutes governing waste, food safety, and toxic substances. Students examine and evaluate current approaches to pollution control and resource management as well as the "next generation" of regulatory strategies, including economic incentives, voluntary emissions reductions, and information disclosure requirements. This course investigates mechanisms for addressing environmental issues at the local, regional, and global levels, and explores the intersection between environmental and energy law and policy. Students gain an understanding of overarching legal and policy concepts, such as federalism, administrative procedure, separation of powers, environmental justice, judicial review, and statutory interpretation. 3 Course cr

ENV 826a, Foundations of Natural Resources Policy and Management Susan Clark
This is a research seminar focused on the foundations of natural resources policy and management and designed for students in any subfield of environmental studies or

other disciplines. The seminar's purpose is to help students improve their skills in thinking more effectively and acting more responsibly in complex management and policy cases. The seminar explores comprehensive and integrated (interdisciplinary) concepts and methods for thinking about problems in natural resources policy and management and proposing solutions to them. Once students gain familiarity with the core concepts and methods of standpoint clarification and problem orientation, they apply them to particular issues in natural resources policy and management. Each student, alone and in collaboration with a group, is responsible for researching a particular problem. Each student circulates a draft of their paper to other seminar participants and lectures on and leads discussion of it in a class session. It is hoped that papers of sufficient quality will be published. Each student is also required to engage in course exercises outside of class and in in-class dialogue on a weekly basis. The seminar is designed to lay the foundation for all future work and for all other policy courses. Enrollment limited to eighteen; application required. 3 Course cr

ENV 827a, Animal Law Staff

This course examines the application of the law to nonhuman animals, the rules and regulations that govern their treatment, and the concepts of “animal welfare” and “animal rights.” The course explores the historical and philosophical treatment of animals; discusses how such treatment impacts the way judges, politicians, lawyers, legal scholars, and lay people see, speak about, and use animals; surveys current animal protection laws and regulations, including overlap with such policy issues as food and agriculture, climate change, and biodiversity protection; describes recent political and legal campaigns to reform animal protection laws; examines the concept of “standing” and the problems of litigating on behalf of animals; discusses the current classification of animals as “property” and the impacts of that classification; and debates the merits and limitations of alternative classifications, such as the recognition of “legal rights” for animals. Students write a series of short response papers. An option to produce a longer research paper for Substantial or Supervised Analytic Writing credit is available. Follows Law School calendar. 2 Course cr

ENV 835a, Seminar on Land Use Planning Jessica Bacher

Land use control exercised by state and local governments determines where development occurs on the American landscape, the preservation of natural resources, the emission of greenhouse gases, the conservation of energy, and the shape and livability of cities and towns. The exercise of legal authority to plan and regulate the development and conservation of privately owned land plays a key role in meeting the needs of the nation's growing population for equitable housing, energy, and nonresidential development as well as ensuring that critical environmental functions are protected from the adverse impacts of land development. This course explores the multifaceted discipline of land use and urban planning and their associated ecological implications. Numerous land use strategies are discussed, including identifying and defining climate change mitigation and adaptation strategies, including affordable housing, community revitalization, energy development and siting, equitable community engagement, transit-oriented development, building and neighborhood energy conservation, distressed building remediation, jobs and housing balance, coastal resiliency, and biological carbon sequestration. The course also explores how recent events impact these planning issues. The focus is on exposing students to the basics of land use and urban planning, especially in the United States but also internationally,

and serving as an introduction for a YSE curricular concentration in land use. Guest speakers are professionals involved in sustainable development, land conservation, smart growth, renewable energy, and climate change management. 1½ Course cr

ENV 836a / ANTH 541a / HIST 965a / PLSC 779a, Agrarian Societies: Culture, Society, History, and Development Kalyanakrishnan Sivaramakrishnan and Marcela Echeverri Munoz

An interdisciplinary examination of agrarian societies, contemporary and historical, Western and non-Western. Major analytical perspectives from anthropology, economics, history, political science, and environmental studies are used to develop a meaning-centered and historically grounded account of the transformations of rural society. Team-taught. 3 Course cr

ENV 840a, Climate Change Policy and Perspectives Daniel Esty

This course examines the scientific, economic, legal, political, institutional, and historic underpinnings of climate change and the related policy challenge of developing the energy system needed to support a prosperous and sustainable modern society. Particular attention is given to analyzing the existing framework of treaties, law, regulations, and policy—and the incentives they have created—which have done little over the past several decades to change the world’s trajectory with regard to the build-up of greenhouse gas emissions in the atmosphere. What would a twenty-first-century policy framework that is designed to deliver a sustainable energy future and a successful response to climate change look like? How would such a framework address issues of equity? How might incentives be structured to engage the business community and deliver the innovation needed in many domains? While designed as a lecture course, class sessions are highly interactive. Self-scheduled examination. 3 Course cr

ENV 850a, International Organizations and Conferences Gordon Geballe

This course focuses on the historic, present, and future roles of international environmental conferences. Through guest speakers, assigned readings, and discussions, students explore conferences including IUCN’s World Conservation Congress, the UN’s Convention on Biological Diversity, UNFCCC’s climate change conference, the UN Environment Programme (UNEP), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Students, along with visiting alumni and guest speakers, discuss the roles and impacts of the various conferences in international environmental decision-making and the future of international conferences in a post-COVID world. The course also assesses the potential for improved equity, justice, and inclusion in international conferences, organizations, and their secretariats. Students attending fall conferences (in person or virtually) develop work plans to be completed during the conference under the guidance of their host delegations and the instructor. 3 Course cr

ENV 878a, Climate and Society: Past to Present Michael Dove

Seminar on the major traditions of thought regarding climate, climate change, and society, drawing largely on the social sciences and humanities. Section I, introduction to the course. Section II, disaster: the social origins of disaster; and the attribution of societal “collapse” to extreme climatic events. Section III, causality: climatic perturbation as revelatory; the politics of weather/climate control; and nineteenth–twentieth-century theories of environmental determinism. Section IV, history and culture: explaining differences among people in terms of differences in climate; and western vs. non-western views of climate. Section V, knowledge: folk knowledge of

climate; and local views of climatic perturbation and change. Section VI, politics: climatic change and perturbation in national politics; and contesting global views of climate change. The goal of the course is to clarify the historical, cultural, and political drivers of climate change debates and discourses. Enrollment capped. 3 Course cr

ENV 884a, Industrial Ecology Yuan Yao

Industrial ecology studies (1) the flows of materials and energy in industrial and consumer activities, (2) the effects of these flows on the environment, and (3) the influences of economic, political, regulatory, and social factors on the flow, use, and transformation of resources (White 1994). The goals of the course are to define and describe industrial ecology; to demonstrate the relationships among production, consumption, sustainability, and industrial ecology in diverse settings and at multiple scales; to show how industrial ecology serves as a framework for the consideration of environmental and sustainability-related aspects of science, technology, and policy; and to define and describe tools, applications, and implications of industrial ecology. 3 Course cr

ENV 894a, Green Building: Issues and Perspectives Peter Yost and Melissa Kops

Our built environment shapes the planet, our communities, and each of us. Green buildings seek to minimize environmental impacts, strengthen the fabric of our cities and towns, and make our work and our homes more productive and fulfilling. This course is an applied course, exploring both the technical and the social-business-political aspects of buildings. Topics range from building science (hygrothermal performance of building enclosures) to indoor environmental quality; from product certifications to resilience (robust buildings and communities in the face of disasters and extended service outages). The purpose of the course is to build a solid background in the processes and issues related to green buildings, equipping students with practical knowledge about the built environment. Extensive use is made of resources from BuildingGreen, Inc., one of the leading information companies supporting green building and green building professionals. The course takes a “joint-discovery” approach with substantial emphasis on research and group project work, some fieldwork, and online individual testing. There are too many topics within green building to cover in one term, so the course is broken down into two sections. The first six weeks focus on the following topics, led by the instructor and/or an expert guest lecturer: building science, materials, indoor environmental quality, rating programs and systems, resilience, systems integration. The second half of the course focuses on selected topics driven by students and their particular interest/academic focus. The class meets once a week, with the instructor available to students that same day. Enrollment limited to twenty-four. 3 Course cr

ENV 898a, Environment and Human Health Michelle Bell

This course provides an overview of the critical relationships between the environment and human health. The class explores the interaction between health and different parts of the environmental system including weather, air pollution, greenspace, environmental justice, and occupational health. Other topics include environmental ethics, exposure assessment, case studies of environmental health disasters, links between climate change and health, and integration of scientific evidence on environmental health. Students learn about current key topics in environmental health and how to critique and understand scientific studies on the environment and human health. The course incorporates lectures and discussion. 3 Course cr

ENV 900a, Doctoral Student Seminar and Responsible Conduct of Research

Oswald Schmitz

This course provides the foundation for doctoral study at the School of the Environment. Students learn what it means to do scholarly research as well as become adept with philosophy of science and research methodology and proposal writing, as a basis for exploring diverse approaches to formulating and addressing research questions. Students work with their advisers to put these concepts and principles into practice to develop the basis for their dissertation research (including building bibliography, identifying and crafting research questions, formulating research hypotheses, and drafting a research proposal). Students further learn about funding opportunities and procedures for submitting grants. The course also covers professional ethics and responsible conduct of research, including ethical approaches to inquiry and measurement, data acquisition and management, authorship and publication, peer review, conflicts of interest, mentoring, collaborative research, and animal and human subjects research. Finally, the course explores ethical ways to advocate for the application of scholarly knowledge in the interest of environmental problem solving. Weekly assigned readings support concepts and issues addressed in class. Students present their embryonic research ideas in class and use feedback from the group to further develop their ideas.

ENV 902a, Environmental Anthropology Research Lab Michael Dove

A biweekly seminar for Dove doctoral advisees and students in the combined YSE/Anthropology doctoral program. Presentation and discussion of grant proposals, dissertation prospectuses, and dissertation chapters; trial runs of conference presentations and job talks; discussion of comprehensive exams, grantsmanship, fieldwork, data analysis, writing and publishing, and the job search; and collaborative writing and publishing projects.

ENV 907a, Justice, Equity, Diversity, and Sustainable Laboratory Seminar

Dorceta Taylor

This course is only open to students who are working in the Justice, Equity, Diversity, and Sustainability Initiative (JEDSI) Lab. The course examines food insecurity; inequities in access to fresh, healthy, and affordable foods; and disparate impacts arising from exposure to environmental hazards. Students also examine issues such as energy and health justice, as well as the distribution of and access to environmental amenities such as parks and open space. 3 Course cr

ENV 953a, Sustainable Business Capstone Consulting Clinic Peter Boyd

This course provides students with a capstone experience, consulting to established organizations confronting real-life challenges at the intersection of business and environmental sustainability. Students apply tools and insights gained in this and other courses, including ENV 553, to a defined project, creating deliverables that will be useful to the partner organizations. The course is designed to help prepare anyone who wishes to become a consultant after graduation, though it is also intended to be useful for those who plan to engage with consultants in their career post-Yale. Client briefs are topical and relevant to challenges and opportunities faced by their organizations, and intersect business and environmental opportunity. They are also likely to surface potential trade-offs and require addressing cross-cutting critical issues of justice, equity, diversity, and inclusion—all complicated by living through, and emerging from, the pandemic. Clients are on hand to provide insight and guidance at points throughout

the term. Through a combination of individual and group work and lively discussion, students establish an understanding of the client's wider purpose and priorities; then help co-define and connect the potential success of the project with the organization's broader goals. Students work together in small consulting teams, holding each other accountable to perform and creating defined deliverables for the client. 3 Course cr

ENV 954a, Management Plans for Protected Areas P. Mark Ashton

A seminar that comprises the documentation of land use history and zoning, mapping and interpretation, and the collection and analysis of socioeconomic, biological, and physical information for the construction of management plans. Plans are constructed for private smallholders within the Quiet Corner Initiative partnership managed by the Yale School Forests. In the past, plans have been completed for the Nature Conservancy; Massachusetts Trustees of Reservations; town land trusts; city parks and woodlands of New Haven, New York, and Boston; and the Appalachian Mountain Club. Ten days fieldwork. Enrollment limited to twenty. Must also register for ENV 957, Field Skills in Land Stewardship. Prerequisite: ENV 659 or permission of the instructor. 3 Course cr

ENV 955a, Seminar in Research Analysis and Communication in Forest Ecology

P. Mark Ashton

A seminar for students in their second year working on research projects. Students start by working through the peer-review publication process. They identify the scope and scale of the appropriate journal for their work. They then work on their projects, which comprise data and projects in applied forest ecology. Discussions involve rationale and hypothesis testing for a project, data analysis techniques, and reporting and interpretation of results. It is expected that manuscripts developed in the course are worthy of publication and that oral presentations are of a caliber for subject area conferences and meetings. Extensive training in writing and presenting work is provided. Enrollment limited to twelve. Prerequisite: ENV 659 or permission of the instructor. 3 Course cr

ENV 957a, Field Skills in Land Stewardship P. Mark Ashton

An intensive technical and field ecology seminar that is taught in combination with ENV 954. In this course students learn field skills that contribute to the base set of information used in assessment, planning, prescription writing, and management of forest and open space. Students learn to identify plants; interpret surficial geology, soils, and hydrology; and read the land for use history. Assessments learned in a series of field exercises comprise forest health and invasive surveys, wildlife habitat evaluations, and soil surveys and wetland delineation. This culminates in understanding and developing a site classification. Lastly, students learn field inventory and sampling techniques in data collection for soils, geology, plants, and wildlife habitat. 3 Course cr

ENV 959a, Clinic in Climate Justice, Law, and Public Health Laura Bozzi

This course is an innovative collaboration between Yale School of Public Health and Vermont Law School and includes faculty and students from both Yale and Vermont Law School. In the course, interdisciplinary student teams carry out applied projects at the intersection of climate justice, law and public policy, and public health. Each team works with a partner organization (e.g., state agency, community organization, other nongovernmental organization) to study, design, and implement a project, typically through community-based participatory research practices. The course affords

the opportunity to have a real-world impact by applying concepts and competencies learned in the classroom. Class sessions and team meetings are conducted using a hybrid approach that combines in-person, all-virtual, and virtually connected classroom arrangements. This course should be of interest to graduate and professional students across the University and is open to Yale College juniors and seniors. In addition, this course is one of the options available to students to fulfill the practice requirement for the M.P.H. degree at YSPH and the capstone requirement for the M.E.M. degree at YSE. Students who plan to enroll must complete an application, which will be used to match each student with a clinic project. Check the course's Canvas site or contact the Yale instructor at laura.bozzi@yale.edu for more information. Prerequisite: EHS 547 or permission of the instructor. 3 Course cr

ENV 960a, Climate Solutions Capstone: Nature-Based Solutions Clinic Brad Gentry

The course pairs teams of students with state and local governments and nonprofit organizations to help advance the nature-based solutions/investments they are pursuing. The focus of the course is on how policy and financing efforts might help advance nature-based solutions from either a mitigation perspective (e.g., storing carbon) or in adaptation and resilience efforts (e.g., managing flooding, reducing temperatures, improving health). Our hope is to attract students from different specializations and backgrounds to form multidisciplinary teams. Projects being offered through the course can be seen on the YSE course site. The course sessions start with an overview of climate and nature-based solutions, followed by practice-based sessions on developing teamwork and consulting skills. The focus on nature-based solutions covers many aspects of the implementation needs of such approaches, such as policy analysis, financing structures, targeted research, and beyond. Once teams are formed and project scopes refined, most class sessions are more focused on allowing students to work on their projects, as well as providing opportunities for feedback and guidance. At the end of the term, the students present their findings and recommendations to their project sponsors and each other. This course is being coordinated with ENV 979, the spring climate solutions capstone on subnational actors (taught with more of an energy focus) so that active and ongoing relationships can be maintained with clients over time. 3 Course cr

ENV 970a, Environmental Protection Clinic: Policy and Advocacy Doug Kysar,

Rebecca Loomis, Jennifer Skene, Conor Dwyer Reynolds, David Hawkins, and Lisa Suatoni

The clinic's mission is to train students in environmental advocacy through skills-based seminars, interdisciplinary project work, and collaboration with the Natural Resources Defense Council and other significant environmental organizations. Students are assigned to teams of two-to-four members drawn from both the Law School and the School of the Environment. Teams work on a project developed in collaboration with client organizations, with most projects having both legal and policy components. In addition to covering substantive areas of environmental law, clinic seminars help students master the tools of effective environmental advocacy, including the abilities to research law and science, write and cite persuasively, navigate environmental organizations, and manage projects cooperatively. Enrollment limited. For all questions, please email Alison Gocke at alison.gocke@yale.edu. *Note:* Attendance at the first class meeting is mandatory for admitted students and for those on the waiting list who wish to remain in consideration for admission if a place becomes available.

Admitted students must confirm their participation in advance of the first class by a date designated by the instructors. A no-drop policy applies. 3 Course cr

ENV 972a, Advanced Environmental Protection Clinic Doug Kysar, Rebecca Loomis,

Jennifer Skene, Conor Dwyer Reynolds, David Hawkins, and Lisa Suatoni

Open only to students who have successfully completed the Environmental Protection Clinic (ENV 970). No statement of interest required. Attendance at clinic seminar is optional. For all questions, please email Alison Gocke (alison.gocke@yale.edu). Permission of the instructor required.

ENV 977a, Nature-Based Carbon Solutions in the Urban Realm: The Yale Campus as a Case Study Oswald Schmitz

This integrative capstone course broadly explores how urban areas can be designed to enlist their natural biophysical features (soils, vegetation, and biodiversity) to enhance natural carbon storage. Students work collaboratively to develop the final product of the course: a nature-based carbon storage plan for the Yale campus and natural lands. Students learn fundamental scientific principles of the carbon cycle and learn to apply these principles to leverage urban natural biophysical features to facilitate carbon capture and storage. Students further learn to conduct economic analysis and financial accounting of carbon storage as investments to offset urban emissions. Finally, students meet with Yale campus planners and land managers to learn about the kinds of information needed to formulate actionable policy to maximize carbon storage on the Yale campus and natural lands as an offset to Yale's carbon emissions. 3 Course cr

ENV 980a, Social Justice in the Global Food System Capstone Kristin Reynolds

This course explores social justice dimensions of today's globalized food system, considering justice in terms of sociopolitical and environmental dynamics. We connect theory and practice through work with community-based organizations working at the nexus of food, agriculture, and social justice. The capstone project work is grounded in food and social justice concepts examined through course materials and seminar discussions. We examine how governmental environmental strategies affect social equity in the food system at multiple scales. We discuss how land grabbing or food insecurity is connected to relative power on the global stage. We consider how phenomena such as structural violence and neoliberalization surface within the food system, and what this means for sustainability and justice—in urban and rural settings. We examine and debate concepts and practices including food sovereignty, agroecology, black agrarianism, and the right to food used to advance positive change. Through the capstone project, students have the opportunity to deepen learning and contribute to the work of community groups forging pathways for equity and justice in the food system, particularly among communities historically marginalized from mainstream economies and policy making. Project work includes meetings with organizational leaders to understand context and co-develop appropriate project approaches. Students work in groups to conduct in-depth research and analysis, and engage in additional professional and educational activities connected to the project. Student groups prepare a final presentation and report to be shared with the partner organizations. The course provides opportunities to develop competencies in analyzing global food system phenomena through social justice frameworks, and working within diverse settings on food and social justice issues, as practice for management, policy making, and other professional roles. 3 Course cr

ENV 999a, Directed Research-Doctoral Staff**Modules**

ENV 001a, Urban Ecosystem Analysis Colleen Murphy-Dunning, Joseph Orefice, Marlyse Duguid, Stuart DeCew, Mark Bradford, Amity Doolittle, and Gaboury Benoit

The goal of this module is to acquaint students with field skills for characterizing and understanding urban ecosystems. It is designed to complement the Yale Myers module, which uses an ecosystem framework and examines comparatively undisturbed systems. In contrast, the urban module explicitly considers how the actions of humans and the existence of the built environment alter ecosystem structure and function. Throughout this module, students also gain a better understanding of the New Haven community, including its resources, history, and challenges. At the same time this module is an opportunity to explore themes and techniques that are especially well suited for human-dominated environments. An emphasis is also placed on qualitative methods and social science research, to complement quantitative methods highlighted at Yale Myers.

o Course cr

ENV 002a, People and Pathways Colleen Murphy-Dunning

In this module, students explore the breadth and dimensions of our diverse perspectives and backgrounds, the flows of energy and food in our economy, and how personal and societal forces shape the development of our communities. Students begin by exploring how we value, produce, and consume energy and food. We examine our own perspectives and environmental footprints, explore the theory and physical realities in energy and food systems, and begin identifying key questions on how to reimagine and adapt these systems toward a sustainable future. We explore the dimensions of these issues through interactive workshops at Yale, lectures from faculty and state leaders, and site visits to better understand the communities, infrastructure, and systems upon which we all depend.

o Course cr

ENV 003a, Ecosystem Science Colleen Murphy-Dunning

In their book on the fundamentals of ecosystem science, Weathers et al. (2013) start by introducing the idea that humans have devised many intellectual systems to understand and manage the complicated world in which we live, from physics to philosophy to economics. One such intellectual system is ecosystem science. It is a science that tries to make sense of the complex natural world and help us to better manage it. Ecosystems can be highly varied in size and character, from a little pool of water in a tree cavity, to a redwood forest, to a neighborhood in a city, to a frigid river, to the entire globe. Nevertheless, a common set of tools and ideas can be used to analyze and understand these varied and complicated systems. The results of these analyses are both intellectually satisfying and useful in managing our planet for the benefit of humankind and nature. Indeed, because of the growing demands placed on living and nonliving resources by humans, it could be argued that ecosystem science is one of the essential core disciplines needed to understand and manage the modern planet Earth. The overarching objective of this module is to explore the ecosystem framework for sustainable resource science, assessment, and management.

o Course cr

ENV 005a, Apprentice Forester Program P. Mark Ashton, Joseph Orefice, and
Marlyse Duguid
Apprentice Forester Program for SAF requirements. o Course cr

CENTERS AND PROGRAMS AT THE SCHOOL OF THE ENVIRONMENT

Teaching, research, and outreach at the Yale School of the Environment are greatly enhanced by the centers and programs that have been initiated by faculty over the years. The centers and programs, each with a different concentration, are a key component of a student's learning experience. They allow students to gain hands-on clinical and research experience through funded student internships and projects, coordination of faculty research in areas of common interest, and creation of symposia, conferences, newsletters, and outreach programs.

Centers and programs are funded primarily through private foundations, nongovernmental organizations, state and federal agencies, international granting agencies, and private corporations. The nature and number of centers and programs evolve over time, reflecting faculty and student interest. Under the current organizational structure, each program falls under the umbrella of a center, which enables further collaboration and resource sharing.

Center for Green Chemistry and Green Engineering at Yale

The mission of the Center for Green Chemistry and Green Engineering at Yale is to advance sustainability by catalyzing the effectiveness of the Green Chemistry and Green Engineering community. Green Chemistry and Green Engineering represent the fundamental building blocks of sustainability. Working in these disciplines, chemists and engineers are creating the scientific and technological breakthroughs that will be crucial to the future success of the human economy.

The Center for Green Chemistry and Green Engineering at Yale works to stimulate and accelerate these advances. Guided by four core operating principles – (1) Insist on scientific and technical excellence and rigor, (2) Focus on generating solutions rather than characterizing problems, (3) Work with a diverse group of stakeholders, and (4) Share information and perspectives broadly – we seek to accomplish four key objectives:

- Advance the science
- Prepare the next generation
- Catalyze implementation
- Raise awareness

The center concentrates on five focus areas:

Research The center supports and advances research in Green Chemistry and Green Engineering (GC&GE), a critical component to building the community, designing and discovering innovative solutions, and achieving a sustainable future. The center serves as a catalyst to both Yale and the greater GC&GE communities for discipline-specific and cross-disciplinary research collaborations focused on key areas of GC&GE within science, technology, and policy for sustainability.

Policy and outreach The center engages in policy, communication, and outreach initiatives that raise awareness of—and support for—GC&GE. In this dialogue the center engages with a wide network of stakeholders, including NGOs, industry, academia, and government, as well as local communities and the general public.

Education A robust educational program is an essential element of the center. Center activities are focused on educating undergraduate and graduate students in the principles and practice of GC&GE. The center also serves the wider academic community by providing opportunities for faculty training and by developing and disseminating GC&GE curriculum materials.

International collaborations GC&GE are rapidly spreading through both industrialized nations and the emerging economies. In all regions, the center engages with the network of scientists, engineers, policy makers, business people, and public health and environmental experts focused on sustainability science on behalf of the greater good.

Industrial collaborations GC&GE can only provide meaningful impact on the challenges of global sustainability when implemented on a large scale. For this reason, collaboration with industry is a key part of the center's work. Direct engagement creates a dialogue that informs industry of the latest research breakthroughs in the field of sustainable science and technology. Likewise, such engagement informs academic researchers on industry's most important concerns. This dialogue facilitates a direct line for implementation of these innovations.

Center for Industrial Ecology

The interdisciplinary, international team at the Yale Center for Industrial Ecology (CIE) brings training in the environmental, social, and policy sciences, engineering, and management to the analysis of materials and energy in society. Researchers study stocks, flows, and transformation of physical resources in systems at scales ranging from materials, products, and product life cycles, to factories, cities, countries, and globally. The center is dedicated to the development and promotion of research, teaching, and outreach in industrial ecology. Current topics of interest include:

1. Mapping and analyzing stocks and flows of resources and their associated drivers, costs, and environmental impacts with tools such as material flow analysis (MFA), life-cycle assessment (LCA), and environmentally extended input-output analysis (EEIOA).
2. Uncovering social, industrial, and economic dynamics that shape stocks and flows of materials and energy in the analysis and development of the circular economy, sustainable production and consumption, and industrial symbiosis/closed-loop systems.
3. Developing and analyzing policies and corporate strategy relevant for industrial ecology including extended producer responsibility (EPR) and business models supporting sustainable, resource-efficient outcomes.

Together with the Center for Green Chemistry and Green Engineering, CIE forms a specialization in the master's program as well as a broad learning community.

JOURNAL OF INDUSTRIAL ECOLOGY

CIE is home to a highly regarded international journal. Published by Wiley and owned by Yale University, the *Journal of Industrial Ecology* is a peer-reviewed, online, multidisciplinary, bimonthly publication on industry and the environment that is aimed at both researchers and practitioners in academe, industry, government, and advocacy organizations. It is edited in partnership with Tsinghua University in Beijing, China, and the Norwegian University of Science and Technology in Trondheim, Norway. The *Journal of Industrial Ecology* is indexed in Science Citation Index Expanded and Scopus, and it is the official journal of the International Society for Industrial Ecology. See www.wileyonlinelibrary.com/journal/jie.

INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROGRAM

The Industrial Environmental Management (IEM) program at Yale aims to equip students with an integrated set of skills with which to tackle the complex, multifaceted environmental problems facing industrial and corporate managers. The core intellectual framework for IEM is the systems science of industrial ecology, which examines materials, water, and energy in a common framework. Students can pursue specialization and certification through the M.E.M. program in Industrial Ecology and Green Chemistry.

An active Industrial Environmental Management and Energy Student Interest Group (SIG) sponsors field trips to industrial sites, on-campus talks by visiting managers, and symposia on current topics of interest.

PROGRAM ON SOLID WASTE POLICY

The program has two principal goals: (1) to inform contemporary policy discussions about solid waste, materials management, and the circular economy by applying the methods and findings of industrial ecology and the social and environmental sciences; and (2) to develop workable policy solutions that address the impediments to safe, cost-effective solid waste management and the complexities of comprehensive materials and life-cycle management. Current research focuses on high-resolution mapping of nonhazardous industrial waste to improve the potential for reuse and on policies for extended producer responsibility.

Environmental Leadership and Training Initiative

In April 2006 YSE launched the Environmental Leadership and Training Initiative (ELTI) – <http://elti.yale.edu> – thanks to a generous grant from the Arcadia Fund, a charitable fund of Lisbet Rausing and Peter Baldwin. ELTI's mission is to cultivate the capacity of people from all sectors and backgrounds to restore and conserve tropical forest landscapes using strategies that support biodiversity and livelihoods. Through complementary, applied, and action-oriented training and follow-up leadership support, ELTI strives to accelerate on-the-ground conservation and restoration actions with the people who depend upon and govern tropical forest landscapes. ELTI's training program includes place-based, experiential field courses with partners in five primary countries and online courses based out of YSE for a global audience. To date, ELTI has trained more than 8,000 leaders around the globe through more than 200

training events. The ELTI team has also facilitated 323 events with alumni of ELTI courses, who include farmers, practitioners, and decision makers in tropical forest landscapes, as part of ELTI's effort to facilitate application of knowledge learned.

ELTI's programs are implemented via partnerships with more than twenty organizations located in tropical countries around the globe, including universities, research institutes, government ministries, NGOs, and community organizations. The field programs are anchored in training landscapes with partners in Brazil, Colombia, Panama, Indonesia, and the Philippines, which enable ELTI to offer short courses for different audiences on a range of themes. The online program is global in reach and includes intensive and interactive short courses lasting six to eight weeks, as well as a yearlong certificate program. The field courses are taught in local languages, and several online courses are available in French, Spanish, Portuguese, and Indonesian. YSE faculty participate in teaching ELTI courses, and ELTI's student internship program provides a unique opportunity for YSE students to develop and implement capacity development courses and materials. Students can also take YSE seminars taught by ELTI team members, as well as conduct field research in ELTI's training landscapes on natural and social science themes.

Hixon Center for Urban Ecology

The Hixon Center for Urban Ecology provides an interdisciplinary forum for scholars, students, and practitioners to work collaboratively on integrated research, teaching, and outreach to improve our understanding and management of urban ecosystems within the United States and around the globe.

The ecological health and integrity of urban ecosystems have a profound impact on urban economic productivity and quality of life. Pioneering research, new theoretical understanding, and innovative practice will be required to provide the knowledge and tools necessary to foster healthy natural systems essential for the future well-being of the modern city and the people who live there. This need has never been greater than today, when a majority of the world's population either resides in or is rapidly migrating to urban areas.

To accomplish its mission, the center builds upon and strengthens the work of several programs at the School, including the Urban Resources Initiative and the Urban Watershed Program.

The Hixon Center has a strong focus on collaboration within the School, across the University, and beyond. The center sponsors lectures and symposia as a means to disseminate ideas about and understanding of the critical issues confronting urban ecosystems.

The Hixon Center also supports Yale faculty initiatives to optimize sustainability and resilience through observational and experimental research on the urban water cycle, green infrastructure, vegetation, and urban green spaces. In addition, the center supports students' basic and applied research through fellowships connected to current Hixon Center priorities in the realm of urban ecology. The center will continue to build the urban environmental focus at Yale while strengthening the School's urban

dimension, creating new models and approaches for addressing urban environmental challenges.

URBAN RESOURCES INITIATIVE

The Urban Resources Initiative (URI) is a not-for-profit/university partnership dedicated to community participation in urban ecosystem management. A substantial body of learning recognizes that sustainable urban ecosystem management depends on the meaningful participation of local residents. Those who know local conditions and whose daily actions influence the health and quality of urban ecosystems must play a central role in designing and implementing rehabilitation strategies. Sustainable natural resource management and conservation cannot be achieved by technical, scientific solutions alone. Conservation efforts, especially in urban areas, must emphasize social revitalization alongside environmental restoration.

Yale's URI program draws on these essential elements to facilitate community participation in urban ecosystem management. "Community" is defined quite broadly. It includes the group of neighborhood leaders with whom interns work to restore lands near their homes. Community is a group of teens who are learning how to assess the tree canopy of their city. Community is the staff and leadership of city agencies who have the responsibility and resources to be environmental stewards of their city. URI's approach responds to and engages all of these communities.

URI offers a number of clinical learning opportunities that allow YSE students to gain real-world practice in their field. Listening to local concerns and developing environmental programs in cooperation with neighborhood groups, NGO partners, schools, and city agencies are the cornerstones of our work. Through these programs YSE students can make a real contribution to the New Haven community while they enrich their academic work by applying theory learned in the classroom with supervised clinical training. These programs include the Community Greenspace program, GreenSkills, environmental education/job training program, research opportunities, and training in urban forestry practices.

Community Greenspace Each summer YSE students work as community foresters as part of the Community Greenspace program, a citywide initiative to revitalize New Haven's neighborhoods by planting trees along streets and in parks, remediating lead from soil in front yards, reclaiming neglected lots, and building community. Each intern works with community groups, which develop restoration goals and design an implementation strategy for the summer. The interns support neighbors in conducting an inventory of existing trees, selecting species, preparing sites for new plantings, and planting perennials, shrubs, and trees.

The Greenspace program is an opportunity for Yale students to learn urban forestry practices. Neighbors initiate the process by identifying their environmental priorities in their community. URI looks to the local experts—the people who live in New Haven neighborhoods—as partners in defining and then assessing, designing, implementing, and sustaining urban restoration sites.

Environmental education/green job training Over nearly two decades, URI staff and interns worked directly within the New Haven school system, teaching thousands of elementary school students about environmental stewardship through the exploration of the city's open spaces. During the 2009–2010 academic year, the City of New Haven

officially incorporated the pond and rivers units from URI's Open Spaces as Learning Places curriculum into the district's science curriculum. Now, students in every sixth-grade classroom have the opportunity to learn about watersheds as they canoe New Haven's rivers and explore local ponds.

Launched in 2007, URI's GreenSkills program creates an opportunity to address a critical predicament—a growing deficit in and unequal distribution of New Haven's street-tree canopy that can be countered by a green job program bringing together Yale and high school interns. In 2010 the GreenSkills program was expanded to include adults with barriers to employment, particularly those whose life experience includes incarceration. Its goals are to improve New Haven's street-tree canopy by engaging adults and local high school students in the planting effort, thereby providing them with job skills and mentoring opportunities in environmental careers, and to foster environmental stewardship.

Research URI activities provide valuable research opportunities in community organizing and development, urban forestry management, environmental education, and monitoring and evaluation of community-managed ecosystems. Some examples of past student research activities include a community survey to determine human health impacts of vacant lands; measurement of biological communities found in Greenspace sites and abandoned lots; how community group dynamics affect urban street-tree survival; and measurement of how children's behavior at play is affected by the design of schoolyards.

URBAN WATERSHED PROGRAM

The Urban Watershed Program promotes faculty and student research on the unique relationships, impacts, and demands of watersheds in urban areas. Watersheds in urban areas encounter unique stresses, while sharing common characteristics and following natural laws of all water systems. Urban watersheds are often polluted and heavily engineered. Stream courses are often transferred to pipes running underground, and thereby visually disconnected from residents. Population density exacerbates stresses on waterways. As cities emerge from a period when they ignored their rivers and harbors, new relationships are being developed with adjacent waterways. Past practices that marginalized waterscapes from the urban environment are being reevaluated. Now, with more attention to urban environmental quality and environmental justice, there is a greater understanding of the vital role waterways play as sources of open space, transportation, recreation, and habitat.

The Urban Watershed initiative currently has two major activities. One is a study of an urban ecosystem restoration project situated in an urban park. For nearly a century, flow in the West River, on the New Haven–West Haven border, has been regulated by tide gates that allow the outward flow of freshwater, but restrict flushing by seawater. These restrictions are being replaced by self-regulating tide gates, which close only in the rare event of potentially hazardous storm surges. As a result, the current degraded tidal freshwater marsh will evolve into a healthier salt marsh, the ecosystem type that existed there in the past. This restoration is being monitored, using a nearby, gated marsh that will not be restored. Monitored parameters are water quality, hydrology, vegetation, fish populations, bird communities, and the attitudes, values,

and recreational and stewardship behaviors of people who use the park. This before-after-control-impact (BACI) experiment is almost unprecedented at this scale.

The second major activity of the Hixon Center's Urban Watershed Program is to monitor, evaluate, and optimize green infrastructure solutions to manage stormwater and improve water quality in partnership with the City of New Haven. In New Haven, three rivers flow through densely settled urban areas before draining into New Haven Harbor and Long Island Sound. Large areas of impervious surface and compacted soils lead to significant overland flow of contaminated stormwater. The contamination in the waterways is the direct result of stormwater runoff from the city's impervious surfaces, which overload the city's combined and separate storm sewer systems and eventually discharge into Long Island Sound. Green infrastructure, such as infiltration bioswales, significantly reduces storm flows and improves water quality. URI and EMERGE (a local NGO), in partnership with the City of New Haven, are installing two hundred bioswales to improve stormwater quality and reduce storm flows to separated and combined sewers.

YALE EXPERIMENTAL WATERSHED

The Yale Experimental Watershed (YEW) is a living laboratory of urban ecology located adjacent to the School. The YEW, a 5.5-acre site between Prospect and Mansfield streets, is being transformed from an underutilized and overgrown site to one that is of great value to the University and the community—where academic research and teaching are conducted, and community members can learn and explore.

Fieldwork and research projects have included tree identification and mapping, coarse woody material assessment, soil sampling and analysis, land cover mapping, bird habitat investigation, and site hydrology and groundwater monitoring. The site has also been used as an educational resource for Yale courses, for high school students in the Common Ground Green Jobs Corps, and for participants in the Yale SCHOLAR program.

Justice, Equity, Diversity, and Sustainability Initiative

The Justice, Equity, Diversity, and Sustainability Initiative (JEDSI) seeks to examine the relationship between social inequalities, lived experiences, and environmental outcomes. To this end, JEDSI currently focuses on six primary areas of research, teaching, and practice:

Environmental history We study environmental history and events from historical and contemporary perspectives. Our work analyzes the contributions of leading figures in the environmental sector. We also bring to the fore people whose voices are often ignored in conservation narratives.

Nature, outdoor experiences, attitudes, and perceptions Our research examines racial, ethnic, gender, and class differences in environmental behavior and in nature and outdoor experiences. We also study environmental attitudes and perceptions.

Environmental inequalities, resilience, and sustainability We theorize about the environmental justice (EJ) movement, engage with EJ activists and communities,

and conduct research about historical and contemporary EJ issues. We examine the occurrence of environmental hazards and discriminatory policies and practices, and we document the existence of open space and other amenities in EJ communities. We identify forms of community resilience that can help communities thrive and foster long-term sustainability.

Food and farming: access, sovereignty, and justice We research food systems, food insecurity, access to healthy and affordable foods, food sovereignty, and food justice. We probe discriminatory policies and practices faced by farmers of color and work with small farmers, urban farmers, and community gardeners. We collect data on the types of food outlets in cities and examine the roles that small farmers, farmers markets, urban farmers, community gardeners, and emergency food assistance organizations play in reducing food insecurity. We also study mechanisms that communities and groups use to enhance food sovereignty.

Institutional diversity, transparency, and workforce dynamics We produce pathbreaking research and publications on diversity in the environmental sector. We study students in environmental programs; the staff, board, and members of environmental institutions; preference to work in green organizations; wages and equity in said organizations; recruitment and retention in the sector; the adoption of diversity measures and the disclosure of diversity activities in enviros; and leadership in these institutions. Environmental professionals use our work to enhance diversity in environmental organizations and the broader environmental movement.

Diversity pathway programming We operate two pathway programs that moved to Yale from the University of Michigan in fall 2020.

- The Doris Duke Conservation Scholars Program provides two summers of internship opportunities to undergraduates who are historically underrepresented in the conservation field. The scholars usually spend one summer conducting research with professors and research scientists and the second summer interning in an environmental nonprofit. About a fourth of our program participants pursue graduate degrees.
- The Environmental Fellows Program provides a summer internship to master's and doctoral students who are historically underrepresented in the environmental sector. The fellows participate in internships at environmental grant-making foundations or environmental nonprofits around the country.

JEDSI also organizes the New Horizons in Conservation Conference. This annual national conference is a gathering of students and professionals of color in the environmental field as well as others who are interested in learning more about and advancing diversity practices in their organizations. Almost 900 people from around the world participated in the 2021 conference. The next conference will be held April 13–16, 2022, at Yale as well as online.

Additionally, JEDSI mentors the students and young professionals in its programs and lab. And it develops profiles of environmental professionals of color who have outstanding careers in the environmental sector. The database contains information on 200 individuals. The profiles, which are available to people seeking mentors, also help

students and young professionals understand how senior professionals forge successful careers.

For additional information, see <https://jedsi.yale.edu>.

The SEARCH Center: Solutions for Energy, AiR, Climate, and Health

The SEARCH Center (Solutions for Energy, AiR, Climate, and Health), funded by a five-year Air, Climate and Energy (ACE) Center grant from the U.S. Environmental Protection Agency, aligns cutting-edge scientific research and technology to support the EPA's strategic goals of protecting human health and the environment. Based at Yale University, with major participation by Johns Hopkins University, the SEARCH Center involves more than two-dozen researchers across a number of institutions including North Carolina State University, Stanford University, Northeastern University, University of Chicago, University of Michigan, and the Pacific Northwest National Laboratory.

The center's main objectives are to: (1) investigate energy-related transitions underway across the United States by combining state-of-the-science modeling of energy systems, air quality, climate, and health; (2) characterize factors contributing to emissions, air quality, and health associated with key energy-related transitions in order to understand how these factors affect regional and local differences in air pollution and public health today and in the future; and (3) identify key modifiable factors (e.g., transportation, land use, power generation) and how those factors and their air pollution impacts are likely to change over time. The center has four research projects, two support units, and an administrative core.

- Project 1 (*Modeling Emissions from Energy Transitions*) encompasses economic modeling of national emissions and air quality under different energy policy scenarios.
- Project 2 (*Assessment of Energy-Related Sources, Factors, and Transitions Using Novel High-Resolution Ambient Air Monitoring Networks and Personal Monitors*) measures and examines real-world exposure to air pollution using stationary and personal monitors.
- Project 3 (*Air Quality and Climate Change Modeling*) draws upon projects 1 and 2 to model relationships between air quality, policy, and health under various climate change scenarios using air quality and climate change modeling.
- Project 4 (*Human Health Impacts of Energy Transitions*) estimates the health impacts of various air quality scenarios from the other SEARCH projects and identifies populations most vulnerable to air pollution.
- The Policy and Decision-Making Unit bridges the divide that often separates science and policy through iterative processes bringing SEARCH scientists and real-world policy makers together.
- The Environmental Data Science Unit provides statistical support for all four projects. This unit is developing statistical methods to address the scientific questions of interest and will facilitate integration across different projects. This

unit will also encourage reproducible research through dissemination of data and statistical code, where feasible.

The Forests Dialogue

The Forests Dialogue (TFD) was established in 2000 to provide international leaders in the forest sector with an ongoing, multi-stakeholder dialogue platform and process focused on developing mutual trust, a shared understanding, and collaborative solutions to challenges in achieving sustainable forest management and forest conservation around the world. In recent years, TFD has expanded its remit to include all actors across the landscape, not just the forest sector. TFD is an autonomous, unincorporated organization hosted by Yale University and with a secretariat based at the Forest School at YSE.

The goal of TFD is to reduce conflict among stakeholders over the use and protection of vital forest resources. Since its founding, TFD has brought together more than 3,000 diverse leaders to work through more than twenty compelling forest and landscape sustainability challenges. TFD uses the multi-stakeholder dialogue model to progress from building trust among participants to achieving substantive, tangible outcomes in such a way that participants are committed to advocate for and work to implement those broadly agreed upon outcomes. TFD is currently orienting much of its work to focus on questions related to forests and climate change. Current TFD initiatives include: Climate Positive Forest Products (CPFP), The Land Use Dialogues (LUD), and Tree Plantations in the Landscape (TPL). Developing initiatives include: Fire and Climate, Forests and Climate Change (FCC), and Water and Climate.

TFD is governed by a steering committee composed of leading individuals representing key stakeholder groups from around the world. TFD hires YSE students as program associates each term to work with the secretariat and steering committee members on all facets of TFD's operations. Duties include background research for the initiatives, communications, secretariat support, dialogue planning, and running the dialogues on location. Students who are interested in forests, climate, and landscape-related issues as well as those who are interested in stakeholder engagement are encouraged to apply to work with TFD.

Tropical Resources Institute

The mission of the Tropical Resources Institute (TRI) is to support interdisciplinary student research on the most complex challenges confronting the conservation and management of tropical environments worldwide. TRI was created in 1983 to strengthen the School's involvement in the study and management of tropical resources. The institute recognizes that the problems surrounding the conservation and management of tropical resources are rapidly increasing in complexity, while demands on those resources continue to grow. Emerging structures of global environmental governance and local conflicts over land use require new strategies and leaders able to function across diverse disciplines and sectors, and at multiple scales. TRI seeks to train students to be leaders in this new era, equipping them with the resources and tools this new generation will require to equitably address the challenges ahead.

TRI serves as the nexus within YSE through which students conduct interdisciplinary research and outreach activities throughout the tropics. Within the broader Yale community, TRI serves as a clearinghouse for research and educational activities pertaining to tropical countries, societies, and environments.

TRI is run by a director, student program assistants, and a faculty steering committee. Its directorship and its student grant program are supported by its own endowments.

Research TRI administers the TRI Fellowship, an endowed fellowship program that supports several dozen master's and doctoral students conducting natural and social science research in the tropics each year. Following the mission of TRI, these research projects are typically interdisciplinary and problem-oriented and cover a wide range of issues concerning the management and conservation of tropical resources. TRI also administers a small grants program focused on Sri Lanka. More information on both programs can be found at <https://tri.yale.edu>.

Education Throughout the academic year, TRI sponsors workshops, discussions, and speakers that focus on timely conservation and development issues in the global tropics. TRI provides mentoring and training to graduate students in research design, proposal writing, and field methods; after research, it helps them develop articles for *Tropical Resources*, TRI's annual journal of student research.

Outreach TRI supports partnerships with international organizations in many tropical regions in order to create innovative research opportunities for YSE students. TRI works to build networks among scholars and international institutions to facilitate research and the dissemination of knowledge on tropical resource issues. TRI distributes its annual *Bulletin* to an international list of practitioners and academics, and it hosts a website, <https://tri.yale.edu>.

Publications TRI publishes *Tropical Resources: The Bulletin of the Yale Tropical Resources Institute*, an annual journal of student research funded by grants from TRI. This publication is disseminated both internationally and domestically to a list that includes practitioners, academics, and institutions that focus on tropical issues; it can also be read online at <https://tri.yale.edu/tropical-resources>. *Tropical Resources* typically contains articles by a dozen or more students based on a wide range of field research experiences.

Ucross High Plains Stewardship Initiative

The Ucross High Plains Stewardship Initiative (UHPSI) fosters land stewardship and conservation in the American West through teaching, research, and outreach. This is primarily achieved through mentoring students on applied research and management projects in collaboration with Western partners. Research and management projects are diverse and interdisciplinary, and address Western conservation challenges. Our broad network of more than fifty partners comprises ranchers, nonprofits, federal and state agencies, and academics. Students engaged with UHPSI develop knowledge and skills in Western issues and natural resource management on private and public lands through our collaborative, experiential-learning framework.

For more information about UHPSI, visit <https://highplainsstewardship.com/meet>.

Yale Carbon Containment Lab

The Yale University Carbon Containment Lab (CC Lab) designs, tests, and develops novel, low-cost, safe, scalable, and verifiable methods of atmospheric carbon containment. Its goal is to contribute to containing one billion metric tons of CO₂ equivalent (MTCO_{2e}) emissions by the end of the century. Anticipating that society will eventually establish policies and markets that compensate verifiable reductions in atmospheric greenhouse gas emissions, the CC Lab will develop carbon containment solutions that can fulfill those demands. The CC Lab is led by Executive Director Dean Takahashi, longtime senior director of the Yale Investments Office, along with managing directors Anastasia O'Rourke '09 Ph.D. and Justin Freiberg '10 M.E.Sc.

The CC Lab focuses on designing and testing approaches that are inspired and supported by natural systems to contain carbon. The CC Lab does this by designing and testing novel systems and methods for gathering, treating, storing, and verifying carbon with bench experiments, pilot site experiments, and larger field experiments; analyzing and measuring methods for carbon containment from a variety of technical, economic, financial, environmental, and social impact perspectives; and engaging markets, paving the way for financing and deploying innovative carbon containment methods at scale, and with sustainable business models.

The CC Lab portfolio currently includes projects sequestering carbon using geologic storage, capturing fugitive methane emissions, and exploring opportunities for carbon containment in wood biomass. Some are led by the CC Lab team and some by external partners and collaborators across a variety of sectors and specialties. Operating as part of the Yale School of the Environment, the CC Lab draws on the exceptional expertise and skills of Yale University faculty, alumni, students, staff, and other external partners and collaborators. The CC Lab eagerly supports student intern opportunities for both undergraduate and graduate students and encourages students to check the CC Lab's website for current opportunities. Additionally, the CC Lab welcomes opportunities and proposals for collaboration.

Interested in working with us? Send your résumé or proposal to carboncontainment.lab@yale.edu.

Yale Center for Business and the Environment

The Yale Center for Business and the Environment (CBEY) educates and inspires interdisciplinary leaders through business solutions to systemic environmental problems.

CBEY joins the strengths of two world-renowned graduate schools—the Yale School of the Environment (YSE) and the Yale School of Management (SOM)—together with a global network of thought leaders and practitioners working at the interface of business and the environment. Home to the oldest and nationally preeminent joint-degree program in business and the environment, we address the need for both environmentally minded business leaders and skilled managers in environmental organizations.

Our approach is characterized by pragmatic optimism: we hold simultaneous ambitions for incremental and systemic change. While we recognize that this takes time, we also

recognize a profound urgency in the work that we do. We are building world-class resources for our community of alumni, students, academics, corporate executives, governments, and NGOs in three key areas: (1) new models for markets and finance; (2) innovation and entrepreneurship; (3) “intrapreneurship” and systems change.

CBEY’s vision is to build a purpose-driven community that collaborates in diverse networks to:

- CBEYond boundaries, disciplines, and challenges and move toward sustainable solutions
- CBEYond current business models by catalyzing innovation and entrepreneurship
- CBEYond traditional financial markets by growing sustainable investment
- CBEYond the degree into active-learning communities and vibrant alumni networks

To learn more, visit <http://cbey.yale.edu>.

Yale Center for Environmental Communication

The Yale Center for Environmental Communication (YCEC) conducts research on the psychological, cultural, and political factors that influence environmental attitudes and behavior; teaches students and trains working professionals; informs and engages the public through environmental journalism; and supports a global network of organizations seeking to build public and political will for environmental solutions.

Research The YCEC conducts world-class research on climate change and environmental communication. Research results are published in public reports, interactive maps, and scientific articles and are shared via public presentations and private briefings. The findings are used by hundreds of news organizations, including CBS, ABC, NBC, CNN, the *New York Times*, *Washington Post*, Associated Press, the *Guardian*, Xinhua, and many others.

Teaching and training The YCEC provides courses in environmental communication for Yale graduate and undergraduate students and training programs for working environmental professionals.

Environmental journalism The YCEC informs and engages the public in environmental science and solutions through several environmental journalism initiatives, including *Yale Environment 360*, Yale Climate Connections, the Environmental Film Festival at Yale, *Sage Magazine*, and the *Yale Environmental Review*.

Supporting a global network of environmental communicators The YCEC organizes national and international meetings, conferences, and events to convene climate change and environmental leaders and supports a global network of environmental communication scholars and practitioners.

Yale Center for Environmental Law & Policy

The Yale Center for Environmental Law & Policy, a joint undertaking between Yale Law School and the Yale School of the Environment, seeks to advance fresh thinking and analytically rigorous approaches to environmental decision-making across disciplines, sectors, and scales. In addition to its research activities, the center aims

to foster discussion and collaboration across the Yale campus on environmental law and policy issues at the local, regional, national, and global levels. Current projects include the biennial Environmental Performance Index (<https://epi.yale.edu>), which ranks countries on their sustainability performance across eleven policy categories covering both environmental public health and ecosystem vitality; the Global Commons Stewardship Index, which ranks countries based on their impact on the shared resources of the Global Commons; the Yale Initiative on Sustainable Finance (<https://cbey.yale.edu/yale-initiative-on-sustainable-finance-yisf>); and Remaking the Global Trading System for a Sustainable Future. Additional research themes include: sustainable investing and ESG reporting, corporate sustainability metrics, rethinking environmental protection for the twenty-first century, corporate sustainability strategy, and global governance. The center also plays a role in leading a major YSE initiative, Yale Environmental Dialogue, which aims to promote conversations on challenging sustainability issues with a goal of bridging political divides. For additional information, please visit <https://envirocenter.yale.edu>.

Yale Forest Forum

The Yale Forest Forum (YFF) was established in 1994 by Professor John Gordon to engage a diverse group of leaders in forestry and forest policy and management in the United States. The group's initial work was to convene the Seventh American Forest Congress to collaboratively develop and articulate a common vision and set of next steps for the future of U.S. forests with over 5,000 stakeholders across the country.

The YFF now serves as the special events hub of the Forest School at the Yale School of the Environment. YFF offers weekly lunch talks during the academic year, providing opportunities to hear from leaders in forest management, conservation, or policy in an informal setting. YFF also offers and supports other engaging forest-related events in collaboration with individuals and organizations throughout YSE.

YFF is governed by a small group of the Forest School staff, faculty, and students to ensure that programming is timely, cutting-edge, and relevant to the work of the School.

Yale Forum on Religion and Ecology

The Yale Forum on Religion and Ecology is an international, multireligious project contributing to a new academic field and an engaged moral force of religious environmentalism. With its conferences, publications, monthly newsletter, and website, it explores religious worldviews, texts, and ethics in order to broaden understanding of the complex nature of current environmental concerns. The forum recognizes that religions need to be in dialogue with disciplines such as science, economics, law, and policy in seeking comprehensive solutions to both global and local environmental problems. The co-founders and co-directors of the forum are John Grim and Mary Evelyn Tucker.

The forum arose from a series of ten conferences on World Religions and Ecology organized by Tucker and Grim at Harvard from 1996 to 1998. They were the series editors for ten volumes from Harvard University Press (1997–2004) that resulted from the conferences.

Since its creation, the forum—which has been based at Yale since 2006—has played an active role in promoting the study of religion and ecology as an emerging field of study and an ethical force for ecojustice. Courses are now taught at colleges and high schools across North America and in Europe, Canada, and Australia. Moreover, a new movement of religious environmentalism is growing in churches, synagogues, temples, and mosques around the world. Now every major religion has statements on the importance of ecological protection and ecojustice. With its many advisers and partners, the Yale Forum on Religion and Ecology has played an active role in these developments. It has formed a special partnership with the United Nations Environment Programme Faith for Earth Initiative.

The forum's website (<https://fore.yale.edu>), hosted at YSE, is the premier site for research, education, engagement, and outreach in the field of religion and ecology. The website contains information and statements on the world's religions and their ecological contributions. The site highlights news, events, books, and articles related to world religions and ecology as well as grassroots projects. The site also highlights Forum Spotlights (a video and podcast series of interviews with scholars and other figures doing work related to religion and ecology) and a blog with features on topics of interest to the field. Website highlights are also featured in a monthly email newsletter distributed to about 12,000 people. The website hosts a fully searchable and filterable database of engaged faith-based projects that address the United Nations Sustainability Development Goals. This project was completed in conjunction with the U.N. Environment Programme (UNEP), Parliament of the World's Religions, United Religions Initiative, and the Bhumi Project. Projects will continue to be added to the site on a quarterly basis.

The work of the forum includes:

Joint master's degree program at Yale The Yale School of the Environment (YSE) and Yale Divinity School (YDS) offer a joint master's degree program in religion and ecology—the first of its kind in North America. It is aimed at students who wish to integrate the study of environmental issues and religious communities in their professional careers and at those who wish to study the cultural and ethical dimensions of environmental problems. The joint degree is supported by co-appointed faculty and by the forum. Beginning in 2017, the program has hosted a graduate student-led conference on religion and ecology each spring.

Massive Open Online Courses (MOOCs) A series of courses, *Religions and Ecology: Restoring the Earth Community*, was released on Yale/Coursera in 2021. The series includes an introduction to the topic as well as studies in , indigenous religions, Western religions, and Asian religions.

Publications The forum has helped to create a new field of research and teaching in religion and ecology that has implications for environmental policy. Recent publications include:

- *Ecology and Religion*, by John Grim and Mary Evelyn Tucker, in a YSE series from Island Press (2014).
- A number of volumes by the late cultural historian Thomas Berry, most recently: *Selected Writings* (Orbis Books, 2014), *The Sacred Universe* (Columbia University Press, 2009), *The Christian Future and the Fate of Earth* (Orbis Books, 2009), and

Evening Thoughts (University of California Press, 2006), all edited by Tucker and Grim.

- The *Routledge Handbook of Religion and Ecology*, edited by Willis Jenkins, Tucker, and Grim (2016).
- The first biography of Thomas Berry, by Tucker, Grim, and Andrew Angyal (Columbia University Press, 2019).

In addition, the forum has supported the first journal in the field, *Worldviews: Global Religions, Culture, and Ecology*, and Tucker and Grim have served on the editorial board since its founding in 1997. They have also served, with Leonardo Boff and Sean McDonagh, as advisers for the twenty-volume Ecology and Justice series from Orbis Books.

Conferences The forum has organized and cosponsored many conferences, including the Thomas Berry Award and Lecture, which has run since 1998. Others include:

- “Renewing Hope: Pathways of Grassroots Religious Environmentalism” (YSE and YDS, 2007, to celebrate the film *Renewal*).
- Yale Forum on Religion and Ecology’s 10th Anniversary Symposium (Yale Club of New York, 2008).
- Thomas Berry Memorial (Cathedral of St. John the Divine, New York, 2009).
- “Environmental Dis/locations: Environmental Justice and Climate Change” (YSE and YDS, 2010).
- With YSE and TERI University, an interdisciplinary workshop focused on the Yamuna River (Delhi and Vrindavan, India, 2011).
- Interdisciplinary conference for the premiere of the film *Journey of the Universe* (YSE and YDS, 2011).
- “Religion and Environmental Stewardship” (YSE and YDS, 2012).
- “Religion and Ecology and Our Planetary Future” (Harvard Center for the Study of World Religions, 2016, celebrating the twentieth anniversary of the Harvard conferences).
- “Living Earth Community: Ways of Being and Knowing the World” (Oak Spring Garden Foundation, Virginia, 2018, with former YSE Dean, Peter Crane).
- With University of Connecticut: “Abrahamic Traditions and Environmental Change” (Rhodes, Greece, 2019).
- With Georgetown University: “Thomas Berry and ‘The Great Work’” (Georgetown University, 2019).

In addition, the forum participates in interdisciplinary conferences worldwide, including conferences with the United Nations Environment Programme (UNEP); United Nations Educational, Scientific and Cultural Organization (UNESCO); the International Union for Conservation of Nature (IUCN); the Dialogue of Civilizations; the Earth Dialogues led by Gorbachev; the Earth Charter; the Religion, Science and the Environment Symposia, led by the Greek Orthodox Patriarch, Bartholomew; and the Parliament of the World’s Religions.

Film The forum was a principal adviser for the film *Renewal: Inspiring Stories from America's Religious Environmental Movement* (2007) and organized a conference at Yale when the film came out.

Multimedia project Tucker and Grim collaborated with evolutionary philosopher Brian Swimme on the Emmy Award-winning film *Journey of the Universe* (2011), which was broadcast on PBS and is available on Amazon. The *Journey of the Universe* project includes a book published by Yale University Press; a twenty-part Conversation series of interviews with scientists and environmentalists available in video and in podcasts; curricular materials for teaching; a newsletter, and a website (<http://www.journeyoftheuniverse.org>). In 2016 Tucker and Grim created another series of MOOCs (Massive Open Online Courses) for Yale/Coursera, titled *Journey of the Universe: A Story for Our Times*.

Yale Program on Climate Change Communication

The Yale Program on Climate Change Communication conducts scientific research on public climate change knowledge, attitudes, policy preferences, and behavior, and on the underlying psychological, cultural, and political factors that influence them. We also engage the public in climate change science and solutions, in partnership with governments, media organizations, companies, and civil society, and with a daily national radio program, Yale Climate Connections.

PARTNERSHIPS

The School of the Environment is a multidisciplinary learning center with tremendous resources, both within and outside the School. The School is engaged in partnerships that range from alliances with other Yale programs and schools to formal agreements with many external organizations and universities. These relationships enrich the School and add important dimensions to the YSE learning experience.

Within Yale

Students of the School of the Environment often take advantage of the faculty and resources of other schools and departments within the Yale system. YSE has several types of arrangements that enable students to fully benefit from the University.

The School has joint-degree agreements with the School of Architecture, Divinity School, School of Engineering & Applied Science, Law School, School of Management, School of Public Health, and Graduate School of Arts and Sciences. For further information on joint degrees, please refer to Joint Master's Degree Programs in the chapter Master's Degree Programs, and to Combined Doctoral Degree in the chapter Doctoral Degree Program.

The School has also cultivated relationships with key faculty members of other divisions of the University who have research and teaching interests that overlap with the School's foci. These faculty hail from the schools of Architecture, Engineering & Applied Science, Management, and Medicine, as well as the departments of Earth and Planetary Sciences, Ecology and Evolutionary Biology, Economics, and Anthropology, among others. For a full list of the faculty with joint appointments, see Secondary Appointments in the chapter Faculty and Administration.

YALE INSTITUTE FOR BIOSPHERIC STUDIES

Established in May 1990, the Yale Institute for Biospheric Studies (YIBS) serves as a key convener for Yale University's research and training efforts in the environmental sciences. YIBS is committed to the teaching of environmental studies to future generations and provides physical and intellectual centers and programs for research and education that address fundamental questions that will inform the ability to generate solutions to the biosphere's most critical environmental problems. There are currently three YIBS centers: the Center for Earth Observation, the Earth System Center for Stable Isotopic Studies, and the Center for Genetic Analysis of Biodiversity. YIBS also provides master's and doctoral student research support through various small-grant initiatives and a doctoral dissertation-enhancement grant program. For full information on YIBS and its associated programs and centers, see <http://yibs.yale.edu>.

YALE PEABODY MUSEUM OF NATURAL HISTORY

The Yale Peabody Museum of Natural History, founded in 1866, contains one of the great scientific collections in North America. Numbering more than thirteen million objects and specimens, the collections are used for exhibition and for research by scholars throughout the world. Each year, an increasing number of specimens from the collection are available online at <http://peabody.yale.edu>.

The mission of the Peabody Museum is to advance understanding of Earth's history through geological, biological, and anthropological research, and by communicating the results of this research to the widest possible audience through publication, exhibition, and educational programs.

Fundamental to this mission is stewardship of the museum's collections, which provide a remarkable record of the history of Earth, its life, and its cultures. Conservation, augmentation, and use of these collections become increasingly urgent as modern threats to the diversity of life and culture continue to intensify.

The museum's collections are a major component of the research and teaching activities of the Peabody and Yale. The curators and staff are engaged in contributing new knowledge based on the museum's research materials. All collections are used in undergraduate and graduate teaching and research, as well as in public programs and exhibitions. The Yale Peabody Museum fills many important roles on the Yale University campus, particularly as it has expanded its role in the community and the region, thereby offering a "front door" to the University for the general public.

In 1995 a formal collaboration was established among the Peabody Museum, the Yale Institute for Biospheric Studies, and the School of the Environment. This environmental partnership recognizes the Peabody Museum as a resource and catalyst for interdisciplinary research on Earth's history and environment, and seeks to strengthen the intellectual ties between the museum and other groups with a shared interest in environmental research at Yale. The School of the Environment maintains a close association with the Peabody.

The Peabody Museum Coastal Field Station on Long Island Sound in Guilford, Connecticut, is used collaboratively by YSE faculty, staff, and students for research on coastal and estuarine systems. The station is a thirteen-mile drive east of Yale and provides centrally located access to one of the country's most important estuaries. The station includes a boat ramp, deep-water moorings, and two boats. There is also simple laboratory space within the field station building, Beattie House. Nearby research lands available to YSE students include an island (Horse Island), coastal pond (Guilford Pond), and salt marsh complex (the Richards Property). The newly constructed Horse Island research station will be available to YSE faculty, staff, and students for research and teaching on the island beginning in fall 2021. To visit or utilize these properties and facilities, contact the Peabody Museum Office of Student Programs.

External Partnerships

The School of the Environment has partnership agreements with numerous local, national, and international organizations beyond the Yale campus. The following are a few examples of these arrangements.

NATIONAL UNIVERSITY OF SINGAPORE

The National University of Singapore is a top research university with a far-reaching faculty and a multinational student body. The university offers a Master of Science in Environmental Management that provides environmental management education for senior and mid-level managers in corporations, institutions, and government and nongovernmental organizations. This program is multidisciplinary, with the combined

resources of seven of the university's faculties, and also draws on the expertise of established environmental agencies and institutions both locally and globally.

In 2001 the Yale School of the Environment (YSE) entered into an official agreement with the National University of Singapore School of Design and Environment to share scientific, academic, and technical resources; exchange faculty and students; and cooperate in research, outreach, and conferences. We have had an active faculty exchange and a joint research program examining industrial ecology and urban metabolism in Singapore.

NEW YORK BOTANICAL GARDEN

YSE enjoys a reciprocal relationship with the Graduate Studies Program at the New York Botanical Garden. The Botanical Garden program, which began in 1896, currently enrolls about a dozen students who are carrying out studies in systematic and economic botany and applied plant ecology at field sites around the world. The program's expertise spans the spectrum of both systematic and economic botany. It is operated in conjunction with several other academic institutions, including YSE.

The resources of the New York Botanical Garden include one of the largest botanical libraries in the world, an herbarium and 10,000 species of living plants housed in several greenhouses, as well as an electron microscope, environmental chambers, and instrumentation for radiobiological, biochemical, anatomical, molecular, phytochemical, chemosystematic, numerical taxonomy, and vegetational studies. YSE offers a combined doctoral degree with the New York Botanical Garden, which is funded by the Lewis B. Cullman Fellowship. NYBG faculty teach courses at YSE in tropical plant taxonomy, applied plant ecology, and ethnobotany.

EXTERNAL JOINT-DEGREE PROGRAMS

YSE also has joint-degree agreements with the Pace University School of Law, the Vermont Law School, and Tsinghua University School of Environment. Further information on these programs is available through the Office of Admissions.

ADMISSIONS: MASTER'S DEGREE PROGRAMS

The Yale School of the Environment offers four two-year master's degrees: the professionally oriented Master of Environmental Management (M.E.M.) and Master of Forestry (M.F.), and the research-oriented Master of Environmental Science (M.E.Sc.) and Master of Forest Science (M.F.S.). The one-year midcareer Master of Environmental Management and Master of Forestry degree programs are designed for individuals with seven or more years of professional experience related to the environment or forestry. Students are currently enrolled in both programs; however, new student enrollment into the midcareer programs has been suspended until further notice.

Learning about YSE

The best way to learn about the School is to visit YSE virtually or in person before submitting an application. The Office of Admissions offers both a virtual and formal campus visit program throughout the year, and we encourage prospective students to visit during one of these events for the most comprehensive view of YSE. Offered every other Monday throughout the fall term and monthly in the spring term, these visits are a great option to make the most of your visit. Programming begins at both 9:30 a.m. and 12 p.m. and runs approximately two hours. Participants will meet students and staff to become familiar with the School's mission and goals, degree requirements and courses, opportunities for research and applied projects, career development, and life at Yale. Registration is required at <https://apply.environment.yale.edu/portal/main-event-page>. YSE faculty and staff also conduct outreach events online, around the United States and abroad, including at graduate school fairs, hosting virtual and off-campus information sessions, and visiting schools and universities. To learn if a representative will be coming to your area, please visit the admissions event schedule at <https://apply.environment.yale.edu/portal/main-event-page>.

Individual appointments are also available based on staff availability. Please note that for individual campus visits, it is best to visit Monday through Thursday, as few classes are held on Fridays, which are generally reserved for field trips and research. Weekend visits are not available. Visitors are welcome to sit in on classes of interest with no advance notice; the class schedule each term is posted at <http://environment.yale.edu/courses>. You can also connect with our admissions assistant directors online by scheduling a one-on-one meeting on the appointment page: https://apply.environment.yale.edu/portal/schedule_appointment. Feel free to directly contact faculty members whose work is of interest to you; email is best. We do not conduct formal interviews as part of the admissions process. To schedule a visit, please contact us at admissions.yse@yale.edu.

The Admissions website, <http://environment.yale.edu/admissions>, has extensive information about the School. Should you have additional questions, we are pleased to correspond with you by email, or you may schedule a telephone conversation with our Admissions staff. The Admissions office can be reached at admissions.yse@yale.edu or telephone at 800.825.0330.

Application Procedures

The application form for admission to the YSE professional and research master's degrees (M.E.M., M.E.Sc., M.F., or M.F.S.) may be acquired online at <https://apply.environment.yale.edu/apply>. This form includes complete instructions for the application requirements.

Questions concerning admission or the application process should be directed to admissions.yse@yale.edu, or 800.825.0330. Admissions offers for YSE enable students to begin their study in the fall term only. The priority deadline for master's application consideration is December 15. Completed individual admissions files submitted by midnight EST on this date are guaranteed to receive a review by the Admissions Committee.

Previous applicants planning to reapply to YSE must submit a new application form and current application fee, an updated résumé/curriculum vitae, and transcripts depicting all academic work not included in the previous application. We also recommend that applicants consider submitting an updated research or personal statement. Admissions records including application forms and supplemental materials are held for two years by the Office of Admissions. Provided reapplication occurs within two admissions cycles, all required materials previously submitted to the Office of Admissions will be incorporated into the new application as requested. Documents submitted prior to the admissions cycle for a fall 2019 entry are no longer available.

Preparation for Admission

In order to excel in their program of study at YSE as well as a career in environmental management, all M.E.M. students are expected to be conversant in four foundational knowledge areas. These areas are: Physical Science, Social Science, Ecology, and Microeconomics.

Each fall term, four thoughtfully designed courses—tailored specifically for incoming M.E.M. students—are offered for students to learn, refresh, and deepen their understanding in each of these knowledge areas. In the process, students form a strong foundation to engage with the rigorous M.E.M. curriculum and approach complex problems through an interdisciplinary lens.

For incoming students with substantial academic or professional experience in any of the four areas, waiver exams will be made available each spring and summer preceding enrollment at YSE. Students may make two attempts to pass a waiver exam. Students who are able to demonstrate sufficient proficiency in a foundational knowledge area through passing an exam will receive a waiver.

Students who do not take or pass a waiver exam will be auto-enrolled by the registrar to complete the required foundational knowledge course(s). These courses must be completed during a student's first fall term:

ENV 511	Ecological Foundations for Environmental Managers
ENV 512	Microeconomic Foundations for Environmental Managers
ENV 521	Physical Science Foundations for Environmental Managers
ENV 522	Social Science Foundations for Environmental Managers

FOUNDATIONAL KNOWLEDGE PREPARATION

YSE recommends that incoming M.E.M. students have previously taken the following undergraduate courses in order to be prepared for the M.E.M. curriculum:

PHYSICAL SCIENCE

A course that satisfies one of the following:

- Earth science course covering geosphere, atmosphere, and hydrosphere
- Two out of four of the following: hydrology, soil science, environmental chemistry, and climate science

SOCIAL SCIENCE

Two courses in any of the following areas:

- Environmental Governance
- Environmental Anthropology
- Environmental History
- Environmental Justice
- Environmental Sociology
- Human Geography
- Political Ecology
- Religion and Ecology

ECOLOGY

A course in at least one of the following areas:

- General Ecology
- Biodiversity Science
- Population or Community Ecology
- Ecosystem Science or Ecosystems Ecology

MICROECONOMICS

- A course in Principles of Microeconomics

Application Requirements

Candidates for admission must hold a four-year baccalaureate degree or an equivalent international degree, and are required to provide the following materials:

1. A completed online application form.
2. A résumé/curriculum vitae. Indicate full- or part-time for each job/internship/volunteer position.
3. A combination of short essays and longer statements that illustrate fit, skills, and overall experience.
4. One transcript or mark sheet from each college and/or university attended. Official transcripts are not required; however, all transcripts submitted must include the applicant's name and institution (not to be added by the applicant). Applicants who have completed a degree outside of the United States or Canada are strongly encouraged to submit a transcript evaluation.

If submitting a transcript evaluation, applicants should use EducationUSA advisers (<https://educationusa.state.gov/find-advising-center>), World Education Services (www.wes.org), or Educational Credential Evaluators (<http://ece.org>) for course-by-course or ICAP evaluation of all transcripts (undergraduate and graduate). Those who secure WES or ECE evaluations should submit their official transcripts directly to WES or ECE, not to the Office of Admissions. An additional copy of the transcript beyond the official evaluation is not required. Evaluations must be received in the Office of Admissions by the December 15 deadline for an application to be considered complete. The applicant is strongly encouraged to begin this process early, as evaluations can take more than a month to complete.

Admitted students submitting transcripts and degree certificates from Chinese universities must arrange for a verification report of their university transcript with the China Academic Degrees and Graduate Education Development Center (CDGDC; www.chinadegrees.cn/cn). Do not request your verification report from the CDGDC until your degree has been awarded. Verification reports should only be sent after accepting an offer of admission. The report must be mailed directly to the Office of Admissions by the CDGDC, rather than by the admitted student or any third party. Any transcript not mailed by the CDGDC will not be considered as a final official transcript.

5. Three letters of reference (academic and/or professional). Submission of the recommendation form and a one- to two-page letter is expected. Please note that we are unable to accept any additional recommendations beyond the required three. It is strongly recommended that the applicant submit at least one academic letter of reference.
6. Standardized test score reports:

The submission of GRE, GMAT, or LSAT scores is *optional* at this time.

An official TOEFL or IELTS score report if English is not a native or customary language of instruction (copies will not be accepted). Applicants must achieve at least a 100 on the iBT version of the TOEFL or a 7.0 on the IELTS examination (minimum of 6.5 in each section) to be given full consideration for admission. See additional information on requirements related to English as a second language below.

7. The \$80 application fee (a need-based fee waiver is available online).
8. If applying to the M.E.Sc. or M.F.S. program, please be sure to include a list of three potential advisers on the application form. Please also attach as an addendum to the personal statement a short paragraph for each of the listed advisers describing why you would like them to serve as your adviser on your intended research. Please be sure to link your research interests with theirs to help connect how they may be able to best advise you on your project.

Note: Additional documents beyond those listed above will not be reviewed and may be discarded at the end of the admissions cycle.

All application materials should be uploaded to the electronic application form. Materials cannot be returned, copied, or forwarded to third parties.

All applicants must hold a bachelor's-level degree and demonstrate satisfactory academic achievement, but there are no arbitrary standards or cutoffs for test scores

or grade-point averages, with the exception of English language ability (TOEFL and IELTS). Letters of reference from individuals who can evaluate the applicant's scholarship, professional activities, leadership skills, and career goals are especially valuable. Letters from undergraduate professors and/or professional supervisors are preferred. The School looks for students capable of making effective contributions to scientific knowledge or to professional service in addressing environmental problems. Special weight is given to relevant experiences obtained subsequent to graduation from college. Clarity regarding professional career goals is a critically important part of the applicant's personal statement. Faculty review teams read the applications submitted to the master's degree programs. Final admissions decisions rest on an integrated assessment of the components described above.

English as a Second Language Training Requirement

Applicants for whom English is not a native or customary language of university instruction must take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). We require a minimum TOEFL score of 100 on the Internet test. A minimum overall score of band 7.0 is required on the IELTS, with a minimum of 6.5 in each section. Please note that we will only accept the iBT version of the TOEFL examination. When taking either test, applicants should indicate the School's Institution Code Number 3996; no department code is necessary. Additional information about TOEFL can be found at www.ets.org/toefl. Information about IELTS can be found at www.ielts.org. Official test results will be sent directly to the School by the testing service and generally take two to three weeks to arrive.

Applicants who are required to submit the TOEFL or IELTS must also submit a supplemental essay (300 words maximum) detailing all educational, research, and/or work and internship experience related to the English language. The Admissions Committee may follow up with a phone interview to assist in determining English proficiency. As a condition of acceptance, it may be required that applicants for whom English is a second language, whose undergraduate degree work has not been conducted in English, or whose application suggests such a need, complete a six-week instructional program in written and spoken English conducted by Yale Summer Session. More information will be provided to those students who may qualify for this requirement.

ADMISSIONS: DOCTORAL DEGREE PROGRAM

The doctoral program is designed to develop the broad knowledge, analytical powers, technical skills, and creative thinking demanded of leaders in environmental and natural resources disciplines. Applicants should hold a bachelor's or master's degree in a field related to their intended program of study as expressed in the application.

Application Procedures

The Doctor of Philosophy (Ph.D.) degree is administered jointly by the Yale School of the Environment and the Yale Graduate School of Arts and Sciences.

Applications for the Ph.D. program can be obtained from the website of the Yale Graduate School of Arts and Sciences at <https://gsas.yale.edu/admission>. The application deadline for the Ph.D. program is January 2, 2022. Doctoral education involves a close pairing between the student and a faculty adviser. Before applying to the doctoral program, applicants must identify and contact one or two faculty members who would serve as their major adviser if accepted to the program.

The Graduate Record Examination (GRE) General Test is optional. Applicants should ask their prospective advisers whether or not they wish to see the scores. For more information on the GRE, visit www.ets.org/gre. The Test of English as a Foreign Language (TOEFL) is required of all applicants whose native language is not English. This requirement is waived only for applicants who, prior to matriculation at Yale, will have received a baccalaureate degree or its international equivalent from a college or university where English is the primary language of instruction. The applicant must have studied in residence at the baccalaureate institution for at least three years to receive a waiver. If you do not qualify for a waiver but have taken the TOEFL within the past two years, you will need to have your TOEFL scores released to the Yale Graduate School of Arts and Sciences (code 3987). The International English Language Testing System (IELTS) may be substituted for the TOEFL. For more information and the latest updates on the TOEFL and IELTS, visit www.ets.org/toefl and www.ielts.org.

TUITION, FEES, AND OTHER EXPENSES

Master's Program Tuition and Fees

The 2021–2022 tuition for master's degrees (M.E.M., M.F.S., M.E.Sc., and M.F.) is \$46,200. Tuition for special students is based on the number of courses taken. The School reserves the right to revise tuition as it deems appropriate. Tuition does not include hospitalization/specialty insurance as required by the University, or materials fees charged by other schools and departments in the University.

Two-year master's students must pay full tuition for two years, regardless of the number of courses taken.

For 2021–2022, a single student should also anticipate estimated expenses of \$500 for books and supplies; \$1,500 for transportation, \$2,650 for hospitalization/specialty insurance; living expenses of \$17,180 for room, board, and personal expenses for the nine-month academic year; \$375 for the mandatory Student Activity Fee; and \$135 for the mandatory Student IT Fee.

Ph.D. Program Tuition and Fees

The 2021–2022 tuition for the Ph.D. program is \$45,700. Most doctoral students receive a School fellowship that covers the cost of their tuition and provides a twelve-month stipend for the first five years of their program. In 2021–2022 the stipend is \$33,600. Doctoral students must pay a nominal continuous registration fee (CRF) for no more than three years thereafter. The continuous registration fee is \$737.50 per term.

Registration

All students in the master's programs must register for courses using the online registration system (available at www.yale.edu/sis) within the registration period for the fall and spring terms. A penalty of \$35 will be charged for any changes made to a student's course registration after the Add/Drop period. No changes are allowed after the midterm point in each term. See the academic calendar for specific dates.

International students are required to complete a nonacademic registration at the Office of International Students and Scholars prior to their regular academic registration.

Tuition Fees for Special Students

The tuition charge for special students is 25 percent of tuition for one course, 50 percent for two courses, 75 percent for three courses, and full tuition for four or more courses for each term of attendance.

Continuous Registration

Master's degree students who wish to pursue their research through a six-month or one-year internship are permitted to do so and are considered enrolled on a full-time

basis (student is entitled to continue membership in Yale Health and defer student loans). Upon return, the student will register as a full-time student and pay tuition for the period needed to complete the degree requirements. Students may not register for regular course work, or work as a teaching assistant, while on continuous registration status. The fee for continuous registration is \$3,250 per term. Students are permitted to be on continuous registration for a maximum of two terms.

Tuition Deposit

Upon acceptance of admission, a deposit of \$500 payable directly to the Yale School of the Environment is required to hold a place in the entering class. If a decision is made not to matriculate, the deposit will not be refunded.

Tuition Rebate and Financial Aid Refund Policy

On the basis of the federal regulations governing the return of federal student aid (Title IV) funds for withdrawn students, the rebate and refund of tuition are subject to the following policy.

1. For purposes of determining the refund of Title IV funds, any student who withdraws from the School of the Environment for any reason during the first 60 percent of the term will be subject to a pro rata schedule that will be used to determine the amount of Title IV funds a student has earned at the time of withdrawal. A student who withdraws after the 60 percent point has earned 100 percent of the Title IV funds. In 2021–2022, the last days for refunding Title IV funds will be November 3, 2021, in the fall term and April 1, 2022, in the spring term.
2. For purposes of determining the refund of institutional aid funds and for students who have not received financial aid:
 - a. 100 percent of tuition will be rebated for withdrawals that occur on or before the end of the first 10 percent of the term: September 10, 2021, in the fall term and January 27, 2022, in the spring term.
 - b. A rebate of one-half (50 percent) of tuition will be granted for withdrawals that occur after the first 10 percent but on or before the last day of the first quarter of the term: September 25, 2021, in the fall term and February 11, 2022, in the spring term.
 - c. A rebate of one-quarter (25 percent) of tuition will be granted for withdrawals that occur after the first quarter of a term but on or before the day of midterm: October 25, 2021, in the fall term and March 7, 2022, in the spring term.
 - d. Students who withdraw for any reason after midterm will not receive a rebate of any portion of tuition.
3. The death of a student shall cancel charges for tuition as of the date of death, and the bursar will adjust the tuition on a pro rata basis.
4. If the student has received student loans or other forms of financial aid, funds will be returned in the order prescribed by federal regulations; namely, first to Federal Direct Unsubsidized Loans, if any; then to Federal Direct Graduate PLUS Loans; next to any other federal, state, private, or institutional scholarships and loans; and, finally, any remaining balance to the student.

5. Recipients of federal and/or institutional loans who withdraw are required to have an exit interview before leaving Yale. Students leaving Yale receive instructions on completing this process from Yale Student Financial Services.

Student Accounts and Billing

Student accounts, billing, and related services are administered through the Office of Student Financial Services, which is located at 246 Church Street. The office's website is <http://student-accounts.yale.edu>.

STUDENT ACCOUNT

The Student Account is a record of all the direct charges for a student's Yale education such as tuition, room, board, fees, and other academically related items assessed by offices throughout the University. It is also a record of all payments, financial aid, and other credits applied toward these charges.

Students and student-designated proxies can view all activity posted to their Student Account in real time through the University's online billing and payment system, YalePay (<https://student-accounts.yale.edu/yalepay>). At the beginning of each month, email reminders to log in to YalePay to review the Student Account activity are sent to all students at their official Yale email address and to all student-designated YalePay proxies. Payment is due by 4 p.m. Eastern Time on the first of the following month.

Yale does not mail paper bills or generate monthly statements. Students and their authorized proxies can generate their own account statements in YalePay in pdf form to print or save. The statements can be generated by term or for a date range and can be submitted to employers, 401K plans, 529/College Savings Plans, scholarship agencies, or other organizations for documentation of the charges.

Students can grant others proxy access to YalePay to view student account activity, set up payment plans, and make online payments. For more information, see Proxy Access and Authorization (<http://sfas.yale.edu/proxy-access-and-authorization>).

The Office of Student Financial Services will impose late fees of \$125 per month (up to a total of \$375 per term) if any part of the term bill, less Yale-administered loans and scholarships that have been applied for on a timely basis, is not paid when due. Students who have not paid their student account term charges by the due date will also be placed on Financial Hold. The hold will remain until the term charges have been paid in full. While on Financial Hold, the University will not fulfill requests for transcripts or provide diplomas and reserves the right to withhold registration or withdraw the student for financial reasons.

PAYMENT OPTIONS

There are a variety of options offered for making payments toward a student's Student Account. Please note:

- All bills must be paid in U.S. currency.
- Yale does *not* accept credit or debit cards for Student Account payments.

- Payments should not be made to a Student Account that are in excess of the balance due (net of pending financial aid credits). Yale reserves the right to return any overpayments.

Online Payments through YalePay

Yale's recommended method of payment is online through YalePay (<https://student-accounts.yale.edu/yalepay>). Online payments are easy and convenient and can be made by anyone with a U.S. checking or savings account. There is no charge to use this service. Bank information is password-protected and secure, and there is a printable confirmation receipt. Payments are immediately posted to the Student Account, which allows students to make payments 365/24/7 up to 4 p.m. Eastern Time on the due date of the bill, from any location, and avoid late fees.

For those who choose to pay by check, a remittance advice and mailing instructions are available on YalePay. Checks should be made payable to Yale University, in U.S. dollars, and drawn on a U.S. bank. To avoid late fees, please allow for adequate mailing time to ensure that payment is received by 4 p.m. Eastern Time on the due date.

Cash and check payments are also accepted at the Student Financial Services Cashier's Office, located at 246 Church Street. The Cashier's Office is open Monday through Friday from 8:30 a.m. to 4:30 p.m.

Yale University partners with Flywire, a leading provider of international payment solutions, to provide a fast and secure way to make international payments to a Student Account within YalePay. Students and authorized proxies can initiate international payments from the Make Payment tab in YalePay by selecting "International Payment via Flywire" as the payment method, and then selecting the country from which payment will be made to see available payment methods. International payment via Flywire allows students and authorized proxies to save on bank fees and exchange rates, track the payment online from start to finish, and have access to 24/7 multilingual customer support. For more information on making international payments via Flywire, see International Payments Made Easy at <https://student-accounts.yale.edu/sites/default/files/files/Yale%20International%20Payments%20-%20YalePay.pdf>.

A processing charge of \$25 will be assessed for payments rejected for any reason by the bank on which they were drawn. In addition, the following penalties may apply if a payment is rejected:

1. If the payment was for a term bill, late fees of \$125 per month will be charged for the period the bill was unpaid, as noted above.
2. If the payment was for a term bill to permit registration, the student's registration may be revoked.
3. If the payment was given to settle an unpaid balance in order to receive a diploma, the University may refer the account to an attorney for collection.

YALE PAYMENT PLAN

A Yale Payment Plan provides parents and students with the option to pay education expenses monthly. It is designed to relieve the pressure of lump-sum payments by allowing families to spread payments over a period of months without incurring any

interest charges. Participation is optional and elected on a term basis. The cost to sign up is \$50 per term.

Depending on the date of enrollment, students may be eligible for up to five installments for the fall and spring terms. Payment Plan installments will be automatically deducted on the 5th of each month from the bank account specified when enrolling in the plan. For enrollment deadlines and additional details concerning the Yale Payment Plan, see <https://student-accounts.yale.edu/ypp>.

BILL PAYMENT AND PENDING MILITARY BENEFITS

Yale will not impose any penalty, including the assessment of late fees, the denial of access to classes, libraries, or other facilities, or the requirement that a student borrow additional funds, on any student because of the student's inability to meet their financial obligations to the institution, when the delay is due to the delayed disbursement of funding from VA under chapter 31 or 33.

Yale will permit a student to attend or participate in their course of education during the period beginning on the date on which the student provides to Yale a certificate of eligibility for entitlement to educational assistance under chapter 31 or 33 and ending on the earlier of the following dates: (1) the date on which payment from VA is made to Yale; (2) ninety days after the date Yale certifies tuition and fees following the receipt of the certificate of eligibility.

Interruption or Temporary Suspension of University Services or Programs

Certain events that are beyond the University's control may cause or require the interruption or temporary suspension of some or all services and programs customarily furnished by the University. These events include, but are not limited to, epidemics or other public health emergencies; storms, floods, earthquakes, or other natural disasters; war, terrorism, rioting, or other acts of violence; loss of power, water, or other utility services; and strikes, work stoppages, or job actions. In the face of such events, the University may, at its sole discretion, provide substitute services and programs or appropriate refunds. The decision to suspend services and programs shall be made at the sole discretion of the University.

Master's Financial Aid

POLICIES AND PROCEDURES

In general, students must apply for financial aid in order to be considered for a YSE scholarship. Since financial aid awards are based primarily on financial need, information about student finances that is not available in the application for admission is required. YSE is need-blind. Therefore, applying for financial aid and having financial need in no way affect the decision to offer admission.

The deadline for prospective students to apply for need-based financial aid is February 15. If that deadline is missed, the student will not be considered for need-based financial aid. This can be a costly oversight, as what is received in the second year is generally the

same as what is received in the first year. The deadline for current students to apply for financial aid is April 15.

If a student is a U.S. citizen or permanent resident, two forms must be submitted, the YSE Financial Aid Application and the Free Application for Federal Student Aid (FAFSA). If a student is an international student, only one form must be submitted, the YSE Financial Aid Application. Students must reapply for financial aid for the second year, although the amount of YSE scholarship will most likely remain the same as in the first year.

A limited number of merit-based scholarships are available, for which no separate financial aid application is required. Examples include merit awards to the top applicants to the Master of Environmental Science and Master of Forest Science programs and the Paul D. Coverdell Fellowships for qualifying Returned Peace Corps Volunteers.

YSE scholarships, work study, and federal loans (Direct Stafford and Grad PLUS) are available to U.S. citizens and permanent residents. YSE scholarships, work study, and Yale International Loans are available to international students.

The primary factor in determining the amount of a need-based YSE scholarship is financial need as determined by the review of the student's (and spouse's, if applicable) income and assets and any third-party funding that the student expects to receive. Merit is a secondary factor.

Students are considered to be financially independent of their parents. Therefore, information about parent income and assets is not required. Students have the option of providing that information, however, which may yield a higher need-based scholarship award. Under no circumstances will it yield a lower scholarship award. On the other hand, students must report any direct financial support that they expect to receive from their parents, such as money for tuition or rent.

Approximately three-quarters of YSE students receive scholarships in any given year from an annual scholarship budget in excess of \$5 million.

Satisfactory Academic Progress

To be eligible for financial aid, a student must be making Satisfactory Academic Progress (SAP) in the degree program. Financial aid includes all federal student aid funds (Federal Direct Stafford Loan, Federal Direct Grad PLUS Loan, and/or Federal Work Study) as well as institutional funds. For a complete explanation of the YSE SAP policy, please see the YSE Student Handbook, chapter Rules & Regulations, section Academic Regulations and Policies.

Less Than Half-Time Enrollment, Including Continuous Registration

Students enrolled less than half-time (i.e., for less than 6 credits in a term) and students who are not actively working toward a degree, such as those in continuous registration status, are not eligible for federal or institutional financial aid. Furthermore, financial aid awards are based on an assumption of full-time enrollment and will be revised proportionately should a student choose to enroll less than full-time. Students

considering enrolling less than full-time should first consult with the assistant dean of student services and director of financial aid to understand the academic and financial consequences, respectively, of that decision.

Joint-Degree Students

In most joint-degree programs, students split their time between the two joint schools, spending one and one-half years at each school for a total program length of three years.

Each school at Yale is financially independent, which means that the financial aid award a student receives at one school is not transferable to the joint school. The joint-degree student should follow the financial aid application procedures of the school to which the student will be paying tuition. If the student is paying tuition at YSE, the student should apply for financial aid through YSE. If the student is paying tuition at the joint school, the student should apply for financial aid through that school.

If the joint-degree student is applying for admission to two schools simultaneously, the student should apply for financial aid at both schools, also simultaneously.

Fifth-Year Students

During their senior year at Yale College, students may apply for admission to the YSE Five-Year Program. These students sometimes defer their enrollment in the YSE master's program for a year of outside volunteer work or employment. To be considered for financial aid for their enrollment at YSE, these students must submit their financial aid application materials by the February 15 deadline prior to their matriculation into the program. This could mean that the student submits the financial aid application materials during the student's deferral or "gap" year. It is the student's responsibility to submit all documents by the February 15 deadline.

Scholarships

Most of the School's scholarship budget is funded by private donors. Scholarship recipients are automatically considered for all named scholarships. The named scholarships listed below are *not* in addition to any generic scholarship a student receives in the financial aid award notification but may be matched to a scholarship recipient once the student matriculates.

The School is delighted to recognize the generosity of the donors who have helped make the following scholarships possible:

Jonah Meadows Adels Memorial Scholarship
 Anne Armstrong-Colaccino Scholarship
 Bataua Scholarship
 Beinecke/YSE Scholarship
 Flora and John Berbee Scholarship Fund
 Berkley Scholarship
 Jabe Blumenthal Scholarship
 George Brett Memorial Fund
 Broad Arrow Scholarship
 Nelson C. Brown (B.A. 1906, M.F. 1908) Scholarship

Sara Shallenberger Brown Scholarship
Coleman P. Burke Scholarship
Leland H. Burt ('30 B.S.) Endowed Scholarship
Burt-Pfeiffer Fund
Philip Laurance Buttrick (M.F. 1911) Scholarship
Paul Douglas Camp Memorial Scholarship
Leonard G. Carpenter (B.A. 1924) Scholarship
Class of 1980 Scholarship
Class of 2017 Scholarship
Crane Family Scholarship
Trammell S. Crow (1974) Scholarship
Crown Zellerbach Foundation Fund
Strachan and Vivian Donnelley Scholarship
Michael P. Dowling Scholarship
Enid Storm Dwyer Scholarship
Environmental Scholars Fund
Frederick V. Ernst (1960) Gift Fund
Boyd Evison Scholarship Fund
Forestry YAF Scholarship Fund
Edith and Johannes Frondt Scholarship
Gonzalez Family Scholarship
James Lippincott Goodwin (B.A. 1905, M.F. 1910)
Charles W. Goodyear Memorial Fund
John S. Griswold (B.A. 1937) Scholarship
Leah Hair Scholarship
H. Stuart Harrison (B.A. 1932) Fellowship
Vira I. Heinz Endowment Scholarship
John and Catha Hesse Fund
Adelaide Hixon Scholarship
Joseph Hixon YSE Scholarship
Jacqueline C. and John P. Hullar Scholarship
Jesse D. Johnson Scholarship
Stephen and Betty Kahn Scholarship
Peggy King Memorial Scholarship
Marvin Klemme (M.F. 1935) Fellowship
Carl W. Knobloch, Jr. Fellowship
Kroon Environmental Studies Scholarship
Fred Krupp Scholarship in Environmental Studies
Charles Chacey Kuehn (M.F. 1934) Fund
Robert H. Kuehn, Jr. '64 B.A., '68 M.U.S., '68 M.Arch. Scholarship
Leadership Scholars Fund
Urey Lisiansky Scholarship Fund
John A. MacLean '27S Scholarship
Alan N. Mann (1908) Memorial Fellowship
Margaret K. McCarthy and Robert Worth Scholarship
Dorothy S. McCluskey Scholarship
Thomas McHenry Scholarship
Preston R. Miller, Jr. '71 YSE Scholarship

Arthur N. Milliken Scholarship
 Mary P. Moran Scholarship
 John M. Musser Fellowship
 Carl F. Norden Family Scholarship
 Obernauer Family Scholarship
 Gilman Ordway (B.A. 1947) Family Scholarship
 Parklands Scholarship
 PETAL Foundation Scholarship
 Joanne Polayes Scholarship
 Kushok Bakula Rimpoche Scholarship
 Rockefeller-Underhill Scholarship for Tropical Conservation
 Heather L. Ross and Edward L. Strohbahn, Jr. Scholarship
 Andrew Sabin International Environmental Fellowship
 William Henry Sage Memorial Fund
 Ralph C. Schmidt and Susan M. Babcock Scholarship
 Drs. Poh Shien and Judy Young International Scholarship
 Simeone Entomology Scholarship
 David M. Smith, Morris K. Jesup Professor of Silviculture Scholarship
 David and Karen Sobotka Scholarship
 Sobotka Joint YSE-Jackson Institute Fellowship
 Cameron and Gus Speth Scholarship
 Gillian and Stuart W. Staley '95 M.P.P.M., '95 M.E.S. Scholarship
 Stapleton Scholarship
 Student Conservation Association Fellowship in honor of John R. Twiss '60
 VIEW Scholarship
 Rodney B. Wagner Class of 1954 International Scholarship
 William D. Waxter III Fellowship
 Marianne Welch Scholarship
 William Egbert Wheeler Fund
 Mr. and Mrs. James Wiley Endowed Scholarship for Conservation Biology
 Hubert Coffing Williams (Ph.D. 1906, M.F. 1908)
 Joseph H. Williams Scholarship
 Charles F. Wilson (B.A. 1939) Memorial Fund
 Ray L. Wilson Scholarship
 Frank & Lynne Wisneski YSE Scholarship
 Charles Boughton Wood Fund
 Wyss Foundation Scholarship for Conservation of the American West
 Yale Club of New Haven
 YSE Alumni Association Board Scholarship

Employment Opportunities

YSE work study These positions vary from clerical to research to editorial work. Eligible students must have financial need, as confirmed by the YSE Office of Admissions and Financial Aid. Applications are available on the Yale Student Employment Office website (www.yalestudentjobs.org) beginning in August. The pay rate is fixed at \$14.75 per hour. At least eighty positions are available annually and only to students with a YSE affiliation.

Regular student jobs and teaching fellowships Financial need is not required. Interested students should contact centers, departments, professors, and programs directly beginning in late spring or summer. Pay rates begin at \$12.50 per hour for regular student jobs. Pay rates for teaching fellowships are either \$4,000 or \$8,000 per term depending on the effort level. At least seventy positions are available annually.

Community service jobs Eligible students must be U.S. citizens or permanent residents and have financial need, as confirmed by the YSE Office of Admissions and Financial Aid. Applications are available on the Yale Student Employment Office website beginning in August. Pay rates begin at \$12.50 per hour. At least one hundred positions are available annually to students across the University.

Other on-campus jobs Financial need is not required. Applications are available on the Yale Student Employment Office website beginning in August. Pay rates begin at \$12.50 per hour. At least four hundred positions are available annually to students across the University.

Loans

Federal Direct Stafford Loan (U.S. citizens and permanent residents only) In general, the maximum annual loan amount is \$20,500. The interest rate is fixed at 5.28% with an origination fee of 1.057%. There is no credit check required. The standard repayment term is ten years. A six-month grace period immediately follows separation from school or otherwise dropping below half-time enrollment status, at which time repayment is required. The loan is requested by completing and returning a loan request form available on the School's financial aid forms webpage: <https://environment.yale.edu/aid/forms>. After initial processing, the loan will be assigned to a servicer contracted with the U.S. Department of Education, such as FedLoan, Great Lakes, Navient, or Nelnet.

Federal Direct Grad PLUS Loan (U.S. citizens and permanent residents only) In general, the maximum annual loan amount is the cost of attendance less all other resources. The interest rate is fixed at 6.28% with an origination fee of 4.228%. A credit check is required. Repayment terms are similar to Federal Direct Stafford Loans. The loan is requested by completing and returning a loan request form available on the School's financial aid forms webpage. After initial processing, the loan will be assigned to a servicer contracted with the U.S. Department of Education, such as FedLoan, Great Lakes, Navient, or Nelnet.

Yale International Loan (international students only) In general, the maximum annual loan amount is \$30,000 or the cost of attendance less all other resources, whichever is less. The interest rate is fixed at 7.75% with an origination fee of 5%. There is no credit check required. Repayment terms are similar to Federal Direct Stafford Loans. The loan is requested by completing and returning loan request and self-certification forms available on the School's financial aid forms webpage. The Yale Student Loan Billing and Payment Office is responsible for the management and collection of the loan.

Private education loan (U.S. citizens and permanent residents as primary borrowers or co-borrowers only) In general, the maximum annual loan amount is the cost of attendance less all other resources. The interest rate is fixed or variable and

dependent on the credit rating of the primary borrower and co-borrower, if applicable. Origination fees from zero to 3%, repayment terms, and servicing are dependent on the lender. A credit check is required. The loan is requested by applying directly to a lender. A list of lenders from whom students have borrowed recently is available at www.elmselect.com/?schoolid=156#/results.

International Students – Certification of Finances for Visa

International students must certify full funding for their entire two-year course of study before visa documents can be issued. Instructions and forms are mailed after an admitted student accepts the offer of admission (deadline April 15). More information is available from Yale's Office of International Students and Scholars: <https://oiss.yale.edu>.

Veterans

Eligible students are strongly encouraged to seek specific information about Veterans Administration benefits from their local Veterans Administration office by calling 800.827.1000 or visiting <https://benefits.va.gov/gibill>. The School also participates in the Yellow Ribbon Program, with a maximum contribution amount of \$7,500 per student per year. The assistant dean of student services and the director of financial aid coordinate the administration of Veterans Administration benefits at YSE.

LIFE AT THE SCHOOL OF THE ENVIRONMENT

Educational Facilities

Kroon Hall, the ultra-green home of the Yale School of the Environment, expresses in physical form the School's best traditions, values, and aspirations. The building, which opened in January 2009, achieves its remarkable energy savings from a host of design elements and technical strategies molded to fit the weather and climate of its New England location. Situated in the area of the University known as Science Hill, Kroon Hall is named for the family of benefactor and Yale College alumnus Richard Kroon, B.A. 1964. With its high barrel-vaulted gable ends, simple lines, and curved rooftop, Kroon Hall is a modernist blend of cathedral nave and Connecticut barn.

Kroon Hall provides office space for fifty faculty and staff members and has three classrooms. The 175-seat Burke Auditorium is used for lectures and classes, and commands beautiful views of West Rock and the David S. Ingalls Rink across the street. The Knobloch Environment Center is meant for socializing, but students have also embraced it as a study space. The Ordway Learning Center on the ground floor also has ample space for quiet study. The \$43.5-million building was designed by Hopkins Architects of Great Britain in partnership with Connecticut-based Centerbrook Architects and Planners and holds the highest rating – platinum – in the green-building certification program, Leadership in Energy and Environmental Design (LEED). Kroon Hall provides 56,467 square feet and is designed to use 67 percent less energy than a typical building of its size. Its tall, thin shape and east-west orientation play a big role in heating and cooling. The lowest floor is set into a hillside, with only its south side exposed, providing thermal insulation, minimizing northern exposure, and increasing the amount of natural light that enters the building from adjacent courtyards. The south facade maximizes solar gain during the winter, and Douglas fir louvers covering glass facades on the east and west ends keep out unwanted heat and glare. The building's shape, combined with the glass facades, enables daylight to provide much of the interior's illumination. Light and occupancy sensors dim artificial lighting when it is not needed.

A 100-kilowatt rooftop array of photovoltaic panels is designed to provide 25 percent of the building's electricity. Four 1,500-foot-deep wells are designed to use the relatively constant 55° (F) temperature of underground water for heating and cooling, replacing the need for conventional boilers and air conditioning. Four solar panels embedded in the southern facade are designed to provide hot water. Exposed concrete walls and ceilings provide thermal stability by retaining heat in winter and cold in summer. Instead of air being forced through overhead ducts, an energy-saving displacement ventilation system moves warm and cool air through an air plenum and multiple diffusers in elevated floors. Low-velocity fans in the basement keep the air circulating throughout the building. In winter, the ventilation system also transfers the heat from exhaust to incoming fresh air; in summer, air handling units spray water on incoming fresh air, reducing its temperature by up to 18° through evaporation.

In mild weather, Kroon's occupants assist in the energy savings by opening windows in response to an electronic, color-coded prompt system. A pair of green and amber lights in each hallway indicate whether it's a "Green Day": i.e., when the green indicator light is on, the ventilation and cooling/heating systems shut down, and the windows should be opened for natural ventilation.

A rainwater-harvesting system channels water from the roof and grounds to a garden in the south courtyard, where aquatic plants filter out sediment and contaminants. The gray water, held in underground storage tanks, is used for irrigation and pumped back into Kroon for flushing toilets. The system is designed to save 300,000 gallons of potable city water annually and to reduce the burden on city sewers by lessening the amount of storm runoff. Half of Kroon Hall's red oak paneling—15,000 board feet—came from the 7,840-acre Yale-Myers Forest in northern Connecticut, which is managed by the School. The building's pale yellow exterior, composed of sandstone from Ohio, echoes other Yale buildings. The north and south courtyards were constructed to create a community among disparate buildings on Science Hill. The south courtyard, landscaped by Olin Studio of Philadelphia, is a raised platform, with a green roof of soil one-foot deep and surrounded by twenty-five varieties of native plantings. Underneath the courtyard is a service node, centralizing all trash and recycling pickups as well as deliveries for the southwest corner of Science Hill and accessible by a single driveway off Sachus Street.

Sage Hall, a four-story building located at 205 Prospect Street and a gift of William H. Sage, B.A. 1865, in memory of his son, DeWitt Linn Sage, B.A. 1897, was completed in 1923. Administrative, development, alumni, and program offices of the School are housed in Sage Hall, along with four classrooms. Sage Hall is home to a computer cluster with twenty-four computers for student use. Sage also houses a 490-square-foot student lounge, appointed with a large table and comfortable couches, which students use for studying, special events, and weekly social events. Bowers Auditorium is designed to handle large lectures and seminars as well as small group projects. Bowers, which has a seating capacity of one hundred with tables and chairs, was built onto Sage Hall in 1931 with funds provided by the bequest of Edward A. Bowers, B.A. 1879. In 2011 the original Bowers floor was replaced using beautiful red oak flooring harvested from Yale-Myers Forest, and in 2016 energy-efficient LED lights were installed.

Facilities for research and instruction in silviculture, natural resource and forest economics, forest policy, and biometry are in Marsh Hall at 360 Prospect Street in the Marsh Botanical Garden. A classroom, meeting space, kitchen, and accessible bathroom are available on the first floor. This large, four-story mansion was originally the residence of Professor Othniel C. Marsh, B.A. 1860, a distinguished paleontologist and Western explorer of the nineteenth century. He bequeathed the building to the University in 1899, and for twenty-five years it housed the entire Forest School. Marsh Hall was designated a National Historic Landmark by the United States Department of the Interior in 1965.

The William B. Greeley Memorial Laboratory at 370 Prospect Street, named in honor of William Buckhout Greeley, M.F. 1904, houses a recently renovated social space in the main lobby; laboratories for research into the ecology and management of landscapes and ecosystems, urban sustainability, the biology of trees, and environmental chemistry; and doctoral program spaces. The building was designed by renowned

architect Paul Rudolph and is a classic example of “Brutalist” architecture. Adjacent to the Greeley lab is a 3,800-square-foot greenhouse, which is used for hands-on learning and research. Greeley Laboratory and its greenhouse were built in 1959 with funds from the forest industries, the John A. Hartford Foundation, and other benefactors.

The Class of 1954 Environmental Science Center at 21 Sachem Street is dedicated to the Class of 1954 in honor of the \$70 million the class donated in 2000 to support new science buildings and other major University priorities. It is an interdisciplinary facility built by the University with the aim of further fostering leadership in teaching of and research in science and engineering. The building was designed to encourage collaboration among faculty and students pursuing environmental studies. Four natural science faculty members from YSE have their laboratories in the Environmental Science Center, which also houses research laboratories for the Yale Science Departments of Ecology and Evolutionary Biology, Earth and Planetary Sciences, and Anthropology as well as the Yale Institute for Biospheric Studies.

The restored former residences at 301 Prospect Street and 380 Edwards Street house the offices of many of the School’s programs, as well as doctoral student offices; each building has a classroom.

The mansion at 300 Prospect Street houses the School’s Admissions, Financial Aid, Communications, and Research offices.

Osborn Memorial Laboratories at the corner of Prospect Street and Sachem Street houses one YSE faculty member’s lab and office in addition to many other Yale laboratories.

YALE FORESTS AND THE QUIET CORNER INITIATIVE

North of New Haven, the Yale Forests Program manages 10,852 acres of forestland in Connecticut, New Hampshire, and Vermont that are part of the Forest School at the Yale School of the Environment. The seven discrete forests, donated to the School between 1913 and 1986, range in size from the seventy-five-acre Crowell Ravine in Vermont to the 7,840-acre Yale-Myers Forest in northeast Connecticut. The composition of the Yale Forests reflects a latitudinal gradient ranging from a central hardwood cover type in Connecticut to a northern hardwood cover type in New Hampshire and Vermont, with extensive mixed-wood stands of pine and hemlock in both regions. The area encompassed by the forests includes almost all of the topographical and soil conditions, site classifications, and cover types found in New England.

The Yale Forests Program provides educational, research, and professional opportunities to the Yale community and beyond through a sustainably managed and ecologically sound working forest. Faculty and students use the Yale Forests as a laboratory for teaching, management, demonstration, and research. Students working at the Yale Forests receive training that covers aspects of hydrology and soils, taxonomy, forest and community ecology, silviculture, forest operations, forest finance and policy, and sociology in order to prepare them for careers as foresters and natural resource managers. Every summer ten to twelve students are chosen for the apprentice forester program at the Yale Forests, which includes hands-on training in maintenance of infrastructure, property boundary research and delineation, geographic information systems (GIS), mapping and classification, sampling and inventory, managing forest

operations, and the design and implementation of silvicultural prescriptions. Several students from the apprentice program are selected to work for the Yale Forests Program the following academic year as assistant forest managers, where they receive additional training in forest administration and management.

Research performed at the Yale Forests is conducted under the supervision of faculty members of the School and by academic institutions across the region and encompasses a broad range of topics that include forest ecology, silviculture, aquatic and wildlife community ecology, hydrology, and economic, legal, and social studies. The forest is used for both doctoral and master's student research, the latter performed either as an independent project or in conjunction with student involvement with existing forest management. The forests also serve as a platform for collaborative research with other universities. Many breakthroughs in human understanding of ecological function began with research conducted at the Yale Forests.

The Yale Forests are used for both academic field trips and workshops held for professional or community organizations. Field trip and workshop topics are wide-ranging and include silviculture and forest dynamics, hydrology, wildlife habitat, carbon dynamics, and forest management.

Faculty and staff oversee management of the forests in partnership with three postgraduate fellows. Graduate professional students working as management fellows or coordinators carry out the bulk of the on-the-ground management. The forests are maintained as working forests, and outputs of management include commercial timber and non-timber forest products. The Yale-Myers Forest is the largest and most actively utilized parcel managed by the Yale Forests Program and is certified by the Forest Stewardship Council. Facilities at Yale-Myers Forest include 8,000 total square feet of living space within five buildings, including rustic bunkhouses that accommodate forty-eight, a classroom and library, kitchen and dining hall, communal living space, a research lab, and an open-air pavilion.

The Quiet Corner Initiative (QCI) engages with the communities and working landscape that surround Yale-Myers Forest. QCI works by developing programs that connect master's-level courses and University research to real environmental assessment and management challenges on private lands surrounding the forest. Current programs focus on forest and open space conservation and management; watersheds and rivers; renewable energy; and sustainable agriculture. The initiative seeks to advance three separate but related sets of goals: (1) to enrich the applied curriculum for professional students at the School of the Environment, providing reliable and consistent opportunities to bring learned skills to tangible problems that are in easy reach of the classroom and that contribute to a vibrant rural economy based on sustainable natural resource management; (2) to provide and cultivate a high-quality natural and social science research environment for students and faculty to investigate and analyze the drivers of environmental change and adaptive management at a landscape scale; and (3) to leverage the traditional strengths of Yale University in research, education, and leadership in working toward landscape-scale sustainability goals in our own backyard.

In addition to the forestland managed by the Yale Forests Program, close working relationships exist with non-Yale forests that faculty and students use for education and research. Yale has a long history of collaboration with the 6,800-acre Great Mountain

Forest in northwestern Connecticut. The program manages the Yale Camp there, on about eight acres deeded to Yale in 1940 by Edward C. Childs, 1928 B.A., 1932 M.F., and his family. The camp can accommodate fifty-four visitors overnight in the main lodge, four cabins, and a director's cottage. Sleeping tents in two large fields can accommodate visitors as well. The camp is mostly used by MODs, with sixty-five people visiting each week. It is powered by a new ground-based solar array. The kitchen in the main lodge is a communal kitchen licensed by the State of Connecticut.

Additionally, the 20,000-acre forestland owned and managed by the South Central Connecticut Regional Water Authority in New Haven County is one of the oldest managed forests in the western hemisphere and easily accessible from Yale's campus. Connecticut state forests and Yale's long history with the Connecticut Forest & Park Association serve as resources for student and faculty engagement as well.

LIBRARY COLLECTION

YSE students have access to the enormous holdings of the Yale University Library (YUL), which comprises fifteen million print and electronic volumes in more than a dozen different libraries and locations. The YUL is committed to acquiring whatever books and journals are needed to support Yale's teaching and research activities. The bulk of YSE materials are located online and in the Marx Science and Social Science Library, while smaller, more specialized collections, such as the Henry Solon Graves Papers and the Rachel Carson Papers, are housed in Manuscripts and Archives (in Sterling Memorial Library) and the Beinecke Rare Book and Manuscript Library. The librarian for environmental studies has an office in Marx Library (Rm. C44) and is available most weekday hours to provide assistance to students. Reference and information services are provided by experienced staff in the Marx Library. For electronic retrieval, the library has a network of databases accessible via its website, covering general environmental topics as well as the specific subject areas of forestry, soils, fish and wildlife, and water resources. Overall, Yale University Library subscribes to more than one thousand databases. Library resources outside of Yale are accessed through the Borrow Direct service as well as Interlibrary Loan. The YUL supports both EndNote and RefWorks bibliographic data management tools, and the librarian for environmental studies provides instruction in both.

The YSE Library Research Guide is located at <https://guides.library.yale.edu/yse>. There are links to Orbis, Yale's main online catalog; direct links to several of the most frequently used bibliographic databases, such as BIOSIS, Web of Science, ProQuest Natural Science Collection, Environment Complete, and CAB Direct; and information ranging from instruction opportunities to online full-text journals. In-house bibliographic instruction begins during MODs and continues throughout the term. Notification of tours and group instruction sessions is posted via email; students may also contact the librarian directly (203.432.5912) to set up an individual session.

For additional information, please visit <https://web.library.yale.edu>.

COMPUTER RESOURCES

The mission of the YSE Information Technology Department (YSE-IT) is to support all aspects of computing for every member of the Yale School of the Environment community. We use and support multiple platforms, including Windows and Macintosh operating systems. Students are strongly encouraged, but not required, to

bring their own computers. Admitted students may contact the YSE-IT Helpdesk by emailing helpdesk.yse@yale.edu for advice on the selection of appropriate hardware and software. We strongly encourage the purchase of Apple Macbook Pro or Lenovo ThinkPad (T or X series) laptop computers. A robust campus network provides wireless access within all YSE buildings and throughout the Yale campus.

YSE-IT and trained student technicians from Yale's Student Technology Collaborative provide drop-in technical support for students to assist with any academic or research computer needs they may have while on campus. Weekend and after-hours student support is also available at Bass Library, within easy walking distance of the School. YSE-IT provides secure, centralized backup services for all YSE faculty, staff, and students, as well as a YSE-provisioned Dropbox account.

YSE-IT maintains a computer lab in Sage Hall, Rm. 39, with sixteen computer workstations that feature dual 24-inch displays, 3 GHz Intel i5 (quad-core) and 2.2 Xeon (10-core) processors, and at least 16 GB of RAM that were updated in the summer of 2018. The lab also features four 27-inch high-definition monitors for students who would like to utilize their own laptops.

The computer lab houses a multifunction copy/scan/fax/print device. Additional wireless student printing is available in each YSE building and throughout the Yale campus via the BluePrint (PaperCut) Printing System. Three-dimensional and wide-format printing is also available at the Yale Center for Engineering Innovation & Design (CEID) and the Yale School of Architecture.

YSE-IT maintains an inventory of equipment that students may borrow for short periods of time through an online equipment checkout system (<https://reservations.yale.edu/yse>). Equipment may be borrowed at no charge (late and replacement fees apply if equipment is returned late, lost, or damaged). Included are iPads, GPS units, digital cameras, walkie-talkies, compact audio recorders, and other equipment.

The Yale University Library is also very active in the integration of information resources in digital format. Students and faculty have online access to an extensive variety of journals and databases as well as innovative research resources such as the Digital Humanities Lab (<https://dhlab.yale.edu>).

The Marx Science and Social Science Library (<https://marx.library.yale.edu>) offers an array of digital media technologies and operates several important digital resources, including the Statistical Classroom ("StatLab"), featuring thirty machines with dual monitors, and a variety of software and databases, such as a Bloomberg Terminal. The Marx Library is also home to a full-time GIS librarian who assists students in obtaining and working with GIS datasets to support their work in any part of the globe, and to a data librarian who is available for questions or consultation about finding, using, and managing research data in the sciences and social sciences.

Faculty members have also developed many special computer applications for their projects, and some of these are available for student use in the Sage Hall computer lab.

Communications

The Office of Communications promotes the work of the Yale School of the Environment, sharing stories about its innovativeness and excellence in teaching and scholarship to a wide range of audiences. We also provide a variety of services to members of the community to help them more effectively tell their own stories.

We aim to strengthen the understanding of and deepen the discourse on environmental issues, inform the public about the ways the School is contributing to achieving a more sustainable future, and encourage the integration of those issues into strategies for business, international development, government, and nongovernmental organizations.

The communications team publicizes original research by our faculty, fellows, and students and School-sponsored events through traditional and digital media.

School news, alumni profiles, and other community updates are regularly published on YSE's website (<https://environment.yale.edu>) and distributed through newsletters and on our social media platforms, including Facebook (<https://facebook.com/EnvironmentYale>), Twitter (<https://twitter.com/YaleEnvironment>), Instagram (<https://instagram.com/EnvironmentYale>), and LinkedIn (<https://www.linkedin.com/school/environmentyale>).

The communications office publishes *Canopy* magazine, which showcases how the YSE community—including its highly engaged alumni network—is providing innovative leadership in addressing environmental challenges across the planet. It also publishes the annual report, which highlights the progress the School has made in achieving the goals defined in its Strategic Plan and the many ways the YSE community has helped to address today's urgent environmental challenges.

Other communication platforms at YSE include:

- *Yale Environment 360* (<http://e360.yale.edu>) features reporting, analysis, and opinion on global environmental issues from leading writers, scientists, policy makers, and journalists in the field. Launched in 2008, this online magazine has established a broad global audience and received numerous awards and honors.
- *Sage Magazine* (<http://sagemagazine.org>) is a student-run environmental arts and journalism publication. Through creative and informative journalism, *Sage* seeks to expand popular notions of environmentalism and bring depth and focus to the debate around pressing environmental issues.
- *Yale Environment Review* (<http://environment-review.yale.edu>) is a student-run online publication that provides concise summaries of peer-reviewed research from around the world, with a focus on topics of general interest to those engaged in environmental and natural resource management.
- The annual Environmental Film Festival at Yale (<http://effy.yale.edu>), held each spring in New Haven, is one of America's premier student-run environmental film festivals.
- Reports and newsletters from the School's centers and programs, listed online at <https://environment.yale.edu/centers>.

To contact the YSE communications office, email communications.yse@yale.edu or call 203.436.4805.

RECORDING POLICY ACKNOWLEDGMENT

In order to capture the breadth of activities that occur at YSE – and integrate the expertise of our faculty, students, and visitors into the broader environmental dialogue – Yale University frequently photographs, videotapes, and/or records events, lectures, and activities (including during alumni events) at YSE. By attending and/or participating in classes and in other YSE and University activities, those in attendance agree to the University’s use and distribution of their image and/or voice in photographs, audio, and video capture, or in electronic reproductions of such classes and activities. These images, recordings, or excerpts may be included, for example, in Yale University websites, publications, and online courses, and otherwise used to support the University’s mission.

Student Organizations

The School has many student-run interest groups. Current student groups include the Africa SIG; Asia (ASIA) SIG; Built Environment and the Environment (BE2); Business and Environment Club SIG (joint with the School of Management); the Climate Change SIG; Economic Consideration of Nature (ECON); Energy SIG; Environmental Data Science at Yale (EDSY); Environmental Justice at Yale (EJAY); Environmental Media & Arts; Fire SIG; FOOD SIG; the Forestry Club (FC); Fresh & Salty SIG; Green Chemistry SIG; GROUNDED; Health and Environment at Yale (HEY); the Industrial Environmental Management and Energy Group (IEME); a student chapter of the International Society of Tropical Foresters (ISTF); the Latin American SIG (LA SIG); LoggeRhythms; Natural Resources Extraction (NRX); Out in the Woods (OIW); Outdoor Rec Industry; PhD SIG; Recess; ROOTS SIG; SAGE Magazine; SCOPE – the Research SIG; the Yale chapter of the Society for Conservation Biology (CONBIO); Society for Ecological Restoration (SER); the Spatial Collective; Sustainability and Finance SIG; Sustainable Development in Latin America and the Caribbean (SDLAC); Take Action Tuesday; Urban Resilience for the Built and Natural Environment (URBAN Environment); WESTIES; Yale Environment Women (YEW); Yale Ethnobotany and Mycology Society (YEMS); Yale Temperate Forestry (formerly known as SAF); and the Student Affairs Committee (SAC). The activities of these groups include sponsoring guest and student lectures, organizing field trips, sponsoring workshops, organizing social events, holding conferences, and interacting with regional divisions of their respective societies.

Funding for Master’s Student Projects and Activities

Master’s students often seek funding for research, professional activities, and social events. Sometimes the request is for an individual activity, sometimes it is on behalf of a group. Students can apply to several funds at Yale University and the Yale School of the Environment. Among the most useful are the Master’s Student Travel fund to support attendance at a conference or symposium at which a student is giving a talk; the Carpenter-Sperry Fund for travel and research; the MacMillan Center for

International and Area Studies, which can help bring international visitors to Yale for a lecture or a conference; the School's Student Affairs Committee (SAC), which supports activities by our many student interest groups (SIGs); the YSE Community Events Fund, administered by the Dean's Office, which supports student events and conferences; the Class of '80 Student Project Fund, administered by the School's Office of Development and Alumni Services, to enrich the quality of life of the student body; as well as funding from grants and contracts to faculty and centers for research.

Alumni Association

The YSE Alumni Association is led by an elected Alumni Association Board (AAB) of twenty to twenty-five alumni who represent the School's more than 5,000 alumni around the world. The AAB meets monthly: in person two times per year and remotely throughout the rest of the academic year, in addition to various committee meetings as needed. The AAB is supported by staff in the YSE Office of Development and Alumni Services.

AAB members lead a number of initiatives focused on alumni-to-alumni, alumni-to-student, and alumni-to-University engagement. The AAB supports and generates efforts around diversity, equity, and inclusion at the School and among alumni; organizes field-based learning programs, educational opportunities, and volunteer opportunities for alumni; and communicates with the alumni body.

The Alumni Association Board also oversees the annual AAB nominations/elections process as well as the selection of the Distinguished Alumni and Prospect Street award recipients named at Reunion weekend each year. The YSE Alumni Association Board Scholarship is awarded annually to two current students who demonstrate outstanding community engagement and volunteer leadership. Alumni events and e-newsletters, along with the YSE magazine *Canopy*, keep alumni throughout the world in touch with each other and the School.

The YSE Alumni Association is also affiliated with the Yale Alumni Association (YAA), which serves all alumni of Yale University.

Alumni may contact the Office of Development and Alumni Services at alumni.yse@yale.edu.

Career Development Office

<http://environment.yale.edu/careers>

The Career Development Office (CDO) seeks to inspire and prepare all students to pursue high-impact environmental careers aligned with their individual abilities, experience, and interests. Its mission is to proactively educate students to maximize their entire YSE experience for impactful careers and lives; cultivate strong relationships with leading domestic and international environmental employers; and support career-related initiatives across YSE.

The CDO's diverse resources, programs, and services enable users to develop key skills needed to present themselves professionally on the job market, develop and refine meaningful career goals, and chart a strategy for conducting effective job and internship searches. We work with students on an ongoing basis through individual

advising appointments as well as through workshops conducted by staff and other career development professionals.

CAREER PLANNING RESOURCES

Career Counseling and Peer Advising

Through individual career advising appointments with our professional team, and drop-in hours with trained peer reviewers, students work with CDO on:

- General career advising (strategy, focus, vision)
- LinkedIn profile development and reviews
- Résumé reviews
- Cover letter reviews
- CV reviews
- Converting a CV to a résumé; converting a résumé to a CV
- Personal statement reviews for Ph.D. program and fellowship applications
- Networking advice at Yale and beyond
- Online tools orientation (YSE Next, LinkedIn, Yale Cross Campus, AlumniFire)
- Interview skills and preparation coaching
- Mock interviews
- Internship planning guidance
- Internship funding advice
- Salary negotiation strategies

YSE Next Online Career Development System

- Access more than 150 YSE-focused jobs and internships added each month
- Publish your résumé for review by alumni and employers
- Create job and internship alerts
- Apply directly online for jobs/internships of interest
- Schedule career counseling appointments
- RSVP for upcoming events
- Access exclusive career development resources

YSE Résumé

We work with students individually and through workshops to write and design a targeted professional résumé. We provide an official *YSE Résumé Template and Résumé Content, Style, and Format Guidelines*.

Workshops and Information Sessions

These programs are designed to guide students through phases of career readiness in line with internship, job, and further-study timelines. Sample programs:

- Building Your LinkedIn Profile
- Résumé Workshop with Peer Review
- Hive Mind: Networking
- Getting Better on Video
- Leveraging Social Media for the Job Search
- Applying for EDF Climate Corps Fellowships
- Cover Letter Writing and Peer Review

LinkedIn Photobooth

Interview Skills Workshop: Behavioral and Traditional Interview Questions

Federal Job Applications

U.S. Presidential Management Fellowship Information Session

Applying for the Ph.D.

How to Work a Career Fair

Salary and Job Offer Negotiations

Career Fairs and Regional Events

YSEinDC: Approximately one hundred students attend this annual two-day program in Washington, D.C., home to the largest YSE alumni population. The event includes employer site visits, preselected job and internship interviews, small group information sessions, alumni networking dinners, and an alumni/student networking reception.

All Ivy Environmental and Sustainable Development Career Fair: Up to eighty employers in a range of fields and more than 1,000 students participate in this annual fair jointly sponsored by the eight Ivy League institutions, which is open to all graduate students, undergraduate students, and alumni from partner schools. The fair is held at Columbia University in New York.

Networking nights and career fairs hosted by partner career offices at Yale: Sample programs include STEM career fair, social impact career events, energy employer information sessions, and international development career panels.

On-Campus Recruiting

Connect with employers during on-campus information sessions, informational interviews, and interview opportunities.

Alumni Connections

YSE LinkedIn Group: The Office of Development and Alumni Services maintains the Yale School of the Environment LinkedIn group.

AlumniFire: A platform that blends professional networking provided by services like LinkedIn with event sharing and discussion opportunities on platforms like Facebook and the functions of a job search site.

Yale Cross Campus: A newly launched platform connecting Yale alumni to students, and alumni to alumni for networking and career development.

SUMMER EXPERIENCES

A ten- to twelve-week summer experience is required of all master's candidates at YSE. Summer experiences provide the opportunity to align research and practice, enhance professional and technical skills, and gain professional confidence and experience. Students are assisted by the CDO, faculty, and alumni in locating or designing opportunities that meet their individual needs and interests.

Given the School's strong ties with natural resource, environmental, business/environment, and conservation organizations worldwide, the possibilities are vast. The summer experience typically occurs between the first and second years of the program; occasionally, however, it lasts for longer periods. Opportunities include

thesis-related fieldwork, traditional work experiences, structured internship programs, and independent or entrepreneurial projects.

YSE 006, Summer Internship/Research The summer experience is an important opportunity for students to apply knowledge and skills gained during their first year of study, gain professional experience and build networks, and investigate potential career paths. Experiences are ten and twelve weeks in duration, typically in the summer between the first and second years of the program. Students have latitude in designing an experience aligned with individual academic and career goals. Students are responsible for securing or creating their summer experience with appropriate faculty supervision, applying for and securing summer funding, and completing appropriate online forms before and after in order to receive course credit. Required of all master's candidates. 0 credits.

2020 Summer Experiences

The following list, compiled by the CDO, shows the rich and diverse experiences that YSE students had during a recent summer. Data for other years is available online at <http://environment.yale.edu/careers/data>. For more information, please contact Senior Associate Director Kathryn Douglas at 203.436.4830 or kathryn.douglas@yale.edu. The School and its students thank donors, host organizations, and supervisors for making these valuable professional experiences possible.

EDUCATION

Pace Energy and Climate Center, Intern in Environmental Law and Policy
 University of Miami, Abess Center for Ecosystem Science and Policy, Fellows in Environmental Justice (2)
 Yale Center for Environmental Law and Policy, Fellows in Environmental Policy Analysis (3)
 Yale Center for Green Chemistry and Green Engineering, Researchers in Green Chemistry (2)
 Yale Center for Industrial Ecology, Interns in Industrial Ecology (2)
 Yale Peabody Museum of Natural History, Fellow in Green Design and the Built Environment
 Yale Program on Climate Change Communication, Intern in Climate Change Mitigation and Adaptation

GOVERNMENT AND PUBLIC SECTOR

California Governor's Office of Planning and Research, Intern in Environmental Policy Analysis
 City of Amesbury, Intern in Urban and Regional Planning
 City of New Haven, Intern in Climate Change Mitigation and Adaptation
 City of Orlando, Fellow in Energy Analysis and Strategy (EDF Climate Corps)
 Connecticut Department of Energy and Environmental Protection, Intern in Environmental Law and Policy
 EVOlve Houston, Fellow in Fleet Electrification (EDF Climate Corps)
 United States Attorney's Office, Intern in Environmental Law and Policy
 United States Environmental Protection Agency, Intern in Environmental Law and Policy

United States Environmental Protection Agency, Intern in Water Resources Management

United States Forest Service, Intern in Forestry Management

INDEPENDENT RESEARCH

Rocky Mountain Biological Lab, Researcher in Environmental Policy Analysis
University of Maryland, Food and Agriculture Researcher in Food and Agriculture / Food Security

Yale Center for Business and the Environment, Researcher in Human Health and the Environment

Yale School of Management, Researcher in Corporate Sustainability

Yale School of the Environment, Researchers in Climate Change Mitigation and Adaptation (3)

Yale School of the Environment, Researchers in Ecosystem and Wildlife Conservation (5)

Yale School of the Environment, Researcher in Energy Analysis and Strategy

Yale School of the Environment, Researchers in Environmental Economics (3)

Yale School of the Environment, Researcher in Environmental Education and Training

Yale School of the Environment, Researcher in Environmental Engineering

Yale School of the Environment, Researchers in Environmental Justice (2)

Yale School of the Environment, Researchers in Food and Agriculture / Food Security (2)

Yale School of the Environment, Researcher in Forestry Management

Yale School of the Environment, Researcher in Human Health and the Environment

Yale School of the Environment, Researchers in Land Management and Land-Use Planning (5)

Yale School of the Environment, Researcher in Religion and Ecology

Yale School of the Environment, Researcher in Social Ecology

Yale School of the Environment, Researcher in Urban Ecology

Yale School of the Environment, Researcher in Urban Structure

Yale Tropical Resources Institute, Fellows in Tropical Resources (3)

NGOS AND NONPROFITS

Asociación Interamericana para la Defensa del Ambiente (AIDA), Intern in Climate Change Mitigation and Adaptation

Boston Harbor Now, Fellow in Coastal and Watershed Systems

Colorado Open Lands, Fellow in Ecosystem and Wildlife Conservation

Earthjustice, Summer Clerk in Environmental Law and Policy

Lincoln Institute, Research Associate, Case Writer in Protected Areas Management

Mad Agriculture, Fellow in Food and Agriculture / Food Security

Malama Maunalua, Researcher in Coastal and Watershed Systems

National Geographic Society, Fellow in Ecosystem and Wildlife Conservation

National Parks Conservation Association, Fellow in Water Resources Management

National Parks Conservation Association, Intern in Ecosystem and Wildlife Conservation

Natural Resources Conservation Cooperative, Researcher in Environmental Policy Analysis

Natural Resources Defense Council, Fellows in Climate Change Mitigation and Adaptation (2)

The Nature Conservancy, Fellow in Forestry Management
Northern Rockies Conservation Cooperative, Researcher in Ecosystem and Wildlife Conservation
Ocean Outcomes, Intern in Environmental Investing
Rare, Intern in Coastal and Watershed Systems
Rocky Mountain Institute, Intern in Energy Analysis and Strategy
Rocky Mountain Institute, Intern in Renewable Energy Development
Salmon Valley Stewardship and National Forest Foundation, Fellow in Protected Areas Management
SBTN, Intern in Environmental Consulting
Shift Health Accelerator, Fellow in Human Health and the Environment
United Nations ESCAP, Intern in Business and the Environment
United Nations Foundation, Intern in Environmental Law and Policy
Urban Resources Initiative, Intern in Urban and Regional Planning
Wildlife Conservation Society, Intern in Ecosystem and Wildlife Conservation
World Business Council for Sustainable Development, Intern in Business and the Environment
World Business Council for Sustainable Development, Intern in Climate Change Mitigation and Adaptation
World Business Council for Sustainable Development, Intern in Corporate Sustainability
World Business Council for Sustainable Development, Intern in Energy Analysis and Strategy
World Resources Institute, Intern in Water Resources Management
World Resources Institute, Intern in Climate Change Mitigation and Adaptation
World Resources Institute, Intern in Green Infrastructure
World Wildlife Fund International, Intern in Environmental Investing

PRIVATE BUSINESS AND CONSULTING

Amp Solar Development, Manager in Renewable Energy
BP, Researcher in Energy Analysis and Strategy
Cabot Creamery, Intern in Business and the Environment
Catalyst Companies, Intern in Environmental Consulting
Chengdu Angel Children's Hospital, Intern in Environmental Consulting
Chinook Forest Partners, Intern in Forestry Management
CITIC Asset, Intern in Business and the Environment
Co-Risk Labs, Intern in Disaster Risk Management
ENGIE, Intern in Energy Analysis and Strategy (EDF Climate Corps)
The Forestland Group, Intern in Carbon and Forest Finance
Gaorong Capital, Intern in Environmental Investing
King Parallel Consulting, Intern in Environmental Consulting
Mars, Incorporated, Fellow in Corporate Sustainability (EDF Climate Corps)
Mesa Foods, Inc., Founder in Food and Agriculture / Food Security
Miranda Bennett Studio, Intern in Corporate Sustainability
PepsiCo, Fellow in Environmental Consulting (EDF Climate Corps)
Resource Management Service, Intern in Carbon and Forest Finance
Skat Consulting, Intern in Green Design and the Built Environment
Symbrosia, Intern in Food and Agriculture / Food Security
Vilicus Farms, Intern in Food and Agriculture / Food Security

IMMEDIATELY FOLLOWING GRADUATION

Each year YSE graduates enjoy employment success in environmental science, policy, and management within the United States and around the world, pursue entrepreneurial ventures, and continue their education with further study. Details including salary information on the most recent as well as previous classes can be found at <http://environment.yale.edu/careers/data>.

Summary data from the class of 2020 master's graduates six months after graduation (112 responses):

Private (Business/Consulting)	36%
Private (Business/Law)	1%
Nonprofit/Nongovernmental	31%
Government/Public Sector	21%
Academic (K–Higher Education)	6%
Further Study	3%
Self-Employed/Social Entrepreneurial	2%

Leave of Absence

Students are expected to follow a continuous course of study at the School of the Environment. However, a student who wishes or needs to interrupt study temporarily may request a leave of absence. There are three types of leave—personal, medical, and parental—all of which are described below. The general policies that apply to a leave of absence are:

1. Any student who is contemplating a leave of absence should see the assistant dean of student affairs to discuss the necessary application procedures.
2. All leaves of absence must be approved by the assistant dean of student affairs or the senior associate dean of academic affairs. Medical leaves also require the written recommendation of a physician on the staff of Yale Health, as described below.
3. A student may be granted a leave of absence of one to two years. Any leave approved by the assistant dean of student affairs or the senior associate dean of academic affairs will be for a specified period.
4. International students who apply for a leave of absence must consult with OISS regarding their visa status.
5. A student on a leave of absence may complete outstanding work in courses for which extensions have been granted. The student may not, however, fulfill any other degree requirements during the time on leave.
6. A student on a leave of absence is not eligible for financial aid, including loans; and in most cases, student loans are not deferred during periods of non-enrollment.
7. A student on a leave of absence is not eligible for the use of any University facilities normally available to enrolled students.
8. A student on leave of absence may continue to be enrolled in Yale Health by purchasing coverage through the Student Affiliate Coverage plan. In order to secure continuous coverage from Yale Health, enrollment in this plan must be requested

prior to the beginning of the term in which the student will be on leave. If a leave of absence is granted during the term, the student must request Yale Health Affiliate Coverage enrollment within thirty days of the date the registrar was notified of the leave. Coverage is not automatic; enrollment forms are available from the Member Services Department of Yale Health, 203.432.0246, or can be downloaded from the Yale Health website (<http://yalehealth.yale.edu>).

9. A student on a leave of absence does not have to file a formal application for readmission. However, the student must notify the assistant dean of student affairs or the senior associate dean of academic affairs in writing of the intention to return at least eight weeks prior to the end of the approved leave. In addition, a returning student who wishes to be considered for financial aid must submit appropriate financial aid applications to the School's financial aid office to determine eligibility.
10. A student on a leave of absence who does not return at the end of an approved leave, and does not request and receive an extension from the dean, is automatically dismissed from the School.

Personal leave of absence A student who wishes or needs to interrupt study temporarily because of personal exigencies may request a personal leave of absence. The general policies governing all leaves of absence are described above. A student who is current with degree requirements is eligible for a personal leave after satisfactory completion of at least one term of study. Personal leaves cannot be granted retroactively and normally will not be approved after the tenth day of a term.

To request a personal leave of absence, the student must apply in writing before the beginning of the term for which the leave is requested, explaining the reasons for the proposed leave and stating both the proposed start and end dates of the leave, and the address at which the student can be reached during the period of the leave. If the assistant dean of student affairs and the senior associate dean of academic affairs find the student to be eligible, the leave will be approved. In any case, the student will be informed in writing of the action taken. A student who does not apply for a personal leave of absence, or whose application for a leave is denied, and who does not register for any term, will be considered to have withdrawn from the School.

Medical leave of absence A student who must interrupt study temporarily because of illness or injury may be granted a medical leave of absence with the approval of the assistant dean of student affairs and the senior associate dean of academic affairs, on the written recommendation of a physician on the staff of Yale Health. The general policies governing all leaves of absence are described above. A student who is making satisfactory progress toward degree requirements is eligible for a medical leave any time after matriculation. The final decision concerning a request for a medical leave of absence will be communicated in writing by the assistant dean of student affairs.

The School of the Environment reserves the right to place a student on a mandatory medical leave of absence when, on recommendation of the director of Yale Health or the chief of the Mental Health and Counseling department, the dean of the School determines that, because of a medical condition, the student is a danger to self or others, the student has seriously disrupted others in the student's residential or academic communities, or the student has refused to cooperate with efforts deemed necessary by Yale Health and the dean to make such determinations. Each case will be assessed individually based on all relevant factors, including, but not limited to,

the level of risk presented and the availability of reasonable modifications. Reasonable modifications do not include fundamental alterations to the student's academic, residential, or other relevant communities or programs; in addition, reasonable modifications do not include those that unduly burden University resources.

An appeal of such a leave must be made in writing to the dean of the School no later than seven days from the effective date of the leave.

An incident that gives rise to voluntary or mandatory leave of absence may also result in subsequent disciplinary action.

A student who is placed on medical leave during any term will have tuition adjusted according to the same schedule used for withdrawals (see Tuition Rebate and Financial Aid Refund Policy). Before re-registering, a student on medical leave must secure written permission to return from a Yale Health physician.

Leave of absence for parental responsibilities A student who wishes or needs to interrupt study temporarily for reasons of pregnancy, maternity care, or paternity care may be granted a leave of absence for parental responsibilities. The general policies governing all leaves of absence are described above. A student who is making satisfactory progress toward degree requirements is eligible for parental leave any time after matriculation.

Any student planning to have or care for a child is encouraged to meet with the assistant dean of student affairs to discuss leaves and other short-term arrangements. For many students, short-term arrangements rather than a leave of absence are possible. Students living in University housing units are encouraged to review their housing contract and the related policies of the Yale Housing before applying for a parental leave of absence. Students granted a parental leave may continue to reside in University housing to the end of the academic term for which the leave was first granted, but no longer.

U.S. Military Leave Readmissions Policy

Students who wish or need to interrupt their studies to perform U.S. military service are subject to a separate U.S. military leave readmissions policy. In the event a student withdraws or takes a leave of absence from the School of the Environment to serve in the U.S. military, the student will be entitled to guaranteed readmission under the following conditions:

1. The student must have served in the U.S. Armed Forces for a period of more than thirty consecutive days;
2. The student must give advance written or oral notice of such service to the assistant dean of student affairs or the senior associate dean of academic affairs. In providing the advance notice the student does not need to indicate an intention to return. This advance notice need not come directly from the student, but rather, can be made by an appropriate officer of the U.S. Armed Forces or official of the U.S. Department of Defense. Notice is not required if precluded by military necessity. In all cases, this notice requirement can be fulfilled at the time the student seeks readmission, by submitting an attestation that the student performed the service.
3. The student must not be away from the School to perform U.S. military service for a period exceeding five years (this includes all previous absences to perform U.S.

military service but does not include any initial period of obligated service). If a student's time away from the School to perform U.S. military service exceeds five years because the student is unable to obtain release orders through no fault of the student or the student was ordered to or retained on active duty, the student should contact the assistant dean of student affairs to determine if the student remains eligible for guaranteed readmission.

4. The student must notify the School within three years of the end of the U.S. military service of the intention to return. However, a student who is hospitalized or recovering from an illness or injury incurred in or aggravated during the U.S. military service has up until two years after recovering from the illness or injury to notify the School of the intent to return.
5. The student cannot have received a dishonorable or bad conduct discharge or have been sentenced in a court-martial.

A student who meets all of these conditions will be readmitted for the next term, unless the student requests a later date of readmission. Any student who fails to meet one of these requirements may still be readmitted under the general readmission policy but is not guaranteed readmission.

Upon returning to the School, the student will resume education without repeating completed course work for courses interrupted by U.S. military service. The student will have the same enrolled status last held and with the same academic standing. For the first academic year in which the student returns, the student will be charged the tuition and fees that would have been assessed for the academic year in which the student left the institution. Yale may charge up to the amount of tuition and fees other students are assessed, however, if veteran's education benefits will cover the difference between the amounts currently charged other students and the amount charged for the academic year in which the student left.

In the case of a student who is not prepared to resume studies with the same academic status at the same point where the student left off or who will not be able to complete the program of study, the School of the Environment will undertake reasonable efforts to help the student become prepared. If after reasonable efforts, the School determines that the student remains unprepared or will be unable to complete the program, or after the School determines that there are no reasonable efforts it can take, the School may deny the student readmission.

Freedom of Expression

The Yale School of the Environment is committed to the protection of free inquiry and expression in the classroom and throughout the School community. In this, the School reflects the University's commitment to and policy on freedom of expression as eloquently stated in the Woodward Report (Report of the Committee on Freedom of Expression at Yale, 1974). See <https://studentlife.yale.edu/guidance-regarding-free-expression-and-peaceable-assembly-students-yale>.

YALE UNIVERSITY RESOURCES AND SERVICES

A Global University

Global engagement is core to Yale's mission as one of the world's great universities. Yale aspires to:

- Be the university that best prepares students for global citizenship and leadership
- Be a worldwide research leader on matters of global import
- Be the university with the most effective global networks

Yale's engagement beyond the United States dates from its earliest years. The University remains committed to attracting the best and brightest from around the world by offering generous international financial aid packages, conducting programs that introduce and acclimate international students to Yale, and fostering a vibrant campus community.

Yale's globalization is guided by the vice president for global strategy, who is responsible for ensuring that Yale's broader global initiatives serve its academic goals and priorities, and for enhancing Yale's international presence as a leader in liberal arts education and as a world-class research institution. The vice president works closely with academic colleagues in all of the University's schools and provides support and strategic guidance to the many international programs and activities undertaken by Yale faculty, students, and staff.

Teaching and research at Yale benefit from the many collaborations underway with the University's international partners and the global networks forged by Yale across the globe. International activities across all Yale schools include curricular initiatives that enrich classroom experiences from in-depth study of a particular country to broader comparative studies; faculty research and practice on matters of international importance; the development of online courses and expansion of distance learning; and the many fellowships, internships, and opportunities for international collaborative research projects on campus and abroad. Together these efforts serve to enhance Yale's global educational impact and are encompassed in the University's global strategy.

The Office of International Affairs (<https://world.yale.edu/oia>) provides administrative support for the international activities of all schools, departments, centers, and organizations at Yale; promotes Yale and its faculty to international audiences; and works to increase the visibility of Yale's international activities around the globe.

The Office of International Students and Scholars (<https://oiss.yale.edu>) hosts orientation programs and social activities for the University's international community and is a resource for international students and scholars on immigration matters and other aspects of acclimating to life at Yale.

The Yale Alumni Association (<https://alumni.yale.edu>) provides a channel for communication between the alumni and the University and supports alumni organizations and programs around the world.

Additional information may be found on the “Yale and the World” website (<https://world.yale.edu>), including resources for those conducting international activities abroad and links to international initiatives across the University.

Housing

The Yale Housing Office has dormitory and apartment units available for graduate and professional students. Dormitories are single-occupancy and two-bedroom units of varying sizes and prices. They are located across the campus, from Edward S. Harkness Memorial Hall, serving the medical campus, to Helen Hadley Hall and the newly built 272 Elm Street, serving the central/science campus. Unfurnished apartments consisting of efficiencies and one-, two-, and three-bedroom apartments for singles and families are also available. Family housing is available in Whitehall and Esplanade Apartments. The Housing website (<https://housing.yale.edu>) is the venue for graduate housing information and includes dates, procedures, facility descriptions, floor plans, and rates. Applications for the new academic year are available beginning April 20 and can be submitted directly from the website with a Yale NetID.

The Yale Housing Office also manages the Off Campus Living listing service (<http://offcampusliving.yale.edu>; 203.436.9756), which is the exclusive Yale service for providing off-campus rental and sales listings from New Haven landlords. This secure system allows members of the Yale community to search rental listings, review landlord/property ratings, and search for a roommate in the New Haven area. On-campus housing is limited, and members of the community should consider off-campus options. Yale University discourages the use of Craigslist and other third-party nonsecure websites for off-campus housing searches.

The Yale Housing Office is located in Helen Hadley Hall (HHH) at 420 Temple Street and is open from 9 a.m. to 4 p.m., Monday through Friday; 203.432.2167.

Dining

Yale Hospitality has tailored its services to meet the particular needs of graduate and professional school students by offering meal plan options that allow flexibility and value. For up-to-date information on all options, costs, and residential and retail dining locations, visit <https://hospitality.yale.edu>. Inquiries concerning food services should be addressed to Yale Hospitality, 246 Church Street, PO Box 208261, New Haven CT 06520-8261; email, yale.dining@yale.edu; tel., 203.432.0420.

Security

As with most universities in urban settings, the security of persons and property is a primary concern of the School of the Environment. The University police and the fire marshal, in cooperation with the police and fire services of the City of New Haven, strive constantly to maintain a safe environment for the Yale community. At an orientation session during the summer modules, incoming students receive detailed

information on emergency communications, personal safety tips, and other ways to protect themselves, equipment, and buildings.

Health Services

The Yale Health Center is located on campus at 55 Lock Street. The center is home to Yale Health, a not-for-profit, physician-led health coverage option that offers a wide variety of health care services for students and other members of the Yale community. Services include student health, gynecology, mental health, pediatrics, pharmacy, blood draw, radiology, a seventeen-bed inpatient care unit, a round-the-clock acute care clinic, and specialty services such as allergy, dermatology, orthopedics, and a travel clinic. Yale Health coordinates and provides payment for the services provided at the Yale Health Center, as well as for emergency treatment, off-site specialty services, inpatient hospital care, and other ancillary services. Yale Health's services are detailed in the *Yale Health Student Handbook*, available through the Yale Health Member Services Department, 203.432.0246, or online at <https://yalehealth.yale.edu/coverage/student-coverage>.

ELIGIBILITY FOR SERVICES

All full-time Yale degree-candidate students who are paying at least half tuition are enrolled automatically for Yale Health Basic Coverage. Yale Health Basic Coverage is offered at no charge and includes preventive health and medical services in the departments of Student Health, Gynecology, Student Wellness, and Mental Health & Counseling. In addition, treatment for urgent medical problems can be obtained twenty-four hours a day through Acute Care.

Students on leave of absence or on extended study and paying less than half tuition are not eligible for Yale Health Basic Coverage but may enroll in Yale Health Student Affiliate Coverage. Students enrolled in the Division of Special Registration as nondegree special students or visiting scholars are not eligible for Yale Health Basic Coverage but may enroll in the Yale Health Billed Associates Plan and pay a monthly fee. Associates must register for a minimum of one term within the first thirty days of affiliation with the University.

Students not eligible for Yale Health Basic Coverage may also use the services on a fee-for-service basis. Students who wish to be seen fee-for-service must register with the Member Services Department. Enrollment applications for the Yale Health Student Affiliate Coverage, Billed Associates Plan, or Fee-for-Service Program are available from the Member Services Department.

All students who purchase Yale Health Hospitalization/Specialty Coverage (see below) are welcome to use specialty and ancillary services at Yale Health Center. Upon referral, Yale Health will cover the cost of specialty and ancillary services for these students. Students with an alternate insurance plan should seek specialty services from a provider who accepts their alternate insurance.

HEALTH COVERAGE ENROLLMENT

The University also requires all students eligible for Yale Health Basic Coverage to have adequate hospital insurance coverage. Students may choose Yale Health Hospitalization/Specialty Coverage or elect to waive the plan if they have other hospitalization coverage, such as coverage through a spouse or parent. The waiver

must be renewed annually, and it is the student's responsibility to confirm receipt of the waiver by the University's deadlines noted below.

Yale Health Hospitalization/Specialty Coverage

For a detailed explanation of this plan, which includes coverage for prescriptions, see the *Yale Health Student Handbook*, available online at <https://yalehealth.yale.edu/coverage/student-coverage>.

Students are automatically enrolled and charged a fee each term on their Student Financial Services bill for Yale Health Hospitalization/Specialty Coverage. Students with no break in coverage who are enrolled during both the fall and spring terms are billed each term and are covered from August 1 through July 31. For students entering Yale for the first time, readmitted students, and students returning from a leave of absence who have not been covered during their leave, Yale Health Hospitalization/Specialty Coverage begins on the day the dormitories officially open. A student who is enrolled for the fall term only is covered for services through January 31; a student enrolled for the spring term only is covered for services through July 31.

Waiving Yale Health Hospitalization/Specialty Coverage Students are permitted to waive Yale Health Hospitalization/Specialty Coverage by completing an online waiver form at <https://yhpstudentwaiver.yale.edu> that demonstrates proof of alternate coverage. It is the student's responsibility to report any changes in alternate insurance coverage to the Member Services Department within thirty days. Students are encouraged to review their present coverage and compare its benefits to those available under Yale Health. The waiver form must be filed annually and must be received by September 15 for the full year or fall term or by January 31 for the spring term only.

Revoking the waiver Students who waive Yale Health Hospitalization/Specialty Coverage but later wish to be covered must complete and send a form voiding their waiver to the Member Services Department by September 15 for the full year or fall term, or by January 31 for the spring term only. Students who wish to revoke their waiver during the term may do so, provided they show proof of loss of the alternate insurance plan and enroll within thirty days of the loss of this coverage. Yale Health fees will not be prorated.

Yale Health Student Dependent Plans

A student may enroll the student's lawfully married spouse or civil union partner and/or legally dependent child(ren) under the age of twenty-six in one of three student dependent plans: Student + Spouse, Student + Child/Children, or Student Family Plan. These plans include services described in both Yale Health Basic Coverage and Yale Health Hospitalization/Specialty Coverage. Coverage is not automatic, and enrollment is by application. Applications are available from the Member Services Department or can be downloaded from the website (<https://yalehealth.yale.edu/resources/forms>) and must be renewed annually. Applications must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

Yale Health Student Affiliate Coverage

Students on leave of absence or extended study, students paying less than half tuition, students enrolled in the EMBA program, students enrolled in the PA Online program, and students enrolled in the EMPH program may enroll in Yale Health Student Affiliate Coverage, which includes services described in both Yale Health Basic and Yale Health Hospitalization/Specialty Coverage. Applications are available from the Member Services Department or can be downloaded from the website (<https://yalehealth.yale.edu/resources/forms>) and must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

ELIGIBILITY CHANGES

Withdrawal A student who withdraws from the University during the first fifteen days of the term will be refunded the fee paid for Yale Health Hospitalization/Specialty Coverage. The student will not be eligible for any Yale Health benefits, and the student's Yale Health membership will be terminated retroactive to the beginning of the term. The medical record will be reviewed, and any services rendered and/or claims paid will be billed to the student on a fee-for-service basis. Assistance with identifying and locating alternative sources of medical care may be available from the Care Management Department at Yale Health. At all other times, a student who withdraws from the University will be covered by Yale Health for thirty days following the date of withdrawal. Fees will not be prorated or refunded. Students who withdraw are not eligible to enroll in Yale Health Student Affiliate Coverage. Regardless of enrollment in Yale Health Hospitalization/Specialty Coverage, students who withdraw will have access to services available under Yale Health Basic Coverage (including Student Health, Athletic Medicine, Mental Health & Counseling, and Care Management) during these thirty days to the extent necessary for a coordinated transition of care.

Leaves of absence Students who are granted a leave of absence are eligible to purchase Yale Health Student Affiliate Coverage for the term(s) of the leave. If the leave occurs on or *before* the first day of classes, Yale Health Hospitalization/Specialty Coverage will end retroactive to the start of the coverage period for the term. If the leave occurs anytime after the first day of classes, Yale Health Hospitalization/Specialty Coverage will end on the day the registrar is notified of the leave. In either case, students may enroll in Yale Health Student Affiliate Coverage. Students must enroll in Affiliate Coverage prior to the beginning of the term unless the registrar is notified after the first day of classes, in which case, the coverage must be purchased within thirty days of the date the registrar was notified. Fees paid for Yale Health Hospitalization/Specialty Coverage will be applied toward the cost of Affiliate Coverage. Coverage is not automatic, and enrollment forms are available at the Member Services Department or can be downloaded from the website (<https://yalehealth.yale.edu/resources/forms>). Fees will not be prorated or refunded.

Extended study or reduced tuition Students who are granted extended study status or pay less than half tuition are not eligible for Yale Health Hospitalization/Specialty Coverage. They may purchase Yale Health Student Affiliate Coverage during the term(s) of extended study. This plan includes services described in both Yale Health Basic and Yale Health Hospitalization/Specialty Coverage. Coverage is not automatic, and enrollment forms are available at the Member Services Department or can be

downloaded from the website (<https://yalehealth.yale.edu/resources/forms>). Students must complete an enrollment application for the plan prior to September 15 for the full year or fall term, or by January 31 for the spring term only.

For a full description of the services and benefits provided by Yale Health, please refer to the *Yale Health Student Handbook*, available from the Member Services Department, 203.432.0246, 55 Lock Street, PO Box 208237, New Haven CT 06520-8237.

REQUIRED IMMUNIZATIONS

Proof of vaccination is a pre-entrance requirement determined by the Connecticut State Department of Public Health. Students who are not compliant with this state regulation will not be permitted to register for classes or move into the dormitories for the fall term, 2021. Please access the Incoming Student Vaccination Record form for graduate and professional students at <https://yalehealth.yale.edu/new-graduate-and-professional-student-forms>. Connecticut state regulation requires that this form be completed and signed, for each student, by a physician, nurse practitioner, or physician's assistant. The form must be completed, independent of any and all health insurance elections or coverage chosen. Once the form has been completed, the information must be entered into the Yale Vaccine Portal (available after June 20), and all supporting documents must be uploaded to <http://yale.medicatconnect.com>. The final deadline is August 1.

COVID-19 Effective April 2021, all students are required to provide proof of completed immunization against COVID-19. Antibody titers or evidence of previous infection are *not* accepted as proof of immunity. Currently approved vaccines include Pfizer-BioNTech (two doses), Moderna (two doses), and Janssen/Johnson & Johnson (one dose). International vaccines that are authorized for emergency use by the World Health Organization will also be accepted by Yale as meeting the COVID-19 vaccination requirement. Yale Health's website will be updated as new vaccines are reviewed (<https://yalehealth.yale.edu/covid-19-vaccination-faq-international-students-and-scholars>). Students who encounter insurmountable difficulties in being vaccinated at home, or live internationally and do not have access to an accepted vaccine, will be provided with free vaccine on campus by special arrangement. Students who are not compliant with this vaccine requirement will not be permitted to register for classes or move into the dormitories for the fall term, 2021.

Influenza All students are required to have flu vaccination in the fall term when it is made available to them by Yale Health.

Measles, mumps, rubella, and varicella All students are required to provide proof of immunization against measles (rubeola), mumps, German measles (rubella), and varicella. Connecticut state regulation requires two doses of measles vaccine, two doses of mumps vaccine, two doses of rubella vaccine, and two doses of varicella vaccine. The first dose must have been given after the student's first birthday; the second dose must have been given at least twenty-eight (28) days after the first dose. If dates of vaccination are not available, titer results (blood test) demonstrating immunity may be substituted for proof of vaccination. The cost for all vaccinations and/or titers rests with the student, as these vaccinations are considered to be a pre-entrance requirement by the Connecticut State Department of Public Health. Students who are not compliant

with this state regulation will not be permitted to register for classes or move into the dormitories for the fall term, 2021.

Quadrivalent meningitis All students living in on-campus dormitory facilities must be vaccinated against meningitis. The only vaccines that will be accepted in satisfaction of the meningitis vaccination requirement are ACWY Vax, Menveo, Nimenrix, Menactra, Mencevax, and Menomune. The vaccine must have been given within five years of the first day of classes at Yale. Students who are not compliant with this state regulation will not be permitted to register for classes or move into the dormitories for the fall term, 2021. The cost for all vaccinations and/or titers rests with the student, as these vaccinations are considered to be a pre-entrance requirement by the Connecticut State Department of Public Health. Please note that the State of Connecticut does not require this vaccine for students who intend to reside on campus and are over the age of twenty-nine.

TB screening The University requires tuberculosis screening for all incoming students who have lived or traveled outside of the United States within the past year.

Hepatitis B series The University recommends that incoming students receive a series of three Hepatitis B vaccinations. Students may consult their health care provider for further information.

Student Accessibility Services

Student Accessibility Services (SAS) facilitates reasonable accommodations for all Yale students with disabilities who choose to register with the office. Registration with SAS is kept private. SAS helps arrange academic, transportation, dietary, and housing accommodations across campus. To qualify as a student with a disability, supporting documentation must be provided. The required first step for a student with a disability is completion of the registration form, which will initiate the process of obtaining disability-related accommodations; see https://yale-accommodate.symplcity.com/public_accommodation.

SAS works with students with sporadic and temporary disabilities as well. At any time during a term, students with a newly diagnosed disability requiring accommodations should register following the above instructions. More information can be found at <https://sas.yale.edu>, including instructions for requesting or renewing accommodations and the guidelines for supporting documentation. You can also reach us at sas@yale.edu or by phone at 203.432.2324.

Resources on Sexual Misconduct

Yale University is committed to maintaining and strengthening an educational, working, and living environment founded on mutual respect. Sexual misconduct is antithetical to the standards and ideals of our community, and it is a violation of Yale policy and the disciplinary regulations of Yale College and the graduate and professional schools.

Sexual misconduct incorporates a range of behaviors including sexual assault, sexual harassment, intimate partner violence, stalking, voyeurism, and any other conduct of a sexual nature that is nonconsensual, or has the purpose or effect of threatening,

intimidating, or coercing a person. Violations of Yale's Policy on Teacher-Student Consensual Relations also constitute sexual misconduct. Sexual activity requires affirmative consent, which is defined as positive, unambiguous, and voluntary agreement to engage in specific sexual activity throughout a sexual encounter.

Yale aims to eradicate sexual misconduct through education, training, clear policies, and serious consequences for violations of these policies. In addition to being subject to University disciplinary action, many forms of sexual misconduct are prohibited by Connecticut and federal law and may lead to civil liability or criminal prosecution. Yale provides a range of services and resources for victims of sexual misconduct. Information on options for reporting an incident, accommodations and other supportive measures, and policies and definitions may be found at <https://smr.yale.edu>.

SHARE: INFORMATION, ADVOCACY, AND SUPPORT

55 Lock Street, Lower Level

Appointments and drop-in hours: 9 a.m.–5 p.m., M–F

24/7 hotline: 203.432.2000

<https://sharecenter.yale.edu>

SHARE, the Sexual Harassment and Assault Response and Education Center, has trained counselors available 24/7 via direct hotline, as well as for drop-in hours on weekdays during regular business hours. SHARE is available to members of the Yale community who wish to discuss any past or current experience of sexual misconduct involving themselves or someone they care about. SHARE services are confidential and can be anonymous if desired. SHARE can provide professional help with medical and health issues (including accompanying individuals to the hospital or the police), as well as ongoing counseling and support. SHARE works closely with the University-Wide Committee on Sexual Misconduct, the Title IX coordinators, the Yale Police Department, and other campus resources and can provide assistance with initiating a formal or informal complaint.

If you wish to make use of SHARE's services, you can call the SHARE number (203.432.2000) at any time for a phone consultation or to set up an in-person appointment. You may also drop in on weekdays during regular business hours. Some legal and medical options are time-sensitive, so if you have experienced an assault, we encourage you to call SHARE and/or the Yale Police as soon as possible. Counselors can talk with you over the telephone or meet you in person at Acute Care in the Yale Health Center or at the Yale New Haven Emergency Room. If it is not an acute situation and you would like to contact the SHARE staff during regular business hours, you can contact Jennifer Czincz, the director of SHARE (203.432.0310, jennifer.czincz@yale.edu), Anna Seidner (203.436.8217, anna.seidner@yale.edu), Cristy Cantú (203.432.2610, cristina.cantu@yale.edu), or Freda Grant (freda.grant@yale.edu).

TITLE IX COORDINATORS

203.432.6854

Office hours: 9 a.m.–5 p.m., M–F

<https://provost.yale.edu/title-ix>

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Sex discrimination includes sexual harassment, sexual assault, and other forms of sexual misconduct. The University is committed to providing an environment free from discrimination on the basis of sex or gender.

Yale College, the Graduate School of Arts and Sciences, and the professional schools have each designated a deputy Title IX coordinator, reporting to Stephanie Spangler, Vice Provost for Health Affairs and Academic Integrity and the University Title IX Coordinator. Coordinators respond to and address specific complaints, provide information on and coordinate with the available resources, track and monitor incidents to identify patterns or systemic issues, deliver prevention and educational programming, and address issues relating to gender-based discrimination and sexual misconduct within their respective schools. Coordinators are knowledgeable about, and will provide information on, all options for complaint resolution, and can initiate institutional action when necessary. Discussions with a Title IX coordinator are confidential. In the case of imminent threat to an individual or the community, the coordinator may need to consult with other administrators or take action in the interest of safety. The coordinators also work closely with the SHARE Center, the University-Wide Committee on Sexual Misconduct, and the Yale Police Department.

UNIVERSITY-WIDE COMMITTEE ON SEXUAL MISCONDUCT

203.432.4449

Office hours: 9 a.m.–5 p.m., M–F

<https://uwc.yale.edu>

The University-Wide Committee on Sexual Misconduct (UWC) is an internal disciplinary board for complaints of sexual misconduct available to students, faculty, and staff across the University, as described in the committee's procedures. The UWC provides an accessible, representative, and trained body to fairly and expeditiously address formal complaints of sexual misconduct. UWC members can answer inquiries about procedures and the University sexual misconduct policy. The UWC is comprised of faculty, senior administrators, and graduate and professional students drawn from throughout the University. UWC members are trained in the protocols for maintaining confidentiality and observe strict confidentiality with respect to all information they receive about a case.

YALE POLICE DEPARTMENT

101 Ashmun Street

24/7 hotline: 203.432.4400

<https://your.yale.edu/community/public-safety/yale-police-department>

The Yale Police Department (YPD) operates 24/7 and is comprised of highly trained, professional officers. The YPD can provide information on available victims' assistance services and also has the capacity to perform full criminal investigations. If you wish to speak with Sergeant Kristina Reech, the Sensitive Crimes & Support coordinator, she can be reached at 203.432.9547 during business hours or via email at kristina.reech@yale.edu. Informational sessions are available with the Sensitive Crimes & Support coordinator to discuss safety planning, available options, etc. The YPD works closely with the New Haven State's Attorney, the SHARE Center, the University's

Title IX coordinators, and various other departments within the University. Talking to the YPD does not commit you to submitting evidence or pressing charges; with few exceptions, all decisions about how to proceed are up to you.

Office of International Students and Scholars

The Office of International Students and Scholars (OISS) coordinates services and support for Yale's nearly 6,000 international students, faculty, staff, and their dependents. OISS staff assist with issues related to employment, immigration, and personal and cultural adjustment, as well as serve as a source of general information about living at Yale and in New Haven. As Yale University's representative for immigration concerns, OISS helps students, faculty, and staff obtain and maintain legal nonimmigrant status in the United States. All international students and scholars must register with OISS as soon as they arrive at Yale.

OISS programs, like daily English conversation groups, U.S. culture workshops and discussions, bus trips, and social events, provide an opportunity to meet members of Yale's international community and become acquainted with the many resources of Yale University and New Haven. Spouses and partners of Yale students and scholars will want to get involved with the International Spouses and Partners at Yale (ISPY), which organizes a variety of programs.

The OISS website (<http://oiss.yale.edu>) provides useful information to students and scholars prior to and upon arrival in New Haven, as well as throughout their stay at Yale. International students, scholars, and their families and partners can connect with OISS and the Yale international community virtually through Facebook.

OISS is housed in the International Center for Yale Students and Scholars, which serves as a welcoming venue for students and scholars who want to peruse resource materials, check their email, grab a cup of coffee, and meet up with a friend or colleague. Open until 9 p.m. on weekdays during the academic year, the center—located at 421 Temple Street, across the street from Helen Hadley Hall—also provides meeting space for student groups and a venue for events organized by both student groups and University departments. For more information about reserving space at the center, go to <http://oiss.yale.edu/about/the-international-center/international-center-room-reservations>. For information about the center, visit <http://oiss.yale.edu/about/international-center>.

Libraries

Yale University Library is comprised of collections, spaces, technology, and people. The collections contain fifteen million print and electronic volumes in more than a dozen libraries and locations, including Sterling Memorial Library, Beinecke Rare Book and Manuscript Library, and the Anne T. and Robert M. Bass Library. Yale Library's resources also include more than a billion licensed e-resources and special collections that represent the diversity of the human experience in forms ranging from ancient papyri to early printed books, rare film and music recordings, and a growing body of born-digital materials. More than five hundred staff members facilitate teaching, research, and practice, offering deep subject-area knowledge as well as expertise in digital humanities, geographic information systems, and the use and management of research data. Yale Library's preservation and conservation specialists develop and

apply leading-edge technology to maintain collections, providing critical support for increased access to collections, an expanding exhibition program, and Yale's emphasis on teaching with primary sources. For more information, visit <https://library.yale.edu>.

Religious Resources

The religious and spiritual resources of the University serve all students, faculty, and staff of all faiths. These resources are coordinated and/or supported through the Chaplaincy (located on the lower level of Bingham Hall on Old Campus); the University Church in Yale in Battell Chapel, an open and affirming ecumenical Christian congregation; and Yale Religious Ministries, the on-campus association of professionals representing numerous faith traditions. This association includes the Saint Thomas More Catholic Chapel and Center at Yale and the Joseph Slifka Center for Jewish Life at Yale, and it supports Buddhist, Hindu, and Muslim life professionals; several Protestant denominational and nondenominational ministries; and student religious groups such as the Baha'i Association, the Yale Hindu Student Council, the Muslim Student Association, the Sikh Student Association, and many others. Hours for the Chaplain's Office during the academic term are Monday through Thursday from 8:30 a.m. to 11 p.m., Friday from 8:30 a.m. to 5 p.m., and Sunday evenings from 5 to 11. Additional information is available at <http://chaplain.yale.edu>.

Graduate-Professional Student Senate (GPSS)

The Graduate and Professional Student Senate (GPSS) is composed of student-elected representatives from each of the thirteen graduate and professional schools at Yale. Any student enrolled in these schools is eligible to run for a senate seat during fall elections. As a governing body, the GPSS advocates for student concerns and advancement within Yale, represents all graduate and professional students to the outside world, and facilitates interaction and collaboration among the schools through social gatherings, academic and professional events, and community service. GPSS meetings occur on alternating Thursdays and are open to the entire graduate and professional school community, as well as representatives from the Yale administration. GPSS also oversees the management of the Gryphon, a graduate and professional student center, located at 204 York Street. The center provides office and event space for GPSS and other student organization activities, funds student groups, and houses Gryphon's Pub, open nightly. For more information, please visit <https://gpsenate.yale.edu>.

Cultural and Recreational Opportunities

CULTURAL OPPORTUNITIES

Keep up to date about campus news and events by subscribing to the Yale Today and/or Yale Best of the Week e-newsletters (<https://news.yale.edu/subscribe-newsletter>), which feature stories, videos, and photos from YaleNews (<http://news.yale.edu>) and other campus websites. Also visit the Yale Calendar of Events (<http://calendar.yale.edu>) and the University's Facebook, Twitter, Instagram, LinkedIn, and YouTube channels.

The Yale Peabody Museum of Natural History, founded in 1866, houses more than fourteen million specimens and objects in ten curatorial divisions: Anthropology, Botany, Entomology, History of Science and Technology, Invertebrate Paleontology,

Invertebrate Zoology, Mineralogy and Meteoritics, Paleobotany, Vertebrate Paleontology, and Vertebrate Zoology. The renowned collections continue to enrich teaching and learning and to inform groundbreaking new research. The museum's galleries are currently under renovation and will reopen in 2024 to display thousands of objects, including the first *Brontosaurus*, *Stegosaurus*, and *Triceratops* specimens ever discovered.

The Yale University Art Gallery was founded in 1832 as an art museum for Yale and the community. Today it is one of the largest museums in the country, holding nearly 300,000 objects and welcoming visitors from around the world. The museum's encyclopedic collection can engage every interest. Galleries showcase artworks from ancient times to the present, including vessels from Tang-dynasty China, early Italian paintings, textiles from Borneo, treasures of American art, masks from Western Africa, modern and contemporary art, ancient sculptures, masterworks by Degas, van Gogh, and Picasso, and more. Spanning one and a half city blocks, the museum features more than 4,000 works on display, multiple classrooms, a rooftop terrace, a sculpture garden, and dramatic views of New Haven and the Yale campus. The gallery's mission is to encourage an understanding of art and its role in society through direct engagement with original works of art. Programs include exhibition tours, lectures, and performances, all free and open to the public. For more information, please visit <https://artgallery.yale.edu>.

The Yale Center for British Art is a museum that houses the largest collection of British art outside the United Kingdom, encompassing works in a range of media from the fifteenth century to the present. Opened to the public in 1977, the center's core collection and landmark building—designed by architect Louis I. Kahn—were a gift to Yale University from the collector and philanthropist Paul Mellon. The museum offers a vibrant program of exhibitions and events both in person and online. For more information, please visit <https://britishart.yale.edu>.

There are more than eighty endowed lecture series held at Yale each year on subjects ranging from anatomy to theology, and including virtually all disciplines.

More than five hundred musical events take place at the University during the academic year. In addition to degree recitals by graduate students, the School of Music presents the Ellington Jazz Series, Faculty Artist Series, Horowitz Piano Series, New Music New Haven, Onepo Chamber Music Series, and Yale in New York, as well as performances by the Yale Opera, Yale Philharmonia, Yale Choral Artists, and various YSM ensembles, along with concerts at the Morris Steinert Collection of Musical Instruments. The Institute of Sacred Music presents Great Organ Music at Yale, the Yale Camerata, the Yale Schola Cantorum, and many other special events. The Norfolk Chamber Music Festival/Yale Summer School of Music presents a six-week Chamber Music Session, along with the New Music Workshop and the Chamber Choir and Choral Conducting Workshop. Many of these concerts stream live on the School's website (<https://music.yale.edu>). Additionally, the School presents the Iseman Broadcasts of the Metropolitan Opera Live in HD free to members of the Yale community. Undergraduate organizations include the Yale Bands, Yale Glee Club, Yale Symphony Orchestra, and numerous other singing and instrumental groups. The Department of Music sponsors the Yale Collegium, Yale Baroque Opera Project, productions of new music and opera, and undergraduate recitals.

For theatergoers, Yale and New Haven offer a wide range of dramatic productions at such venues as the University Theatre, Yale Repertory Theatre, Yale Cabaret, Yale Residential College Theaters, Off Broadway Theater, Iseman Theater, Whitney Humanities Center, Collective Consciousness Theatre, A Broken Umbrella Theatre, Elm Shakespeare Company, International Festival of Arts and Ideas, Long Wharf Theatre, and Shubert Performing Arts Center.

RECREATIONAL OPPORTUNITIES

The Payne Whitney Gymnasium is one of the most elaborate and extensive indoor athletic facilities in the world. This complex includes the 3,100-seat John J. Lee Amphitheater, the site for varsity basketball, volleyball, and gymnastics competitions; the Robert J.H. Kiphuth Exhibition Pool; the Brady Squash Center, a world-class facility with fifteen international-style courts; the Adrian C. Israel Fitness Center, a state-of-the-art exercise and weight-training complex; the Brooks-Dwyer Varsity Strength and Conditioning Center; the Colonel William K. Lanman, Jr. Center, a 30,000-square-foot space for recreational/intramural play and varsity team practice; the Greenberg Brothers Track, an eighth-mile indoor jogging track; the David Paterson Golf Technology Center; and other rooms devoted to fencing, gymnastics, rowing, wrestling, martial arts, general exercise, and dance. Numerous group exercise classes in dance, martial arts, zumba, yoga, pilates, spinning, HIIT and cardio, and sport skills are offered throughout the year. Yale undergraduates and graduate and professional school students may use the gym at no charge throughout the year. Memberships at reasonable fees are available for faculty, employees, postdocs, visiting associates, alumni, and members of the New Haven community. Memberships are also available for spouses and children of all members. Additional information is available at <https://sportsandrecreation.yale.edu>.

During the year, various recreational opportunities are available at the David S. Ingalls Rink, the McNay Family Sailing Center in Branford, the Yale Outdoor Education Center in East Lyme, the Yale Tennis Complex, and the Yale Golf Course. All members of the Yale community and their guests may participate at each of these venues for a modest fee. Up-to-date information on programs, hours, and specific costs is available at <https://sportsandrecreation.yale.edu>.

Approximately fifty club sports are offered at Yale, organized by the Office of Club Sports and Outdoor Education. Most of the teams are for undergraduates, but a few are available to graduate and professional school students. Yale students, faculty, staff, and alumni may use the Yale Outdoor Education Center (OEC), which consists of 1,500 acres surrounding a mile-long lake in East Lyme, Connecticut. The facility includes overnight cabins and campsites, a pavilion and dining hall available for group rental, and a waterfront area with supervised swimming, rowboats, canoes, stand-up paddleboards, and kayaks. Adjacent to the lake, a shaded picnic grove and gazebo are available to visitors. In a more remote area of the facility, hiking trails loop the north end of the property; trail maps and directions are available on-site at the field office. The OEC runs seven days a week from the third week of June through Labor Day. For more information, including mid-September weekend availability, call 203.432.2492 or visit <https://sportsandrecreation.yale.edu>.

Throughout the year, Yale graduate and professional school students have the opportunity to participate in numerous intramural sports activities, including

volleyball, soccer, and softball in the fall; basketball and volleyball in the winter; softball, soccer, ultimate, and volleyball in the spring; and softball in the summer. With few exceptions, all academic-year graduate-professional student sports activities are scheduled on weekends, and most sports activities are open to competitive, recreational, and coeducational teams. More information is available from the Intramurals Office in Payne Whitney Gymnasium, 203.432.2487, or online at <https://sportsandrecreation.yale.edu>.

CITY AND COUNTRYSIDE

Only a short bike ride away from the center of New Haven lies the countryside of a state that is over one-half forest land. Farms, parks, lakes, trails, beaches, and nature preserves all await students seeking to spend a few hours away from their studies.

The most spectacular local features are the region's traprock ridges, the largest being East Rock, West Rock, and the Sleeping Giant. All three of these have been preserved as parks. East Rock and West Rock actually extend into New Haven, and their rusty-orange cliffs form a dramatic backdrop for the city. Sleeping Giant lies a pleasant ninety-minute bicycle ride from town.

New Haven is also surrounded by water supply forests. For a small annual fee, the Water Authority's twenty thousand acres of woods, traprock ridges, lakes, and streams are open for hiking, cross-country skiing, and fishing.

Tucked away in pockets off the main corridors of development lie some of the country's most fertile farmland. The Central Valley of New England, in which New Haven is situated, was once famous for its tobacco, onions, potatoes, apples, and seed growers. The remaining acres are now mostly in dairy farms and pick-your-own orchards, providing the region with rural scenery and fresh produce.

Farther out from the city, the land gets progressively hillier and less inhabited. The most dramatic region of the state is the Northwest Highlands of Litchfield County, where the School maintains its Great Mountain Forest Camp. Just a two-hour drive from New Haven, the Northwest Highlands boast the Appalachian Trail, New England's largest caves, a portion of the Taconic Mountains, and the vibrant fall colors of the Litchfield Hills.

But there is no need to travel so far to experience nature's bounty. New Haven itself is fortunate to have five major parks, including Edgewood Park, designed by Frederick Law Olmsted, Jr. Seventeen percent of New Haven is parkland, a figure that few cities in the world can match.

With so much nature near at hand and foot, New Haven comes close to maintaining the elusive ideal balance of the convenience and culture of the city with the pleasures of the countryside.

ENROLLMENT

MASTER'S DEGREES

CONFERRED, 2021

MASTER OF ENVIRONMENTAL MANAGEMENT

Ashia Ajani
Taryn Akiyama
Diego Angel Hakim
Bridget Barnes
Brian Basso
Shimul Bijoor
Bipul Bipul Mayank
Elliot Boyle
Margot Buckelew
Jill Capotosto
Michela Catena
Shitiz Chaudhary
Qiuzi Chen
Jeamme Chia
Niraja Chopade
Wan Ping Chua
Tony Cisneros
Brett Cozzolino
Alex Dalessio
Megan Edwards
Svetlana Gabriilyan
George Gemelas
Becca George
Joyita Ghose
Bridget Gilmore
Rachel Gould
Shengjie Guo
Bijan Gurung
Tevin Hamilton
Kelsey Hartman
Erica Hellen
Julia Hofmann
Adam Houston
Kara Hoving
Chelsea Huang
Cam Humphrey
Seth Inman
Rory Jacobson
Yujin Kim
Ian Leahy

Jonathan Lee
Nour Mardini
Tiffany Mayville
Sage Melcer
Nomawethu Moyo
Jenna Musco
Fadhili Njilima
Julia Nojeim
Devin Osborne
Bill Pedersen
Chris Perkins
Wilder Person
Katie Pofahl
Hardik Pokhrel
Anna Raffeld
Mia Reback
Celia Ristow
Aaron Rudyan
Melissa Saale
Claudia Sanchez de Lozada
Humna Sharif
Krista Shennum
Jonathan Silverthorne
Nathalie Simoes
Radhika Sundaresan
Urvi Talaty
Mallika Talwar
Chris Tapnio
Viola Taubmann
Molly Tyson
Brett Vecchiarelli
Shubhra Verma
Tiana Wilson
Ella Witts
Klara Zimmerman

MASTER OF ENVIRONMENTAL SCIENCE

Allison Adams
Blanca Begert
Itai Boneh
Damaris Chenoweth
Andie Creel
Deja Curtis
Jenna Davis

Dahn-Young Dong
 Sally Donovan
 Erin Eck
 Aymane Eddahmani
 Carey Glenn
 Brooks Lamb
 Jieyi Lu
 Alishia Orloff
 Mk Speth
 Ashley Stewart
 Dewi Tan
 Brendan Wirth
 Qinrui Xiahou

MASTER OF FORESTRY

Rebecca Bland
 Andrew Currie
 Austin Dziki
 Jesse Gehrke
 Jon Johnson
 Kristen Jovanelly
 Reid Lewis
 James Puerini
 Emily Sigman
 Matt Valido

**PH.D. DEGREES
 CONFERRED,
 DECEMBER 2020**

Erica Bergen Barth-Naftilan
 Chen Chen
 Hao Deng
 Henry Bernard Glick
 Amy Leigh Johnson
 Chelsea Elizabeth Judy
 Clara Christina Pregitzer
 Jonghyun Yoo
 Zihan Daniel Zhuo

**PH.D. DEGREES
 CONFERRED, MAY 2021**

Kelly Aho
 Peter Berrill
 Wade Davis
 Michaela Olivia Foster Laepple
 Bhartendu Pandey
 Paul Wolfram
 Zhemin Xuan

**STUDENTS WORKING
 TOWARD MASTER'S
 DEGREES**

**MASTER OF ENVIRONMENTAL
 MANAGEMENT**

Forest Abbott-Lum
 Marco Alvarez
 Zane Anthony
 Lauren Ashbrook
 Ines Ayostina
 Katherine Ball
 Cristina Barrera
 Jessica Bediako
 Shannon Bell
 Charlotte Benishek
 Aditi Bhatkhande
 Jake Billhorn
 Marisa Bruno
 Simon Bunyan
 Yiqing Cai
 Mariana Camacho Fernandez
 Suman Chandra
 Lani Chang
 I-Hsin Cheng
 Zhiheng Chi
 Joanne Choly
 Steven Clarke
 Ryan Clemens
 Tyler Clevenger
 Lily Colburn
 DeNeile Cooper
 Gillian Cowley
 Sawyer Cresap
 Erin Davies
 Joshua De-Anda
 Nadeem Demian
 Xuan Du
 Rebecca Dube
 Caroline Ebinger
 Katie Ebinger
 Vania Farid
 Ashley Felix
 Danielle Flanagan
 Ryanna Fossum
 Paul Freudenburg
 Laura González Mantecón
 Charlie Governali

Claire Goydan
Victoria Gramuglia
Marissa Grenon
Ian Grosfelt
Cally Guasti-O'Donoghue
Elise Guinee Cooper
Liam Gunn
Yuqin Han
Charles Harper
Isabel Harrison
Grace Hilbert
Elizabeth Himschoot
John Hite
Sam Horowitz
Tim Ibbotson-Sindelar
Sophie Janeway
Emily Judson
Clair Dasowl Jung
Pari Kasotia
Meghana Kharod
Veenu King
Sam Konstantinov
Akshyah Krishnakumar
Cameron Kritikos
Komal Kunwar
Elaine Lac
Helena Lam
Danyan Leng
Gabe LePage
Noah Lerner
Yang Li
Tara Litjens
Qingyang Liu
Grace Lowe
Yulan Lu
Maggie Lund
Julian Macrone
Matt Mahoney
Emily Mangan
Victoria Mansfield
Charlie Markowitz
Kelly McGlinchey
Emily McInerney
Kate Meyer
Shoshana Micon
Noah Mitchell-Ward
Daniel Monteagudo
George Moore
Eileen Nakahata
Labibah Naveed
Emile Newman
Claudia Ochoa Perez
Emmie Oliver
Rachel Siew Hui Ooi
Desmond Owuoth
Eric Pan
Alix Pauchet
Taina Perez
Siya Piparsania
Liz Plascencia
Bryce Powell
Ub Qiu
Miles Radin
Cameron Ramey
Allie Rand
Lovinia Reynolds
Emily Richardson
Kristina Rodriguez
Talia Rubnitz
Jackie Ruggiero
Jack Rusk
Lauren Sadowski
Abdeali Saherwala
Carolina Salazar
Gillian Sawyer
Max Schreck
Maximilian Schubert
Yvonne Shih
Avery Siler
Aprajita Singh
Tanya Sinha
Tabitha Sookdeo
Vivan Sorab
Raghav Srivastava
Elizabeth Stagg
Ben Stern
Julia Sweatman
Claire Swingle
Golden Tayebwa
Katherine Tucker
Carlos Velazquez
Jhena Vigrass
Jenna Walczak
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Jikai Wang
Shuya Wang

Sonia Wang
 Zilin Wang
 Abigail Warner
 Shelby Warrington
 Darya Watnick
 Eleah Wilkerson
 Winter Wilson
 Ari Winer
 Allegra Wiprud
 Alexandra Wisner
 Kristen Wraithwall
 Qijin Wu
 Longyi Xiang
 Jamie Yates
 Nenha Young
 Anna Yu
 Michelle Zackin
 Mingjia Zhong
 Anelise Zimmer
 Alexandra Zorn

**MASTER OF ENVIRONMENTAL
 SCIENCE**

Vivian Bi
 Sarah Bonello
 Jacqueline Buonfiglio
 Kevin Cellucci
 Francis Commercon
 Cloe Dickson
 Quint Doan
 Ryan Dougherty
 Logan Emler
 Lloyd Farley
 Ben Girgenti
 Stan Gosliner
 Luca Guadagno
 Melissa Halstead
 Nora Hardy
 Neeti Jain
 Aarthi Kannan
 Minnie Min Ying Li
 Rosie Li
 Alexandra Morrison
 Tobias Muellers
 Jonathan Rigby
 Rachael Ross
 Kieren Rudge
 Carolyn Savoldelli

Arunima Sircar
 Stella Stepanyan
 Uthara Vengrai
 Andrew Vogt
 Liang Zheng
 Rixin Zhu

MASTER OF FOREST SCIENCE

Eudora Miao
 Cecilia Rogers
 William Weinberg
 Yihong Zhu

MASTER OF FORESTRY

Hannah Andrew
 Walker Cammack
 Chris DeFiore
 Musa Joko
 Kyle Lemle
 Eliot Nagele
 Ryan Smith
 Genevieve Tarino
 Brad Ward

**STUDENTS WORKING
 TOWARD PH.D. DEGREE**

Ethan Teichman Addicott
 Yara Abdulrahman Alshwairikh
 Adam Andis
 Kristy Marie Barnes
 Christopher Beltz
 Alexandra Mochary Bergstein
 Logan Billet
 Aleca Borsuk
 Samara Meade Brock
 Jesse Bryant
 Mary Burak
 Paul Burow
 Katherine Burrows
 Yutian (Ivy) Cao
 Scott Matthew Carpenter
 Tirthankar Chakraborty
 Hayon Michelle Choi
 Danica Anne Doroski
 Alicia Renee Entem
 Christian Espinosa Schatz
 Ana Clara Fanton Borges
 Yufang Gao
 Jonathan Gewirtzman

Edgardo Gonzalez
Matthew David Gordon
Thomas Harris
Chris Hebdon
Momoko Ishii
Daniel Kane
Lav Kanoi
Koichi Steven Kanaoka
Simon Fridtjof Lang
Manon Lefèvre
Jinge Li
Laura LogoZZo
Kathryn Ann McConnell
Katherine Adelle Meier
Julia Monk
Katherine Downey (Kaggie) Orrick
Alexander Polussa
Kyra Prats
Meredith Reba
Helen Siegel
Rohan Daniel Simkin
Evan Singer
Nathalie Sommer
Mario Soriano
Rory Stewart
Megan Sullivan
Akshay Surendra
Harikrishnan Venugopalan Nair
Radhamoni
Elisabeth Ballard (Eli) Ward
Lisa Christina Weber
Stephanie Margalit Weber
David J. Woodbury
Shoko Yamada
Yichen Yang
Joseph Zailaa
Keer Zhang
Yong Zhao
Wen Zhou
Laura Zwicker

THE WORK OF YALE UNIVERSITY

The work of Yale University is carried on in the following schools:

Yale College Est. 1701. Courses in humanities, social sciences, natural sciences, mathematical and computer sciences, and engineering. Bachelor of Arts (B.A.), Bachelor of Science (B.S.).

For additional information, please visit <https://admissions.yale.edu>, email student.questions@yale.edu, or call 203.432.9300. Postal correspondence should be directed to Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234.

Graduate School of Arts and Sciences Est. 1847. Courses for college graduates. Master of Advanced Study (M.A.S.), Master of Arts (M.A.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.).

For additional information, please visit <https://gsas.yale.edu>, email graduate.admissions@yale.edu, or call the Office of Graduate Admissions at 203.432.2771. Postal correspondence should be directed to Office of Graduate Admissions, Yale Graduate School of Arts and Sciences, PO Box 208236, New Haven CT 06520-8236.

School of Medicine Est. 1810. Courses for college graduates and students who have completed requisite training in approved institutions. Doctor of Medicine (M.D.). Postgraduate study in the basic sciences and clinical subjects. Five-year combined program leading to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.). Master of Medical Science (M.M.Sc.) from the Physician Associate Program and the Physician Assistant Online Program.

For additional information, please visit <https://medicine.yale.edu/education/admissions>, email medical.admissions@yale.edu, or call the Office of Admissions at 203.785.2643. Postal correspondence should be directed to Office of Admissions, Yale School of Medicine, 367 Cedar Street, New Haven CT 06510.

Divinity School Est. 1822. Courses for college graduates. Master of Divinity (M.Div.), Master of Arts in Religion (M.A.R.). Individuals with an M.Div. degree may apply for the program leading to the degree of Master of Sacred Theology (S.T.M.).

For additional information, please visit <https://divinity.yale.edu>, email div.admissions@yale.edu, or call the Admissions Office at 203.432.5360. Postal correspondence should be directed to Admissions Office, Yale Divinity School, 409 Prospect Street, New Haven CT 06511.

Law School Est. 1824. Courses for college graduates. Juris Doctor (J.D.). For additional information, please visit <https://law.yale.edu>, email admissions.law@yale.edu, or call the Admissions Office at 203.432.4995. Postal correspondence should be directed to Admissions Office, Yale Law School, PO Box 208215, New Haven CT 06520-8215.

Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. For additional information, please visit <https://law.yale.edu>, email gradpro.law@yale.edu, or call the Graduate Programs Office at 203.432.1696. Postal correspondence should be directed to Graduate Programs, Yale Law School, PO Box 208215, New Haven CT 06520-8215.

School of Engineering & Applied Science Est. 1852. Courses for college graduates. Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://seas.yale.edu>, email grad.engineering@yale.edu, or call 203.432.4252. Postal correspondence should be directed to Office of Graduate Studies, Yale School of Engineering & Applied Science, PO Box 208292, New Haven CT 06520-8292.

School of Art Est. 1869. Professional courses for college and art school graduates. Master of Fine Arts (M.F.A.).

For additional information, please visit <http://art.yale.edu>, email artschool.info@yale.edu, or call the Office of Academic Administration at 203.432.2600. Postal correspondence should be directed to Office of Academic Administration, Yale School of Art, PO Box 208339, New Haven CT 06520-8339.

School of Music Est. 1894. Graduate professional studies in performance and composition. Certificate in Performance (CERT), Master of Music (M.M.), Master of Musical Arts (M.M.A.), Artist Diploma (A.D.), Doctor of Musical Arts (D.M.A.).

For additional information, please visit <https://music.yale.edu>, email gradmusic.admissions@yale.edu, or call the Office of Admissions at 203.432.4155. Postal correspondence should be directed to Yale School of Music, PO Box 208246, New Haven CT 06520-8246.

School of the Environment Est. 1900. Courses for college graduates. Master of Forestry (M.F.), Master of Forest Science (M.F.S.), Master of Environmental Science (M.E.Sc.), Master of Environmental Management (M.E.M.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://environment.yale.edu>, email admissions.yse@yale.edu, or call the Office of Admissions at 800.825.0330. Postal correspondence should be directed to Office of Admissions, Yale School of the Environment, 300 Prospect Street, New Haven CT 06511.

School of Public Health Est. 1915. Courses for college graduates. Master of Public Health (M.P.H.). Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://publichealth.yale.edu>, email ysph.admissions@yale.edu, or call the Admissions Office at 203.785.2844.

School of Architecture Est. 1916. Courses for college graduates. Professional and post-professional degree: Master of Architecture (M.Arch.); nonprofessional degree: Master

of Environmental Design (M.E.D.), Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://www.architecture.yale.edu>, email gradarch.admissions@yale.edu, or call 203.432.2296. Postal correspondence should be directed to the Yale School of Architecture, PO Box 208242, New Haven CT 06520-8242.

School of Nursing Est. 1923. Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate (P.M.C.), Doctor of Nursing Practice (D.N.P.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://nursing.yale.edu> or call 203.785.2389. Postal correspondence should be directed to Yale School of Nursing, Yale University West Campus, PO Box 27399, West Haven CT 06516-0974.

David Geffen School of Drama Est. 1925. Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, Doctor of Fine Arts (D.F.A.).

For additional information, please visit <https://drama.yale.edu>, email dgsd.admissions@yale.edu, or call the Registrar/Admissions Office at 203.432.1507. Postal correspondence should be directed to David Geffen School of Drama at Yale University, PO Box 208325, New Haven CT 06520-8325.

School of Management Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.), Master of Advanced Management (M.A.M.), Master of Management Studies (M.M.S.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences.

For additional information, please visit <https://som.yale.edu>. Postal correspondence should be directed to Yale School of Management, PO Box 208200, New Haven CT 06520-8200.

M.E.SC./M.F.S. THESIS RESEARCH NUMBERS

Faculty	ENV Thesis Research Number
Anisfeld, Shimon	3010
Ashton, Mark	3020
Bell, Michelle	3035
Benoit, Gaboury	3040
Berlyn, Graeme	3050
Bradford, Mark	3054
Brodersen, Craig	3072
Burke, Ingrid	3073
Carpenter, Carol	3110
Chertow, Marian	3130
Clark, Susan	3140
Comita, Liza	3143
Doolittle, Amity	3158
Dove, Michael	3160
Duguid, Marlyse	3175
Esty, Daniel	3180
Farrell, Justin	3185
Fenichel, Eli	3195
Freidenburg, Kealoha	3252
Gillingham, Kenneth	3215
Gregoire, Timothy	3240
Grim, John	3242
Kotchen, Matthew	3257
Lauenroth, William	3261
Lee, Xuhui	3260
Marlon, Jennifer	3300
Mendelsohn, Robert	3320
Orefice, Joseph	3345
Queenborough, Simon	3350
Rao, Narasimha	3363
Raymond, Peter	3364
Saiers, James	3390
Schmitz, Oswald	3400
Seto, Karen	3408
Skelly, David	3420
Taylor, Dorceta	3450

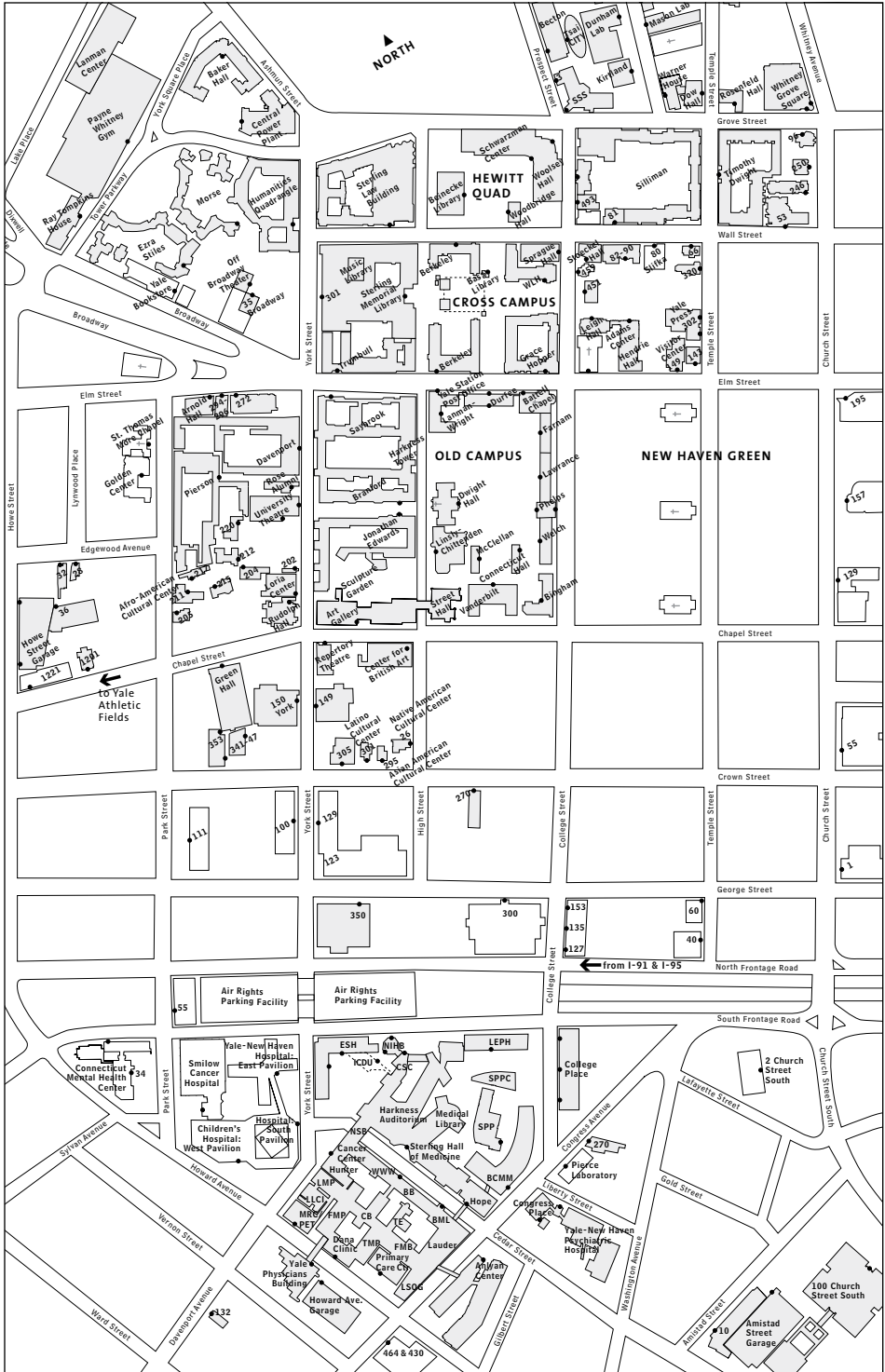
Torres, Gerald	3462
Vedder, Amy	3469
Wargo, John	3470
Yao, Yuan	3488
Zimmerman, Julie	3500

PROJECT COURSES

Faculty	ENV Project Course Number
Anastas, Paul	1008
Anisfeld, Shimon	1010
Ashton, Mark	1020
Bacher, Jessica	1030
Bell, Michelle	1035
Benoit, Gaboury	1040
Berlyn, Graeme	1050
Bradford, Mark	1054
Brodersen, Craig	1072
Carpenter, Carol	1110
Chertow, Marian	1130
Clark, Susan	1140
Comita, Liza	1143
Cort, Todd	1147
DeCew, Stuart	1153
Decker, Mary Beth	1155
Doolittle, Amity	1158
Dove, Michael	1160
Duguid, Marlyse	1175
Esty, Daniel	1180
Farrell, Justin	1185
Fenichel, Eli	1195
Geballe, Gordon	1200
Gentry, Bradford	1210
Gillingham, Kenneth	1215
Gregoire, Timothy	1240
Grim, John	1242
Gross, Daniel	1243
Klinkenborg, Verlyn	1256
Kotchen, Matthew	1257
Kysar, Douglas	1259
Lauenroth, William	1261
Lee, Xuhui	1260
Leiserowitz, Anthony	1263
Lifset, Reid	1270
Marlon, Jennifer	1300
Mendelsohn, Robert	1320

Michelangeli, Fabian	1325
Montagnini, Florencia	1330
Narasimha, Rao	1363
Orefice, Joseph	1345
Queenborough, Simon	1350
Raymond, Peter	1364
Reuning-Scherer, Jonathan	1380
Reynolds, Kristin	1368
Saiers, James	1390
Schmitz, Oswald	1400
Seto, Karen	1408
Skelly, David	1420
Smith, Ronald	1430
Taylor, Dorceta	1450
Toensmeier, Eric	1457
Tomlin, Dana	1460
Torres, Gerald	1462
Tucker, Mary Evelyn	1463
Vandebroek, Ina	1467
Vedder, Amy	1469
Wargo, John	1470
Weber, Albert William	1473
Wood, Stephen	1475
Yao, Yuan	1488
Yost, Peter	1490
Zimmerman, Julie	1500

YALE UNIVERSITY CAMPUS SOUTH & YALE MEDICAL CENTER



The University is committed to basing judgments concerning the admission, education, and employment of individuals upon their qualifications and abilities and affirmatively seeks to attract to its faculty, staff, and student body qualified persons of diverse backgrounds. In accordance with this policy and as delineated by federal and Connecticut law, Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex, race, color, religion, age, disability, status as a protected veteran, or national or ethnic origin; nor does Yale discriminate on the basis of sexual orientation or gender identity or expression.

University policy is committed to affirmative action under law in employment of women, minority group members, individuals with disabilities, and protected veterans.

Inquiries concerning these policies may be referred to Valarie Stanley, Senior Director of the Office of Institutional Equity and Access, 203.432.0849. For additional information, see <https://oiea.yale.edu>.

Title IX of the Education Amendments of 1972 protects people from sex discrimination in educational programs and activities at institutions that receive federal financial assistance. Questions regarding Title IX may be referred to the University's Title IX Coordinator, Stephanie Spangler, at 203.432.4446 or at titleix@yale.edu, or to the U.S. Department of Education, Office for Civil Rights, 8th Floor, 5 Post Office Square, Boston MA 02109-3921; tel. 617.289.0111, fax 617.289.0150, TDD 800.877.8339, or ocr.boston@ed.gov.

In accordance with federal and state law, the University maintains information on security policies and procedures and prepares an annual campus security and fire safety report containing three years' worth of campus crime statistics and security policy statements, fire safety information, and a description of where students, faculty, and staff should go to report crimes. The fire safety section of the annual report contains information on current fire safety practices and any fires that occurred within on-campus student housing facilities. Upon request to the Yale Police Department at 203.432.4400, the University will provide this information to any applicant for admission, or to prospective students and employees. The report is also posted on Yale's Public Safety website; please visit <http://publicsafety.yale.edu>.

In accordance with federal law, the University prepares an annual report on participation rates, financial support, and other information regarding men's and women's intercollegiate athletic programs. Upon request to the Director of Athletics, PO Box 208216, New Haven CT 06520-8216, 203.432.1414, the University will provide its annual report to any student or prospective student. The Equity in Athletics Disclosure Act (EADA) report is also available online at <http://ope.ed.gov/athletics>.

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