



Environmental Field Studies Abroad

AUSTRALIA
BHUTAN
CAMBODIA & VIETNAM
COSTA RICA
KENYA
PANAMA
PERU
TANZANIA
TURKS & CAICOS ISLANDS

Overview



A Legacy of Environmental Leadership

In the early 1980s, some of our nation’s top colleges and universities introduced environmental studies into their curricula, pioneering the notion that effective stewardship of our planet and its finite resources must include not only scientists, but also informed and concerned individuals from all walks of life and in all professions.

In the summer of 1981, we sent our first group of 75 students into the field. Building on more than three decades of international education and research, The School for Field Studies (SFS) is widely known as the premier environmental study abroad program. At our global network of field stations, students learn how to collaborate with local community partners and engage in scientific inquiry to address critical environmental problems and create long-term solutions.

Who Studies With SFS?

We encourage students from all disciplines to join our programs around the world—biology, environmental science, history, anthropology, political science, art, drama, education, economics, pre-vet and pre-med, engineering, business, communications, and many others. We welcome a diverse student body and create an atmosphere that is open to different learning styles and perspectives while encouraging students to look beyond the boundaries of their chosen disciplines.

Semester Program Structure

Semester programs run for approximately three months, including a midterm break in most programs. We compress a 16-week semester into 14 weeks, so be prepared for a very intense but rewarding learning experience! Students enroll in four courses at four credits each—three topical courses and a Directed Research course—and in many programs an additional two-credit culture and language course. Program activities take place six days a week with at least part of one weekday devoted to community engagement. Students learn through classroom lectures, field lectures and exercises, group projects, and other activities.

Objectives of the SFS Academic Program

Our semester programs help students identify and analyze local environmental issues, explore options for solving problems, and understand the decision-making process for taking action. In the three topical courses, students prepare for the Directed Research projects in the field by learning the conceptual foundations and building technical and analytical skills essential for field research. Research questions are designed in partnership with local stakeholders and are defined in each Center’s Five-Year Research Plan.

Summer Programs

Each of our summer programs consists of a single interdisciplinary course that combines lectures with field exercises, expeditions, and short research projects. The curriculum focuses on issues related to how local communities engage in natural resource management decision-making. In Kenya, the focus is on public health. Students earn four credits in four intense weeks of study—except in our Bhutan course, which is six weeks and carries six credits. Most summer programs can be taken back-to-back, offering eight credits in eight weeks.

Emphasis on Field Skills

Students learn a suite of skills and analytical techniques that are used in natural and social science field research. Depending on the program, students are trained in field methods as varied as species identification, animal behavior observations, habitat assessment and mapping, water quality assessment, ecological restoration techniques, and animal and plant population sampling techniques. Students use quantitative and qualitative social science field research methods, including structured questionnaires, informal interviews, and participant observation. Students also use descriptive and inferential statistics in data analysis and hypothesis testing to answer research questions.

Language Preparation

All SFS courses are taught in English. Where English is not widely spoken, however, interaction with the local community is greatly enhanced by having local language conversation skills. Semester students in Bhutan, Cambodia and Vietnam, Costa Rica, Tanzania, Peru, and Panama receive two additional credits in a culture and language course. For the Costa Rica semester program only, students need at least three years of high school Spanish with high academic achievement or at least one semester of college-level Spanish (or the equivalent test scores).

Safety

The health and safety of our students is of utmost importance to SFS. Our dedicated safety and student life team leads a comprehensive global risk management system, which incorporates the Forum on Education Abroad safety standards and touches every element of an SFS program.

SFS runs structured programs, coordinating itineraries and logistics to protect and enhance the student experience. Each program is staffed with a full-time residential Student Affairs Manager (SAM) who coordinates logistics, programming, community outreach, student advising and counseling, and on-site risk management, and serves as the primary medical responder. Staff members at each SFS Center are trained in wilderness medicine, as well as the emergency protocols that are relevant to that location. Educating students on accurate expectations, resources, and preventive care is an integral component of our approach. Pre-departure medical screening and student orientation about health and safety procedures upon arrival in the country encourage a positive and successful abroad experience.

Many of our field staff are host-nation citizens, providing students with a rich cultural context, as well as helping us to assess risk quickly. We also seek input from a variety of external resources including the U.S. State Department and Overseas Security Advisory Council.

All of these elements enable us to adapt to dynamic changes of the natural and political world to prevent and respond to risk quickly and soundly. For a more detailed description of our safety model and for contact information, please visit cat.fieldstudies.org/safety.



Each one of us has a valuable role to play in helping to protect our environment for the present and future of plant, animal, and human life on Earth. We continue to face unprecedented, complex global challenges including climate change, population growth, and biodiversity loss. The next generation of environmental leaders will be charged with developing cleaner sources of energy, safer supplies of food and water, and more equitable and sustainable social, political, and economic institutions. As global environmental problems become increasingly more complex, so must our solutions.

To meet these challenges, we need “an educated populace and a diverse and competent work force prepared for the rapidly changing world of the 21st century,” according to the National Council on Science and the Environment. Yet, “our scientific knowledge and public and professional understanding of the environment is in many ways inadequate to these challenges. Research and education must be critical elements of a national strategy for environmental protection, a sustainable economy, and a secure society.” The School for Field Studies (SFS), founded more than 30 years ago, addresses this need by giving students hands-on field experience, practical and transferable research skills, and cross-cultural awareness.

SFS believes that a personal commitment to conservation results from a meaningful personal experience founded on intellectual understanding. SFS students advance their education in an international setting, with an interdisciplinary curriculum centered on local environmental issues that are related to sustainable development and biodiversity conservation. Our programs offer a compelling opportunity to engage in field research projects that are designed in collaboration with local stakeholders. By conducting applied, user-inspired research, students learn through experience and contribute to a growing body of knowledge about local issues related to natural resource management.

Today’s global economy increasingly calls for individuals with experience that extends beyond a traditional classroom education. At SFS, you develop important, transferable skills in research, science communication, teamwork, community living, leadership, and critical thinking that will make you a strong candidate for graduate school and lay the groundwork for almost any professional career, particularly those in conservation, environmental science, and sustainable development. No matter which SFS program you choose, you will acquire a unique perspective on what it really takes to develop long-term solutions to environmental issues.

Our alumni frequently tell us that SFS ignited a passion for their careers. To date, more than 16,000 students have participated in SFS programs, and among these we count leaders at environmental organizations including the World Wildlife Fund, the International Fund for Animal Welfare, and The Nature Conservancy. We also have alumni making significant contributions at multinational corporations including Chevron, Caterpillar, and Alcoa in carbon management, environmental health, and environmental protection.

“I plan to change the world. Thanks for the jump start.” These words, written by an SFS student, illustrate how The School for Field Studies transforms students and shapes their futures. Our programs will challenge and inspire you, and you will leave with valuable skills that will enhance your academic and professional careers. Most importantly, after SFS, you will never view the world—or yourself—the same way again.

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Admissions Requirements and Instructions

APPLY ONLINE NOW

When to Apply

The School for Field Studies (SFS) reviews applications on a rolling basis, and students may apply up to a year in advance. While there is no admissions deadline for most programs, students should apply early to ensure admission to their program of choice, and check with their home institutions regarding school-specific study abroad application deadlines.

Before You Apply

Due to the field-based nature of our programs, the academic experience will likely be very different from your home school and traditional study abroad programs. Before applying, be sure to read about the SFS program model and learning objectives, and study the documents related to your program of interest. Please contact the SFS Admissions Office with any questions regarding our programs.

Requirements and Policies

You must be at least 18 years of age to participate in an SFS program. You must be in good academic standing and have completed at least one college-level ecology or biology course to be eligible for a semester program. An environmental studies course is also an acceptable prerequisite for the Costa Rica and Panama programs. Prior to participation, applicants for the Costa Rica program must have taken three years of high school Spanish with high achievement or one college-level course in Spanish. Students are encouraged to have taken coursework in statistics, anthropology, international development, and economics. We suggest that students complete one semester of college prior to the start of the program, but gap-year students are welcome to apply, provided they fulfill the prerequisites. For more details, please contact the SFS Admissions Office.

Academic Credit

SFS participants receive academic credit in one of two ways. Students from SFS's Affiliate Institutions usually receive credit directly from their home schools. Students from non-affiliate schools are registered at and receive transcripts from the University of Minnesota, which is the school of record for SFS programs. SFS courses are approved and assigned course numbers by the University of Minnesota. Our semester programs in Australia and the Turks and Caicos Islands include four courses and carry a total of 16 semester-hour credits in biology or environmental studies. Our semester programs in Cambodia/Vietnam, Peru, Bhutan, Costa Rica, Panama, and East Africa carry 18 semester-hour credits in biology, environmental studies, and language. Summer courses carry four semester-hour credits except for our Bhutan program which offers six credits. Participants receive an official transcript from the University of Minnesota or The School for Field Studies approximately four weeks (two weeks for direct credit Affiliates) after the conclusion of the program.

Students come from more than 300 colleges to attend SFS programs each year and most are able to transfer credit for their participation. The final decision regarding credit and grade transfer rests with your home institution. Check with your academic or study abroad advisor and registrar's office before applying to learn how your SFS coursework will be applicable for credit in your degree program. If you have questions regarding credit transfer, please contact the SFS Admissions Office.

The SFS Affiliate Program

Students from Affiliate institutions receive priority admissions and financial aid based on the availability of space and funds. Affiliate institutions typically provide direct academic credit for SFS participation and have preapproved our courses. Each Affiliate institution has at least one SFS representative who is available to provide on-campus advising on our programs. Please visit cat.fieldstudies.org/advisors/affiliates for an up-to-date listing of Affiliate representatives at your school.

How to Apply

1. Review program information and prerequisites located in the catalog or at cat.fieldstudies.org. Please call 800-989-4418 or email us at admissions@fieldstudies.org if you need help deciding which program is right for you.

2. Collect the necessary application materials:

- **SFS APPLICATION FOR ADMISSION.** You may apply online or download the application PDF from our website.
- **PARTICIPATION APPROVAL FORM** to be completed by your study abroad advisor. If you attend one of SFS's Affiliate Institutions, the form must be completed by a designated Affiliate representative.
- **NON-REFUNDABLE APPLICATION FEE OF \$50.** Credit card or check made payable to The School for Field Studies.
- **CURRENT OFFICIAL TRANSCRIPTS** from all schools attended. It is not necessary for college students to submit high school transcripts after a full academic year of college coursework has been completed.
- **SFS ACADEMIC REFERENCE FORM** to be completed by a teacher, professor, or academic advisor who is well acquainted with your current academic performance.
- **SFS CHARACTER REFERENCE FORM** to be completed by someone who knows you well, such as another academic source, a job supervisor, volunteer advisor, athletic coach, etc. It is not appropriate for this reference to be completed by a relative, peer, or family friend.

We encourage you to apply online. If you do submit print application materials, however, please send them to:

The School for Field Studies
100 Cummings Center, Suite 534-G
Beverly, MA 01915-6239

After You Apply

Once we receive your application, we will contact you about missing materials. If your application is incomplete, it is your responsibility to send any remaining materials. We cannot begin the application review process until all materials are received. To expedite the review of your application, we suggest that you submit all of your application materials together. Once your application is complete, we will contact qualified candidates to schedule a short phone interview. Admissions decisions are generally available within two to four weeks of completing your application. You should apply early to allow sufficient time for your application to be processed. If you would like to check the status of your application materials received by SFS, please log in to your SFS account to view your Admissions Checklist. Please note that participation in an SFS program is contingent upon medical approval.

Medical Approval

SFS requires that all students submit an Online Medical Review Form and additional required forms signed by a medical professional within 10 business days of acceptance. To ensure that you will be able to meet the physical challenges of SFS programs without undue risk to yourself or others, the SFS Safety Department reviews all medical forms. Your final acceptance and ability to participate in SFS programs is contingent upon receiving medical approval and you may be disqualified from participating on medical grounds. Students with late medical forms may forfeit their space in a program. Additionally, you will not be permitted to join an SFS program without proof of current medical insurance.

Disability Information

SFS welcomes students with disabilities. If you are requesting accommodations, however, you must notify SFS in writing within 10 business days of acceptance. For accommodations of physical disabilities, please contact the SFS Safety Department. For learning accommodations, please contact the SFS Office of Academic Affairs. Please be aware that the level of accessibility, services, and accommodations to which you may have access at your home campus may not be available overseas.

Dietary Restrictions

Students with medically-related dietary restrictions must contact the SFS Safety Department within 10 business days of acceptance and document the restrictions on the medical review form. Students with special dietary preferences (vegetarian, vegan, kosher, etc.) should discuss these with their Admissions Counselor during the interview process. SFS makes every effort to accommodate dietary needs within the limitations of local supply, availability, cultural practice, and cost. All dietary restrictions require discussion and approval prior to arrival.

Non-discrimination Policy

SFS is an equal opportunity institution. SFS admits students of any sex, religion, race, color, national or ethnic origin, sexual orientation, or economic status to all the rights, privileges, programs, and activities generally accorded or made available to students of SFS. SFS does not discriminate on the basis of sex, religion, race, color, sexual orientation, national or ethnic origin, physical or mental disability, or other protected status in the administration of its educational policies, admissions policies, scholarship and loan programs, and other School-administered programs.

SFS in Kenya

SFS has temporarily suspended Kenya operations for the Wildlife Management Studies program for the 2014-15 academic year. While this program was previously run as a two-country program, it will operate solely in Tanzania for the Fall 2014 and Spring 2015 semesters. At this printing, SFS anticipates that Public Health and the Environment in Kenya will run in the summer of 2015. Please check the SFS website for the most up-to-date status on this program.

Tuition, Financial Aid, and Scholarships

FINANCIAL AID OVERVIEW

A key component of SFS's mission is to ensure that qualified students are able to participate in our programs regardless of their financial resources. Since our founding in 1980, more than 16,000 students have participated in SFS programs across the globe. The School for Field Studies awards more than \$330,000 in need-based scholarships each year, and 90 percent of students who apply for SFS aid receive assistance. We strive to keep SFS accessible by offering need-based scholarships, grants, and loans.

SCHOLARSHIPS AND GRANTS

SFS General Scholarship Fund

SFS provides grants and aid in order to eliminate or reduce the gap between what a student pays to study on his or her home campus and the cost of studying abroad with SFS. All SFS applicants are eligible. Awards are determined on the basis of need.

Andreas Family Foundation Scholarship

Andreas Scholarship funds are designated to assist students who are enrolled in public institutions in the United States. The awards are granted for semester programs only.

Trailblazer Grant

Trailblazer Grants are awarded to students with financial need who are enrolling in new SFS programs. These grants may supplement other SFS scholarships, grants, or loans.

Travel Grants

Travel Grants are need-based awards designed to help offset the cost of travel to SFS programs.

LOANS

Zero-Interest Loans

This loan program was created through the generosity of the Merck Family Foundation. Semester loans must be repaid within two years and summer loans within one year of program completion.

Low-Interest Loans

This low-interest loan program is designed to assist semester students in bridging the gap between their financial resources and total program cost. This loan is set at a competitive market rate with manageable repayment terms.



ENDOWED SCHOLARSHIPS

Stephen F. Lee Memorial Scholarship

Established in memory of Stephen F. Lee, an SFS alumnus (*Florida '86*), intern (*Hawaii '87, '88*), and faculty member (*Hawaii '89*), this need-based scholarship supports applicants to SFS marine programs.

Heather Jo Leibowitz Memorial Scholarship

Honoring the memory of Heather Jo (*Kenya '04*), this need-based scholarship supports applicants to SFS's East Africa program. Preference is given to students who demonstrate a commitment, as Heather Jo did, to making a difference in the lives of resource-dependent communities in East Africa.

McKee Scholarship

This endowed scholarship is made possible by the generosity of SFS Trustee and alumni parent Charles D. McKee. It is awarded on an annual basis to a financially deserving student.

Tozer Scholarship

This endowed scholarship was made possible through the generosity of former SFS Trustee W. James Tozer, Jr. and his wife, Elizabeth. The Tozer Scholarship is awarded on the basis of need.

Fountain Scholarship

The Fountain Scholarship was established by SFS alumnus and Trustee Darren Aronofsky (*Kenya '85; Alaska '86*), the film director of *The Fountain*, *The Wrestler*, *Black Swan*, and *Noah*. It provides tuition assistance to SFS applicants who (a) have spent most of their lives in an urban environment whether in the United States or abroad; (b) demonstrate financial need; and (c) demonstrate a commitment to and concern for environmental issues.

SFS AID AND HOME SCHOOL AID

Many applicants receive aid through their home institutions or other outside sources; however, you may qualify for SFS assistance even if you are not receiving aid from your home institution. SFS encourages all students with need to apply.

For students who do receive aid from their home institutions, many schools allow students to take institutional financial aid off campus. Check with your financial aid office to see what aid you can apply to your SFS program. You may also look into applying for additional funds, including loans, through your home school prior to applying for SFS aid. In addition to the possibility of transferring institutional aid from your home school, your home school should be able to process a Stafford Loan or other federal sources of support to assist your SFS participation.

HOW TO APPLY FOR FINANCIAL AID

All students accepted to SFS are eligible to apply. You can apply for SFS aid once accepted to an SFS program, but no later than 60 days before the start of your semester program (30 days for summer). The single aid application puts you into consideration for all of the scholarships, grants, and loans offered by SFS.

To download the SFS financial aid application, visit: cat.fieldstudies.org/admissions/aid

Deposits and Tuition

Please see our website for information about payment of deposits and tuition, and for billing and refund policies.

“I would like to thank The School for Field Studies for its generous support, without which I would not have been able to participate in this amazing program.”

SEMESTER COSTS FALL 2014 – SPRING 2015

Program	Tuition	Room & Board	Total Program Cost
Australia	\$16,050	\$4,900	\$20,950
Cambodia & Vietnam	\$16,275	\$4,275	\$20,550
Costa Rica	\$15,930	\$4,595	\$20,525
Panama	\$15,905	\$4,335	\$20,240
Peru	\$16,225	\$4,525	\$20,750
Tanzania	\$16,375	\$4,575	\$20,950
Turks & Caicos Islands	\$15,930	\$4,595	\$20,525

Fall 2015 program costs will be announced in March 2015 and posted to the SFS website.
For complete course budgets, including out-of-pocket expenses, please visit cat.fieldstudies.org.

SUMMER COSTS 2015

Program	Tuition	Room & Board	Total Program Cost
Australia	\$4,380	\$1,460	\$5,840
Australia/New Zealand	\$4,395	\$2,195	\$6,590
Bhutan	\$6,415	\$3,470	\$9,885
Costa Rica	\$4,245	\$1,355	\$5,600
Kenya	\$4,510	\$1,355	\$5,865
Tanzania	\$4,695	\$2,200	\$6,895
Turks & Caicos Islands	\$4,245	\$1,355	\$5,600



BHUTAN

SEMESTER PROGRAM

NEW PROGRAM

SEMESTER PROGRAM DATES
Fall 2015*: September 7 – December 10
*Program will be offered in fall semesters only.



Himalayan Environment and Society in Transition

NEW PROGRAM HIGHLIGHT
The Kingdom of Bhutan is a small, landlocked country nestled in the rugged eastern Himalayas between India and China, two of Asia’s geopolitical giants. The landscape comprises mountains and valleys, with seven major river systems draining the high Himalayas from over 23,000 feet to 1,000 feet above sea level at the southern border. As one of the major biodiversity hot spots in the world, Bhutan is home to a beautiful array of birds, butterflies, and rhododendrons. The takin, snow leopard, golden langur, blue sheep, and tiger are among Bhutan’s diverse and charismatic fauna. In Bhutan, rich cultural traditions and social and political institutions reflect Buddhist principles of The Middle Path, integrating people and nature, traditional knowledge, and modern science. The country’s four pillars of development—equitable socioeconomic growth, preservation and promotion of culture, conservation of environment, and good governance—are geared towards promoting the collective goal of achieving a high Gross National Happiness. In 2008, Bhutan transitioned from an absolute monarchy to a constitutional democratic monarchy with the enactment of the kingdom’s first constitution. Because the majority of people still reside in rural areas and practice small-scale agriculture and forest product extraction, sustainable management of local natural resources is critical for achieving the country’s development, and happiness, goals.

- PROGRAM CURRICULUM**
This new semester program will take an integrated approach to examining issues related to conservation, governance, and rural livelihoods in Bhutan. SFS has a partnership with the Ugyen Wangchuck Institute for Conservation and Environment (UWICE), an international research and training facility, and part of Bhutan’s Ministry of Agriculture and Forests. SFS students contribute to the advancement of the Institute’s research agenda in several priority areas including sustainable forestry, conservation biology, water resources, socioeconomics, and policy. Underlying themes of the joint research we undertake include climate change adaptation, natural resource management, and sustainable livelihoods. The semester curriculum comprises three thematic components, all centered on the environment:
- People’s relationship with nature: Students will interrogate the human-nature interface through the lenses of religion, society, and culture. We will strive to uncover the knowledge, perceptions, beliefs, and attitudes about nature from an array of stakeholders. Students will evaluate human dependence on and vulnerabilities to the processes, resources, and events in nature.
 - Democratization, governance, and rural development: Students will learn about the policies and institutions in Bhutan that provide conditions necessary for livelihood security, good governance, and equitable socioeconomic development.
 - Conservation and resource management: Students will study key species and their habitats, as well as Bhutan’s conservation and natural resource management strategies—key pillars supporting human welfare and economic development in Bhutan.

- FIELD-BASED LEARNING**
The three-month program will operate primarily in the central districts of Bumthang and Zhemgang. Much of our learning will occur in the forests, fields, and villages of these areas. Students will get to know the local and national institutions that contribute to the management and governance of environmental resources. Field-based activities will include the following:
- Observe changes in vegetation zones on the journey from the capital city to central Bhutan
 - Explore Phobjikha Valley, an important wetland conservation area for the black-necked crane
 - Trek through villages and relict forests to 14,000 feet elevation
 - Conduct biodiversity studies in forests and fields
 - Study traditional agricultural systems and practices, and assess how modernization affects the agro-ecosystem and household economies
 - Pursue socioeconomic questions in towns, on farms, and with businesses
 - Visit monasteries to learn about the role of Buddhism in Bhutanese society and culture

Note: The program operates in rugged and rural environments, and we live and study at altitude (around 10,000 feet elevation). Our work takes us (often by foot) to higher altitudes. The trek and field work require participants to be in excellent physical condition. Our facilities and other rural infrastructure are rustic, and the Bhutanese diet is fairly simple. Flexibility and patience are equally important attributes for a successful participant.

For program updates, visit: cat.fieldstudies.org/bhutan





BHUTAN

SUMMER PROGRAM

SUMMER 2015 PROGRAM DATES
June 8 – July 16



Eastern Himalayan Forests and Rural Livelihoods

In Bhutan—a Himalayan country characterized by towering mountains, lush forests, and a unique cultural heritage—progress and development are evaluated on the basis of cultural preservation and environmental conservation rather than purely economic achievements. Bhutanese communities maintain rich cultural traditions, and the country has developed social and political institutions imbued with Buddhist principles of The Middle Path, which balance people and nature, traditional knowledge, and modern science. Sustainable management of natural resources—including soil, water, biodiversity, and minerals—is critical for Bhutan, as these resources are fundamental to the national identity, as well as the local and national economies.

Bhutan’s recent transition to a constitutional democratic monarchy and the trends in rural-urban migration put pressure on the environment. Issues related to human-wildlife conflicts in rural areas, agricultural production and food security, forest resource governance, and environmental policy create a complex web that ultimately affects the well-being of humans and nature.

Curriculum and Research Focus

Traveling through Bhutan, students learn about culture and history, religious traditions, environmental issues, and conservation policies, and explore the role that environmental services and natural resources play in rural livelihoods and national development. With the central district of Bumthang as their classroom, and a trek across valleys and through villages, students gain an intimate understanding of local environments and rural livelihood strategies.

Through Directed Research projects, students contribute to the advancement of SFS’s joint research agenda with the Ugyen Wangchuck Institute for Conservation and Environment (UWICE) in areas including sustainable forestry, watershed management, and rural development. Students develop skills in assessing environmental problems, defining research questions, conducting field research, and communicating results.

In this six-week program, students conduct a Directed Research project on themes related to forest management. Project themes have included the following:

- Social, economic, and environmental impacts of community forestry
- Floral biodiversity
- Blue pine forest encroachment and the potential for private forestry development
- Climate, water management issues, and flood preparedness

- Field Exercises and Expeditions**
- Conduct interviews with Bhutanese citizens who have resource-based livelihoods, exploring the relationship between human well-being and natural resources
 - Guided by UWICE staff, learn important features of local forest species, including species composition and community dynamics; practice field techniques for tree measurement and how to estimate timber volume
 - Consider how religion influences attitudes about the treatment of the environment
 - Take a multi-day trek through cultural and natural landscapes, up and over the ridge, between Chamkhar and Tang valley
 - Visit the stunning Punakha Dzong and Bumthang monasteries

The cultural elements of the program include multiple interactions with local schools and government institutions, and visits to several monasteries. Sports and other activities with forestry trainees and local children keep us rooted in community.

Note: The program operates in rugged and rural environments, and we live and study at altitude (around 10,000 feet elevation). Our work takes us (often by foot) to higher altitudes. The trek and field work require participants to be in excellent physical condition. Our facilities and other rural infrastructure are rustic, and the Bhutanese diet is fairly simple. Flexibility and patience are equally important attributes for a successful participant.

For details and how to apply, visit: cat.fieldstudies.org/bhutan

COURSES		
Summer students are registered in one academic course accredited through the University of Minnesota:		
Course No.	Name	Credits
SFS 3580	Eastern Himalayan Forests and Rural Livelihoods	06
Go to page 49 for course descriptions		



“Our classroom followed our group to wherever we traveled. While on morning walks, and on our trek, we worked on plant IDs. Around campfires, traditional dances and songs were shared with us. While visiting a dzong, we learned about the meanings of paintings in the temple walls. During homestay with a local family, we learned how to cook traditional dishes. I have never taken so much new knowledge away from a program.

— **Theresa Wondra**
University of St. Thomas
Bhutan Summer '12



PERU

SEMESTER PROGRAM

SEMESTER PROGRAM DATES
Spring 2015: February 2 – May 7
Fall 2015: September 7 – December 10



Biodiversity and Development in the Amazon

THE ENVIRONMENTAL CONTEXT

With its extensive humid tropical rainforest and dramatic elevation gradient upwards to the continental towers of the Andes Mountains, Peru easily earns itself a place among the five most megadiverse countries in the world. The mountain influence on the Amazon plain is distinct in the southern region of Peru. The complex topography and array of habitats support diverse flora and fauna and are home to many indigenous groups. Because of the wealth of diversity in Peru, this is a leading destination for biodiversity enthusiasts, anthropologists, scientists, educators, and students from around the world.

The rich natural resources of the Andes-Amazon region have supported human populations for millennia, including indigenous groups who still live in these forests. Today, the region draws people from other parts of the country who engage in both extractive and productive activities, including small-scale agriculture, timber and non-timber forest product management, fishing and hunting, and mining. Conservation efforts in the region provide some local residents with alternative livelihoods, resulting in changing perceptions, attitudes, and behaviors in some Amazonian communities. Will this result in sustainable resource management and equitable economic growth?

The ecosystems, habitats, and species of the region are threatened by rapid and unplanned urban and peri-urban development, road installation, destructive logging, unregulated mining, and high-input agriculture. The social fabric of local communities is jeopardized by significant inequities in socioeconomic development and environmental degradation associated with these industries. Poverty in rural areas remains high and reaches up to 60 percent in some regions, and there are stark differences in literacy rates and access to water and sanitation. Rapid and unorganized growth in the region threatens biodiversity, cultural integrity, and economic development.



THE SFS CENTER FOR ANDES-AMAZON STUDIES

The Villa Carmen Biological Station—operated by the Amazon Conservation Association (ACA) and its sister organization, Asociación para la Conservación de la Cuenca Amazónica—is the home of the new SFS Center for Andes-Amazon Studies. An eight-hour drive northeast of Cusco, at an elevation of 2,500-4,000 feet above sea level, it is situated adjacent to the Manu Biosphere Reserve which supports a wide variety of habitats, including intact but disturbed rainforest, secondary forests, streams, rivers, waterfalls, and a highly diverse flora and fauna. Students are housed in shared accommodations in the station's dormitory. The field station's infrastructure includes a classroom, lab, organic gardens, and many miles of trails.





Peru Program Description

OUR CURRICULUM AND RESEARCH

This program seeks to understand both the conflicts and synergies of conservation and development in western Amazonia, with a focus on Peru. Students gain a sense of the richness of the Andes-Amazon region—biodiversity, social and cultural diversity, and ecosystem services—while exploring strategies for sustainable livelihoods in this highly productive and diverse region of South America.

The interdisciplinary themes of resilience, environmental justice, and conservation guide our inquiry. Through coursework, field exercises, and Directed Research, participants study people’s dependence on the environment, examine the threats to the environment and to social networks, and explore the tools and strategies for mitigating the threats while promoting well-being among rural communities.

Students have a unique opportunity to learn first-hand about the extraordinary biodiversity of the Andes-Amazon region in the eastern slope of the

Peruvian Andes. We look at the patterns and processes that contribute to the generation and maintenance of biodiversity of this region at multiple scales: landscape, ecosystem, communities, and species. Students discuss concepts of ecological resilience, multifunctionality, and redundancy in the context of the region, and explore the effects of climate change and land use on the regional and global biodiversity and human well-being.

The region’s rich ecosystems support a diversity of social actors and cultural groups who employ a suite of livelihood strategies that are both typical of resource-rich, rural areas and unique to Peru. We consider how nature-society interactions, such as agriculture, resource extraction, tourism, and rural development, shape both the natural landscape and the social and economic conditions in rural areas. Students may discover that conservation, then, is about managing people and our interactions with the natural environment.

Students engage in “conversation about conservation,” focusing on the practical aspects of conservation planning, implementation, and measuring outcomes. We identify the threats to the natural and human systems and explore strategies and tools to mitigate those threats through conservation measures.

In the first year of programming in Peru, our research projects are geared towards identifying the range of socio-ecological issues, as well as basic questions about biodiversity, which help us guide and inform the program’s research agenda.

Field Exercises and Skills Development

- Explore the lowland tropical rainforest biome with its distinct habitats of palm swamps, oxbow lakes, flooded forests, and upland forests
- Conduct a socioeconomic impact assessment of a proposed development initiative in Pillcopata
- Examine urban development and tourism in Cuzco, a UNESCO World Heritage Site renowned for its meeting of two distinct cultures—Inca and Hispanic
- Use planning tools to design conservation strategies for a local issue or an existing development project
- Visit the lowland rainforest on a multi-day excursion by river to understand differences in forest types and species composition
- Learn and practice a series of different field techniques to collect data on biodiversity and habitat: looking at orchid diversity in the highlands, soil macrofauna across soil types, or measuring temperature and humidity along a vegetation cover gradient
- Consider the impacts of elevation and slope aspect on species distributions during a weeklong excursion in the highlands
- Develop field research skills including species identification, biodiversity assessment, survey design and interviewing techniques, environmental impact and protected-areas assessment, scientific writing and oral presentation, GIS or remote sensing, habitat assessment and mapping species distributions

Student Directed Research Project Examples

- Effects of agricultural practices on fallow plant community structure and composition
- Assessment of soil macrofauna in areas of high activity of peccary
- Vulnerability of understory herbaceous species to a changing climate in a transitional forest
- Survey of livelihood strategies of residents of Pillcopata: historical perspectives, present outlook, and future aspirations
- Knowledge, attitudes, and perceptions of conservation efforts in the region among multiple social groups
- Perceptions by local people of land use and land cover change in the Kosñipata District
- Examination of urban development and tourism in rapidly-growing Amazonian towns

Get Involved With the Local Community

Peruvians are proud of their diverse cultures and have a very strong national identity. Appreciation of food, civility, and hard work feature strongly in the local ethics. Student engagement with the local residents is supported by studies of Spanish language and attention to understanding and observing the cultural norms and social mores in the region.

Students have many opportunities to interact with our neighbors in Pillcopata, as well as to participate in cultural exchange with self-identified indigenous communities. Students may get involved in community volunteer projects and social activities such as local environmental education, recycling and waste management, and teaching English.

As in all SFS programs, with the results of our research we offer data and recommendations that inform decision-makers and build relationships between SFS and the stakeholders involved in biodiversity conservation and resource management.

Our Partner in Peru

Envisioning a sustainable world, an environmentally educated and responsible human population, and thriving, healthy ecosystems, SFS and Asociación para la Conservación de la Cuenca Amazónica (ACCA) have joined together in an academic and research partnership which aims to strengthen the local scientific community and inform conservation decisions. Environmental research, reciprocity with the surrounding community, and education are at the core of the SFS and ACCA collaboration.

Peru Program Prerequisites

While it is not required, previous coursework in Spanish (at least three years of high school Spanish or one college-level course) would be extremely advantageous for students.

For details and how to apply, visit:

cat.fieldstudies.org/peru



COURSES

Semester students are registered in five academic courses accredited through the University of Minnesota:

Course No.	Name	Credits
SFS 3830	Tropical Ecology of the Andes-Amazon	04
SFS 3800	Conservation Science and Practice	04
SFS 3840	Political Ecology of Developing Landscapes	04
SFS 4910	Directed Research	04
SFS 2090	Language, Culture, and Society of Peru	02

Go to page 46 for course descriptions



CAMBODIA & VIETNAM

SEMESTER PROGRAM

SEMESTER PROGRAM DATES

Spring 2015: February 2 – May 10

Fall 2015: September 7 – December 13



The Living Mekong: Environmental Ethics and Conservation

THE ENVIRONMENTAL CONTEXT

The mighty Mekong River, whose headwaters originate in the Tibetan plateau and empty into the massive delta in Vietnam, is a ribbon of life, providing myriad habitats to threatened species and sustaining many millions of people. About two percent of the entire world’s freshwater catch of fish comes from waters associated with the Mekong; countless fishers, farmers, and merchants owe their livelihoods to the river. The dynamic river and its great lake, Tonle Sap, are home to the Irrawaddy dolphin, Cantor’s giant softshell turtle, and other key species. The Mekong also hosts diverse terrestrial eco-regions, including tropical forests, peat swamps, and estuarine mangroves.

The people living in the many dispersed rural villages rely on the Mekong’s productive soils for their farms and rangelands. Their livelihood strategies include subsistence and small-scale commercial farming of rice and other crops. The river system also provides rich grounds for fishing and fish farming. As nature- and culture-inspired tourism in Tonle Sap and the Angkor temples becomes a more dominant economic force, there are increasing opportunities for livelihoods in the service economy.

While there are high levels of biodiversity in the lower Mekong, conservation efforts are only just beginning and environmental policies have yet to be fully developed. Vietnam and Cambodia, both newly emerging post-conflict nations, are engaged in rapid economic development. Each country’s path toward prosperity will have distinct yet profound effects on the natural and cultural landscapes of the region and the livelihoods of rural residents. Drivers of environmental change in the lower Mekong—whether urban expansion, tourism, or climate change—will influence the development trajectories for current and future generations. A primary focus of this program is identifying these drivers and ways to mitigate the damage to natural systems while maintaining human livelihoods.



THE SFS CENTER FOR MEKONG STUDIES

The program is based in Siem Reap, Cambodia, adjacent to the ancient ruins of Angkor, Phnom Kulen National Park, and Tonle Sap lake. SFS has exclusive use of a guesthouse in town which serves as our field station. Students have easy access to the bustling community life and marketplaces in Siem Reap which enhances opportunities for cultural exchange. The Center is just a short distance away from our primary field sites in the forests, lake, and temples. While in Vietnam, students are housed in the international dormitory at Can Tho University.



Cambodia & Vietnam Program Description

OUR CURRICULUM AND RESEARCH

In this two-country program, students learn about the complexity and fundamental importance of the Mekong River to the region’s ecosystems and socioeconomic systems. In Cambodia, through coursework, field excursions, and Directed Research, we focus on conservation and rural development. Students may engage in research on water resource management, conservation methods and practices, environmental ethics, and socioeconomic development. The greater Siem Reap region provides myriad riverine and terrestrial habitats to explore. The UNESCO World Heritage site of Angkor serves as a backdrop for understanding Buddhist cosmology and the deep historical and spiritual connectedness that humans feel with nature. In Vietnam, we introduce students to dynamic hydrology, biodiversity, communities, and politics, with a focus on the role of the river in the delta region.

In the first year of programming, we are focusing on understanding the ecology of the flora and fauna of the region and threats to biodiversity and traditional rural livelihoods. Program components and topics may include:

- Scientific principles relevant to conservation practice
- Practical elements of conservation management
- Focus on protecting the remaining biological diversity and informing society’s transition to sustainability
- Understanding how fishers, farmers, and merchants utilize the Mekong watershed for daily sustenance and livelihoods
- Drivers of environmental change and how local and national polities have organized mitigation or adaptation measures to limit risk to humans and wildlife

Students begin to understand these processes and concepts with environmental ethics as their lens of inquiry. We continuously discuss and reflect upon the moral relationship between humans and the environment, study the belief systems of the people in the places we visit, and assess the moral status and intrinsic value of the natural world.

Students in this program, unlike any other SFS program, live and learn at a host-nation university for two weeks. The Vietnam component, which occurs mid-way through the semester, exposes students to a contrasting political, social, and economic system from what they have experienced in Cambodia. Can Tho University scholars—some of the most respected ecologists, climate scientists, and geographers in the world—provide students with an in-depth understanding of the Mekong Delta region ecosystems, its vibrant human communities, and the juxtaposition of rural and urban livelihoods.

While in Vietnam, students experience a different socioeconomic structure and different geo-political ideologies and philosophies. Cambodia and Vietnam may share the Mekong River; however, they are worlds apart in their respective approaches to and capabilities for environmental sustainability and conservation of natural resources.

Field Exercises and Skills Development

- Participate in baseline biodiversity studies in Phnom Kulen National Park and Kbal Spean, a spiritual and well-protected area that has yet to be thoroughly studied and categorized
- Visit the Angkor Center for Conservation and Biodiversity and learn how captive endangered species, such as the pileated gibbon, the silvered langur monkey, the slow loris, and the palm civet, are being cared for before they are reintroduced into the wild
- Observe how the Angkor Butterfly Center raises “trophy” species of butterflies that attract lepidopterists from around the world, and encourages small-scale silk worm harvesting which augments rural family incomes
- Conduct research around Tonle Sap, investigating the health and status of migratory bird species and monitoring the extraction of lake resources

- Study impacts and opportunities of tourism while exploring the resplendent Khmer temple complex of Angkor
- Get to know the many major social justice, human rights, and environmental organizations that operate in Phnom Penh and learn about the international NGO community
- Study conservation efforts for the endangered Irrawaddy dolphin and Cantor’s giant softshell turtle in the Kratie area of the Mekong River
- Examine the Mekong Delta ecosystems in Vietnam and the economics of shrimp and fish aquaculture farms and rice farming in large- and small-scale communities
- Visit Ream National Park on the Cambodian coast in Sihanoukville to study marine ecosystems and a variety of bird species
- Develop field research skills including aquatic and terrestrial organism behavioral observations, biodiversity assessment, survey design and interviewing techniques, environmental impact and protected-areas assessment, scientific writing and oral presentation, GIS or remote sensing, and habitat assessment and mapping species distributions

Student Directed Research Project Examples

- Livelihood strategies of local residents on the Tonle Sap: resource extraction and subsistence versus commercial fishing
- Baseline biodiversity studies in the Phnom Kulen highlands
- Status of key terrestrial species populations and their distributions in space
- Habitat degradation around the Angkor temple complex caused by increased tourist activity in the area
- The influence of Buddhist philosophy and religion on conservation policy and environmental consciousness in the community

Get Involved With the Local Community

Community reciprocity is at the heart of the SFS organizational and educational model. As an SFS student, you face the real world complexities of issues affecting our host communities. With the results of our research, we offer data and recommendations that inform decision-makers and build relationships between SFS and the stakeholders involved in biodiversity conservation and resource management.

As at our other Centers throughout the world, SFS is a part of the social fabric of the communities in which we are hosted. SFS students get involved in community volunteer projects and social activities such as:

- Hosting community lectures or demonstrations
- Attending community festivals, pagodas, and traditional Apsara dance performances
- Tutoring or mentoring local children in English language skills or other academic subjects
- Exploring marketplaces to try unique local foods

For details and how to apply, visit: cat.fieldstudies.org/mekong

COURSES

Semester students are registered in five academic courses accredited through the University of Minnesota:

Course No.	Name	Credits
SFS 3810	Ecosystems and Livelihoods along the Mekong	04
SFS 3800	Conservation Science and Practice	04
SFS 3820	Environmental Ethics and Development	04
SFS 4910	Directed Research	04
SFS 2080	Language and Culture of Cambodia and Vietnam	02

Go to page 46 for course descriptions





TURKS & CAICOS ISLANDS

SEMESTER PROGRAM

SEMESTER PROGRAM DATES

Spring 2015: February 2 – May 7
Fall 2015: September 7 – December 10



Marine Resource Studies

THE ENVIRONMENTAL CONTEXT

For the tourists who flock here, the Turks and Caicos Islands (TCI)—which lie at the southeastern end of the Bahamian archipelago—are a diving and angling paradise. The clear waters are considered among the world’s top 10 diving destinations, where vibrant coral reefs, a dramatic sea wall, and a deep ocean trench harbor a stunning diversity of sea life, from corals to whales. The charismatic fauna include more than 300 species of fish, many elasmobranchs such as the spotted eagle ray and lemon shark, as well as sea turtles and humpback whales. The colorful and cryptic biota is abundant in the warm waters just steps from our Center. Nearby seagrass beds, mangroves, sandy shoals, and reefs lend a patchwork appearance to the miles of shallow blue waters that surround the Islands. But beneath the turquoise waters, a delicate ecosystem is under assault.

The diverse marine environment supports the TCI economy through fisheries and tourism. The beauty and ecosystem functions of island, coastal, and ocean habitats are critical for maintaining the value of these industries. The country has an extensive network of more than 30 established protected areas to promote the sustainability of natural and historic resources, with four marine parks in close proximity to our field station on the island of South Caicos. However, lack of scientific understanding, insufficient environmental stewardship, and underutilized local ecological knowledge and human capital hinder management of marine resources and the effectiveness of these protected areas. Increasing demand for fisheries resources, unregulated coastal development, and the meteorological and biophysical impacts of climate change put enormous pressures on marine and coastal ecosystems and on island-based livelihoods. Without quantitative and qualitative scientific assessments, better facilitated community management, and collaborative environmental education, the existence of many of these ecosystems and resources is threatened.

SFS plays a critical role in supporting the TCI fishers, island residents, and environmental authorities through collaborative research and knowledge-exchange. Together we are working to implement positive change in the social, cultural, and economic spheres, as well as to support and mitigate impacts on the coastal and marine ecosystems.



“I love the program’s integrative approach in mixing local knowledge with the scientific efforts to sustain the resources on this beautiful island.”

— Maggie Jones
Gonzaga University
TCI Spring '14

THE SFS CENTER FOR MARINE RESOURCE STUDIES

The Center, located just steps from a crystal clear ocean laboratory, is adjacent to Cockburn Harbour, a town of about 1,200 residents. Our field station sits 40 feet above the water looking directly out to sea. Within a three-mile radius are coral reefs, barrier islands, mangroves, seagrass beds, and carbonate platform flats offering abundant snorkel and dive sites. The facilities include a dining area, kitchen, classroom, computer room, a pool, and a veranda with spectacular island and ocean views. Students share living quarters in two residence wings. We are fully equipped for marine operations with access to docks, motorboats, an air compressor, and plenty of tanks and weights for SCUBA diving.





Turks & Caicos Islands Program Description

OUR CURRICULUM AND RESEARCH

With most local residents dependent upon marine resources for their livelihood, along with increasing resource demand by tourists, finding viable options for managing fisheries and conserving marine biodiversity is crucial.

Snorkeling and SCUBA diving in the waters surrounding South Caicos, students learn field research and monitoring techniques to identify and assess the health of a wide range of marine organisms and habitats. Students learn to identify and observe the behavior of marine species, assess coastal and marine habitats, and quantify fisheries resources through hours of training, observation, and study in the water. TCI has an extensive network of 34 protected areas, but little is known about their function and effectiveness. With the Admiral Cockburn Land and Sea National Park and East Harbour Lobster and Conch Reserve at their doorstep, students evaluate the concept and practice of marine protected areas (MPAs) as a resource management tool.

In the community, students grapple with the challenges of assessing the rights and needs of

local stakeholders and reconciling those with conservation goals. Fisheries management and market engagement require considered analysis of the costs and benefits of species protection, fishing techniques, and market dynamics, all in the context of global and national markets and policies. Assessing the feasibility and ecological viability of resource management and habitat conservation options, and their associated social and economic implications, brings students face-to-face with the real-life dilemmas for governmental regulators and the residents of South Caicos.

The growing tourism industry in the TCI is increasing the demand for reef fish on restaurant menus. Local fishers on South Caicos recognize this market, and commercial sale of select reef fish species is rapidly increasing. Apart from having established “no-take” marine protected areas and a ban on spear fishing, there are currently few other regulations in place to manage the harvest of reef fish. It is critical for the TCI to establish a comprehensive management plan for reef fish species so they can be harvested in a sustainable manner to avoid population declines.



Through field observation, exercises, and research, students will gain the concepts, skills, and data to understand the marine ecosystems and island community dynamics. Central themes and skills in the curriculum include the following:

- Marine habitats and species and community dynamics
- Techniques and level of fishing efforts
- Relationship between environment and tourism
- Drivers and causes of marine habitat destruction
- Island community structure and social relationships
- Diversity of local livelihood strategies

Field Exercises and Skills Development

- SCUBA diving and snorkeling for fish, coral, seagrass, and mangrove identification exercises
- Studying ecosystem function and anthropogenic impacts
- Examining habitat enhancement and restoration
- Lecture by Department of the Environment and Maritime Affairs (DEMA) on the TCI government fisheries’ regulations and enforcement
- Site tour from a local tourism developer and discussion on plans for constructing residences and a resort
- Visits to local seafood processing plants and discussions with operators
- Excursion to neighboring Middle and North Caicos: tour aquaculture operations and desalination plants; explore the caves and bat colonies of Middle Caicos; discover the tropical dry forests of North Caicos; and absorb local ecological knowledge of bush medicines and foods
- Develop field research skills including marine species identification and behavioral observations, biodiversity assessment, survey design and interviewing techniques, field research ethics, stakeholder facilitation techniques, data management and analysis, scientific writing and oral presentation, snorkel and SCUBA skills, economic valuation methods, and habitat assessment and mapping



Student Directed Research Project Examples

- Population size assessment of potential commercial finfish species around South Caicos
- Ecological and social assessments of the impacts of climate change and ocean acidification
- Rapid assessment of density and distribution of invasive lionfish
- Coral reef ecology, including growth, survival, and recruitment
- Baseline biodiversity surveys in critical habitats
- Interactions between mangrove and seagrass faunal communities
- Assessments of local livelihood strategies and human capital, including perceptions of tourism and fishing industries and bottom-up ideas for managing the island’s natural environment
- Assessment of conch population structure and regulation compliance
- Youth empowerment through marine-oriented citizen science
- Elasmobranch ecology

SFS at Work

- Lobster, conch, and finfish stock assessments provide important information, allowing government agencies to establish sustainable fishing rules and guidelines.
- Natural resource workshop with DEMA to provide the TCI government workers with training on coral reefs, lobster biology, marine fishes, turtles, and sharks
- Working with DEMA and local businesses to develop a protocol for coral reef monitoring and queen conch distribution
- Applying baseline data to examine reef health trends, species interactions, and impacts of coral diseases
- Students present findings at the South Caicos Environmental Forum, run and hosted by SFS, to disseminate findings to the local community.

Get Involved With the Local Community

The community of South Caicos has hosted SFS students for more than 20 years. During that time, staff and students have integrated into the small community on multiple levels and collaborated extensively with local stakeholders on a variety of projects. We are dedicated to helping the community conserve its natural resources and develop sustainably. Students become involved with the community, learning about the Caribbean culture and island society. Community activities may include:

- Providing swimming and snorkeling lessons for local children
- Friendship Family Program pairs students with local families to better understand new cultures
- Hosting “Sea Day” at the Center to introduce local students to the marine environment
- Reading, tutoring, and volunteer projects at the local library and grade school
- Teaching English to Haitian and Dominican residents
- Collaborating with local youths and NGOs to conduct beach clean-ups to increase environmental awareness

NEW PADI Open Water SCUBA Certification

Previously, students who wished to dive were required to complete their open water certifications prior to arrival at SFS, but the Center for Marine Resource Studies is now offering PADI Open Water SCUBA certification to semester students. The certification takes place during the first two weeks of the program. The course, taught by the Center’s Dive Safety Officer and assisted by four PADI Divemasters, will introduce students to diving and the environment where they will be learning and researching for the next several months.

Note: It is not necessary to use SCUBA to participate in our program; many students choose to snorkel only. Divers and snorkelers must bring their own SCUBA and snorkeling equipment. Weights and tanks are provided on-site at no cost. Please contact the SFS Admissions Office if you have any questions.

For details and how to apply, visit:
cat.fieldstudies.org/tci



“I was anticipating a wonderful term but I was in no way prepared for the meaningful work and relationships that came out of [the semester].”

I participated in conch and lobster research that fed into government decisions, assessed coral bleaching for a worldwide NGO database, and collected turtle and elasmobranch data for a professor’s longstanding research project. I surveyed Turks Islanders and tourists nationwide to improve the accuracy of seafood landings—research that yielded crucial though unexpected results for the TCI government and is the first SFS project to span an entire country.



Jenna Wiegand
Oregon State University
TCI Fall ’13



TURKS & CAICOS ISLANDS

SUMMER PROGRAM

SUMMER 2015 PROGRAM DATES

Session I: June 8 – July 7

Session II: July 13 – August 11



Marine Resource Studies

The turquoise waters of the Turks and Caicos Islands (TCI) provide the perfect laboratory for marine studies. The relatively healthy marine and coastal ecosystems support much of the community on the island of South Caicos, with fisheries providing the primary source of livelihood. The small island community embraces the challenge of balancing economic development with environmental conservation. Having a sound understanding of the ecology of key fisheries species and their habitats provides the foundation for achieving this balance through resource management and conservation.

The environment is changing, however, as pollution, climate change, ocean acidification, and the unsustainable extraction of precious marine resources, coupled with a growing tourism industry, threaten the island’s fragile ecosystems. Depletion of key resources would also have a dramatic impact on the social systems of South Caicos by putting pressure on food security and employment prospects. Developing sustainable fisheries and tourism is essential if this resource-dependent coastal community is to thrive.

NEW SESSION I: TROPICAL MARINE ECOSYSTEMS: MONITORING AND MANAGEMENT

Students explore the ecological and socioeconomic aspects of various tropical marine ecosystems, learning how to assess and maintain their health. This includes understanding key factors, such as the need to conserve biodiversity and critical habitats, the nature of sustainable management for important fisheries species such as the queen conch and spiny lobster, and the importance of ensuring environmental management objectives are sympathetic to community livelihood goals. Students also consider how climate change and ocean acidification may impact the TCI’s marine ecosystems. The course helps prepare students to conduct marine research while working with clients and stakeholders.

NEW SESSION II: APPLIED MARINE RESEARCH TECHNIQUES

This course enables students to apply the scientific process in a field research project addressing a local issue related to the management of tropical marine environments in the TCI. Students learn how to develop a scientific approach to identify key problems affecting the health of coral reefs, seagrass beds, and mangrove stands that surround the island. These problems include both local phenomena such as overfishing and increased coastal development, as well as global issues like climate change and ocean acidification.

Field Expeditions and Exercises

The spectacular reefs, turquoise waters, and island community of South Caicos serve as the laboratory for studies and field work. Potential research sites, field exercises, and excursions in these summer programs include:

- Exploring coral reefs in the island’s marine parks; fringe and island mangrove ecosystems; and extensive and varied seagrass meadows
- Touring of current coastal development projects and seafood processing plants
- Attending skills workshops, including stakeholder engagement techniques and science dissemination practice
- Examining anthropogenic impacts to nearshore ecosystems
- Identifying critical ecosystems around South Caicos
- Valuing ecosystems of the Turks and Caicos for coastal planning decisions

SUMMER COMBINED: SESSIONS I + II

We have expanded the summer programming on South Caicos to offer two four-credit courses that may be taken individually or in combination to provide a thorough introduction to tropical marine ecology and environmental management, as well as field research techniques for addressing conservation questions. Students participating in both sessions are eligible for a \$675 discount.

For details and how to apply, visit: cat.fieldstudies.org/tci

COURSES		
Summer students are registered in one or two academic courses accredited through the University of Minnesota:		
Course No.	Name	Credits
SFS 3530	Tropical Marine Ecosystems: Monitoring and Management	04
SFS 3560	Applied Marine Research Techniques	04
Go to page 49 for course descriptions		



“As the divers and snorkelers gear up each week for amazing underwater adventures, there are constantly new surprises waiting for us. One dive brought about the luck of witnessing a squadron of 15 eagle rays! Others had the incredible experience of diving with a few dolphins who were also reveling in the beauty of South Caicos.

— Jack Fishman
College of Charleston
TCI Summer '13



COSTA RICA

SEMESTER PROGRAM

SEMESTER PROGRAM DATES

Spring 2015: February 2 – May 7
Fall 2015: September 7 – December 10



Sustainable Development Studies

THE ENVIRONMENTAL CONTEXT

Costa Rica is internationally recognized for its efforts to ensure biodiversity conservation and protect natural resources. The country supports more than five percent of the world’s species and boasts 230 protected areas—about 26 percent of the land area of the country. The cloud forests, rainforests, volcanoes, coastal environments, and mountaintops shelter as many as 9,000 plant species, including at least 1,500 species of orchids alone. More than 1,000 species of butterflies and almost 900 species of birds, such as quetzals, toucans, hummingbirds, and scarlet macaws, are found throughout Costa Rica’s various tropical ecosystems. This remarkable biodiversity provides a rich platform for nature-based tourism, which is one of the country’s primary economic drivers. The diverse landscape mosaic of forests, pastures, coffee farms, and agricultural fields, and the stunning beaches and extensive mangroves, offer residents and tourists alike a natural haven for good food, rich culture, and exploration of tropical biodiversity.

Costa Rica faces a challenge common to developing countries: preserving beautiful—and economically valuable—natural resources while increasing prosperity and allowing for sustainable development. The Costa Rican paradise is increasingly threatened by population growth, urban development, inappropriate waste disposal, and monoculture expansion. The rapid conversion of rural agricultural landscapes into urban areas, the consequent loss and fragmentation of forests, and the increased demand for water in developed areas are threatening the country’s sustainable development efforts. Finding long-term solutions in sustainable practices is imperative for Costa Rica’s future.



“Studying a concept in a classroom is one thing, but experiencing it is a different kind of learning altogether. Through classes and field trips, we had the chance to explore in-depth what sustainable development meant, seeing real-life examples that improved my understanding tremendously.

— Pin Pravalprukskul
Wellesley College
Costa Rica Spring '11

THE SFS CENTER FOR SUSTAINABLE DEVELOPMENT STUDIES

The Center, located an hour from the capital city of San José, comprises a campus facility integrated with a small Rainforest Alliance Certified™ mango and orange farm overlooking the fertile Central Valley. Practicing sustainability is part of the student learning and living experience. The Center’s facilities include a dormitory and cafeteria, indoor and outdoor classrooms, an organic garden and greenhouse, a soccer field, a basketball court, a swimming pool, and a forested area with trails. The campus is part of the small neighborhood of La Presa/Los Angeles, and the friendly town of Atenas is only three miles from campus. Costa Rica’s tropical forests, beaches, mountains, and volcanoes are within a day’s travel.





Costa Rica Program Description

OUR CURRICULUM AND RESEARCH

Costa Rica is currently undergoing a period of rapid economic and social change. As this resource-rich and biodiverse country continues along a path of rapid development, it is increasingly influenced by globalized markets and policies, such as free-trade agreements with the United States, China, Canada, Mexico, and Chile, among others. Costa Rica’s economy has shifted from one based chiefly on agriculture to one driven by services. At the same time, rapid rural-to-urban conversion is straining natural resources in ecologically fragile areas. The country is at a critical juncture as resource management decisions are being made in an effort to keep pace with competitive global markets.

Our goal is to analyze different development and resource management models that protect the biodiversity of Costa Rica’s ecosystems while promoting socioeconomic benefits for its people. Students will examine the effects of globalization on development issues such as agriculture, biodiversity protection, economic development, urban sprawl, population growth, waste management, and water

quality. Students can see how the SFS farm compares with other sustainable farms in the region through an assessment of ecosystem services in the agricultural landscape.

This program focuses on evaluating the actual success of Costa Rica’s world-renowned conservation systems and developing alternative strategies for economic development and biodiversity conservation, such as land-use planning, organic agriculture, and conservation outside of protected areas. Visits to cloud forests, dry forests, volcanoes, lowland rainforests, farms, and plantations offer opportunities to examine management schemes, identify benefits of protected areas, and determine which systems offer the best options for economic development, the maintenance of cultural norms, and the preservation of biodiversity. Understanding the priorities for Costa Rica’s policies, within the context of environmental changes, is crucial as students analyze potential sustainable solutions for Costa Rica and the Central American region.



Field Experience and Skills Development

- Compare and contrast development and resource-use issues during an extended field expedition to Nicaragua or remote Costa Rican locations (conditions permitting)
- Visit national parks to investigate the pressures of ecotourism on small gateway communities and learn about cloud forest ecology
- Learn about bio-indicators of ecosystem health and rainforest ecology
- Develop management policies by continuing long-term bird monitoring programs and analyzing the impact of roads as barriers and sources of mortality for the fauna in Carara and Santa Rosa National Parks
- Conduct social science research to better understand people’s perceptions about their surrounding environment
- Visit Monteverde Cloud Forest Reserve, a protected area rich in biodiversity and cultural significance
- Explore rare and threatened tropical dry forest ecosystems while camping in the national parks of the Guanacaste Province and studying one of the most successful management models for protected areas in Latin America
- Develop field research skills including habitat assessment and mapping, species identification, infrastructure assessment in protected areas, GIS or remote sensing, scientific writing and oral presentation, and survey design and interview techniques



Student Directed Research Project Examples

- Investigation of Carara National Park’s management practices in response to increased tourism
- Evaluation of the socioeconomic benefits of Costa Rica’s national parks for neighboring communities
- Analysis of impact of road traffic noise on the avifauna of national parks
- Measurement of ecosystem services, such as biodiversity conservation and carbon sequestration, in agroforestry systems such as shade-grown coffee farms
- Evaluation of the impacts of artificial feeders on the ecology of hummingbirds in Monteverde Cloud Forest Reserve
- Assessment of public perception of the problems and solutions associated with environmental impacts resulting from climate change, urbanization, or management of solid wastes

SFS at Work

- Evaluating the impact of invasive species on plant diversity in the Municipal Forest of Atenas
- Conducting biophysical assessments of micro-watersheds for local authorities such as the Ministry of Environment, the Ministry of Health, and the Atenas municipality
- Evaluating the ecological status of freshwater springs in the Cerro Atenas Protected Zone
- Monitoring visitation in national parks of the Central Volcanic Mountain Range Conservation Area

Get Involved With the Local Community

Conversations and collaborations with local residents, small business owners, and farmers about their perspectives and needs provide the framework for SFS research plans. Our Center is an important stakeholder and partner for local municipalities and ministries, development organizations, and many national parks.

A cornerstone of the program is the opportunity for student engagement in Atenas and surrounding areas. The Center collaborates with local organizations on projects such as:

- Monitoring and maintaining trail infrastructure at the Municipal Forest with local schools and conservation organizations
- Engaging in long-term community projects: U.S. culture and English taught in the elementary schools; environmental education at the Municipal Forest; and recycling projects
- Establishing nurseries of native tree species, and reforestation and watershed conservation projects with local organizations
- Participating in soccer games, community festivals, and short homestay visits

Costa Rica Program Prerequisites

Applicants for the semester program in Costa Rica must be at least 18 years of age, in good academic standing, and must have completed a college-level course in Spanish (or three years of high school Spanish), as well as a course in ecology, biology, or environmental studies. Students are encouraged to have taken coursework in international development, economics, or anthropology prior to participation.

For details and how to apply, visit:
cat.fieldstudies.org/costarica



“Beyond the knowledge I gained from the coursework and lectures, I really enjoyed the hands-on activities,

whether it was hiking through forests, helping with recycling in town, or doing farm chores at the Center. These activities gave us a chance to understand how the information we were learning plays out in real situations. In the classroom, we were learning about trash collection and waste management and on the



weekends we were in town sorting recycling because Costa Rica does not have a service that picks up recyclable items at homes. The connections were truly endless.

Sarah Foss
Pennsylvania State University
Costa Rica Fall ’11

COURSES

Semester students are registered in five academic courses accredited through the University of Minnesota:

Course No.	Name	Credits
SFS 3770	Tropical Ecology and Sustainable Development	04
SFS 3030	Economic and Ethical Issues in Sustainable Development	04
SFS 3740	Principles of Resource Management	04
SFS 4910	Directed Research	04
SFS 2050	Language, Culture, and Society of Costa Rica	02

Go to page 46 for course descriptions



COSTA RICA

SUMMER PROGRAM

SUMMER 2015 PROGRAM DATES

Session I: June 8 – July 7

Session II: July 13 – August 11



Sustainable Development Studies

Costa Rica is known worldwide for its conservation efforts, which have attracted millions of tourists to its natural protected areas. Accelerated economic growth and urban development, however, are taking place in the absence of coordinated land-use planning, consideration of water and energy sustainability, and waste management systems. These oversights, in combination with climate change impacts, challenge the sustainable development goals of the country and threaten its biodiversity.

SESSION I: SUSTAINING TROPICAL ECOSYSTEMS: BIODIVERSITY, CONSERVATION, AND DEVELOPMENT

Students explore and address key features of sustainable development strategies including the most pressing challenges at the intersection of conservation and economic development. Students learn about Costa Rica’s historical and current sustainable development strategies, as well as tropical ecosystem function and connectivity, allowing them to understand the impacts of development on the environment and on society. Field exercises and lectures introduce students to models of economic development and biodiversity conservation in and around Costa Rica’s protected areas. A short field research project provides a practical introduction to research design and methods for achieving conservation goals.

Field Expeditions and Exercises

- Explore the biological diversity of the rainforests of Braulio Carrillo National Park in the Volcanic Cordillera Conservation Area
- Compare and contrast biodiversity protection in examples of conventional and organic agriculture
- Evaluate tourism services and park management practices in Poás Volcano National Park
- Analyze the challenges of the ecotourism project of the El Sur community near Carara National Park; hike through the rainforest; and interact with local schoolchildren through outreach projects

SESSION II: APPLIED RESEARCH TECHNIQUES AND STRATEGIES TOWARD SUSTAINABILITY

Students learn about the ecological, natural resource management, and socioeconomic factors impacting protected areas and surrounding communities and farms in Costa Rica. In this research-intensive program, the focus is on developing relevant research questions that address local issues related to sustainability. Students are involved in designing and conducting field research on a topic of immediate relevance to local clients. They also propose alternative approaches toward sustainable development in an effort to help address challenges to conservation goals.

Field Expeditions and Exercises

- Explore Poco Sol Biological Station within the Children’s Eternal Rainforest to quantify forest dynamics
- Hike the oak forest and páramo ecosystems of the highlands of Cerro de la Muerte
- Visit Arenal Volcano National Park and evaluate the consequences of increased tourism at La Fortuna in an effort to inform park managers about opportunities to foster better relationships with surrounding communities

SUMMER COMBINED: SESSIONS I + II

This summer program offers two four-credit courses that may be taken individually or in combination to provide a thorough introduction to the sustainability of tropical ecosystems, as well as field research techniques for addressing conservation questions. Students participating in both sessions are eligible for a \$675 discount.

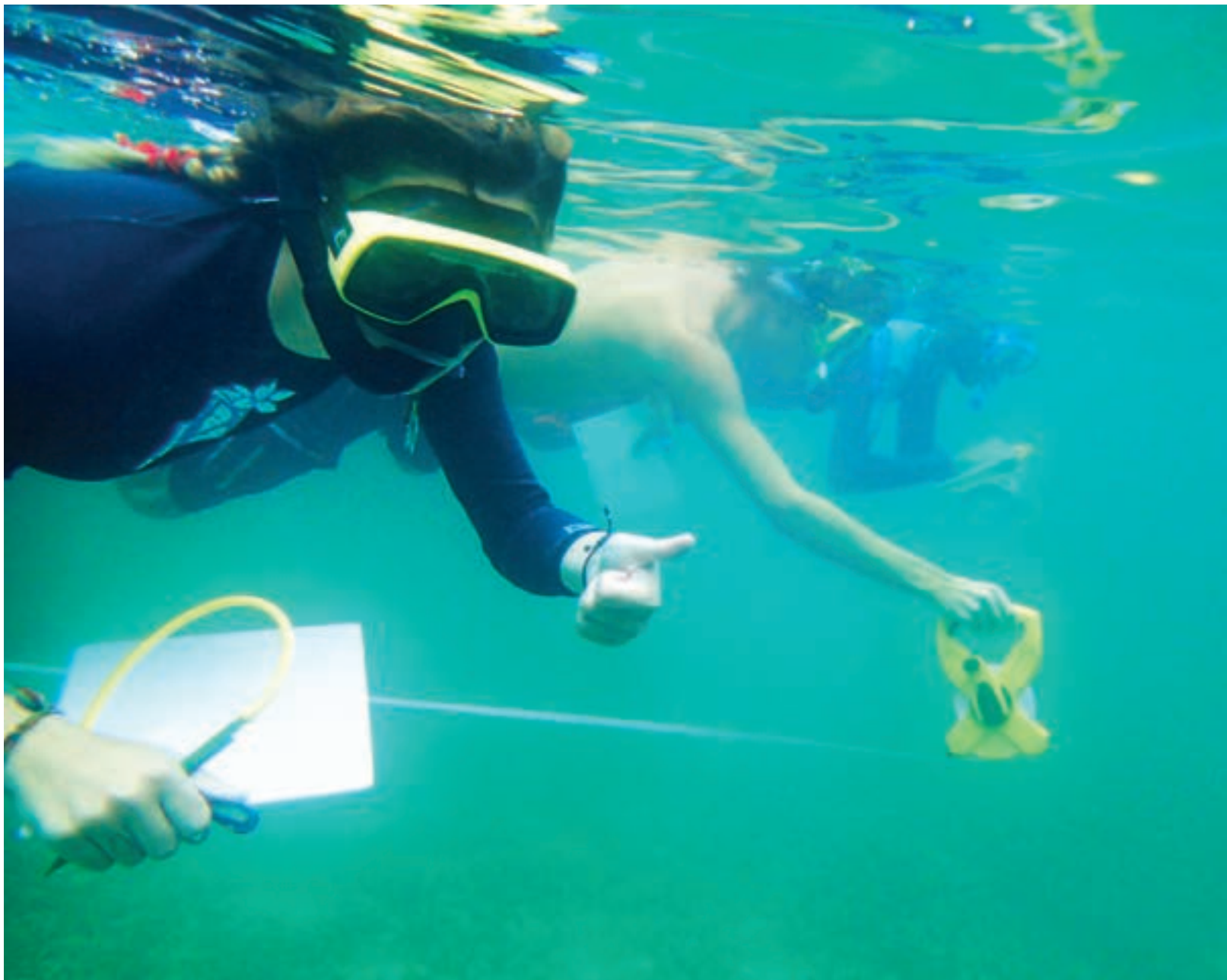
For details and how to apply, visit: cat.fieldstudies.org/costarica

COURSES		
Summer students are registered in one or two academic courses accredited through the University of Minnesota:		
Course No.	Name	Credits
SFS 3520	Sustaining Tropical Ecosystems: Biodiversity, Conservation, and Development	04
SFS 4930	Applied Research Techniques and Strategies Toward Sustainability	04
Go to page 49 for course descriptions		



“We were presented with a variety of local issues on field trips such as water and waste management, ecotourism, and forest fragmentation... issues critical for continued sustainable economic and environmental development. Our professors encouraged us to come up with our own solutions to these issues, and this required me to think not as a student but as an environmentalist.

— **Holly Lindberg**
The University of Tennessee at Chattanooga
Costa Rica Summer '12



PANAMA

SEMESTER PROGRAM

SEMESTER PROGRAM DATES
Spring 2015: February 2 – May 7
Fall 2015: September 7 – December 10



Tropical Island Biodiversity Studies

THE ENVIRONMENTAL CONTEXT

Panama is the great connector between two continents, a corridor that links the natural riches of Central America to South America. Few places on Earth can claim the density of species and ecosystem richness of this isthmus. The Bocas del Toro archipelago, located on the Caribbean side of the country, is a complex and biologically diverse area composed of islands, mangrove forests, coral reefs, and seagrass meadows. The islands themselves are covered with a diversity of terrestrial ecosystems—from tropical lowland rainforest to freshwater marshes—that are important habitats for an abundance of birds, monkeys, sloths, butterflies, and the distinctive poison-dart frog. Many of the islands’ beaches are important nesting grounds for threatened marine turtles. Commonly referred to as the “Galápagos of the Caribbean,” the island systems of Bocas del Toro contain a remarkable wealth of natural resources.

Bocas del Toro is at a critical juncture. Due to a boom in tourism and poorly managed resort development in the past two decades, mangroves and coastal ecosystems are rapidly being converted into tourist infrastructure, resulting in a loss of biodiversity. Local population growth, unchecked extraction of resources, water management issues, pollution, and the encroaching recreational practices of humans have put strains on the natural places of the archipelago, many of which form the basis of tourism to the region. Sustainable natural resource harvesting, conservation, and monitoring are critical in order to maintain the economic, societal, and ecological stability of the region.

The degradation of the islands’ marine ecosystems and commercial overfishing in the region have also compromised the livelihoods of the indigenous groups who live in the archipelago. The burgeoning service economy of the area attracts locals to join a corps of low-scale wage earners. While this income is important, indigenous people are losing traditional knowledge of the land and sea. Losing this meaningful connection with the environment may compromise the stewardship of habitat and natural resources.

The goal of this program is to assess the state of the archipelago’s fragile natural habitats and understand the community’s goals in natural resource management. We are assessing which activities are harmful to the flora and fauna, and which support species and habitat conservation, and ultimately, local livelihoods. In addition, we are investigating how the local environment and residents of the archipelago are adapting to disruptive weather events and changing climatic influences.



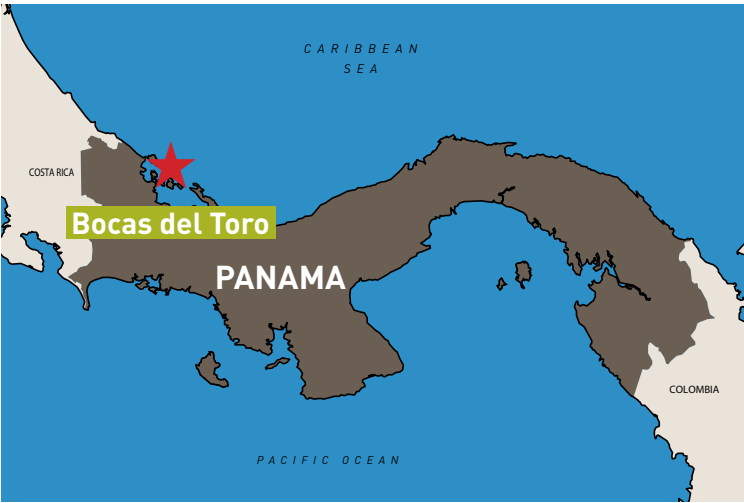
“Nothing will ever compare to the feeling of riding on a boat between islands, staring at the rainforests and beaches in the distance, gazing into the crystal clear water below you, and feeling the wind breeze across your face...”

— Meredith Bower
University of Maryland, College Park
Panama Spring ‘14

THE SFS CENTER FOR TROPICAL ISLAND BIODIVERSITY STUDIES

The field station on the island of Solarte is located less than a 10-minute boat ride from Bocas Town on the vibrant Caribbean waters of Almirante Bay and nestled in the rainforest. The Center sits between two indigenous villages of the Ngöbe people, giving students access to understanding traditional ways of life. The Center’s open-air classroom overlooks the jungle and ocean. With trails that wind through lush forests and coastal mangroves to snorkeling spots filled with tropical fishes, Solarte is a rich learning landscape allowing for total immersion right outside of the Center steps.





Panama Program Description

OUR CURRICULUM AND RESEARCH

Bocas del Toro is home to biologically diverse marine and terrestrial ecosystems, such as coral reefs, mangrove cays, white sand beaches, and tropical rainforests; however, the unplanned development of these areas and unmanaged resource use by residents and tourists alike has put increasing pressures on the ecosystems and threatened the human communities that depend on them.

The curriculum of the program focuses on defining key island systems, both natural and human, and how they interface. Our research in Bocas del Toro has already revealed patterns and processes at the nexus of biodiversity, conservation, and human livelihoods that merit ongoing study. Through field observations and research, students identify and understand the pressures, both direct and indirect, on the environment and social systems.

Students also evaluate the responses by local actors and policy-makers aimed at mitigating pressures and restoring balance in the environment. Studies with local residents about their livelihood strategies, approaches to farming,

and use of natural resources help us to assess the sustainability of land and resource use in the region. While Bocas del Toro is home to an eclectic mix of people—including Latinos, Afro-Antilleans, indigenous people, and expatriates—each group occupies a niche in the social and economic systems of the islands, and each has a distinctive way of relating to the environment. The archipelago offers myriad opportunities to examine how natural systems and human systems are able to mutually exist—but not necessarily without conflict—in this small island region of the rural Caribbean.

Through coursework and research, students gain an understanding of the interdependence of livelihood strategies of island residents, population structure of key species, and habitat arrangements and conditions, and then apply sustainability principles to define potential management strategies. Lectures by Panamanian and international researchers and government environmental officials help students to understand the social, economic, and policy context for environmental management.



Field Experiences and Skills Development

- Snorkel for field research and species identification on coral reefs, seagrass beds, and other marine habitats
- Take shallow water excursions to the fragile intertidal surf zones where giant starfish and spiny sea urchins abound
- Explore lowland wet rainforests, viewing a diversity of butterflies, birds, monkeys, and numerous poison dart frogs
- Visit and participate in sea turtle conservation projects, patrolling nesting beaches and working with local sea turtle researchers
- Tour large banana plantations on the mainland to understand the impact of commercial agriculture on the local economy and coastal environment
- Visit indigenous villages and learn about the livelihoods of traditional farmers, fishers, and forest gatherers
- Observe dolphin behavior and assess the impact of tourist interaction on resident dolphin populations
- Visit eco-lodges and resort hotels to understand how different types of land development put varied pressures on fragile marine habitats and ecosystems
- Participate in public forums on community-based tourism projects
- Develop field research skills including marine and terrestrial organism behavioral observations, biodiversity assessment, survey design and interviewing techniques, environmental impact and protected-areas assessment, scientific writing and oral presentation, GIS or remote sensing, habitat assessment and mapping species distributions



Student Directed Research Project Examples

- Status of key species, including corals, lobsters, and reef fish, and the importance of these species to the livelihoods of local fishers
- Condition of marine and terrestrial habitats, including coral reefs, seagrass beds, mangroves, and humid forest, and strategies for monitoring changes over time
- Levels of butterfly diversity as an indicator of forest and environmental disturbances
- Status and distribution of invasive lionfish in southern Caribbean waters and the effect on native fish population dynamics
- The viability of amphibian species to thrive in fragile ecosystems affected by anthropogenic factors such as habitat loss, land cover changes, and a warming climate
- Habitat changes at the terrestrial-marine interface including receding beaches, destruction of mangroves, siltation of reefs, and pollution-caused degradation due to increased tourism and development
- Livelihood strategies of residents, such as fisheries, ecotourism, agriculture, ranching, and forestry; and decision-making processes of families that extract natural products for subsistence and income generation

Get Involved With the Local Community

Conservation, resource use, forest preservation, and marine species monitoring are important to local farmers and fishers, resource managers, and concerned community groups. With the results of our research, we offer data and recommendations that inform decision-makers and build relationships between SFS and the stakeholders involved in tropical island system conservation and management.

SFS students get involved in community volunteer projects and social activities such as:

- Participating in service trips to help local conservation groups and communities, such as monitoring sea turtle nesting and baby sea turtle emergence (seasonal), as well as beautification or recycling efforts
- Meeting with members of the indigenous Ngöbe community to learn more about their culture and efforts to promote their role in land management and sustainable natural resource use
- Hosting community lectures or demonstrations
- Attending community festivals and sporting competitions
- Tutoring or mentoring indigenous school children in English language skills and environmental education

Panama Program Prerequisites

Applicants for the semester program in Panama must be at least 18 years of age, in good academic standing, and must have completed a college-level course in ecology, biology, or environmental studies. Students are encouraged to have taken coursework in international development, economics, or anthropology prior to participation. While not required, previous coursework in Spanish (at least three years of high school Spanish or one college-level course) would be extremely advantageous for students.

For details and how to apply, visit: cat.fieldstudies.org/panama



“Living on a tropical island was definitely an unforgettable experience...

being a two-minute walk from swimming in the clear, warm Caribbean waters, a one-minute walk from dense jungle filled with amazing plants and animals, and only a five-minute walk to an indigenous village. I love that our field was just so variable. Whether it was trekking through the jungle and measuring trees to estimate carbon storage, species identification of marine life while snorkeling, or learning the area’s history from the indigenous community, I saw and learned something new every excursion.



Sarah Cady
University of San Diego
Panama Fall '13

COURSES

Semester students are registered in five academic courses accredited through the University of Minnesota:

Course No.	Name	Credits
SFS 3790	Tropical Coastal Ecology	04
SFS 3740	Principles of Resource Management	04
SFS 3020	Environmental Policy and Socioeconomic Values	04
SFS 4910	Directed Research	04
SFS 2070	Language, Culture, and Society of Panama	02

Go to page 46 for course descriptions



AUSTRALIA

SEMESTER PROGRAM

SEMESTER PROGRAM DATES
Spring 2015: February 2 – May 7
Fall 2015: September 7 – December 10



Tropical Rainforest Studies

THE ENVIRONMENTAL CONTEXT

For thousands of years, the tropical rainforests of Far North Queensland, Australia, have been home to Aboriginal groups that play a vital role in co-managing the World Heritage Wet Tropics. The forests also are home to numerous plants, birds, and marsupials found nowhere else in the world. Daintree National Park, where the rainforest-covered mountains meet the coast, is home to some of the oldest living plants on Earth. Giant strangler figs, abundant vines and epiphytes, large pythons, colorful parrots, the giant cassowary, bandicoots, and tree kangaroos fill the Wet Tropics forests with color, sound, and complexity.

Northeastern Queensland’s ancient rainforests preserve millions of years of evolutionary history, though unfortunately, these repositories have been greatly affected by habitat loss, fragmentation, and climate change. Northern Australia once supported extensive rainforests, but logging, mining, and agricultural production over the past two centuries have destroyed and degraded rainforest habitats, disrupting the patterns and processes that keep these forests vibrant. Today, over much of the area, only fragments of the original forests remain.

Global climate change is very likely contributing to accelerating the loss of plant and animal species as well. The potentially devastating effect of climate change is playing out in the rainforests of Far North Queensland, where climate models predict a significant rise in local temperatures over the next century. The world-renowned Wet Tropics are often viewed as the “canary in the coal mine,” as a threat of this magnitude could possibly result in the loss of more than half of all Australian bird species and endemic mammals.

Australia continues to be a global front-runner in recognizing the significance of ecosystem services and restoration ecology practices to maintain and ensure healthy rainforests. The country has halted rainforest destruction, established effective protected areas, and is confronting the threat of forest species loss from climate change more proactively than most tropical countries. Still, the integrity and survival of these ancient, unique, and majestic rainforests hinge upon developing management solutions that consider large-scale and localized impacts on biodiversity, including global climate change, while also providing conditions for economic and social sustainability for local communities.



“Being able to walk through the Australian rainforest and see what I had been learning about in the classroom gave me a deeper connection with the area than I could have ever believed to be possible.”
— **Melissa Stine**
University of California, San Diego
Australia Fall '13



THE SFS CENTER FOR RAINFOREST STUDIES

The Center lies on the edge of the Atherton Tablelands in the heart of the traditional land of the Yidinji people. Protected World Heritage forests and farmland surround the rolling hills covered in tropical foliage. Student cabins are nestled within the rainforest, which comprises 97 percent of the property’s 153 acres. The site is alive with the sounds of the rainforest, and sightings of tropical birds, bandicoots, pademelons, musky rat kangaroos, amethystine pythons, and other unique rainforest species are common. Students share eight-person cabins with separate shower and bathroom blocks. The main building of the field station houses the classroom, dining area, and a common room.



Australia Program Description

OUR CURRICULUM AND RESEARCH

While representing only a small percentage of the world’s rainforest, the astonishing biodiversity of Australia’s rainforest and the country’s dynamic conservation efforts make Queensland an extraordinary laboratory for students to study rainforest management and restoration. Cyclones and other extreme weather events continue to threaten the remaining rainforest fragments, raising questions on how to manage these hyper-disturbed areas in times of change. Management strategies developed here may serve as a model for conserving and restoring other rainforests around the world.

The ecological and economic benefits of rainforests are increasingly well understood, but much less is known about rainforest ecosystem dynamics and, particularly in this part of the world, how to effectively restore and manage highly fragmented rainforest habitats. Our goals are to help understand the dynamics of rainforest ecosystems, including potential impacts of fragmentation and global climate change, and in turn, develop

rainforest conservation and restoration strategies that benefit both ecosystems and human communities.

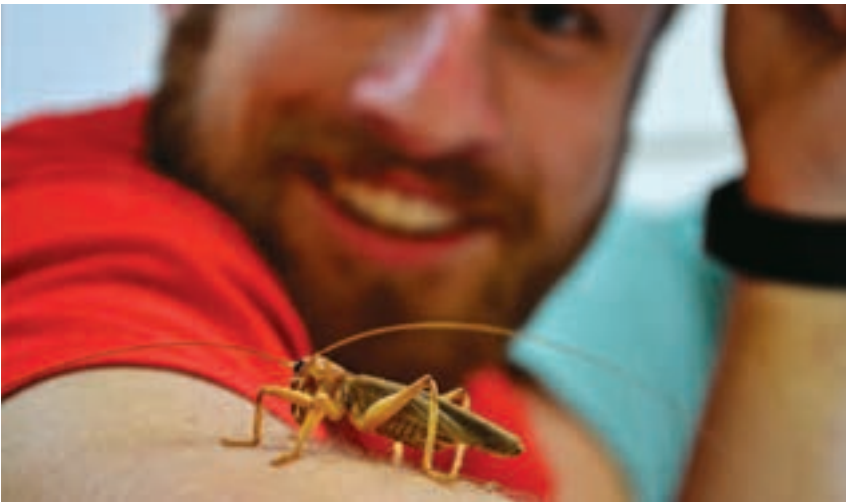
The program curriculum and research agenda address a critical local and regional environmental problem—loss and fragmentation of once extensive rainforests—and examine environmental policies on local and national levels. SFS staff and students, in collaboration with local landholders and stakeholder organizations, focus on enhancing the condition of tropical rainforests and determining how to regenerate and restore the rainforest on the Atherton Tablelands.

Students learn field research techniques as they collect data on topics as diverse as potential responses of biotic communities to global climate change, habitat use and animal behaviors, resilience to cyclonic events, land use, sustainable tourism, local resident involvement in restoration projects, and cost-effective and ecologically beneficial methods of restoration.

SFS students’ work is recognized as a vital contribution toward broader studies on global climate change, ecological integrity of rainforest fragments, and developing restoration practices to maximize rates of plant growth and colonization by fauna. Students are also actively involved in replanting initiatives and restoration site maintenance with local land-care groups.

Field Exercises and Skills Development

- Camp in the Outback and explore Chillagoe’s caves, rock formations, remnant dry rainforests, and eucalypt savannah
- Multi-day excursion to Cape Tribulation and Daintree National Park: hike through lowland rainforests, giant pandans with peppermint stick insects, mangrove forests, and palm forests; traverse the Daintree River, famous for its crocodiles; visit the canopy tower at the Daintree Discovery Centre
- Lend a hand at the TREAT (Trees for the Evelyn and Atherton Tablelands Inc.) nursery
- Assess local residents’ and tourists’ attitudes toward nature and restoration
- Learn about the geology and historical biogeography of the Atherton Tablelands
- Assess seedling recruitment of restored tropical rainforest at revegetation sites
- Examine growth and mortality of tropical rainforest species
- Examine fauna in endangered plant communities
- Develop field research skills including GIS, rainforest management strategies, seedling propagation, social science research methods, data recording and analysis, research design, restoration techniques, and climate modeling



Student Directed Research Project Examples

- Using plant functional traits to predict drought and cyclone resistance
- Determining barriers and opportunities for eco-cultural tourism with a local Aboriginal community.
- Climate modeling and rainforest corridor plantings and restoration
- Examining patterns of colonization of restored rainforest by vertebrates
- Using scats and scratch marks to investigate habitat use by tree kangaroos
- Determining carbon sequestration values of rainforest restoration
- Evaluating policy instruments that are used to tackle environmental problems
- Assessing nature-based tourism and its role in the Wet Tropics
- Studying long-term effects and recovery of forests from selective logging

SFS at Work

Understanding local views on the ecological and socioeconomic challenges facing the community of Far North Queensland is key to our mission. Our ongoing research and close ties with community stakeholders allow students to make meaningful contributions including:

- Assisting community members with propagating, planting, and maintaining more than 15,000 trees over the last few years to restore degraded forests, improve water quality, and sequester carbon
- Assessing tree seedling recruitment and growth, working toward recommending best practices for achieving a successful restoration
- Helping community members with restoration of more than one mile of rainforest from grassland along the lower Peterson Creek
- Assisting in developing biodiversity management action plans for species such as the Lumholtz’s Tree Kangaroo

Get Involved With the Local Community

The Atherton Tablelands and Wet Tropics have been home to The SFS Center for Rainforest Studies for over 25 years. SFS is an active and engaged partner with many community organizations including TREAT, Landcare, and Tablelands National Park Volunteers. Our research provides solid scientific data and has direct policy implications for local decision-makers. It also creates important linkages between our Center and the diverse stakeholders involved in rainforest restoration and management and the development of sustainable communities and industries.

Perhaps of greatest importance, by participating in restoration projects side-by-side with citizen volunteers, students come to understand rainforest ecosystems and management from a local perspective. Our students forge strong connections with residents who are passionate and knowledgeable about environmental stewardship.

SFS students and staff add significantly to the social fabric of the community by getting involved in community volunteer projects and social activities such as:

- Helping local conservation groups and communities plant rainforest trees
- Participating in community fauna surveys
- Attending special lectures on local wildlife in conjunction with local conservation groups
- Hosting community dinners and participating in short homestays
- Attending bush dances and community festivals, visiting the Malanda theatre, and socializing at the local pubs and sporting competitions
- Engage with Aboriginal elders to learn more about their culture and efforts to reclaim their role in land management

For details and how to apply, visit:
cat.fieldstudies.org/australia



“Going out and doing challenging hands-on research is the most rewarding thing I’ve ever done.

It gave me such a sense of ownership and pride in our work. Even though there were obstacles, eventually they simply became part of the adventure. It was incredible to go out and engage with the rainforest in such a direct way.



Having this close bond with the landscape further fueled my drive to continue working to protect the beautiful rainforests within the Wet Tropics.

Sienna Courter
Wesleyan University
Australia Fall ‘13

COURSES

Semester students are registered in four academic courses accredited through the University of Minnesota:

Course No.	Name	Credits
SFS 3690	Rainforest Ecology	04
SFS 3700	Principles of Forest Management	04
SFS 3020	Environmental Policy and Socioeconomic Values	04
SFS 4910	Directed Research	04

Go to page 46 for course descriptions



AUSTRALIA & NEW ZEALAND

SUMMER PROGRAM

SUMMER 2015 PROGRAM DATES

Session I: June 8 – July 7

Session II: July 13 – August 11



Tropical Rainforest Studies

Rainforest ecosystems harbor some of the world’s highest levels of biodiversity. In Australia and New Zealand, rainforests also host extraordinary remnants of the world’s oldest species of plants and animals. Large areas of northeastern Queensland, Australia, were once covered in spectacular tropical rainforests, preserving millions of years of evolutionary history. Over the centuries, however, logging, farming, and development have destroyed and disrupted rainforest ecosystems and habitats, leaving fragile fragments that are often too small or isolated to sustain some species.

Though many of Australia’s tropical forests and species are now protected under World Heritage legislation, they are faced with continual threats due to climate change and invasive species. Similarly, in northern New Zealand, only fragments of ancient forests remain to house endemic fauna and flora, as well as provide food, medicine, and spiritual value to residents and visitors.

SESSION I: RAINFOREST MANAGEMENT STUDIES IN AUSTRALIA AND NEW ZEALAND

Students compare and contrast the ecological, geographic, social, economic, and historical factors that have shaped natural resource management in northeastern Australia and northern New Zealand. These two countries share a similar Gondwanan history; however, European settlement patterns, indigenous histories, and economic development differ significantly between the two countries. In New Zealand, students discover its critically endangered flora and fauna and the impacts that have led to their decline. In Australia, students build on their New Zealand experiences by examining similarities and differences in political structure, co-management arrangements, land-use patterns, and biogeography in the two countries.

- Field Expeditions and Exercises**
- Examine the influence of fragmentation and other pressures on abiotic and biotic elements of forest communities in Australia and New Zealand
 - Visit the ancient rainforest refugia at Mossman Gorge and Daintree National Park
 - Explore the ancient podocarp and Kauri forests of northern New Zealand
 - Examine historic Aboriginal and Maori land-use practices in Australia and New Zealand and experience contemporary indigenous culture

SESSION II: TECHNIQUES FOR RAINFOREST RESEARCH IN AUSTRALIA

In this second summer session, the emphasis is on learning and practicing field research methods in ecology, resource management, and social science. Examining the effects of habitat loss and fragmentation in rainforest systems and changes to the human communities living near them, students explore Australia’s tropical rainforests and develop effective field skills while learning about rainforest restoration, conservation, and sustainable development.

- Field Expeditions and Exercises**
- Learn sampling design, plant identification, forest survey techniques, animal survey methods, and social science research techniques
 - Experience largely intact lowland rainforest and contrast these with the fragmentation effects impacting the rainforests of the Atherton Tablelands

SUMMER COMBINED: SESSIONS I + II

This summer program offers two four-credit courses that may be taken individually or in combination to provide a thorough introduction to biodiversity conservation and the socioeconomic factors influencing land and resource management in two unique areas. Students participating in both sessions are eligible for a \$675 discount.

For details and how to apply, visit: cat.fieldstudies.org/australia

COURSES		
Summer students are registered in one or two academic courses accredited through the University of Minnesota:		
Course No.	Name	Credits
SFS 3540	Rainforest Management Studies in Australia & New Zealand	04
SFS 3550	Techniques for Rainforest Research in Australia	04

Go to page 49 for course descriptions



“At various points along the way, [our professor] made us turn all of our headlamps off and asked us to be perfectly still and quiet. As my eyes adjusted... the rainforest literally glowed right before my eyes... It was pitch black, you could hear every chirp and rustle of a critter, you could feel the enormous trees swaying around you... That was the first time I experienced the magic of the rainforest.

— **Kaitlyn Marie Whitley**
The University of North Carolina at Chapel Hill
Australia Summer '13



TANZANIA

SEMESTER PROGRAM

SEMESTER PROGRAM DATES

Spring 2015: February 2 – May 10 & February 3 – May 11

Fall 2015: September 7 – December 13 & September 8 – December 14



Wildlife Management Studies

THE ENVIRONMENTAL CONTEXT

Changing land-use practices and socioeconomic shifts occurring among the Maasai, Iraqw, and other ethnic groups are influencing the current conservation and rural development practices in the Maasai steppe of East Africa.

The traditional nomadic, pastoral lifestyles of the Maasai and other groups maintained the integrity of open grasslands that serve as critical migration corridors and dispersal areas for wide-ranging wildlife species, such as elephant, wildebeest, giraffe, and zebra. Today, however, these changing lifestyles—from nomadic pastoralism to a more sedentary, agro-pastoralism—are posing a challenge to the long-term conservation of wildlife and other natural resources. Permanent homesteads, land sub-division, and extensive agriculture exert more pressure on the region’s natural resources, including water, productive grasslands, and wildlife populations.

Increasing competition for land and other scarce resources in this semi-arid region has ecological, social, and economic costs, including fragmentation of critical wildlife dispersal areas, breakdown in land administration, disparities in land ownership, and human-wildlife conflict. With climate change causing unforeseen shifts in hydrology and habitat, protected areas—such as national parks and community wildlife sanctuaries—no longer provide a safe haven for wildlife. Habitat destruction, uncontrolled tourist activities, and poaching endanger biodiversity. The negative impacts of these drivers of change threaten ecotourism activities, which are an important source of revenue for the government and local communities in Tanzania.

SFS strives to identify and assess the drivers of habitat degradation and land-use change, as well as the implications for wildlife conservation and local and regional economies. Students evaluate and promote the management of wildlife populations and their critical dispersal areas, productive grazing lands, and reliable water points. Our goal is to help wildlife survive, local communities meet current and future livelihood needs, and to reduce conflict between humans and wildlife.



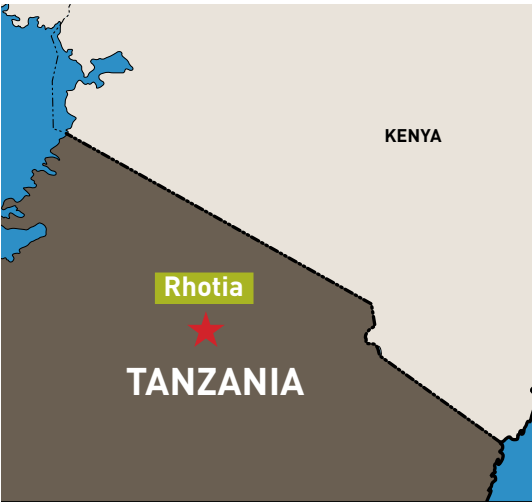
“Whether I was looking out at the beautiful savannah from the back of a Land Rover or playing tag with children in a Maasai *boma*, I will forever cherish the multiple moments that make up what was arguably my most influential and life-changing college semester.

— Heleen Bennett
University of San Diego
East Africa Fall '13



THE SFS CENTER FOR WILDLIFE MANAGEMENT STUDIES

Students live at Moyo Hill Camp (MHC) located in the Tarangire-Manyara ecosystem between Lake Manyara National Park and the famous Ngorongoro Conservation Area. This wonderfully scenic area is world-renowned for its beauty, geography, history, and wildlife. MHC is a fenced facility nestled among maize plantations and other crop fields. Students sleep among the native acacia and fig trees, and birdsong fills the air in the morning. The camp consists of multiple buildings including an administrative center, a *chumba*, which serves as an eating and social activity center, a classroom and library, a computer room, and student, faculty, and staff housing. MHC comprises part of a small community where students can enjoy daily interaction with neighbors. Walking, jogging, soccer, and socializing outside of the camp round out daily life at MHC.



Tanzania Program Description

OUR CURRICULUM AND RESEARCH

Northern Tanzania is a hub of wildlife tourism. Home to world-famous national parks such as Tarangire, Lake Manyara, Kilimanjaro, Serengeti, and the Ngorongoro Conservation Area, this remarkably scenic area is the center of tourism in East Africa. It has also been the home of the Maasai, Iraqw, and other groups for centuries.

Despite the seemingly negative trends of availability and quality of habitat and resources for wildlife and livestock on the Maasai steppe, there are many opportunities for effective conservation, natural resource management, and rural development. SFS’s field station is surrounded by wildlife using diverse migration corridors and seasonal dispersal areas. The Maasai, and now settlers from other ethnic communities, depend on these same areas as communal grazing grounds for livestock and for growing food. As a result, they



Field Experiences and Skills Development

- Visits to cultural *manyatta*, an opportunity to glimpse Maasai and Iraqw cultures: musical ceremonies, demonstrations in fire-making, and dances by Maasai *morans* (warriors)
- Exploration of Lake Manyara National Park to learn large mammal identification, baboon ecology, and threats to wetlands from tourism, land-use changes, and local resource use
- Excursions to Tarangire National Park for exercises on animal counting, wildlife management, lion ecology and behavior, conservation models, and preservation of corridors
- A visit to Ngorongoro Conservation Area to learn about integrated management, inclusion of indigenous communities in conservation and management of natural resources, animal identification, and the role of volcanism in species diversity
- Multi-day field expedition to Serengeti National Park to learn about large mammal ecology, diseases, and migrations
- Day trip to Burunge Wildlife Management Area to study community-based management of wildlife and understand how communities benefit from conservation of wildlife resources
- Develop field research skills including habitat assessment and mapping, species identification, research design, data collection, valuation methods, social surveys, wildlife census techniques, GIS, transect and patch sampling, animal behavior observations, geology, and soil identification



Student Directed Research Project Examples

- Conservation initiatives in the Tarangire-Manyara ecosystem
- Local community strategies for coping with variation in water availability
- Assessment of attitudes and awareness on wildlife conservation among the Iraqw and the Maasai communities
- Influence of ecological and social factors on the distribution of elephants in Tanzania’s Tarangire-Manyara ecosystem
- Livelihoods and socioeconomic indicators among wildlife-conserving communities
- Effectiveness of wildlife conservation strategies between areas of differing protection levels
- Importance of habitat quality and heterogeneity on wildlife sanctuary viability
- The role of government in human-wildlife conflict resolution

SFS at Work

- Working with community members to assess the biodiversity and tourism potential of privately owned wildlife sanctuaries to empower local communities to benefit from, as well as conserve, wildlife on their land
- Assessing water-use competition to make appropriate recommendations for water resource conservation, management, and sustainable use
- Evaluating the status of Buger community forest to understand the challenges and opportunities for joint forest management
- Working with local communities to assess human-wildlife conflicts and provide the best strategies for conflict mitigation
- Assessing the abundance and distribution of large mammalian species and habitat characterization for Manyara Ranch Conservancy to establish long-term trends and advise best range management options for the ranch



Get Involved With the Local Community

East Africa boasts SFS’s oldest Center. After almost 30 years in Kenya, SFS expanded its highly successful Wildlife Management Studies program to Tanzania. Students have a special opportunity to see the intricate and complex connection between wildlife conservation and rural livelihoods. SFS faculty and staff are local people with intimate knowledge of the challenges of conservation in East Africa.

Local community members and government officials play an important role in the Center’s research. With the results of our research, we offer data and recommendations to inform decision-makers. SFS works collaboratively with our stakeholders to help monitor and manage habitat degradation and land-use changes while bolstering tourism and finding balance between economic and conservation goals.

Students often enjoy soccer games, church services, and other events with community members. Additionally, students participate in community volunteer projects and social activities such as:

- Visit local markets and neighboring homesteads for traditional celebrations, a lecture on culture and artifacts, and conducting interviews for research work
- Visit and stay with Iraqw communities
- Community service work in local schools and orphanages
- Presentations of research findings to community stakeholders

For details and how to apply, visit: cat.fieldstudies.org/eastafrica



“When a regular week involves counting wildebeest to help with a wildlife census,

learning the ins and outs of Maasai spear throwing, and interviewing subsistence farmers about the last time an elephant attacked their crops, it becomes easier to understand how thirty-plus days can start blending into one. In other words, we have experienced so much over the past month that the only alternative to quick acclimation would be to stand in slack-



jawed wonder at everything we do and see... I can safely say that this is the most unique and extraordinary experience I have ever had.

Andrew Veselka
Dickinson College
East Africa Spring ’14

COURSES

Semester students are registered in five academic courses accredited through the University of Minnesota:

Course No.	Name	Credits
SFS 3710	Techniques in Wildlife Management	04
SFS 3720	Wildlife Ecology	04
SFS 3020	Environmental Policy and Socioeconomic Values	04
SFS 4910	Directed Research	04
SFS 2060	Intro to Swahili Language and East African Tribal Communities	02

Go to page 46 for course descriptions



TANZANIA

SUMMER PROGRAM

SUMMER 2015 PROGRAM DATES
Session I: June 8 – July 7
Session II: July 13 – August 11



Wildlife Management Studies

Northern Tanzania, home of world-famous national parks such as Tarangire, Lake Manyara, Kilimanjaro, Serengeti, and the Ngorongoro Conservation Area, offers a tightly packed hub for wildlife conservation and tourism opportunities amid a growing human population and development activities. This magnificent setting on the Maasai steppe is our classroom. Expeditions to the national parks and other protected areas offer a significant opportunity to experience hands-on learning about environmental issues and a suite of strategies for resolving them.

Both sessions take a multidisciplinary approach to study the complex realities of balancing ecological, economic, and sociocultural factors in sustainable wildlife conservation and management studies. Students learn the many perspectives on wildlife management and conservation from SFS faculty and guests with extensive field experience and knowledge of the area. We visit key national parks and other protected areas in northern Tanzania. The program also offers a wide range of opportunities for students to interact with the local communities.

SESSION I: WILDLIFE MANAGEMENT AND CONSERVATION

Students learn about wildlife management practices and the complex issues involving sustainable wildlife conservation in the Tarangire-Manyara ecosystem of Tanzania. The course combines concepts and principles of ecology, natural resource management, and socioeconomics, all of which are central to effective and sustainable wildlife conservation. In this course, students develop field skills to explore the ecology, social organization, and behavior of common African large mammals.

Central to this first summer session is the understanding and evaluation of protected areas management in the region. Students learn methods to examine the complexities of conserving wildlife both inside and outside protected areas amidst a rapidly changing socioeconomic and political environment. In addition, they examine constraints to the conservation of wildlife among resource-poor rural populations and identify key aspects of human-wildlife conflicts.

SESSION II: TECHNIQUES FOR WILDLIFE FIELD RESEARCH

In this second session, students learn a suite of field research techniques and methods for studying wildlife ecology and assessing management policies and practices in East Africa. The focus is on the Tarangire-Manyara ecosystem, where we practice field techniques in national parks, community wildlife management areas, and in villages.

Students learn foundational field skills in observation and evaluations of wildlife, as well as interactive methods used for assessing local community attitudes and behaviors toward conservation efforts, and apply these techniques to advance long-term research goals at our Center.

Students also learn effective species identification; sampling and data analysis methods for flora and fauna; large mammal behavioral study methods; remote and on-ground sensing and spatial mapping; social survey design and interviewing skills; and communication skills.

SUMMER COMBINED: SESSIONS I + II

This summer program offers two four-credit courses that may be taken individually or back-to-back to provide a thorough introduction to wildlife management and the research methods routinely used to assess wildlife ecology. Students participating in two sessions are eligible for a \$675 discount.

For details and how to apply, visit: cat.fieldstudies.org/eastafrica

COURSES		
Summer students are registered in one or two academic courses accredited through the University of Minnesota:		
Course No.	Name	Credits
SFS 3500	Wildlife Management and Conservation	04
SFS 3570	Techniques for Wildlife Field Research	04

Go to page 49 for course descriptions



“This program changed the way I thought about environmentalism, wildlife management, and what “conservation” means in different countries. It has significantly shaped what I want to do with my life; I would not be the same person I am today without my summer abroad with SFS.

— Alexandra Klimko
University of Wisconsin-Madison
Tanzania Summer '13



KENYA

SUMMER PROGRAM

SUMMER 2015 PROGRAM DATES
Session II: July 13 – August 11



Public Health and the Environment

In rural Kenya, land tenure reform, emerging economic opportunities, and expansion of agriculture are driving fundamental changes in access to water and food, exposure to health risks, and social networks. As the traditionally nomadic, pastoral Maasai in southern Kenya adapt to more sedentary, agro-pastoral lifestyles, their healthcare needs and health-seeking behaviors are changing. Poor exposure to public healthcare and networks for community action has brought about new health problems for the Maasai, including an escalation in sanitation-related and water-borne diseases, infant and childhood diseases, and HIV/AIDS.

Curriculum and Research Focus

SFS has conducted health-related research in the region since 2007, focusing on establishing baseline data on issues including water and sanitation, access to health care, and general health indicators. Except for the household surveys conducted by SFS students, there is little baseline information on the health status of local and migrant residents in southern Kenya. The absence of this data adds another dimension to the public health challenge. Our aim is to provide Kenyan health officers with data on the most prevalent health issues in households and villages, as well as assessments of the effectiveness of the community-level health services, in order to enhance preventive measures to minimize health concerns.

This course introduces students to rural health issues and healthcare systems in Kenya, emphasizing the links between health and environment, and community-based healthcare and modern medicine. Students participating in this course provide, through field research, a vital link between the challenges and health needs of the local Maasai communities and Kenya’s national health strategy. Students also gain invaluable experience with designing and implementing a field assessment project in public health. The program is particularly applicable to those considering a major or concentration in global health, public health, nursing, pre-med, or medical and health sciences programs, but it is open to all majors.

Field Expeditions and Exercises

- Learn about the socioeconomic, cultural, and environmental issues related to public health and health care services in rural Kenya
- Visit Maasai villages and group ranches, local health clinics and dispensaries, and HIV/AIDS clinics
- Work with local health workers to see firsthand the health challenges that communities face at the household level
- Implement a research project: conduct field-based data collection, analyze and assess data, practice report writing, and present findings and recommendations to public health officials and local residents

SUMMER COMBINED: WILDLIFE MANAGEMENT AND PUBLIC HEALTH

This course may be taken independently or in combination with the Wildlife Management and Conservation course in Tanzania (Session I). Students participating in two sessions are eligible for a \$675 discount.

For program updates, visit: cat.fieldstudies.org/publichealth

Note: SFS has temporarily suspended Kenya operations for the Wildlife Management Studies program for the Fall 2014 and Spring 2015 semesters. At this printing, however, SFS anticipates that it will run Public Health and the Environment in Kenya in the summer of 2015. Please check the SFS website for the most up-to-date status on this program.

COURSES

Summer students are registered in one academic course accredited through the University of Minnesota:

Course No.	Name	Credits
SFS 3070	Field Practicum in Public Health and Environment	04
Go to page 49 for course descriptions		



“This program has enabled me to begin to understand the complexities surrounding access to healthcare... I have been empowered and inspired to create change, but in a sustainable, effective, efficient, and equitable manner that reaches from the community level up.

— Elisabeth Leaning
Franklin University Switzerland
Kenya Public Health Summer '13

Semester Course Descriptions



AUSTRALIA

SFS 3690 RAINFOREST ECOLOGY introduces structure and function of tropical rainforests including floral and faunal components. Ecological processes that maintain biodiversity and the evolutionary processes that generate it are presented. We examine the dynamic relationships between plants and animals, including pollination and seed dispersal. On a larger scale, we examine tropical vegetation patterns along climatic gradients and discuss mechanisms for preserving and restoring tropical ecosystems.

SFS 3700 PRINCIPLES OF FOREST MANAGEMENT presents the ecological and analytical tools used in the management of terrestrial, living resources. Students use examples from the tropics to stress the theories and skills that provide the foundation for land management worldwide. The assessment and minimization of adverse environmental impacts caused by resource development, as well as the restoration and rehabilitation of areas suffering from chronic human-induced disturbances, provide key foci for applying principles learned.

SFS 3020 ENVIRONMENTAL POLICY AND SOCIOECONOMIC VALUES provides insight into the broad social context surrounding natural resources to determine effective approaches to resource management. Objectives are to understand sociocultural context including hierarchies and power structures; formal and informal decision-making processes; value systems relevant to natural resources, including religious factors and environmental ethics; past and present uses of natural resources; economic factors (local, regional, external); ownership patterns; attitudes and other factors that affect change and their historical basis; and legal basis for enforcement of environmental policy. Students are introduced to major constituencies that effect conservation (NGO conservation groups, economic interests, etc.) and their underlying philosophies.

SFS 4910 DIRECTED RESEARCH prepares students to distinguish hidden assumptions in scientific approaches and separate fact from interpretation, cause from correlation, and advocacy from objectivity. Specific tools include experimental design, field techniques, basic descriptive statistics, and parametric and non-parametric quantitative analysis. Succinct scientific writing, graphic and tabular presentation of results, and effective delivery of oral presentations are emphasized.

BHUTAN

Please see website for course descriptions and program updates.

CAMBODIA & VIETNAM

SFS 3810 ECOSYSTEMS AND LIVELIHOODS ALONG THE MEKONG focuses on the natural history of the Mekong River, its associated waterways, and the human landscape that envelops it. We explore the physical forces of the river and understand the hydrological cycles of the entire basin. Students examine the ecology of the region and learn about the functions of organisms and ecosystems. This examination of the natural and physical systems is coupled with study of how fishers, farmers, and merchants utilize the Mekong River watershed daily for sustenance and livelihoods. Students examine how humans have altered the landscape and explore the impacts that large upstream dams will have on downriver conditions and dynamics. Field exercises are carried out in several major ecosystems: the river, the lake, the forests, the delta, and the coast.

SFS 3820 ENVIRONMENTAL ETHICS AND DEVELOPMENT uses lenses from philosophy and social science to examine the moral relationship between human beings and the environment and its non-human contents. This course presents ethics as a lens of inquiry, recognizing that environmental problems can be complicated, in moral, social, political, and ecological terms. Students study environmental ethics in relation to economic growth and development, and consider the purpose of nature and humans' role in managing it while still encouraging responsible development.

SFS 3800 CONSERVATION SCIENCE AND PRACTICE introduces the concepts, tools, and incentives to affect conservation of the environment and natural resources. The field of conservation is focused on protecting biological diversity—including ecosystems, species, and genetic diversity—by promoting processes, both ecological and social, that support biodiversity. The course focuses on five core themes: what biodiversity is; why biodiversity is important; threats to biodiversity; strategies for conservation; and the concept of sustainability. We focus the practical aspects on local case studies, considering the array of conservation strategies in the region, and using this lens to evaluate global concerns on a local scale.

SFS 2080 LANGUAGE AND CULTURE OF CAMBODIA AND VIETNAM contains two distinct but related modules: society and culture of Cambodia and Vietnam, and Khmer language. This course provides a basic introduction to spoken and written Khmer as well as the history and culture of Southeast Asia. The Khmer language module offers listening, oral, and limited written practice of the Khmer language at a beginner/basic level of proficiency to increase students' communication and comprehension skills. The sociocultural model helps students develop a more refined understanding of Cambodian and Vietnamese cultures while learning about the rich history of the region. Both modules are designed to help students experience immersion into regional culture and work more effectively in their community-based Directed Research efforts.

SFS 4910 DIRECTED RESEARCH prepares students to distinguish hidden assumptions in scientific approaches and separate fact from interpretation, cause from correlation, and advocacy from objectivity. Specific tools include experimental design, field techniques, basic descriptive statistics, and parametric and non-parametric quantitative analysis. Succinct scientific writing, graphic and tabular presentation of results, and effective delivery of oral presentations are emphasized.

COSTA RICA

SFS 3770 TROPICAL ECOLOGY AND SUSTAINABLE DEVELOPMENT examines the ecological impact of human activity, especially agriculture, in a tropical country. Students study the agroecology of important crops, with emphasis on biodiversity as the source of production means and materials. Students identify renewable and non-renewable resources and examine their historical use. We study the long-term and large-scale impact of local agricultural and other practices on the national and global environment (e.g., water pollution, waste management, climate change). Options for alternative resources use, land restoration, and preservation are examined from ecological, sociopolitical, and economic viewpoints. Basic field techniques and measurements are also covered.

SFS 3740 PRINCIPLES OF RESOURCE MANAGEMENT is designed to examine the connection between society and natural resources, and how application of management tools can lead to biodiversity conservation and sustainable livelihoods. This course introduces underlying concepts and practical tools used in addressing complex environmental problems, including protected area planning and management, guidelines for ecologically sustainable development, and environmental impact assessment. Local case studies are examined using the theory and practice learned in this course.

SFS 3030 ECONOMIC AND ETHICAL ISSUES IN SUSTAINABLE DEVELOPMENT addresses the principles and applications of ecological economics, or the scientific and management aspects of sustainability. Allocation, distribution, and scale are presented as parameters to assess the sustainability of development models (at macro and micro levels). Basic concepts of ecological economics cost-benefit valuation techniques are presented and applied. The roles of local people, government, and private, national, and bilateral aid agencies are examined as constraints for the implementation of sustainable development models. The empowerment of local people and their reaction to non-local proposals for sustainable development are examined through the review of specific case studies.



SFS 4910 DIRECTED RESEARCH prepares students to distinguish hidden assumptions in scientific approaches and separate fact from interpretation, cause from correlation, and advocacy from objectivity. Specific tools include experimental design, field techniques, basic descriptive statistics, and parametric and non-parametric quantitative analysis. Succinct scientific writing, graphic and tabular presentation of results, and effective delivery of oral presentations are emphasized.

SFS 2050 LANGUAGE, CULTURE, AND SOCIETY OF COSTA RICA contains two distinct but integrated modules. The Spanish language module offers listening, oral, and written practice of the Spanish language at beginner, intermediate, and advanced levels of proficiency. Students engage in oral and written grammar and vocabulary exercises, and develop Spanish language skills and tools required for their research projects. The sociocultural module helps students to develop a more refined understanding of Costa Rican culture and the various communities with which we work. Students participate in lectures, field exercises, and other activities including a homestay—all of which teach them strategies and skills for working with people in a community-based research context and help them to assist with community extension projects.

TANZANIA

SFS 3710 TECHNIQUES IN WILDLIFE MANAGEMENT introduces students to the questions, principles, and tools used by resource managers in the East Africa savanna ecosystem. Students study habitat assessment, plant and animal identification, associations and distributions, and other approaches to evaluating the savanna ecosystems. Students examine the behavioral, physiological, and social responses of animals to a changing environment. Field and laboratory techniques for monitoring ungulate populations and optimizing management practices are presented. Decision-making processes on which wildlife management programs are based are addressed.

SFS 3720 WILDLIFE ECOLOGY presents students with the information and conceptual background necessary to understand the underlying ecological principles of the East Africa savanna ecosystem. We focus on the fundamental processes and interrelationships between the biotic and abiotic environment. We begin with basic ecological principles, setting them against the background of East Africa. Students examine the factors underlying distributions, population biology, and behavioral ecology, along with competition and predation, using African examples. Theoretical models are discussed in light of observations on field trips.



SFS 3020 ENVIRONMENTAL POLICY AND SOCIOECONOMIC VALUES provides insight into the broad social context surrounding natural resources to determine effective approaches to resource management. Objectives are to understand sociocultural context, including hierarchies and power structures; formal and informal decision-making processes; value systems relevant to natural resources, including religious factors and environmental ethics; past and present uses of natural resources; economic factors (local, regional, external); ownership patterns; attitudes and other factors that affect change and their historical basis; and legal basis for enforcement of environmental policy. Students are introduced to major constituencies that effect conservation (NGO conservation groups, economic interests, etc.) and their underlying philosophies.

SFS 4910 DIRECTED RESEARCH prepares students to distinguish hidden assumptions in scientific approaches and separate fact from interpretation, cause from correlation, and advocacy from objectivity. Specific tools include experimental design, field techniques, basic descriptive statistics, and parametric and non-parametric quantitative analysis. Succinct scientific writing, graphic and tabular presentation of results, and effective delivery of oral presentations are emphasized.

SFS 2060 INTRODUCTION TO SWAHILI LANGUAGE AND EAST AFRICAN TRIBAL COMMUNITIES contains two distinct but integrated modules. The Swahili language module offers listening, oral, and written practice of the Swahili language, at a basic level of proficiency, to increase students' communication and comprehension skills. Much of the Maasai population does not speak Swahili, but it is the national language in Tanzania—this phenomenon will be explained in the second course module. The sociocultural aspects of East African tribes module emphasizes understanding of, and direct contact and interaction with, the native communities with which SFS works, primarily the Maasai. This exposure to culture and language is reviewed and processed through lectures, field exercises, and classroom discussion. The sociocultural module is designed to help students experience intense immersion in the culture and be therefore more adept at working effectively in their community-based Directed Research efforts.

PANAMA

SFS 3790 TROPICAL COASTAL ECOLOGY introduces students to the ecology of coastal and marine ecosystems as well as terrestrial systems that affect the marine environment. Students learn to identify species in these habitats. The concept of island biogeography helps to frame the examination of the status and delicate nature of tropical island systems. Climate change and impacts on small islands are addressed. Field exercises are held in forests and coastal waters where students encounter mud and monkeys one second, damselfish and moray eels the next.

SFS 3740 PRINCIPLES OF RESOURCE MANAGEMENT examines fisheries management (commercial and artisanal) focusing on local fisheries, including finfish, lobster, and sport fish. We study the environment from the lens of tourism, examining the impact of tourism on fragile habitats. Another theme of the course is land use and land cover change—especially in regard to increasing pastureland and plantation land under cultivation (mostly banana) in close proximity to the ocean and important watershed habitats. An additional theme is climate change and how this affects natural resources and livelihoods based on land, sea, and forest resources, including timber and non-timber forest products.

SFS 3020 ENVIRONMENTAL POLICY AND SOCIOECONOMIC VALUES provides a critical look at the livelihood strategies of island residents, the land use and environmental regulations in place, and actual or recommended responses by society (including government, civil society, and individuals) aimed at mitigating pressures and restoring balance in the environment. Students gain an understanding of the local perceptions of conservation of natural resources and the pressure points between development and preservation. The economic importance of tourism may be measured and examined against habitat degradation. Common property issues are addressed in relation to land use of indigenous islanders and new property owners wishing to build on once sovereign land. Gauging environmental awareness and literacy of tourists helps students to understand their impact on the future of endangered island ecosystems that will be put under continuous pressure with the climbing number of visitors.



SFS 4910 DIRECTED RESEARCH prepares students to distinguish hidden assumptions in scientific approaches and separate fact from interpretation, cause from correlation, and advocacy from objectivity. Specific tools include experimental design, field techniques, basic descriptive statistics, and parametric and non-parametric quantitative analysis. Succinct scientific writing, graphic and tabular presentation of results, and effective delivery of oral presentations are emphasized.

SFS 2070 LANGUAGE, CULTURE, AND SOCIETY OF PANAMA contains two distinct but integrated modules. The Spanish language module offers listening, oral, and written practice of the Spanish language at beginner, intermediate, and advanced levels of proficiency. Students engage in oral and written grammar and vocabulary exercises, and develop Spanish language skills and tools required for their research projects. The sociocultural module helps students to develop a more refined understanding of Panamanian culture and the various communities with which we work. Students participate in lectures, field exercises, and other activities including a homestay—all of which teach them strategies and skills for working with people in a community-based research context and help them to assist with community extension projects.

PERU

SFS 3830 TROPICAL ECOLOGY OF THE ANDES-AMAZON examines biodiversity of the region from multiple scales, including regional, landscape, ecosystem, habitat, communities, species, and genes. We study the patterns and processes of biodiversity that comprise the field of ecology. Students learn to identify and characterize the diversity of non-human life in the Andes-Amazon region, understand the patterns and processes that support this diversity, and appreciate the importance of biodiversity to people. Students examine the fundamental principles of ecology through the study of a diverse mosaic of ecosystems, habitats, and species along an elevational gradient, successional gradients, and geomorphic patterns.

SFS 3840 POLITICAL ECOLOGY OF DEVELOPING LANDSCAPES focuses on human interactions with and impacts on local natural systems, and vice versa. We consider these interactions through the interdisciplinary lens of political ecology, examining the political, economic and social factors of environmental issues and changes. The course provides the conceptual and practical skills and tools to critically examine and assess the human-environment nexus. We also consider the theories and ethics of sustainable and unsustainable development, and the need to view these issues in ways that are inclusive and just. Practical exercises in the field help students to understand the distinct situation in the Kosñipata valley and southern Peru.

SFS 3800 CONSERVATION SCIENCE AND PRACTICE introduces the concepts, tools, and incentives to affect conservation of the environment and natural resources. The field of conservation is focused on protecting biological diversity—including ecosystems, species, and genetic diversity—by promoting processes, both ecological and social, that support biodiversity. The course focuses on five core themes: what biodiversity is; why biodiversity is important; threats to biodiversity; strategies for conservation; and the concept of sustainability. We focus the practical aspects on local case studies, considering the array of conservation strategies in the region, and using this lens to evaluate global concerns on a local scale.

SFS 2090 LANGUAGE, CULTURE, AND SOCIETY OF PERU provides two integrated modules: Spanish language instruction and Peruvian society and culture. The language module offers listening, oral and written practice of Spanish to increase students’ communication and comprehension skills. The sociocultural module is designed to help students experience immersion in the culture and therefore become more adept at working effectively in their community-based Directed Research efforts. Both modules emphasize the understanding of, and direct interaction with, the local communities with which the Center works. This exposure to culture and language is reviewed and processed through lectures, field exercises, community outreach, and classroom discussion.

SFS 4910 DIRECTED RESEARCH prepares students to distinguish hidden assumptions in scientific approaches and separate fact from interpretation, cause from correlation, and advocacy from objectivity. Specific tools include experimental design, field techniques, basic descriptive statistics, and parametric and non-parametric quantitative analysis. Succinct scientific writing, graphic and tabular presentation of results, and effective delivery of oral presentations are emphasized.

TURKS & CAICOS ISLANDS

SFS 3730 TROPICAL MARINE ECOLOGY discusses the interactions that determine the distribution and abundance patterns of tropical marine organisms, with emphasis on the ecology of nearshore areas. Basic principles of ecology are integrated with an understanding of the sea as a habitat for life. Physical, chemical, and geological oceanography are discussed. Major groups of dominant marine organisms of the region are examined in the field. Major nearshore marine habitats are examined, along with their associated biotic communities. Coral reef ecosystems are emphasized to illustrate basic concepts. Applications to the management of indigenous marine resources are discussed and demonstrated.

SFS 3740 PRINCIPLES OF RESOURCE MANAGEMENT is designed to examine the connection between society and natural resources, and how application of management tools can lead toward biodiversity conservation and sustainable livelihoods. This course introduces underlying concepts and practical tools used in addressing complex environmental problems, including protected area planning and management, guidelines for ecologically sustainable development, and environmental impact assessment. Local case studies are examined using the theory and practice learned in this course.

SFS 3020 ENVIRONMENTAL POLICY AND SOCIOECONOMIC VALUES provides insight into the broad social context surrounding natural resources to determine effective approaches to resource management. Objectives are to understand sociocultural context, including hierarchies and power structures; formal and informal decision-making processes; value systems relevant to natural resources, including religious factors and environmental ethics; past and present uses of natural resources; economic factors (local, regional, external); ownership patterns; attitudes and other factors that affect change and their historical basis; and legal basis for enforcement of environmental policy. Students are introduced to major constituencies that affect conservation (NGO conservation groups, economic interests, etc.) and their underlying philosophies.

SFS 4910 DIRECTED RESEARCH prepares students to distinguish hidden assumptions in scientific approaches and separate fact from interpretation, cause from correlation, and advocacy from objectivity. Specific tools include experimental design, field techniques, basic descriptive statistics, and parametric and non-parametric quantitative analysis. Succinct scientific writing, graphic and tabular presentation of results, and effective delivery of oral presentations are emphasized.



Summer Course Descriptions

AUSTRALIA & NEW ZEALAND

These courses can be taken individually or back-to-back.

SFS 3540 RAINFOREST MANAGEMENT STUDIES IN AUSTRALIA & NEW ZEALAND (SESSION I) compares and contrasts the ecological, geographic, social, economic, and historical factors that have shaped natural resource management in Australia and New Zealand. Students gain an understanding of the drivers of species extinctions and current conservation problems including management of endangered species. In both countries, students examine the influence of fragmentation on abiotic and biotic attributes of forest communities during field exercises, and identify management techniques with regard to biological systems, national boundaries, and political structures.

SFS 3550 TECHNIQUES FOR RAINFOREST RESEARCH IN AUSTRALIA (SESSION II) includes a wide range of lectures and hands-on field activities that concentrate on developing management recommendations for reforestation practices on the Tablelands of Australia. We explore the ecological roles, environmental services, and economic benefits of tropical rainforests. Students examine the structure and function of Australian tropical rainforests and the roles that humans have played, and are playing, in current forest dynamics. We examine reforestation applications on the Tablelands: the goals, techniques, successes, and the failures. Finally, we develop and maintain an actual rainforest restoration project.

BHUTAN

SFS 3580 EASTERN HIMALAYAN FORESTS AND RURAL LIVELIHOODS is an interdisciplinary, field-based course where students get to know a country in a region that is recognized worldwide for its dramatic mountain landscapes and rich flora and fauna. We travel in Bhutan, learning about how environmental issues and rural development goals intersect. Trekking across valleys and ridges and through villages, students gain an intimate knowledge of the local environments and rural livelihoods. Students develop skills in assessing environmental problems, defining research questions, conducting field research, and communicating results. They gain an appreciation of the complexity of identifying and addressing conservation issues in a rapidly developing region.

COSTA RICA

These courses can be taken individually or back-to-back.

SFS 3520 SUSTAINING TROPICAL ECOSYSTEMS: BIODIVERSITY, CONSERVATION, AND DEVELOPMENT (SESSION I) provides students with practical field skills necessary to develop and participate in ongoing, long-term community and tropical ecosystem-based research projects. Students are introduced to the ecological, economic, and natural resource management issues that surround protected areas and tourism management, parks and people relations, and biodiversity assessment and protection in national parks and surrounding areas, with the intent of exploring sustainable development and management strategies.

SFS 4930 APPLIED RESEARCH TECHNIQUES AND STRATEGIES TOWARD SUSTAINABILITY IN COSTA RICA (SESSION II) applies the scientific process in a field research project that addresses a local environmental issue. Students help to design a field research project: collect, manage, and analyze data; and communicate research results.

KENYA

SFS 3070 FIELD PRACTICUM IN PUBLIC HEALTH AND ENVIRONMENT (SESSION II) introduces students to rural health issues in Kenya, emphasizing the links between health and environment, and community-based health care and modern medicine. Students gain experience in assessing and analyzing public health and environmental concerns in Maasai communities, in partnership with local community-based health organizations.

TANZANIA

These courses can be taken individually or back-to-back.

SFS 3500 WILDLIFE MANAGEMENT AND CONSERVATION (SESSION I) exposes students to wildlife management practices and the complex issues involving sustainable wildlife conservation in the Tarangire-Manyara ecosystem of Tanzania. The course combines concepts and principles of ecology, natural resource management, and socioeconomics, which are central to effective and sustainable wildlife conservation.

SFS 3570 TECHNIQUES FOR WILDLIFE FIELD RESEARCH (SESSION II) exposes students to a suite of wildlife field techniques and methods routinely used to assess wildlife ecology and management policies and practices in East Africa, with specific application to Tanzania’s Tarangire-Manyara ecosystem conservation areas. The focus is multidisciplinary and reflects the complex realities of balancing ecological, economic, and sociocultural factors in sustainable wildlife conservation and management studies. Students learn foundational skills in observation and evaluations of wildlife, as well as interactive methods used for assessing local community attitudes and behaviors toward conservation efforts, and apply these techniques to advance long-term research goals at our Center.

TURKS & CAICOS ISLANDS

These courses can be taken individually or back-to-back.

SFS 3530 TROPICAL MARINE ECOSYSTEMS: MONITORING AND MANAGEMENT (SESSION I) is an interdisciplinary course that highlights key aspects of environmental assessment and management of tropical marine ecosystems. In addition, it explores sustainable development strategies for the Turks and Caicos Islands on a local and global scale. Students gain knowledge of subtropical marine ecosystem function and connectivity, and begin to understand the most pressing challenges at the intersection of marine conservation and economic development. Students learn how to engage in management of local fisheries and coastal development and how to respond to the global phenomena of climate change and ocean acidification.

SFS 3560 APPLIED MARINE RESEARCH TECHNIQUES (SESSION II) provides students with the opportunity to apply the scientific process in a field research project addressing a local issue related to the management of tropical marine environments. This course prepares students to develop scientific approaches to identify key problems affecting the health of coral reefs, seagrass beds, and mangrove forests that surround the island. Students learn to implement the scientific research process while contributing to a growing body of research that informs local marine conservation and resource management decisions.



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