

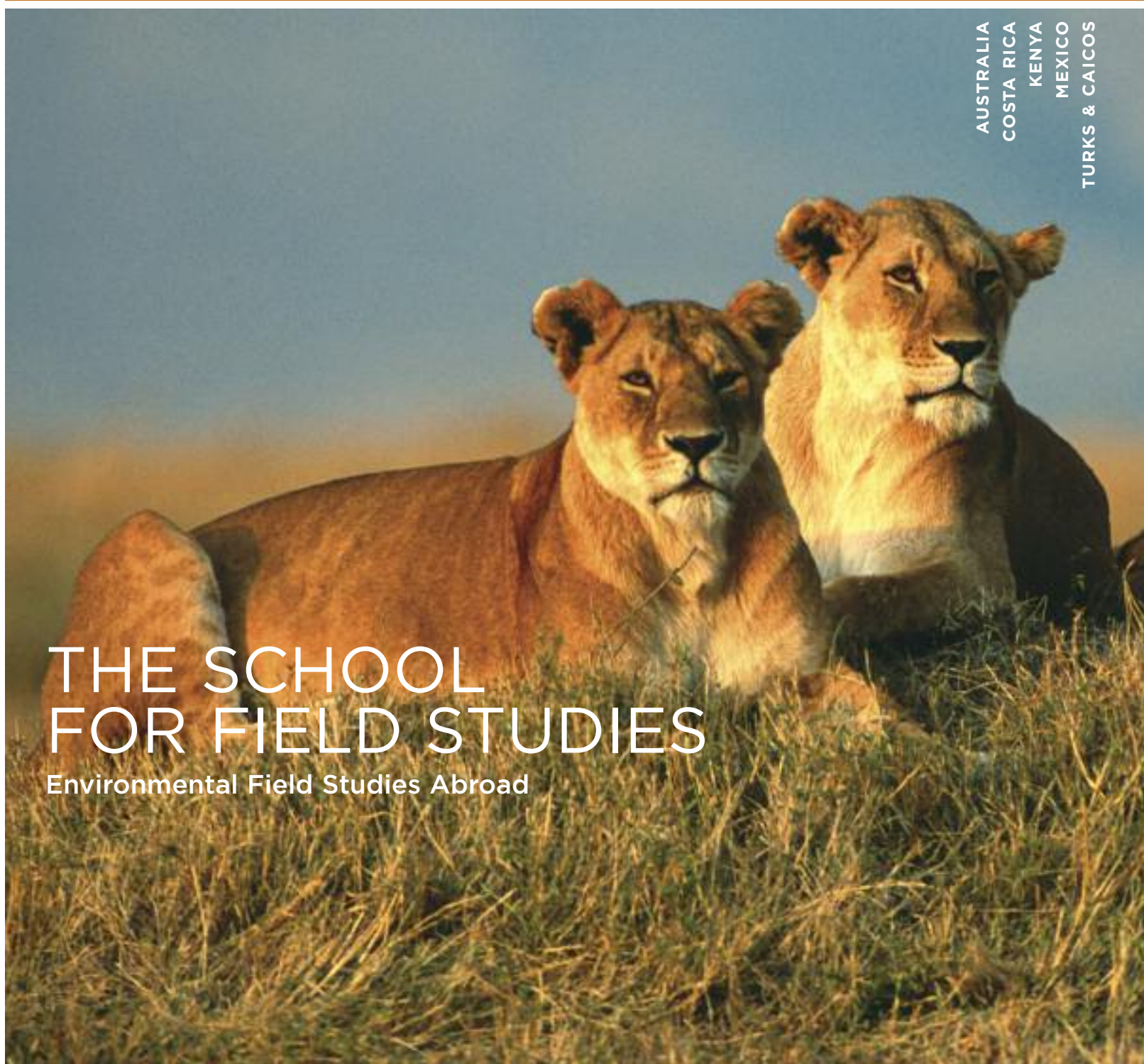
SEMESTER & SUMMER PROGRAMS

08

AUSTRALIA
COSTA RICA
KENYA
MEXICO
TURKS & CAICOS

THE SCHOOL FOR FIELD STUDIES

Environmental Field Studies Abroad





WHERE WE WORK. WHERE WE STAND.

The approach to mitigating global warming seems clear: Cut down on power consumption, replace carbon intensive power sources and appliances with efficient ones, cut out unnecessary travel and convert to green fuels and vehicles. In this way, we abate our industrial and household emissions of carbon dioxide. We then plant more trees which absorb carbon dioxide through photosynthesis, and thus fight global warming.

There's just one problem. Trees are 50% carbon, and on a global scale, deforestation — the felling or burning of trees — accounts for up to 25% of global emissions of heat-trapping gases. Transport and industry account for 14 % each. Every year, we clear an area the size of Great Britain of trees to graze cattle, grow crops, produce timber, or just make way for people. That's why Indonesia and Brazil, where forests fall at an alarming rate, are among the top five greenhouse gas emitters. (The US and China occupy the top two spots, thanks mostly to their fossil fuel emissions.)

By 2100, Australia will face a 100 to 200% increase in bushfire vulnerability if greenhouse gas emissions aren't curbed. And it's not just a "foreign" problem. According to a recent NOAA report, "the US west can expect 10-20 % less rainfall by mid-century, which will increase air pollution, kill off trees and shrink the available water supply by as much as 25%." As our western forests burn, they're being transformed from carbon sinks that sequester up to 20 to 40% of our carbon output into a source of carbon dioxide.

Trees cover less than 7% of the earth but are home to 50% of the world's

species and a universe of carbon atoms. Unfortunately, forests are worth more dead than alive. As Hylton Philipson, a trustee of Rainforest Concern, puts it: "In a world where we are witnessing a mounting clash between food security, energy security and environmental security — while there's money to be made from food and energy and no income to be derived from the standing forest — it's obvious that the forest will take the hit."

SFS students in Kenya need only see the nearly vanished ice cap on Mt. Kilimanjaro to witness the dramatic effects of global warming. During the last few decades, the permanent snow and ice on the summit has almost completely disappeared and scientists speculate that the glaciers could be completely gone from Kilimanjaro by the year 2015. The melting ice cap means a dramatic reduction in water, triggering major disruptions to ecosystems and the lives of people and wildlife on the dry African plains that spread out at its feet.

The Center for Naval Analyses, a government-funded think tank, recently called climate change a national security challenge. In a recent report they stated that climate change acts as a "threat multiplier" in troubled regions around the world. British Home Secretary John Reid says that global warming contributed to the genocide in Darfur: "The blunt truth is that the lack of water and agricultural land is a significant contributory factor to the tragic conflict we see unfolding in Darfur. We should see this as a warning



sign.” Former U.N. Secretary General Boutros Boutros-Ghali has said that the next war in the Middle East will be fought over water. Worldwide, more than a billion people lack safe, clean water sources and in an era of globalization, our national security depends on the stability of a whole constellation of developing nations. Their stability, in turn, depends on what experts call “human security” — not just from external attack but from ecological, economic, and natural disasters such as drought, crop failure, fisheries collapse, poverty, conflict, and a resulting flood of refugees seeking to escape environmental catastrophes.

WHAT CAN BE DONE?

No one nation — let alone one organization — can solve this problem. But at SFS, we believe in the power of collective action and research. Since 1981 we’ve introduced the human element in the form of students like you into the equation of sustainable development starting at the community level. SFS students discover that success defies simple answers. Protecting a fishery in the Turks and Caicos is not a simple matter of imposing strict quotas: not when those extra fish put food on the table for the families of the fishermen whose active help is needed to sustain the fishery. On Mexico’s Baja peninsula, convincing a family not to eat turtle at Easter is like convincing an American family to forgo turkey at Thanksgiving. Conservation can be a hard sell

in developing countries, and achieving sustainable development requires sensitivity to the full range of human interaction, from local government policies to cultural norms and immediate resource needs. It requires research, understanding, advocacy, and passion.

Scientific and economic research has emphasized the world needs to reduce emissions substantially by year 2050 to avoid catastrophe. Our Center for Rainforest Studies in Australia is aiming to reduce its carbon footprint and become a carbon-neutral operation through a combination of abatement and growing trees that will absorb CO₂ and sequester the carbon in the body of the tree and in the soil.

In Kenya, where development and the competition for scarce resources is forcing formerly nomadic tribes to cluster together on shrinking plots of land, our new environmental public health program is seeking to protect the Maasai from the onset of environmentally triggered health threats.

In Costa Rica, we’re working with grassroots organizations to decrease the illegal harvest of palm hearts, which causes significant structural damage to the forest understory, interferes with forest regeneration and interrupts forest dynamics.

Margaret Mead once said, “Never doubt that a small, group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.” While the scale of global warming requires more than a small group of committed citizens, our ability to change the world remains. We invite you to join us where we work and make a stand.

New Program Highlight



KENYA

FOOTHILLS OF MT. KILIMANJARO

FIELD STUDY IN PUBLIC AND ENVIRONMENTAL HEALTH

SUMMER 2008 PROGRAM

See SFS Web site for program details and dates.

In the early 1980s Kenya began a process of privatizing its open grazing land into group ranches. This significant land-use change has forced traditionally nomadic peoples, including the Maasai, onto smaller plots of land. The Maasai, a proud and historically self-sufficient society are now facing many social, political, economic, and environmental challenges. The result has increased their vulnerability to disease and famine, and they frequently rely on relief food and water to survive.

This major shift from nomadicism to pastoralism has brought about new health problems for the Maasai, including an escalation in sanitation-related and water-borne diseases, infant and childhood disease, and HIV/AIDS. Access to quality health care, both physically and culturally, poses a critical issue for this predominantly rural population. The fact that there are virtually no baseline data on Maasai health status in southern Kenya adds another dimension to this public health challenge.

In Kenya, nearly 80% of the population, including the Maasai, still depends on herbal medicine — it remains an important source of treatment, particularly for rural communities. The World Health Organization's global strategy includes popularizing and incorporating herbal medicine in the national health systems of member countries. Consequently, Kenya is developing a national policy that will incorporate herbal medicine in its health provision strategy. Students participating in this SFS course may provide a vital link between the needs of the Maasai and Kenya's national health strategy.

Research Focus

SFS has partnered with several leading universities including Boston University School of Public Health, Northern Arizona University Schools of Nursing and Health Sciences, and the Moi University (Kenya) Schools of Public Health and Medicine to respond to the environmental health issues extant among the Maasai.

This course will provide students with field experience in assessing and analyzing public health and environmental concerns in identified Maasai communities in partnership with local community-based health organizations. This program is a graduate-level field course open to both graduate and qualified undergraduates in public health, nursing, pre-med, medical and health sciences.

Field Expeditions and Exercises

- Visit Maasai villages & group ranches, local health clinics & dispensaries, HIV/AIDS clinics, and Amboseli National Park.
- Learn about the historical, socioeconomic, cultural, environmental, political, and health aspects of life in Kenya.
- Assess and analyze health issues and report findings and recommendations to key stakeholders and communities of interest.

Visit www.fieldstudies.org for a more complete description of this program and to take a virtual tour of our field station.





Program Overview

The School for Field Studies: A Legacy of Environmental Leadership

In the early 1980s, following the first Earth Day and the creation of environmental studies curricula at some of the nation's top universities, there came a growing acknowledgement of the urgent need to sustainably manage the world's remaining natural resources. To some, it was becoming increasingly clear that the ranks of conservationists charged with the future stewardship of our planet must include not only scientists but also informed and concerned individuals from all walks of life.

In the summer of 1981, SFS sent its first group of 75 students into the field. Today, with 27 years of environmental work behind us, SFS is widely known as the premiere environmental study abroad program. Through our network of field stations, we have been teaching students how to collaborate with local community partners to address critical environmental problems and create long-term conservation solutions.

Who Studies with SFS?

We encourage students from many disciplines – environmental science, biology, liberal arts, economics, pre-vet and pre-med, engineers, business administration, communications, and more – to join our field research projects. We welcome a diverse student body and promote an atmosphere open to different cultures and perspectives. Students come to us with a broad spectrum of backgrounds and experiences.

Academic Program

Our interdisciplinary, experiential approach to education is designed to train students to learn by doing. As students engage in high-quality field research, they learn the value of experiencing another culture, of collaborating with their fellow students, and with the local community to develop workable solutions. They are also given the rare opportunity to work side-by-side with an international research team and learn state-of-the-art field research skills.

Admission

SFS has rolling admissions year-round, and completed applications are considered on a first-come, first-served basis. Programs fill quickly, so we encourage you to submit your completed application early to ensure admission into the program of your choice. For details on how to apply, please refer to page 30. You can now apply on-line from our Web site: www.fieldstudies.org.

Curriculum and Academic Credit

SFS students are registered at and receive credit from Boston University, which accredits our programs. Most students from SFS Affiliate and Consortium schools receive credit directly from their home institutions. See page 32 for details.

Semester Program Structure and Content

Semester programs run for approximately 95 days, including a 5-day midterm break (an opportunity to travel on your own). We compress a 16-week semester into 14 weeks, so be prepared for a very intensive but rewarding learning experience! The first half of the semester includes approximately fifteen 60-90 minute lectures a week plus three to five other academic activities (e.g., research/field exercise, group meetings, presentations, and guest lecturers). Afternoons are often filled with field exercises and field trips. Academic activities occur six days a week with at least part of one weekday devoted to a community service activity.

Elements of the SFS Academic Program

SFS semesters are designed to train students to become competent field researchers. We identify the Directed Research projects for each student and then train them in professional field research techniques and how to carry out the projects through three courses delivered in a case study format.

Courses, Field Exercises, Directed Research Projects

Faculty provide the core lectures needed to understand the content areas pertinent to the case study and research questions (ecology, natural resource management, socioeconomics and policy, and directed research). Students are enrolled in four courses of four credits each, including the Directed Research project.

Examples of Field Skills Taught in Our Programs

Depending upon the program, some of the skills learned might include: animal behavior observations; census of populations; mark and recapture studies; radio tracking; habitat assessment and mapping; species identification; geology and soil identification; water sampling methods; research mapping; timber estimation; transect and patch sampling; reef monitoring; data recording/analysis; cost benefit analysis; valuation methods; GIS; statistical analysis; environmental valuation; histograms; Likert scaling development; ecological sampling; carbon sequestration values; plant functional trait sampling; restoration techniques, etc.

Summer Courses

Condensed, month-long, four-credit programs. Like our semester programs, they include lectures, field exercises, research, and field trips. SFS does not have application deadlines. However, we urge students to submit their application early as programs fill quickly and applications are reviewed on a first come, first served basis.

Financial Aid

Approximately one-third of our students receive SFS financial aid in the form of grants, scholarships, and interest-free loans. If you need financial assistance, please submit an SFS financial aid application (available on our Web site: www.fieldstudies.org) as soon as possible. Qualifying students may use a combination of federal financial aid (Stafford Loans, Pell Grants, and PLUS Loans), home school grants, and SFS financial aid and scholarships to participate in our programs. You must apply early to be considered for SFS financial aid and you should consult with your home school to determine whether you may use your institutional financial aid. For details regarding financial aid and program costs, please refer to page 31.

Language Preparation

All SFS courses are taught in English. However, your interaction with the local community will be greatly enhanced if you have local language conversation skills. Costa Rica and Kenya semester students will receive two additional credits (20 contact hours of language instruction; 20 hours of lecture, field, and community activities) for our culture and language courses. We offer informal language instruction in our Mexico program. You will need to have completed at least one semester of college-level Spanish or otherwise demonstrate a level of proficiency to participate in our Costa Rica semester program.

Requirements and Prerequisites

Applicants for semester programs must be at least 18 years of age, in good academic standing, have completed at least one college-level ecology or biology course, and completed at least one semester of college prior to the start of the program.

**Applicants for the semester program in Costa Rica must have completed a college-level course in ecology or environmental studies, and are encouraged to have taken coursework in international development, economics, or anthropology. Students must have one college-level course in Spanish or otherwise demonstrate a working knowledge of conversational Spanish prior to participation.*



Safety is a Priority

Any educational experience, whether attending a college or university in the United States or studying abroad, carries with it inherent risks. These could include injury, illness, or even death.

SFS has developed an extensive safety strategy over the past 27 years. It begins with conducting due diligence in our information gathering and in our ongoing risk analysis. We are one of the very few study abroad organizations to have a full-time Safety Director whose sole responsibility is risk management and to require our staff to have emergency medical training. Each center has a Student Affairs Manager (SAM) whose primary responsibility is program safety, which includes risk management, facilitating the student community, and providing support for each student. Each SAM is required to have a current certification as a Wilderness First Responder (72 hours of medical training). Other SAM training may include Wilderness EMT, Lifeguard, Emergency Water Safety, Rescue SCUBA Diver, British Canoe Union/American Canoe Association kayak training. Educating students on safety issues and orienting them to the local culture is critical, both before and during the program. We have Risk Assessment Management Plans in order to anticipate and prevent incidents. We have contingency plans to respond to incidents should they occur. We conduct regular internal safety reviews. Besides our training requirements and staffed positions, we also have a Safety Advisory Group comprised of experienced professionals with medical, international, and risk management expertise.

SFS has a detailed plan in place designed to address safety concerns. Our plan includes providing students with safety information before they get to the field, minimizing risk while in the field, and having contingency plans to effectively react to an emergency situation. Detailed predeparture information includes information on risks, safety, health issues and a thorough on-site orientation to the country, community and cultural norms in which our students will be living.

Highlights to the SFS Approach to Program Safety and Risk Management Include:

- Safety Director: a full-time professional focusing on managing the risks in our programs by promoting a high awareness of safety through training and risk assessment.
- Safety Advisory Committee: comprised of experienced professionals with medical, international, and outdoor program expertise.
- Student Affairs Manager (SAM): each field station's SAM is responsible for promoting safety in our programs through the ongoing presentation of a risk management and judgement curriculum. This includes an overview of all local risks and the review of a number of case studies. Part of their goal is to foster intercultural competence to assist our students in their navigation of an unfamiliar environment. The SAM also serves as the primary on-site medical person.

EXPECTATIONS & RESPONSIBILITIES

STUDENT CONDUCT

Students are expected to conduct themselves in a mature and responsible manner.

The School for Field Studies reserves the right to require any participant to withdraw from any program at any time if the field station staff deem the student's conduct to be detrimental to or incompatible with the interest, harmony, comfort, safety, or welfare of the program — including abuse of alcohol or use of drugs not authorized by a medical doctor, or uncooperative or disruptive behavior. Students who are expelled or depart early from the program will be withdrawn from all courses and will not receive credit.

RESPONSIBILITY

In organizing and managing these programs, SFS, its agents, employees, and staff shall not be liable, financially or otherwise, for among other things, non-performance or unsatisfactory service; injury to persons including death, loss of, or damage to property; for accident or delay; and/or expenses arising from strikes, weather, quarantine, sickness, government regulations; or from any act or omission of its agents, contractors, and/or airline, railroad, bus company, automobile rental agency, hotel, or other suppliers of service.

SFS is a charitable corporation located in Salem, Massachusetts, U.S.A. All matters relating to, arising out of, or involving in any way your relationship with SFS shall be governed by Massachusetts law and any legal dispute shall be determined by a Massachusetts court. SFS reserves the right to refuse any applicant admission to any program if s/he is deemed unsuited for the program for any reason and at anytime during the admissions process. All courses, fees, and dates are tentative until verified and confirmed in writing by SFS.

PROGRAM CHANGES

SFS operates in a variety of environments. As a result, there are various factors that may have an effect on a program such as tenuous weather conditions, access to highly regulated and sensitive environments, or changes in political conditions. SFS reserves the right to make changes before or during a program. Indeed, part of your challenge lies in adapting to changing conditions and overcoming the obstacles they may present.

Faculty Profiles

KENYA

Center for Wildlife Management Studies

SIMON K. OLE SENO, PH.D., CENTER DIRECTOR
Wildlife and Fisheries Science, Minor in Cultural Anthropology, University of Arizona

Seno went to school when most Maasai did not — he was not a good livestock herder. Seno obtained a B.S. in Range Science and an M.S. in Wildlife Ecology at New Mexico State University and his Ph.D. from the University of Arizona. He worked for the Kenyan government for over 7 years and taught at Moi University for more than 15 years. Seno has traveled extensively in Zambia, Zimbabwe, Botswana, Namibia, and Uganda to study human-related conservation problems. While most of Seno's training is in wildlife ecology and management, his recent focus is on human dimensions in natural resource conservation.

MOSES MAKONJO OKELLO, PH.D.

Wildlife Ecology and Management, University of Alberta (Canada); M.Sc., Wildlife Resources, University of Idaho B.Sc., Wildlife Management, Moi University
Okello's research interests include wildlife conservation and ecology, human/wildlife interactions, the role of traditional institutions and roles in resource conservation, spatial wildlife distributions and influence of landuses on this distribution, and application of both GIS and biostatistical techniques in natural resource research.

JOHN WARUI KIRINGE, PH.D.

Wildlife Ecology and Conservation Biology, University of Leicester (U.K.)

Kiringe's dissertation research work was conducted in Hell's Gate National Park (Kenya) and adjoining private ranches, where he looked at population dynamics and habitat preferences of large mammalian herbivores. He also examined range primary productivity and the impact of livestock and wildlife on range condition. While a lecturer at the University of Nairobi he got involved in joint research activities on wildlife in some renowned conservation areas of Kenya. Since joining SFS in September 2000 his research work has mostly focused on the value and conservation status of ethno-medicinal and other valuable tree and shrub species in a communally owned Maasai Group Ranch situated in the larger Amboseli Ecosystem.

SALATON TOME, M.PHIL.

Environmental Studies, Human Ecology, Moi University
Specializing in human/wildlife interaction, Tome has worked and carried out consultancies for international organizations such as the World Wide Fund For Nature and Pact/USAID on issues ranging from traditional mechanisms of managing natural resource conflict to sustainable development. Tome is a member of the Maasai community and hails from Narok district, which is home to the world famous Maasai Mara Game Reserve.

AUSTRALIA

Center for Rainforest Studies

AMANDA FREEMAN, PH.D., CENTER DIRECTOR
Animal Ecology, Lincoln University (New Zealand)

Amanda's career has combined the disciplines of resource management and ecology in her work for a number of government and community organizations. She has been employed in fisheries management, conservation policy, and ecological research roles in New Zealand and Australia and has been actively involved with community conservation organizations on the Atherton Tablelands since moving to the district in 1997. For her Ph.D. research, Amanda determined the degree of dependence of a New Zealand petrel species on a large-scale fishery, using GIS as a means to analyze and map seabird fisheries interactions. Amanda's Master's research was on Maori involvement in national park policy and planning.

TIMOTHY CURRAN, PH.D.

Plant Ecology, The University of New South Wales (Australia)

Tim's research interests include functional ecology, evolutionary ecology, biogeography, and restoration ecology. He is particularly interested in how plant functional traits (such as wood density) can be used to understand how rainforest plants survive disturbances such as cyclones and drought. Tim has wide experience in natural resource management, having served as the scientific representative on committees established to conserve vegetation in northern New South Wales and to manage koalas and their habitat at Port Stephens in New South Wales.

COLIN HUNT, PH.D.

Social Sciences, Flinders University (Australia)

Colin has taught Ecological Economics at the graduate level at the Australian National University and has been a senior research fellow in economics at the Nation Research Institute of Papua New Guinea. He has undertaken assignments in Australia and the Pacific region for the World Bank, the Asian Development Bank, WWF, and the Papua New Guinea and Solomon Islands governments. His Ph.D. thesis investigated the economic, social, and spatial implications of the adoption of ecologically sustainable development (ESD).

JESS WALLACE, M.S.

University of Waikato

Jess's career in conservation has seen her working with a wide range of endangered wildlife, beginning with the largest and one of the most endangered parrots in the world – the kakapo. She tested a new non-invasive method for identifying individuals of Archey's frog through photography, and was recently involved with translocating 100 individuals of Archey's frog after chytrid was discovered in the last healthy population. However, her research has primarily focused on the short-tailed bats of New Zealand, comparing flight activity within different heights of podocarp and beech forests. The results provided recommendations for improved detectability of short-tailed bats, based on the type of forest that was being monitored.

COSTA RICA

Center for Sustainable Development Studies

GERARDO AVALOS, PH.D., CENTER DIRECTOR
Biology, University of Missouri-St. Louis

Gerardo was trained in the physiological ecology of tropical lianas and worked on the canopy crane set up at the Smithsonian Tropical Research Institute in Panama. His current research interests include the response of tropical montane forests to global warming, the biomechanics of woody palms and the ecophysiology of tropical lianas, among many others. He has taught at the University of Costa Rica, EARTH University, and ACM.

JUAN AGUIRRE, PH.D.

Agricultural Economics & Economic Development, Cornell University

Juan has extensive experience in the area of agricultural and natural resource economics and has been a consultant to IDB, USAID, World Bank, IFAD, UNEP, FAO, OAS, IICA, and CATIE where he was a former dean of the graduate school. His areas of specialization and interest include agricultural and forest policy, environmental and natural resource economics, and organic marketing. He is negotiating the publication of his recently completed book: MERCADOS ORGANICOS IN COSTA RICA with the Costa Rica Organic Program and Editorial de la Universidad de Costa Rica.

JOSE EDGARDO AREVALO, PH.D.

University of Lausanne, Switzerland

After completing his Master's degree, Jose returned to Costa Rica where he worked as the head of the research program at Monteverde Conservation League for seven years, coordinating sustainable development projects. In 2001, Jose Edgardo obtained a Ph.D. grant from the University of Lausanne to conduct research on the effect of habitat fragmentation on forest-dependent birds and landscape ecology in the Monteverde area.

MEXICO

Center for Coastal Studies

HÉCTOR PÉREZ-CORTÉS, PH.D., CENTER DIRECTOR

Marine Biology, Center for Marine Sciences of the National Polytechnical Institute

Hector has worked on research and management projects for several species of marine mammals and migrating waterfowl. In addition, Hector has experience developing non-consumptive use alternatives for marine resources (such as whale watching and photographic tours). Most recently, Hector has worked for the Mexican government in a research position where he has developed natural resource policy, made management decisions, provided advice to political decision makers, and built links with research and conservation agencies in Mexico.

GUSTAVO HINOJOSA ARANGO, PH.D.

Marine Ecology, Queen's University of Belfast, (Northern Ireland)

Gustavo has taught undergraduate (Vegetal Physiology and Introductory Biology) and postgraduate modules (Coastal Ecology and Coastal Management) both in Mexico and the United Kingdom. In addition, he demonstrated different undergraduate modules such as Introductory Biology, General Biology, Biodiversity, and Marine Ecology at the Queen's University of Belfast. Gustavo has extensive research experience and he has participated in numerous projects that include research with marine mammals, marine plants, and invertebrate communities.

REBEKKA GOODMAN, PH.D.

Geography, University of Exeter (U.K.)

After obtaining Bachelor's degrees in both French and German from Arizona State University, Rebekka spent time in Brussels, Belgium working towards her Master's degree in International Relations and Development. This work took her to Russia where she studied the link between society, culture, and economic development. With a desire to further investigate issues such as sustainable development, Rebekka obtained her Ph.D. in Geography from the University of Exeter in the United Kingdom. Her work focused on a small fishing community in Thailand and its quest for sustainable tourism development.

GEORGINA SAAD, M.A.

Marine Management, Dalhousie University

Born in Mexico City, Georgina studied Marine Biology at Universidad Autónoma de Baja California Sur (UABCS). She spent five years getting to know the area as a tourist guide on the Sea of Cortez. She received her Master's degree in Marine Management at Dalhousie University and later returned to La Paz where she worked for PRONATURA, the oldest and largest non-governmental organization in Mexico dedicated to the conservation of natural resources. She has worked on several projects dealing with environmental awareness and resource management on the northwest coast of Mexico, but in recent years, has worked intensively in Bahía Magdalena.

TURKS & CAICOS ISLANDS

Center for Marine Resource Studies

STEVE NEWMAN, PH.D., CENTER DIRECTOR
Marine Ecology, University of Plymouth (UK) and Bimini Biological Field Station (Bahamas)

Steve has been living and working in the Caribbean since 1999, and has directed research and field operations in the Bahamas and Jamaica prior to joining SFS. Steve's Ph.D. research revealed wild lemon sharks become increasingly selective predators as prey become more abundant. This suggests that with depleting fish stocks, sharks will have to compensate by either feeding more opportunistically (potentially resulting in reduced growth and recruitment) or will have to move to find food – which may result in increased encounters with humans. Steve's work has also involved detailed biodiversity studies of mangrove and sea grass communities, demonstrating the importance of mangroves to juvenile sharks and reef fish, and their need for protection in the Bahamas.

JOHN A. B. CLAYDON, PH.D.

James Cook University (Australia)

John conducted his Ph.D. work on spawning aggregations of coral reef fishes in Papua New Guinea. During his time in Papua New Guinea he found spawning aggregations of over 40 species, 12 of which had not been documented spawning in aggregations previously. He was also involved in a number of local conservation initiatives including the development of monitoring protocol for protected reefs, coral bleaching monitoring, and teaching a marine environmental education program to Papua New Guinean high-school students.

RICHARD PLATE, PH.D. (IN PROGRESS)

University of Florida

Richard's work is focused on how people perceive and value the environmental systems that support them. His Ph.D. work evaluated the value of systems-oriented education as a method for increasing students' abilities to comprehend complex environmental systems. Using a modified version of existing cognitive mapping techniques, this study showed that students who had received systems-oriented training were better able to understand new information about a complex system involving ecological, economic, and social processes.



KENYA

FOOTHILLS OF MT. KILIMANJARO

SEMESTER PROGRAM DATES

Spring 2008: February 1 - May 8

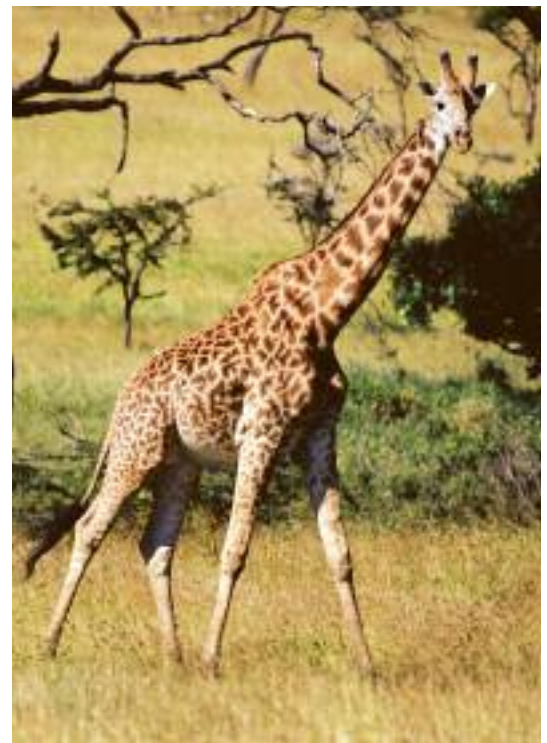
Fall 2008: September 5 - December 11



Wildlife Management Studies

ENVIRONMENTAL ISSUES

In Kenya, the search for ecologically appropriate solutions to the conflict between human and wildlife habitat is at a critical juncture. Urban, industrial, and agricultural expansion and Kenya's soaring population increasingly threaten the habitat and resources required by Kenya's wildlife, and in turn, the culture, viability and well-being of traditional, nomadic peoples such as the Maasai. Lion, elephant, giraffe, rhino, monkey, zebra, and other indigenous wildlife are the country's most famous and economically valuable resource, the result of a well-developed global tourism industry. But today, the rangelands where wildlife and pastoralists previously interacted freely and peacefully are now places of rapidly increasing human/wildlife conflicts and intensifying resource competition. Land, water, pasture, and space are diminishing every year, posing great challenges to wildlife and environmental conservation. Nomadic peoples, including the Maasai (and the cattle herds they depend upon), are being confined to smaller plots of land, resulting in overgrazing and rangeland degradation. Further, the wildlife, which has co-existed for centuries with these non-hunting peoples, are now not only seen as competitors, but are themselves intensely persecuted through illegal practices such as snaring for bush meat trade. Threats to wildlife in dispersal areas outside protected areas are many, but even in protected areas where they seemed safe, negative impacts of tourism, administrative activities, habitat restriction, and poaching are endangering biodiversity.



LEARN FIELD RESEARCH SKILLS AT THE BASE OF MT. KILIMANJARO AND IN WORLD-FAMOUS NATIONAL PARKS

Live in close proximity to wildlife and local Maasai communities on an African savanna. Learn top-notch field research skills, how to speak Swahili and about East African tribal culture. Explore human/wildlife conflicts from the perspective of the Maasai and park managers. Research ways to preserve traditional Maasai culture and wildlife viability. Observe and conduct research in three distinct geographical regions at various stages of development.



"Kenya pushed me to grow. It answered questions that I never thought to ask. It challenged me to take lessons out of the book and develop initiatives towards tangible solutions. The conflicts are real, the people are real, and the solutions must be real. The SFS program was extremely demanding. I have never worked harder or been more exhausted in my life. I've also never been happier."

ANN MARIE ALBRIGHT, KNOX COLLEGE



Kenya Program Description

OUR RESEARCH

Observe and conduct research in three geographical regions at various stages of development: Nakuru-Hellsgate (a completely fenced park), Nairobi National Park (partially fenced), and the Amboseli-Tsavo ecosystem (unfenced). The research question is: *What lessons can be learned in the Nakuru-Hellsgate and Nairobi National Park regions that can serve to assist the Amboseli-Tsavo ecosystem in maintaining its integrity while simultaneously promoting sustainable cohabitation between human communities, wildlife, and other natural resources?*

The diverse habitat surrounding our Kilimanjaro Bush Camp (KBC), which is used by wildlife as a migration corridor between Tsavo, Chyulu, and Amboseli National Parks. The KBC research is framed by the needs of dispersing and migrating wildlife between the wildlife dispersal areas of Amboseli National Park on the west and Tsavo West-Chyulu Hills National Parks in the east; the conflicts between wildlife, livestock, and humans in the group ranches which occupy the spaces between the protected areas; and the changing human community and land-use patterns of now

non-Maasai cultivators in addition to Maasai livestock herders. The Maasai, and now other settlers, depend upon this same area as a communal grazing zone for livestock as well as for growing food. As a result, they often face economic hardship due to crop damage from migrating wildlife, loss of livestock, and resource depletion.

Students gather data on wildlife conservation among resource-constrained communities – a critical first step in developing integrated land-use strategies that will enable residents to derive optimal benefits from their land and forestall additional fragmentation of key wildlife areas.

While based at our National Park Camp, student research focuses on the needs of the wildlife, which are protected when in the Park, but not in the dispersal area; and the needs of the people, which are excluded from the Park but are exercising their rights as landowners to settle and cultivate, or develop industry on their land, the dispersal area. This increased development in Nairobi National Park threatens its biological integrity and has led to the precipitous decline of large mammal populations.

Pollution and climate change threaten the already strained water supply and the health of numerous birds and animals. Increased human and livestock populations in areas surrounding the park are leading to intensified conflicts, including disease, predation, and destruction of crops by migrating wildlife. The inevitable encroachment on Nairobi National Park is stimulating intense debate as to whether the best way forward is simply to fence off the Park, such as was done with Lake Nakuru National Park, from the dispersal area, leaving the wildlife trapped inside, but at least giving better protection to the Park and its wildlife.

SFS students assist the Kenya Wildlife Service as follows: vegetation mapping; grazing and browsing impact surveys; large mammal population counts and distributions; educational facility upgrades; and human impact on the park.

Field Research, Lectures, Exercises, Skills Development

Field expeditions might include:

- Amboseli elephant research: students learn elephant ecology and wildlife management techniques through recording elephant sightings, collecting census data, understanding ecological keystone and tourism flagship roles and examining human/elephant conflicts.
- Lake Nakuru National Park & Hellsgate: world-famous for its flamingos, also an important sanctuary for rare birds, black and white rhino; huge herds of waterbuck, zebra, and buffalo; endangered Rothschild giraffe; prides of lion; and leopard. Examine ramifications of an enclosed ecosystem on wildlife biodiversity.
- Manyatta: rare opportunity to glimpse Maasai culture, including rural settlements not usually visited by tourists. Maasai women musical ceremonies, demonstrations in fire-making, dances by Maasai morans (warriors), and lessons in spear throwing.
- Amboseli and Tsavo National Parks: multi-day excursions illustrating the management implications of high concentrations of animals in a confined area. The impact of the elephants, whose trumpeting punctuates the night, are clearly visible by daylight.

COURSES

Semester students are registered in five academic courses accredited through Boston University:

Course No.	Name	Credits
BI/EE(NS) 371	Techniques in Wildlife Management	04
BI/EE(NS) 372	Wildlife Ecology	04
EE(SS) 302	Environmental Policy and Socioeconomic Values	04
EE 491 or 492	Directed Research	04
LE 205E	Introduction to Swahili Language and East African Tribal Communities*	02

See page 26 for course descriptions.



***Introduction to Swahili Language and East African Tribal Communities (LE 205E),** offers listening, oral, and written practice of Swahili at the beginner level of proficiency. This training will enhance student communications with Maasai, and increase the immersion experience. The socio-cultural module helps students develop a more refined understanding of East African tribal culture and our community partners.

- Sample of field research skills development: habitat assessment and mapping; species identification; data recording/analysis; cost/benefit analysis; valuation methods; census of populations; mark and recapture techniques; research mapping; GIS; transect and patch sampling; animal behavior observations; radio tracking; geology and soil identification.

Student Directed Research Project Examples

- Population dynamics, distribution, and vegetation preference of specified fauna residing in Nairobi National Park.
- Rangeland and grazing capacity assessment of the grasslands of Nairobi National Park.
- Land-use patterns and human/wildlife relations in the southern dispersal corridor of Nairobi National Park.
- Large mammal dispersal corridors and dispersal areas: human activities and structures causing contraction of wildlife dispersal area, and implications for neighboring protected areas such as Amboseli National Park.
- Impact of humans and large mammals such as elephants on plant communities in group ranches and implications of these on wildlife conservation and human livelihoods.
- Human population growth and structure, their distribution and use of resources, and implications of these on wildlife conservation in communal Maasai rangelands.
- Subdivision of the Maasai group ranches and their implication on land-use and wildlife conservation.
- Feasibility study for the establishment of another Maasai-owned wildlife sanctuary in Kuku Group Ranch. Student research has become the basis for a funding proposal to establish a new sanctuary, and in 2005, the group ranch members voted to establish the wildlife sanctuary and seek funding.
- Socioeconomic impacts assessment of the Kimana Wildlife Sanctuary (KWS).
- Collaboration with local Maasai and the KWS to conduct the first assessment of water and grazing resources in the Ngong Hills. Decisions regarding stock rotation and use of pasturelands were based on student findings.
- Assistance in building a library in the town of Magadi and teaching the local school children about the environment.

Get Involved with the Local Community

Above all else, we seek to give back to our host communities around the world. Understanding community views on wildlife, the challenges faced, and management policies employed by park managers is central among our research goals. Students have many opportunities for social interaction as well, including:

- Presentations of research findings to community stakeholders.
- Visits to local markets and a neighboring boma (Maasai homestead) for traditional Maasai celebrations, a lecture on culture and artifacts, jewelry making with Maasai mamas, and to conduct interviews for research work.
- Community service work in local schools, hospitals, orphanages, and with a local women's group.
- Visits to an elephant orphanage and a giraffe center.

Program Prerequisites

Applicants for semester programs must be at least 18 years of age, in good academic standing, and have completed at least one college-level ecology or biology course and at least one semester of college prior to the start of the program.



SFS AT WORK

SFS collaborated with the Amboseli Elephant Research Project on mitigating human-elephant conflict in the Amboseli ecosystem, including lands outside of the park that support wildlife migrations. Wildlife migrations had historically been accepted by many locals; however, increases in elephant population numbers within Amboseli National Park had resulted in a greater frequency of elephants foraging outside of the park, and consequently higher and more severe incidences of damage to local crops. Such damage has resulted in conflict between local landowners within the Amboseli ecosystem and conservation practices aimed at protecting the elephants. Our research was designed to address this human-elephant conflict by looking at various factors, including which crop raiding deterrents were most successful. Working with local farmers in the area, tests were conducted to introduce deterrents (such as air pressure horns, early warning systems such as trip wires, and elephant observation towers). As a result of this research, better deterrent methods are being used in the communities, incidences of crop raiding have decreased, and thus farmers' incomes have increased. The project was successfully transitioned to the local community and currently both Kenya Wildlife Service and community members are continuing to monitor the elephant deterrent methods.

Student Research Contributions

- Collaboration between the Amboseli Elephant Research Project and SFS on a proposal to US Fish and Wildlife (USFW), entitled "Mitigating Human-Elephant Conflict in the Amboseli Ecosystem, Kenya" resulting in USFW funding the project for three years (with additional contributions from Born Free and the International Fund for Animal Welfare).



COSTA RICA

ATENAS

SEMESTER PROGRAM DATES

Spring 2008: February 4 - May 8

Fall 2008: September 8 - December 11



Sustainable Development Studies

ENVIRONMENTAL ISSUES

Weed species (hearty, adaptive, fast-proliferating species such as deer, rats, kudzu) thrive in diverse environments and can overwhelm indigenous species if the conditions are right. Reduced habitat, pollution, and strained resources — the hallmarks of unsustainable industrial development — can pitch a delicately balanced ecosystem into a precipitous decline where the weeds proliferate. It's still life, but homogenized life where the web will become just a few common strands that can be found nearly anywhere, replacing and sometimes completely extinguishing thousands of species, forever.

While Costa Rica is internationally recognized for its efforts to ensure biodiversity and protect natural resources, the country has experienced significant resource degradation linked to population growth, industry, and development — all of which threaten to ruin this tropical paradise, and in turn, economic opportunities. The country supports more than 5% of the world's biodiversity and boasts 230 different protected areas (about 25% of the country). The cloud forests, rainforests, volcanoes, and mountain plains here shelter as many as 6,000 plant species, including at least 1,000 varieties of orchids alone. More than 500 species of butterflies and over 800 bird species, such as quetzals, toucans, hummingbirds, and scarlet macaws, are found in the wet and/or dry forests. The magnificent beaches bordering both coasts are among the world's largest-known nesting grounds for sea turtles.

Costa Rica now faces a struggle common to developing countries in a global economy: preserving beautiful (and ecologically and economically valuable) natural resources while increasing its prosperity and allowing for sustainable development. A particular challenge is maintaining biodiversity in the face of competing land use, such as urban growth, foreign investment in resorts and big hotels, agriculture driven by export products, and ensuring that Costa Rica's world-famous parks benefit surrounding communities as well as ecotourism development.



EXPLORE COSTA RICA'S INCREDIBLE BIODIVERSITY AND UNIQUE ECOSYSTEMS

Study tropical ecology, economics, and understand the socio-cultural issues related to the natural resource management challenges in world-renowned protected areas. Learn professional level field research skills and work with local Costa Rican park rangers, farmers, and top environmental officials to understand the challenges of maintaining the biodiversity of the country. Travel to Nicaragua on a field expedition. Become a member of the friendly community of Atenas and sharpen your Spanish conversation skills.



"To be doing things for the sake of wildlife conservation and social change is enough to make a person feel very, very alive."

BRIAN ESTES, GONZAGA UNIVERSITY



Costa Rica Program Description

OUR RESEARCH

Costa Rica is currently undergoing a period of great economic and social change. As this resource-rich, wonderfully biodiverse country continues along a path of rapid development, it is becoming increasingly influenced by global policy such as the Central American Fair Trade Act (CAFTA) and foreign markets. Costa Rica's economy has shifted from one predominately based on agriculture to one driven by ecotourism and technology exports. At the same time, brisk population growth is straining natural and developed resources. The country now faces a critical juncture as resource management decisions are being made in an effort to keep pace with competitive global markets. Our goal is to study different sustainable 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 classic sustainability issues such as agro-

ecology, national park protection, economic development, urban sprawl, population growth, trash management, and air quality. Students focus on evaluating the success of Costa Rica's world-renowned management systems as well as developing alternative strategies, such as sustainable practices and organic agriculture as an alternative to poaching around national parks, that conserve biodiversity and protect natural resources. Visits to cloud forests, dry forests, volcanic parks, lowland rainforests, and plantations offer opportunities to examine management schemes, identify the benefits of protected areas, and determine which systems offer the best option for economic development, the maintenance of cultural norms, and the preservation of biodiversity. Understanding the forces that are driving Costa Rica's policies as well as those driving change, will be key as students analyze potential natural resource solutions for Costa Rica, and hopefully, beyond.

Field Research, Lectures, Exercises, and Skills Development

The interdisciplinary approach to our research teaches students about tropical ecology, agro-ecology, socioeconomic, sustainability, park management, natural resource management, ecological economics, and Costa Rican history, culture, and the Spanish language. Possible field trips, lectures, and exercises include:

- Nicaragua: extended field expedition to compare and contrast development and resource use issues between the two countries.
- Palo Verde National Park: camping trip to explore a rare and threatened tropical dry forest ecosystem, site of one of the most sustainable management models for protected areas in Latin America.
- Volcan Poas National Park: investigate parks and people relations and park facility and visitor information needs. Learn about cloud forest ecology.
- Braulio Carrillo National Park: learn about bio-indicators of ecosystem health and rainforest ecology.
- Carara National Park: see the reintroduction of bird species in the park and learn about forest dynamics and food webs.
- Volcan Arenal National Park: examine the pressures that ecotourism places on small communities.
- Monteverde protected zone: visit the largest private reserve in Latin America initiated by donations to explore the difficult dynamics of private and public preservation policies and the impact of heavy tourism.
- Rincon de La Vieja National Park: camping trip to the cloud forest and volcanic mud piles.
- Field research skills development: GIS; timber estimation; transect and patch sampling; data recording and analysis; cost/benefit analysis; valuation methods; habitat assessment and mapping; species id; water sampling methods; census of populations; mark and recapture techniques; infrastructure assessment in protected areas; zoning; ecotourism and trail assessment; survey and interview techniques; statistical analysis; environmental valuation; histograms; Likert scaling development; ecological sampling.

COURSES

Semester students are registered in five academic courses accredited through Boston University:

Course No.	Name	Credits
EE(NS) 377	Tropical Ecology and Sustainable Development	04
EE(SS) 303	Economic & Ethical Issues in Sustainable Development	04
EE(NS) 374	Principles of Resource Management	04
EE 491 or 492	Directed Research	04
(LS) 205E	Language, Culture, and Society of Costa Rica*	02

See page 26 for course descriptions.



"I am immersed in the issues, talking with real people, working on solutions for an ecologically, socially, and economically sustainable future. The more I learn, the more I realize that I need to learn more. For every question answered, I find several more waiting to be asked."

GARRETT MEIGS, CORNELL UNIVERSITY

Student Directed Research Project Examples

- Development of an agroforestry system to plant *Euterpe precatoria* in small forest patches with communities surrounding the national parks.
- Development of certification programs for the sustainable or organic cultivation of *Euterpe precatoria* by small communities.
- Impact of illegal extraction of heart of palm on the population growth of *Euterpe precatoria* and development of sustainable use alternatives.
- Long-term monitoring program of the avifauna of Volcan Poas National Park. Analysis of the impact of poaching on bird diversity and distribution.
- Long term monitoring of the effects of international policies on agro-ecology systems.
- Impact of seasonal changes in the abundance and diversity of aquatic macroinvertebrates as indicators of water quality in two pristine streams of Braulio Carrillo National Park.
- Evaluation of the socioeconomic benefits between Costa Rica's national parks and its surrounding communities.
- Evaluation of the socioeconomic benefits between Guayabo National Park and its surrounding communities.

Student Research Contributions

- Presentation of our research results and proposed model of development at a meeting of the Costa Rican Ministry of Energy and Environment.
- Request by the President of Costa Rica to help design a national 15-year environmental strategy for Costa Rica.
- Visitor services and expectations for Nicaragua's national parks.
- Environmental waste management and recycling education programs.
- Evaluating and making recommendations for an environmental education program piloted at an elementary school in a community surrounding Volcan Poas National Park.
- Developing and monitoring water quality indicators for Braulio Carrillo National Park.

Get Involved with the Local Community

Community needs are the impetus behind our research goals. Conversations and collaborations with local residents, small business owners, and farmers to better understand their perspectives and needs provide the framework for SFS research plans. Activities might include:

- Monitoring and maintaining trail infrastructure at the Municipal Forest and Cacao watershed with the local high school, ministry of agriculture, and municipality.
- A full Spanish presentation of the results of the research conducted during the semester to government agencies.
- Long-term community projects: U.S. culture and English taught in the elementary school, fighting diseases in Atenas, and trail management and construction in the Municipal Forest.
- Soccer games, community festivals, and short home stays.

Prerequisites

Applicants for semester programs must be at least 18 years of age, in good academic standing and have completed at least one college level course in ecology or environmental studies, and are encouraged to have taken coursework in statistics, international development, economics, or anthropology. Students must have completed at least one college level course in Spanish or otherwise demonstrate a working knowledge of conversational Spanish prior to participating.

Applicants for summer programs must be at least 16 years of age, in good academic standing, and have completed at least their junior year of high school prior to the start of the program. See page 28 for summer program information.

*Language, Culture and Society of Costa Rica

(LS) 205E offers listening, oral, and written practice of Spanish at beginner, intermediate, and advanced levels of proficiency. Written grammar and vocabulary exercises help students develop Spanish language skills and tools required for their course work and research projects. The socio-culture module helps students develop a more refined understanding of Costa Rican culture.



SFS AT WORK

Illegal extraction of heart of palm from Costa Rica's numerous national parks has been very extensive and the long term implications include extirpation of the species, and potentially, the eventual extinction. After being approached by the Costa Rican Ministry of the Environment (MINAE), SFS students implemented a full-scale evaluation of the consequences of poaching as well as the driving forces behind the illegal poaching. The multi-disciplinary research conducted by the students and the findings have been used by MINAE in the ecological and social data to determine the status of the remaining populations of the species within national parks, as well as to develop the potential to sustainably cultivate the species in plantations or agro-forestry systems. The latter outcome of this research project has lead to a collaboration between SFS and El Zota (a small rural cooperative of families engaged in alternative ways of sustainable rainforest management) to expand the heart of palm project to small fragments owned by rural families around national parks. This research is monitoring the illegal extraction of heart of palm in Braulio Carrillo National Park. By interacting with El Zota, SFS is triggering the interest of local farmers on wild heart of palm cultivation to reduce extraction from public lands. El Zota is now able to better manage its forests, facilitate the marketing of their products, and increase their capacity to receive and educate visitors.



MEXICO

BAHÍA MAGDALENA

SEMESTER PROGRAM DATES

Spring 2008: February 4 - May 8

Fall 2008: September 8 - December 11



Conserving Marine Mammals & Coastal Ecosystems

ENVIRONMENTAL ISSUES

Touted as Earth's "final frontier," mankind has historically treated the ocean as a source of nearly limitless resources. Today, we know better the limits of this wilderness. Despite nearly two decades of conservation efforts, important sea turtle species are sliding towards extinction worldwide. Bahía Magdalena is one of the largest remaining and relatively intact coastal wetland/lagoon systems along the Pacific coast of the Americas, and one of the world's most important habitats for California gray whales and several species of endangered sea turtles. Extensive sea grass beds and mangrove stands, intertidal sand and mudflats, barrier islands, and large rocky shore areas make for rich biodiversity, though dependent upon a delicately balanced ecosystem.

The Bay is an important feeding ground and nursery area for East Pacific green turtles, and olive ridley, hawksbill, and the rare loggerhead turtles are sometimes seen. The area is home to pods of bottlenose dolphins and large groups of sea lions. Over 100 species of migratory and resident birds use the Bay at various times of the year. Bahía Magdalena is one of the three most important calving areas for the entire California gray whale population, and hundreds of these animals can be found here between January and April.

Bahía Magdalena has also played a critical role in supporting its human residents. A growing tourism industry, based on whale watching, provides income for many residents, and fishers ply the waters for commercially important species. Unfortunately, critically endangered sea turtles are caught as by-catch in some of these fishing operations.

Most local residents are economically dependent on the Bay's marine resources, yet little research has been done on this ecosystem and sustainable resource use. Due to its high productivity and amazing biodiversity, the World Wildlife Fund has ranked Bahía Magdalena as one of the nine most important coastal habitats needing protection in all of Mexico. There is consensus among researchers and U.S. and Mexican governments that protection of this unique ecosystem is vital, yet it remains under siege by pollution and lack of effective management.



RESEARCH ISSUES CRITICAL TO ENDANGERED SEA TURTLES' SURVIVAL

Learn state-of-the-art field research techniques and coastal ecology. Help the local community protect marine mammals and conserve marine resources. Explore pristine natural habitats ranging from flowering deserts and mangrove-filled lagoons to species-rich marine ecosystems. Get involved with the local Bahía Magdalena community and learn about Mexican culture.



"Collecting data about sea turtle mortality made us more aware of the social and natural problems that this organism encounters.... This definitely encouraged us to give our best in order to help as much as we can in the conservation of sea turtles, as well as marine mammals and the great ecosystem in which we have the chance to be living."

EGLÉ FLORES GONZÁLEZ, UNIVERSIDAD DE LAS AMERICAS PUEBLA



Mexico Program Description

OUR RESEARCH

In addition to our year-round research on the management of critically important fisheries and water quality issues in Bahía Magdalena, our unique location allows students to concentrate on very different but equally fascinating species each semester. Students in the fall and summer programs research conservation strategies to protect several marine turtle populations reduced to near-extinction. Despite strong regulations against their exploitation, green turtles are still frequently poached for their meat and are caught as by-catch by fishers. A complex interaction of community social and cultural factors, lack of enough protected area sanctuaries, lack of enforcement of existing regulations, and economic hardship in local communities has lead to the continued exploitation and the rapid decline of sea turtle populations throughout Mexico.

In Bahía Magdalena, which is a key nursery and feeding ground for the green turtle, there is no comprehensive recovery or protection plan for sea

turtles. Students gather data to help understand the condition of the various habitats of the Bay that are critical to the turtles’ lifecycle, monitor the demographic and behavioral characteristics of turtle populations, and gain more insight into the role of the turtle in the social, cultural, and economic lifestyle of the local community. Student research, in partnership with the local community and conservation groups and governmental agencies, is contributing to the development of a conservation and management plan for sea turtles.

Spring semester students, while continuing our research on turtle conservation, also focus on applied ecology of the gray whale and a socioeconomic analysis of whale watching activities. Since commercial whaling was banned in 1946, the gray whale population is thought to have recovered to around 24,000. Only four calving and mating grounds for this species are known to exist and Bahía Magdalena is the only one not currently

protected. The recovered population now drives a growing whale watching industry, which creates new problems that require field research to understand and resolve them.

Our research also focuses on sustainable harvesting and management of important commercial marine resources. SFS students learn professional field research skills as they interview fishermen, explore changes in fishing technology, and collect and analyze catch data as part of our efforts to help regulators and harvesters develop more sustainable management strategies for the fisheries of Bahía Magdalena.

Field Research, Lectures, Exercises, and Skills Development

- Research expedition to Puerto Magdalena Island to learn about the fascinating culture of a small, communal fishing cooperative.
- Field exercises at the Bay’s fishing grounds to practice and learn about fisheries such as blue crab and scallops.
- Field expedition to intertidal zones of Bahía Santa Maria to illustrate the incredible diversity of local marine life.
- Camping trips to offshore islands to explore the area’s rich biodiversity, stark dunes, and pristine white beaches.
- Collecting GIS data for projects that in turn will help the local government, fishers, and tourism operators to design community-supported marine protected areas.
- Visit to three different natural protected areas in the state of Baja California Sur; day trips to various reefs, deserts, oases, and mangroves.
- Field research skills development: GIS; transect and patch sampling; data recording and analysis; qualitative data techniques; cost/benefit analysis; valuation methods; habitat assessment and mapping; species id; water sampling methods; population/stock evaluation methods; census of populations; mark and recapture techniques; diversity assessments; basic identification methods (invertebrates, fish, turtles, birds, marine mammals).

COURSES		
Semester students are registered in four academic courses accredited through Boston University:		
Course No.	Name	Credits
BI/EE(NS) 379	Coastal Ecology	04
EE(NS) 374	Principles of Resource Management	04
EE(SS) 303	Economic & Ethical Issues in Sustainable Development	04
EE 491 or 492	Directed Research	04
See page 26 for course descriptions.		



"I was placed in the middle of a group of extraordinary people from all over Mexico and the United States who genuinely cared about animals and the environment. I am so grateful that I was able to form strong bonds with people whose academic interests varied greatly from mine, but who all still shared a love of learning and exploration."

PATRICIA MARQUEZ, SARAH LAWRENCE COLLEGE

Student Directed Research Project Examples

- Economic benefit and socioeconomic analysis of whale watching in Bahía Magdalena.
- Assessment of the implementation of a sea turtle protected area and monitoring turtle populations.
- Gray whale abundance, distribution, and behavior during breeding season in Bahía Magdalena.
- Regional environmental education model: marine mammals and sea turtles as a tool for involving teachers in curriculum development.
- Analysis of the socioeconomic effects of proposed marine protected areas on local fishers, tourism operators, and the community.
- Development of tourist alternatives to conserve Puerto San Carlos and its environment.

- Socioeconomic analysis of blue crab fishery, providing valuable data to the Puerto San Carlos Office of Fisheries to assist in developing management strategies.
- Sea turtle research leading to increased awareness and stewardship.

Get Involved with the Local Community

Helping the residents of Bahía Magdalena develop long-term natural resource conservation plans while still providing sustainable economic development is our chief concern. In addition to working with local clients and interviewing community leaders, SFS students enjoy getting involved in community volunteer projects and social activities such as:

- Participation in the Puerto San Carlos Gray Whale and Sea Turtle Festivals.
- Teaching English classes for local school children.
- Spanish lessons throughout the program, which help sharpen conversational and cross cultural skills.
- Participation in folkloric dance classes, Mexican holiday celebrations, short home stays, and hosting community events at our field station to deepen students' experience of a different culture and connection with the local community.
- Local sports, community meetings, conservation activities, and environmental education programs for local school children.

Student Research Contributions

Our field station on the Bay has drawn many researchers from Mexico and abroad, involving SFS students in several important investigations and projects, including:

- Hosting a symposium of research organizations active in conserving the Bay to develop collaborations among Mexican and international researchers.
- Water quality analysis funded by The David and Lucile Packard Foundation, which resulted in the development a water quality and green sea turtle monitoring program and alternative disposal recommendations, including the installation of a waste water filtration system at a local cannery that had been seriously polluting the Bay.
- Gray whale population study, which has lead to a safe increase in whale watching permits and better adherence to regulations.
- Management plan for regional sustainable development created by a student-initiated, community-based conservation plan.
- Joint SFS, government, and local fishers' exploration of alternative shrimp net designs to reduce by-catch and destruction of the fragile Bay bottom.

Program Prerequisites

Applicants for semester programs must be at least 18 years of age, in good academic standing, and have completed at least one college-level ecology or biology course and at least one semester of college prior to the start of the program.

Applicants for summer programs must be at least 16 years of age, in good academic standing, and have completed at least their junior year of high school prior to the start of the program. See page 28 for summer program information.

Special note: Due to our community focus and extensive interaction with the people of Puerto San Carlos, applicants are strongly encouraged to develop their conversational Spanish skills in preparation for this program.



SFS AT WORK

Whale watching tour operator Fito Gonzalez has changed the way he conducts business on Bahía Magdalena. Whale watching in Mexico witnessed its most spectacular growth increase in the mid-1990s where it expanded 800%. The potential effect of this increased activity on whales is starting to cause concern in the international community. While short-term changes in whale behavior due to tourism activities have been proven (increased swimming velocity, changes in direction and changes in respiratory rhythm), the long-term effects are uncertain. Like other large whales, gray whale numbers were reduced to just a few hundred at two different times. On the other hand, properly conducted whale watching can be an important economic activity (and conservation lesson) today and in the future.

Fito has worked closely with SFS to improve his operation to respect marine life and ensure that he has all the necessary permits to run his business in an ethical manner (something not all operators adhere to). The operational changes he has implemented are a result of SFS students' research findings. As tourism in the area is picking up, Fito and other operators see an ever increasing need to adopt these changes in order to keep the bay thriving for their businesses.



AUSTRALIA

ATHERTON TABLELANDS

SEMESTER PROGRAM DATES

Spring 2008: February 4 - May 8

Fall 2008: September 8 - December 11



Tropical Rainforest Studies

ENVIRONMENTAL ISSUES

Rainforests are one of the world's most important and diverse ecosystems, yet thousands of acres disappear each day, mostly a result of human activity. Along with the loss and fragmentation of rainforest areas due to practices such as intensive logging and increased farming, global climate change is very likely contributing to accelerating loss of plant and animal species. The potentially devastating effect of climate change is playing out in north Queensland, where models predict a significant rise in local temperatures over the next century that would result in a nearly 50 percent extinction rate among endemic species in affected areas. And because rainforests are so diverse, the threat to this one section of the continent places nearly half of all Australian bird species and endemic mammals at risk.

For thousands of years the tropical rainforest of Queensland has been home to about 18 indigenous tribes, along with numerous primitive plant species, birds, and marsupials found nowhere else in the world. Giant strangler figs, abundant vines and epiphytes, large pythons, colorful parrots, giant cassowary, bandicoots, and tree kangaroos fill these forests with color, sound, and complexity. Northeastern Queensland's ancient rainforests preserve millions of years of evolutionary history, though sadly, these repositories have been greatly affected by habitat loss, fragmentation, and climate change. The eastern seaboard of northern Australia once supported extensive rainforests, but logging, mining, and agricultural production have destroyed and disrupted rainforest habitats and the traditional land of Aboriginal people. Today, over much of the area, only fragments of the original forests remain.

Australia confronted the threat of rainforest loss much faster than most tropical countries, but the integrity and survival of these rainforests hinge upon developing solutions that consider larger-scale impacts, including global climate change, yet also provide economic benefits for the local community.



RESEARCH IN A TROPICAL RAINFOREST AMID AN AMAZING VARIETY OF UNIQUE PLANTS, BIRDS, AND OTHER WILDLIFE

Work with local tree-planting groups and research organizations and learn from members of the indigenous community to manage forest resources. Learn about the current condition and dynamics of a tropical rainforest ecosystem, including what is happening to this system as a consequence of global climate change. Learn professional level field research skills and participate in community projects to restore tropical rainforests. Explore some of the most exciting natural wonders of Australia.



"I came away with a deep knowledge of a serious environmental problem along with the tools to help solve it. Never before have I felt so connected to something so positive."

CLAIRE NELSON, WELLESLEY COLLEGE



Australia Program Description

OUR 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 studying rainforest management and restoration. Recent cyclones have further damaged the remaining rainforest fragments, raising questions on how to manage these hyper-disturbed areas. Conservation challenges and cutting-edge management strategies developed here will likely serve as a model for conserving the rest of the world's tropical rainforests.

The ecological and economic benefits of rainforests are increasingly well-understood, but much less is known about rainforest ecosystem dynamics and the ability to restore a rainforest once it has been cleared. Our goals are to help understand the dynamics of rainforest ecosystems, including potential impacts of global climate change, and in turn develop rainforest restoration

strategies that benefit both ecosystems and human communities.

Student research work addresses a critical local and regional environmental problem — loss and fragmentation of once extensive rainforests, and the environmental policies that are currently under consideration by the local and Commonwealth governments. SFS staff and students, in collaboration with local landholders and stakeholder organizations, focus on enhancing the condition of tropical rainforests, as well as determining how we should regenerate and restore the rainforest on the Atherton Tablelands. Students learn professional field research techniques as they collect data on potential responses to global climate change, habitat use and animal behaviors, resilience to cyclonic events, land-use, local resident involvement in restoration projects, and cost effective and ecologically beneficial methods of restoration. Student work represents a vital contribution toward larger studies on global

climate change, biological integrity of rainforest fragments, and developing restoration practices to maximize rates of plant growth and colonization by fauna. Students are actively involved in either rainforest replanting or site maintenance with local landcare groups.

Field Research, Lectures, Exercises, Skills Development

- Chillagoe: camp in the Outback and explore caves, rock formations, remnant dry rainforests, and eucalypt savannah. Learn firsthand about the history of the Barbaram people.
- Cape Tribulation: hike through lowland rainforests, giant sedges with peppermint stick insects, mangrove forests, and palm forests; traverse the Daintree River, notorious for its crocodiles; visit the canopy tower at the Daintree Environment Centre; sample and examine an array of forest types across the landscape.
- Visit the TREAT (Trees for the Evelyn and Atherton Tablelands Inc.) nursery.
- Learn about the geology of the Atherton Tablelands.
- Seedling recruitment of restored tropical rainforest at revegetation sites.
- Examine growth and mortality of tropical rainforest species.
- Sample plant functional traits and their effect on drought and cyclone resistance.
- Examine fauna in endangered plant communities.
- Sample of field research skills development: hair tube analysis; GIS; rainforest management strategies; seedling propagation; timber estimation; carbon sequestration values; transect and patch sampling; data recording and analysis; cost/benefit analysis; valuation methods; experimental design; plant functional trait sampling; restoration techniques; bat detection.

COURSES

Semester students are registered in four academic courses accredited through Boston University:

Course No.	Name	Credits
BI/EE(NS) 369	Rainforest Ecology	04
EE(NS) 370	Principles of Forest Management	04
EE(SS) 302	Environmental Policy and Socioeconomic Values	04
EE 491 or 492	Directed Research	04

See page 26 for course descriptions.



"After four intensive weeks of pushing my physical and mental capabilities to the limit, I feel as though I am ready for just about anything!"

ASHLEY CAMHI, VASSAR COLLEGE

Student Directed Research Project Examples

- Using plant functional traits to predict drought and cyclone resistance.
- Micro bat use of rainforest fragments.
- Use of restored and natural rainforests by rainforest birds.
- Patterns of colonization of restored rainforest by vertebrates.
- Determining carbon sequestration values of rainforest restoration.
- Monitoring the Peterson Creek revegetation project.
- Evaluating policy instruments that are used to tackle environmental problems.

Student Research Contributions

Understanding local views on the ecological and socioeconomic challenges facing the community of north Queensland is key. Our on-going research and close ties with community stakeholders allow students to make meaningful contributions including:

- Assisting community members with planting more than 15,000 trees over the last few years, some of which were grown from seed at our field station, to restore degraded forests, improve water quality, and sequester carbon through plantings around watersheds.
- Assessment of tree seedling recruitment and growth working toward recommending best practices for achieving a successful restoration.
- Assisting community members with restoration of more than one mile of rainforest from grassland along the lower Peterson Creek.

Get Involved with the Local Community

Conservation, resource use, and rainforest restoration are extremely important to local farmers, resource managers, and concerned community groups. With the results of our research, we offer advice to local decision-makers and create linkages between our staff and the stakeholders involved in rainforest restoration and management. SFS students enjoy getting involved in community volunteer projects and social activities such as:

- Meeting with Aboriginal elders of the Yidinji, Ngadjon Jii, and Barabaram tribes to learn more about their culture and their effort to reclaim their role in land management.
- Community service trips to help local conservation groups and communities plant rainforest seedlings.
- Participating in annual community fauna surveys such as the crane count (October) and spectacled flying-fox counts (November).
- Attending special lectures on tree kangaroos, spectacled flying fox, rock wallaby, cassowary, and other local wildlife in conjunction with local conservation groups.
- Hosting community dinners and participating in short home stays.
- Bush dances, community festivals, visiting the Malanda theatre, socializing at the local pubs and sporting competitions, such as lawn bowling with Aussies.
- Learning how to make and play didgeridoos.

Program Prerequisites

Applicants for semester programs must be at least 18 years of age, in good academic standing, and have completed at least one college-level ecology or biology course and at least one semester of college prior to the start of the program.

Applicants for summer programs must be at least 16 years of age, in good academic standing, and have completed at least their junior year of high school prior to the start of the program. See page 28 for summer program information.



SFS AT WORK

One of the most crucial and endangered types of forest in the Atherton Tablelands is Mabi 5b rainforest, home to the highest densities of rare green ringtail possums and Lumholtz's tree kangaroos in the world. SFS students have been conducting research on existing Mabi 5b forest fragments and have been working closely with the Mabi Forest Recovery Team to implement forest conservation and restoration initiatives. When Tropical Cyclone Larry swept across the southern Atherton Tablelands, many Mabi 5b forest fragments experienced extensive tree fall and defoliation. Students and faculty alike immediately set out to research the impacts that this storm had on the forest and are using those results in collaboration with the Mabi Forest Recovery Team and the Queensland Parks and Wildlife Service to inform management and restoration plans. Additionally, SFS students have continued to work with local Landcare groups on rainforest restoration – contributing technical expertise, providing seedlings from the SFS nursery, and planting trees. Because of the extent of students' work on the ground, miles of the Peterson Creek have been revegetated, abandoned pasture has been restored, and previously isolated fragments of Mabi 5b forest are now buffered and connected, with green ringtail possums and Lumholtz's tree kangaroos starting to be seen utilizing the restored forest.



TURKS & CAICOS

SOUTH CAICOS ISLAND, BRITISH WEST INDIES

SEMESTER PROGRAM DATES

Spring 2008: February 4 - May 8

Fall 2008: September 8 - December 11



Marine Resource Management Studies

ENVIRONMENTAL ISSUES

For the tourists who flock here, the Bahamian archipelago is a diving and angling paradise. But beneath the turquoise waters, a delicate ecosystem is under assault. The British-governed Turks and Caicos Islands (TCI) lie at the southeastern end of the Bahamian archipelago. The clear waters of the TCI are considered to be among the world's top 10 diving locations. Nearly 50 species of coral and over 350 large fish species, including spotted eagle rays, sharks, groupers, snappers, and dolphin fish are easily spotted in the clear, warm waters just steps from our field station. Nearby sea grass beds, mangrove forests, sandy shoals, and deep reefs lend a patchwork appearance to the miles of shallow blue waters that surround the Islands. However, pollution and overharvesting of precious marine resources, coupled with unsustainable tourism and industrial development are poised to inflict irreparable damage to this delicate ecosystem. In short, conservationists may soon lose the battle.

These diverse and relatively intact and healthy ecosystems support much of the community on South Caicos Island, with fisheries providing the primary source of livelihood. The TCI are a major international exporter of rapidly dwindling stocks of queen conch and spiny lobster. Depletion of these resources, along with burgeoning tourism development, will have a dramatic impact on employment and social structure on South Caicos Island. Developing a sustainable fishery is essential if this resource-dependent community is to survive. While many Caribbean communities have promoted economic diversification to improve economic and social stability, uncontrolled tourism and land development will drive this fragile marine ecosystem and the traditional Caribbean culture it supports to the brink of collapse. Other forms of economic diversification and plans for sustainable development need to be implemented in order to avoid this pending environmental catastrophe.



RESEARCH IN ONE OF THE MOST SPECTACULAR MARINE HABITATS IN THE BRITISH WEST INDIES

Learn about tropical marine ecology and environmental management. Learn professional field research skills. Help find innovative approaches to fisheries, marine protected areas, and economic diversification. Join the friendly South Caicos Island community known as "Belongers" and learn about Caribbean culture.



"We took our first trip to an island of mangroves to spend time learning the scientific names of the common species. With a partner and a staff member all to ourselves we saw all the types of mangroves, fire sponges, sea cucumbers, giant Caribbean anemones, and even several lemon sharks!"

COLIN ACKERMAN, LAWRENCE UNIVERSITY



Turks & Caicos Program Description

OUR RESEARCH

Our Center is working with the TCI government's Department of Environment and Coastal Resources (DECR) and the National Park Service to develop management strategies that shield the TCI from the fate that has befallen other nearby areas in the Caribbean. Student field research is helping to provide the local government, community, and tourism developers with advice that will help sustain the economic, societal, and ecological stability of South Caicos and its island community.

With so many local residents dependent upon marine resources for their livelihood, along with increasing resource consumption by tourists, finding viable options for managing fisheries and conserving critical habitats, including coral reefs, is crucial. Snorkeling and SCUBA diving in waters surrounding South Caicos, students learn professional field research techniques to identify a wide range of marine organisms and habitats, and learn about marine ecology and coastal ecosystems. Students grapple with the challenges of balancing the economic needs of the fishing

community with fisheries management and analyze the costs and benefits of potential new fisheries. Assessing the pros and cons of resource management and habitat conservation options, and the social and economic implications of these options, brings students face-to-face with the real-life dilemmas faced by the governmental regulators and the residents of South Caicos.

Recent research indicates that conch and lobster nursery areas in dense sea grass beds need urgent protection in order to sustain these economically important resources. SFS students research the distribution and role of the sea grass habitats in the coastal environment of South Caicos. With the Admiral Cockburn Land and Sea National Park at their doorstep, students are able to evaluate the concept of marine protected areas (MPAs) as a resource management tool. Students help monitor the condition of the spectacular coral reefs, both inside and outside the MPAs, using scientifically rigorous monitoring techniques. Based on their field observations, students assess the validity of

indicator species for reef health, the effects of diver tourism and habitat destruction, marine species interactions, the impact of coral diseases, and many other issues related to marine natural resource harvesting, conservation, and monitoring.

Reef fish stocks unprotected

The growing tourism industry in the TCI as a whole is increasing the demand for reef fish on restaurant menus. Local fishers on South Caicos recognize this market and commercial sale of certain reef fish species is rapidly increasing. Apart from having established a few "no-take" marine protected areas and banning spear fishing, there are currently no 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 that they can be harvested in a sustainable manner to avoid total species collapse.

Field Research, Lectures, and Exercises

- SCUBA or snorkeling for field research and species identification exercises.
- Visual assessment of queen conch and coral reef fish populations.
- Fish, coral, sea grass, and mangrove identification.
- Zoning for multiple uses in marine protected areas.
- Ecosystem functioning and anthropogenic impacts.
- Lecture from DECR officials on the TCI government fisheries regulations and enforcement.
- Lecture and site tour from local tourism developer on plans for constructing a resort.
- Field research skills development: transects, quadrats, behavioral observations; survey design and interviewing techniques; environmental impact assessment; MPA assessment; data recording, analysis and statistics; scientific writing and oral presentation; peer evaluation and review; snorkel and SCUBA skills; GIS; cost/benefit analysis; valuation methods; habitat assessment and mapping; species id; water sampling methods; census of populations; mark and recapture techniques; reef monitoring.

COURSES

Semester students are registered in four academic courses accredited through Boston University:

Course No.	Name	Credits
BI/EE(NS) 373	Tropical Marine Ecology	04
EE(NS) 374	Principles of Resource Management	04
EE(SS) 302	Environmental Policy and Socioeconomic Values	04
EE 491 or 492	Directed Research	04

See page 26 for course descriptions.



"I spent about 45 minutes each day floating along the bottom just looking at the most amazing fish in the world. Everyday I'd be down there thinking to myself, 'I can't believe this is school. This is the only way to learn.'"

CHRISTINE DODGE, SKIDMORE COLLEGE

Student Directed Research Project Examples

- Population size assessment of potentially commercial finfish species around South Caicos.
- Finfish dock landing.
- Water quality monitoring.
- Coral settlement rates.
- Interactions between mangrove and sea grass faunal communities.
- Ecology of Nassau grouper.
- Local perceptions of tourism and fishing industries.

Student Research Contributions

- Lobster, conch, and finfish stock assessments have provided important information for government agencies.
- Natural resource workshop with the DECR and the National Park Service to provide the TCI government workers with educational training about coral reefs, lobster biology, marine fishes, turtles, and sharks.
- Working with the DECR, Protected Areas Department, and local businesses to develop a protocol for coral reef monitoring and to share data about queen conch distribution.
- Hosting or supporting public forums and activities attended by government officials and community members to facilitate communal problem solving.
- Applying baseline data to examine reef health trends, species interactions, and impacts of coral diseases.

Get involved with the Local Community

Our program in the TCI is dedicated to helping the community conserve its natural resources and develop sustainably. Students quickly become involved with the community, spending time with local residents, fishers, and resource managers learning about the local Caribbean culture and the challenges they face. Some community activities may include:

- Reading, tutoring, and volunteer projects at the local library and grade school.
- Hosting SEA DAY twice a year at our field station to introduce elementary students to the marine environment.
- Providing swimming lessons for local children.

Program Prerequisites

Applicants for semester programs must be at least 18 years of age, in good academic standing, and have completed at least one college-level ecology or biology course and at least one semester of college prior to the start the program. Many past students in this program have found one semester of statistics to be helpful.

Applicants for summer programs must be at least 16 years of age, in good academic standing, and have completed at least their junior year of high school prior to the start of the program. See page 28 for summer program information.

SCUBA Certification

It is not necessary to use SCUBA to participate in our program – many students choose to snorkel instead. However, if you intend to use SCUBA you must be certified before arrival. Divers and snorkelers must bring their own SCUBA and snorkeling equipment (with certification, insurance etc). Weights and tanks are provided on-site at no cost.

Visit our Web site for a photo tour of our field station: www.fieldstudies.org



SFS AT WORK

In collaboration with the Department of Environmental and Coastal Resources (DECR), SFS developed a portable test kit capable of detecting the illegal use of household bleach in the fishing industry. In the TCI, some fishermen use household bleach, as well as liquid dishwashing detergent mixed with gasoline, to force spiny lobsters from their dens. When bleach is injected into a lobster den, it has the effect of 'doping' the lobster, making them easier to catch but quickly destroying the surrounding habitat. Specifically, corals and other organisms are killed by the bleach with fleshy and turf algae rapidly recolonizing the area, thereby making the recolonization by corals and other organisms difficult and slow. Anecdotal evidence also suggests that the lobster den remains uninhabitable for other lobsters for some time after bleaching. These destructive practices are also known to occur in fisheries throughout the greater Caribbean, and indeed, in many other fisheries around the world. The bleach detection kits hit the docks with DECR enforcement and conservation officers performing spot inspections at landing locations and on the water. Due to a mass public awareness campaign by the DECR prior to the implementation date, those fishermen who use bleach chose to leave their bleach bottles at home and not risk the penalties associated with a positive swab—a tremendous success for our clients, partners, and all stakeholders in the industry.

Semester Course Descriptions

BI/EE (NS) Students choose to register for either Biology or Environmental Studies credit

EE (NS) Environmental Studies (Natural Science)

EE (SS) Environmental Studies (Social Science)

LE Swahili

LS Spanish

SS Social Sciences

KENYA

BI/EE (NS) 371 TECHNIQUES OF WILDLIFE

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

BI/EE (NS) 372 WILDLIFE ECOLOGY presents students with the information and conceptual background necessary to understand the underlying ecological principles of the East Africa savanna ecosystem. We will focus on the fundamental processes and inter-relationships between the biotic and abiotic environment. We begin with basic ecological principles, setting them against the background of East Africa. Factors underlying distributions, population biology, and behavioral ecology will be examined along with competition and predation using African examples. Theoretical models will be discussed in light of our observations on field trips.

EE (SS) 302 ENVIRONMENTAL POLICY & SOCIOECONOMIC VALUES provides insight into the broad social context surrounding natural resources to determine effective approaches to resource management. Objectives are to understand socio-cultural 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. Introduction of major constituencies that effect conservation (NGO conservation groups, economic interests, etc.) and their underlying philosophies.

EE 491 (FALL) EE 492 (SPRING) 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 will 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 will be emphasized.

LE 205E 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 Kenya — this phenomenon will be explained in the second course module. The socio-cultural 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 will be reviewed and processed through lectures, field exercises, and classroom discussion. The socio-cultural 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.

COSTA RICA

EE (NS) 377 TROPICAL ECOLOGY & SUSTAINABLE DEVELOPMENT examines the ecological impact of human activity, especially agriculture in a tropical country. The agroecology of important crops will be studied with emphasis on biodiversity as the source of production means and materials. Students will identify renewable and nonrenewable resources and examine their historical use. We will 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 will be examined from ecological, socio-political, and economic viewpoints. Factors that constrain or promote particular options will be included. Basic field techniques and measurements will also be covered.

EE (SS) 303 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 will be presented as parameters to assess the sustainability of development models (at a macro and micro level). Basic concepts of ecological economics cost-benefit valuation techniques will be presented and applied. The roles of local people, government, and private, national, and bilateral aid agencies will be 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 will be examined through the review of specific case studies.

EE (NS) 374 PRINCIPLES OF RESOURCE MANAGEMENT

introduces practical tools used in addressing complex environmental problems including coastal zone planning, guidelines for ecologically sustainable development, environmental impact assessment, fisheries management, and protected-area planning and management. We will review these tools in terms of their application to local issues and to Case Studies from the Caribbean, the United States, Central America, and East Africa.

EE 491 (FALL) EE 492 (SPRING) 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 will 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 will be emphasized.

LS 205E 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 will engage in oral and written grammar and vocabulary exercises and develop Spanish language skills and tools required for their research projects. The socio-culture module helps students 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 home stay — 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.

MEXICO

BI/EE (NS) 379 COASTAL ECOLOGY examines the ecological processes interface between land and sea in order to understand how human perturbations impact both marine and terrestrial systems. The watershed concept will be used to explore nutrient flow, energy cycling, coastal circulation, productivity, and biotic interactions. This course provides a basic understanding of how natural systems work in order to help guide resource managers toward ecologically sound and sustainable decisions. Fieldwork exposes students to techniques of surveying, monitoring, and the study of biotic interactions in a complex physical/chemical milieu.



EE (NS) 374 PRINCIPLES OF RESOURCE MANAGEMENT introduces practical tools used in addressing complex environmental problems including coastal zone planning, guidelines for ecologically sustainable development, environmental impact assessment, fisheries management, and protected-area planning and management. We will review these tools in terms of their application to local issues and to case studies from the Caribbean, United States, Central America, and East Africa.

EE (SS) 303 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 will be presented as parameters to assess the sustainability of development models (at a macro and micro level). Basic concepts of ecological economics cost-benefit valuation techniques will be presented and applied. The roles of local people, government, and private, national, and bilateral aid agencies will be 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 will be examined through the review of specific case studies.

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AUSTRALIA

BI/EE (NS) 369 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 will be presented. We will examine the dynamic relationships between plants and animals including pollination and seed dispersal. On a larger scale, we will examine tropical vegetation patterns along climatic gradients and discuss mechanisms for preserving and restoring tropical ecosystems.

EE (NS) 370 PRINCIPLES OF FOREST MANAGEMENT presents the ecological and analytical tools used in the management of terrestrial, living resources. We will 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.

EE (SS) 302 ENVIRONMENTAL POLICY & SOCIOECONOMIC VALUES provides insight into the broad social context surrounding natural resources to determine effective approaches to resource management. Objectives are to understand socio-cultural 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. Introduction of major constituencies which effect conservation (NGO conservation groups, economic interests, etc.) and their underlying philosophies.

EE 491 (FALL) EE 492 (SPRING) 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 will 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 will be emphasized.

TURKS & CAICOS ISLANDS

BI/EE (NS) 373 TROPICAL MARINE ECOLOGY discusses the interactions that determine the distribution and abundance patterns of tropical marine organisms, with emphasis on the ecology of near-shore 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 near-shore 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.

EE (NS) 374 PRINCIPLES OF RESOURCE MANAGEMENT introduces practical tools used in addressing complex environmental problems including coastal zone planning, guidelines for ecologically sustainable development, environmental impact assessment, fisheries management, and protected-area planning and management. We will review these tools in terms of their application to local issues and to case studies from the Caribbean, United States, Central America, and East Africa.

EE (SS) 302 ENVIRONMENTAL POLICY & SOCIOECONOMIC VALUES provides insight into the broad social context surrounding natural resources to determine effective approaches to resource management. Objectives are to understand socio-cultural 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. Introduction of major constituencies which effect conservation (NGO conservation groups, economic interests, etc.) and their underlying philosophies.

EE 491 (FALL) EE 492 (SPRING) 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 will 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 will be emphasized.

Summer Programs

SUMMER 2008 PROGRAM DATES

Session I: June 9 – July 8

Session II: July 14 – August 12

There are no application deadlines. However, students are urged to submit their application early as programs fill quickly and applications are reviewed on a first come, first served basis, except for the Kenya Environmental Public Health course, which has an early spring deadline. Please see our website for updated information.

Overview

Our month-long, four-credit summer programs combine interdisciplinary lectures with field research exercises and expeditions.

Students in summer programs assist our faculty in conducting research designed to support local communities in natural resource management decision-making.

Each course carries four college-level credits in environmental studies. In some cases, the summer course may fulfill a university's field-study requirement. There are no course pre-requisites for summer courses. The majority of summer participants are college undergraduates, but motivated high-school seniors and recent college graduates may also participate.

Please visit our Web site at www.fieldstudies.org or call 800.989.4418 to order a complete summer course catalog.

Summer Program Descriptions

AUSTRALIA/ NEW ZEALAND

SESSION I: TROPICAL RAINFOREST MANAGEMENT STUDIES IN NEW ZEALAND & AUSTRALIA

SESSION II: TECHNIQUES FOR RAINFOREST RESEARCH IN AUSTRALIA

Rainforest ecosystems are a "hot spot" for faunal and floral biodiversity and provide humans with clean air, water, food, and medicines, yet thousands of acres disappear each day. Large areas of northeastern Queensland were once covered in spectacular tropical rainforests, preserving millions of years of evolutionary history, but agricultural and residential development and global climate change have destroyed and disrupted rainforest habitat, leaving only a fragmented belt. This summer program offers two new four-credit courses, which can be taken back-to-back to provide a thorough introduction to biodiversity conservation techniques and the socioeconomic factors influencing land management in two unique areas.

SESSION I: TROPICAL RAINFOREST MANAGEMENT STUDIES IN NEW ZEALAND & AUSTRALIA

Students compare and contrast the ecological, geographical, social, economic, and historical factors that have shaped natural resource management in far north Queensland and northern New Zealand. These two countries share a similar Gondwanan ancestry; however, indigenous and European settlement patterns and economic development significantly differ between the two countries. In New Zealand, students discover the critically endangered flora and fauna of northern New Zealand and the factors that have led to their disjunct populations. In Australia, students take their New Zealand experiences and examine similarities and differences in political structure, land use patterns, and biogeography.

SESSION II: TECHNIQUES FOR RAINFOREST RESEARCH

Examining the effects of fragmentation in highly endangered rainforest systems, students explore Australia's tropical forests and develop effective rainforest research skills while learning about rainforest conservation.

COSTA RICA

SUSTAINING TROPICAL ECOSYSTEMS: BIODIVERSITY, CONSERVATION, AND DEVELOPMENT

The Republic of Costa Rica is known worldwide for its conservation efforts. More than 25% of the land in the

country is under some type of conservation model and these areas are protecting more than 5% of the entire world's biodiversity. This phenomenon has attracted thousands of tourists to Costa Rica and its parks and reserves. With a population of 4.5 million people, Costa Rica receives more than 1.7 million tourists per year, of which 53% visit national parks to see, experience, and enjoy the biodiversity of tropical ecosystems. The lack of funding necessary to cover park operating costs has created major stress to the park system and surrounding communities. Visitors are demanding and needing increased services that cannot be provided due to financial constraints. As a result, the Ministry of Environment of Costa Rica have asked SFS for assistance in producing useful information through hands-on applied research to better manage the operation of the parks within the conservation areas. Students will learn about the ecological, resource management, and socioeconomic factors impacting the parks and surrounding regions, and will be directly involved in designing and proposing recommendations to park managers in response to the challenges of heavy visitation and threats to conservation goals.

KENYA

COMMUNITY WILDLIFE MANAGEMENT

In recent years, there has been a steady shift in land use from purely pastoral to mixed agropastoral systems in the Maasai group ranches that occupy the land between Amboseli and Tsavo West National Parks in southern Kenya. This land use change is driven by a variety of socioeconomic, cultural, and political factors and is compromising the integrity and quality of dispersal habitats for a wide variety of wildlife species that historically have dispersed across the group ranches while migrating between the parks. Such dispersal hindrances are turning protected areas like Amboseli National Park into ecological islands that cannot sustain natural ecological processes nor maintain the high density and diversity of wildlife species using it for dry season grazing. Students will examine how land use practices within Maasai group ranches (Kuku-Kimana-Mbirikani) can be sustainably managed to enhance the economic livelihood of the local population and at the same time promote wildlife conservation.

FIELD STUDY IN PUBLIC AND ENVIRONMENTAL HEALTH

In the early 1980s Kenya began a process of privatizing open grazing land into group ranches. This significant land use change has forced traditionally nomadic peoples, including the Maasai, onto smaller plots of land. The Maasai, a proud and historically self-sufficient society are now facing many environmental, social, political and economic challenges. The result has increased their vulnerability to



disease and famine, and they frequently rely on relief food and water to survive. This major shift from nomadicism to pastoralism, coupled with adverse environmental conditions, has brought about new health problems for the Maasai, including an escalation in sanitation-related and water-borne diseases, infant and childhood disease, and HIV/Aids. This course will provide students with experience in assessing and analyzing public health and environmental concerns in identified Maasai communities. This program is a graduate-level field course open to both graduate and qualified undergraduates in public health, nursing, pre-med, medical and health sciences. This course has an early spring application deadline. Please check the SFS website for updated deadline information.

MEXICO

PRESERVING COASTAL DIVERSITY: SEA TURTLES AND BAY RESOURCES

Despite nearly two decades of conservation efforts, some species of sea turtle continue to decrease in Mexican waters and are sliding toward extinction worldwide. Bahía Magdalena has played an important role as a refuge for several sea turtle populations, mostly green turtles, but also olive ridleys, and the rare loggerhead and hawksbill turtles. Despite strong regulations against their exploitation, sea turtles are still poached and caught as by-catch in fishing activities. A complex interaction of community social and cultural factors, such as lack of protected area sanctuaries in the area, lack of enough enforcement of existing regulations, and economic hardship in local communities has led to the continued exploitation and the rapid decline of sea turtle populations. Students examine the ecological, societal, and economic issues surrounding sea turtles in Bahía Magdalena.

TURKS AND CAICOS ISLANDS

MARINE PROTECTED AREAS: MANAGEMENT TECHNIQUES AND POLICIES

The reefs of South Caicos harbor an incredible array of marine life — resources that have proven to be critically important for this island community. The importance of these reefs has not guaranteed their survival, however, and the reefs face pollution, dredging, dumping, and damage from boats and divers. The spectacular reefs and waters of South Caicos serve as the laboratory for most of our field work. Students explore the effectiveness of the government-established marine parks in protecting biodiversity and critical habitats, enhancing stocks of commercially important species, and contributing effectively to the socioeconomic sustainability of the local community.



Summer Course Descriptions

KENYA

EE (NS) 350 COMMUNITY WILDLIFE MANAGEMENT introduces students to wildlife management concepts and field skills to investigate the human/wildlife conflict dynamic present in Kenya. This course explores the potential for re-thinking wildlife as a source of income generation, rather than as a competitor for space and water and/or as a threat to human endeavor — which may provide an alternative and sustainable form of human/wildlife co-existence and land-use option. We will explore possible commercial uses of wildlife such as game cropping, regulated sport hunting, and ecotourism. Compare the potential benefits of utilizing wildlife with alternative land-use options such as agriculture.

IH 707 FIELD STUDY IN PUBLIC AND ENVIRONMENTAL HEALTH intensive 5-week field-based course is conducted in Kenya among the Maasai community. Participants get community based hands-on experience in designing and implementing a household health survey; in analyzing data and preparing a report. Participants present and discuss survey findings with community leaders to identify follow-up health discussion, and supervise and coordinate field visits in collaboration with an indigenous NGO with community-based health programs in Maasailand.

COSTA RICA

EE (NS) 352 SUSTAINING TROPICAL ECOSYSTEMS: BIODIVERSITY, CONSERVATION, AND DEVELOPMENT provides students with practical field skills necessary to develop and participate in on-going, long-term, community and tropical ecosystem-based research projects. Students will be introduced to the ecological, economic, and natural resource management issues that surround protected area 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.

MEXICO

EE (NS) 356 PRESERVING COASTAL DIVERSITY: SEA TURTLES AND BAY RESOURCES exposes students to the relationship between the decline in biodiversity and the health of the Magdalena Bay ecosystem. We will identify the most critically threatened areas in Bahía Magdalena to help design a strategy for protecting these resources. Lectures and field exercises: integrated coastal zone management, sea turtle protection, ecological economics, Mexican history and society,

coastal ecology, and fisheries management. The research component of the course will concentrate on the threatened green turtle.

NEW ZEALAND & AUSTRALIA

EE (NS) 354 TROPICAL RAINFOREST MANAGEMENT STUDIES compare and contrast the ecological, geographical, social, economic and historical factors that have shaped natural resource management in Australia and New Zealand. 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 will be able to identify management techniques with regards to biological systems, national boundaries, and political structures.

AUSTRALIA

EE (NS) 355 TECHNIQUES FOR RAINFOREST RESEARCH includes a wide range of lectures and hands-on field activities that will concentrate on developing management recommendations for reforestation practices on the Tablelands of Australia. We will explore the ecological roles, environmental services, and economic benefits of tropical rainforests. Examine the structure and function of Australian tropical rainforests and the roles that humans have played in current forest dynamics. Examine reforestation applications on the Tablelands: the goals, techniques, successes, and the failures. We will develop and maintain an actual rainforest restoration project.

TURKS & CAICOS ISLANDS

EE (NS) 351 MARINE PROTECTED AREAS: MANAGEMENT TECHNIQUES AND POLICIES will focus on lectures, field exercises, and other activities that enable us to understand how the Caicos Bank ecosystem works, its resource development potential, the threats facing these resources, and the role of marine parks in protecting and enhancing these resources and their critical habitats. Particular emphasis will be given to commercially important resources such as conch and lobster stocks. Our project findings will contribute toward developing marine parks policy, management plans, and innovation and technology transfer to assist in the management of marine protected areas.

Admissions Requirements & Instructions

When to Apply

The School for Field Studies reviews applications on a rolling basis, beginning approximately one year before the session begins. While there is no admissions deadline for semester programs, we encourage students to apply early to ensure admission to their program of choice. Semester students should check with their home institution regarding school-specific deadlines. Decisions are generally available within two to four weeks of the date when your application becomes complete. Review cannot begin until all application materials have been received.

Before You Apply

The SFS program will likely be very different from your traditional academic experience and traditional study abroad program. We expect you to take a proactive role in all aspects of your experience including scheduling activities, selecting research projects, managing risk, and supporting the day-to-day operation of the field station. Before applying, be sure to read the program components and relevant information. Please contact the SFS Admissions office at 800.989.4418 with any questions regarding programs.

Requirements and Policies

Applicants for semester programs must be at least 18 years of age, in good academic standing, have completed at least one college-level ecology or biology course, and completed at least one semester of college prior to the start of the program.

*Applicants for the semester program in Costa Rica must have completed a college-level course in ecology or environmental studies, and are encouraged to have taken coursework in international development, economics, or anthropology. Students must have one college-level course in Spanish or otherwise demonstrate a working knowledge of conversational Spanish prior to participation.

Applicants for summer programs must be at least 16 years of age, in good academic standing, and have completed at least their junior year of high school prior to the start of the program.

Applying to SFS

Your complete application for admission includes:

- **SFS APPLICATION FOR ADMISSION FORM.** You may apply online or use the enclosed paper application.
- **PARTICIPATION APPROVAL FORM** to be completed by your study abroad advisor or academic dean. Students from Affiliate Schools should have their form completed by one of the designated Affiliate representatives at their school. Please refer to our Web site to find out if your school is an Affiliate Partner and who your representatives are: http://www.fieldstudies.org/pages/73_affiliation_with_sfs.cfm
- **NON-REFUNDABLE APPLICATION FEE OF \$45** (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. It is not appropriate for this reference to be completed by an undergraduate level TA.
- **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.

Please call the SFS admissions office if you have questions regarding your reference selection. You should request that each SFS reference form be completed and returned to you in a sealed envelope, signed across the back. Supplementary letters of recommendation are welcomed, but, at a minimum, both individuals providing references must complete the SFS reference forms.

Steps to Apply

1. Review program information and prerequisites located in the catalog or at www.fieldstudies.org. Please feel free to call 800.989.4418 if you need help deciding which program is right for you.
2. Collect necessary materials to complete your application.
3. Complete participation approval form.
4. Select application method:
 - Paper application (enclosed)
 - Download a PDF of our application from www.fieldstudies.org
 - Complete our online application at www.fieldstudies.org

If you are submitting a paper application, please return your complete application materials in one envelope to:

The School for Field Studies
10 Federal Street, Ste. 24
Salem, MA 01970-3876

When can I expect to hear a decision on my application?

Once an application is received, you will be contacted by email with information about any missing materials. If your application is incomplete, it is your responsibility to follow up on any missing materials. SFS is unable to begin the application review process until all necessary materials are received. To expedite the completion of your application, we suggest that you submit all of your application materials together. From the date when an application becomes complete, an admissions decision is generally available within two to four weeks. You should apply early to allow sufficient time for your application to be processed. Please note that final acceptance to all programs is contingent upon medical approval.

Medical Approval and Disability Information

PHYSICAL EXAMINATION AND MEDICAL INSURANCE

All acceptances are contingent upon medical approval. You must submit an online medical review form and an SFS physical examination and authorization form signed by a qualified medical professional, within two weeks of acceptance. Please refer to the SFS Web site (www.fieldstudies.org) for information about the medical approval process. Students with late medical forms may forfeit their space on a program. All medical forms will be reviewed by the SFS safety director. You must be able to meet the physical challenges presented by SFS programs without undue risk to yourself or others. Academically qualified individuals may be disqualified from participating on medical grounds. You will not be allowed to join an SFS program without proof of current medical insurance.

Disability Information

Students with disabilities are welcome on SFS programs. However, students with disabilities requesting accommodations are responsible for notifying the SFS safety director of physical disabilities and the SFS program dean of learning disabilities. Notification of disability must be made in writing and submitted within one week of acceptance. 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. Please refer to the appropriate SFS academic handbook for more information, or call us at 800.989.4418 for further assistance.

Dietary Restrictions

If you have any special dietary restrictions, please contact the SFS safety director within one week of acceptance and document the restrictions on your online medical review form. Students with dietary preferences (vegetarian, vegan, etc.) should discuss these with their admissions counselor.

Non-discrimination Policy

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 and 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 loan programs, and other School-administered programs. SFS is an equal opportunity institution.

Tuition, Financial Aid, & Scholarships

Financial Aid

A key component of the SFS mission is to ensure that as many interested and eligible students as possible are able to participate in SFS programs. Since our founding in 1980, close to 13,000 students have taken advantage of our semester or summer programs in all corners of the world. However, a significant challenge for a number of potential SFS students is the ability to meet our program and travel costs. Therefore, SFS has developed a range of financial resources to support our students.

SCHOLARSHIPS

SFS General Scholarship Fund: awards are need-based. All SFS students are eligible to apply. Maximum \$5,000 for semester; \$2,000 for summer.

Andreas Family Foundation Scholarship: awards are need-based. Eligibility is limited to students attending US public institutions and is for semester programs only. Maximum award \$5,000. *Andreas Family Fund Scholarship Application Deadlines: October 15 for spring programs; March 15 for fall programs.*

SFS Travel Grants: need-based awards meant to help offset the cost of travel to SFS programs. Preference will be given to those students participating in Kenya and Australia programs, where the cost of airfare is significantly higher than other SFS programs.

Heather Jo Leibowitz Memorial Scholarship for Kenya - \$1,000

Awards are need-based and available only to students on the Kenya program. In remembrance of Heather, preference will be given to students who have a commitment to making a difference in the lives of resource dependent communities in Kenya.

McKee Scholarship

This endowed scholarship was made possible by the generosity of Charles D. McKee, a member of the SFS Board of Trustees and father of SFS Alumna Heidi McKee. It is awarded on an annual basis to a financially deserving student attending any SFS summer or semester program.

Erin L. Bergstrom Memorial Scholarship

Awards are need-based and available only to students at the University of San Diego. Preference will be given to students who have both a commitment to preservation of the environment, and have demonstrated leadership skills at the University or in their communities.

Fountain Scholarship

This scholarship provides tuition assistance to those SFS applicants who (a) have spent the substantial part of their childhood and teenage years growing up in an

urban/city environment (whether in the US or internationally); (b) demonstrate financial need; and (c) demonstrate a commitment and concern for environmental issues. This scholarship is made possible by the generosity of SFS alumnus and noted film director of *The Fountain*, Darren Aronofsky.

LOANS

Zero Interest Loans

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 current financial resources and total program cost. This loan is set at a competitive market rate with manageable repayment terms.

Many applicants receive aid through their home schools or other outside sources. You may qualify for SFS assistance even if you are not receiving aid from your home school.

If you will need financial assistance please complete an SFS Financial Aid Application as soon as possible. Financial aid applications are reviewed following acceptance. For an application or more information on how to qualify for assistance, please call the SFS admissions office at 800.989.4418 or visit www.fieldstudies.org.

SEMESTER STUDENTS: A growing number of 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. We encourage you to investigate applying for federal financial aid funds including loans through your home school. Because the credits you earn for your SFS participation will, in all likelihood, be applied toward your degree, your school should be able to process a Stafford Loan to assist your SFS participation. If you encounter difficulty in arranging to use federal financial aid funds for your SFS program, please contact the SFS admissions office at 800.989.4418 and we will do our best to assist you.

Deposits and Tuition

Payment of a non-refundable program deposit is due 10 business days following acceptance to an SFS program. Semester: \$650; Summer: \$450. All deposit payments are non-refundable EXCEPT in cases where SFS financial aid is sought.* Students who are accepted on a contingency basis and elect to pay the deposit are NOT eligible for a

deposit refund should the student fail to meet the required contingency. Final tuition payment is due no later than 60 days prior to the start of the program.

**You must complete and return the financial aid application within 10 business days of acceptance to qualify for refund status on your program deposit.*

Refund Policies

SEMESTER

If you withdraw by notifying SFS in writing, the following amounts will be refunded:

- Withdrawal 61 days or more prior to the first day of the program = 100% refund of total program cost (less deposit).
- Withdrawal 60-31 days prior to the first day of the program = 50% refund of total program cost (less deposit).
- Withdrawal 30 days prior to 14 days after the start of the program = 25% refund of total program cost (less deposit).
- Withdrawal 15 or more days after the start of the program, or if a student is asked to leave the program = NO REFUND.

Students may transfer the non-refundable deposit to an SFS course within the next 12 months subject to acceptance.

Financial aid candidates: deposits are refundable if withdrawal is less than 10 days following financial aid offer. (You must complete and return the financial aid application within 10 business days of acceptance to qualify for refund status on the deposit). Application fees are non-refundable.

SUMMER

If you withdraw by notifying SFS in writing, the following amounts will be refunded:

- Withdrawal prior to 60-22 days before the start of the program = 100% refund of total program cost (less deposit).
- Withdrawal 21-0 days prior to the start of the program = 50% refund of total program cost (less deposit).
- Withdrawal after the program starts = NO REFUND.

Students may transfer the non-refundable deposit to an SFS course within the next 12 months subject to acceptance.

Financial aid candidates: deposits are refundable only if withdrawal is less than 10 days following financial aid offer. You must complete and return the financial aid application within 10 business days of acceptance to qualify for refund status on the deposit. Application fees are non-refundable.

SEMESTER COSTS FALL 2007 – SPRING 2008

*Program Costs for Fall 2008 will be determined in March 2008

Program	Tuition	Program Fees	Total Program Cost
Kenya	\$10,700	\$4,965	\$15,665
Australia	\$10,700	\$4,830	\$15,530
Turks & Caicos	\$10,700	\$4,325	\$15,025
Costa Rica	\$10,700	\$4,325	\$15,025
Mexico	\$10,700	\$4,325	\$15,025

SUMMER COSTS 2008

Program	Tuition	Program Fees	Total Program Cost
Kenya Public Health	TBD	TBD	TBD
Kenya Wildlife Mgmt	\$2,610	\$1,505	\$4,115
Australia	\$2,610	\$1,470	\$4,080
Turks & Caicos	\$2,610	\$1,260	\$3,870
Costa Rica	\$2,610	\$1,055	\$3,665
Mexico	\$2,610	\$870	\$3,480

Academic Credit

SFS participants are registered at and receive transcripts from Boston University, which accredits SFS programs. The only exceptions are students from SFS Affiliate and Consortium schools who receive credit directly from their home institutions.

All SFS courses are approved and assigned course numbers by Boston University. SFS semester programs incorporate four courses and carry a total of 16 semester-hour credits (Costa Rica and Kenya programs carry 18 semester-hour credits) in biology or environmental studies from Boston University. Summer courses carry four semester-hour credits in environmental studies. Participants receive an official transcript from Boston University approximately six to eight weeks after the conclusion of the program for delivery to the office responsible for credit transfer at their home institution.

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. Therefore, you should check with your advisor/registrar when applying to our programs to learn how your SFS course work will be applicable for credit in your degree program. If you have questions regarding credit transfer, please call the SFS admissions office at 800.989.4418. In most instances, we can direct you to someone on your campus familiar with credit transfer for SFS programs.

The SFS Affiliate Program

The SFS Affiliate Program assists students in maximizing their SFS experience by building better linkages to the academic community from which SFS students are drawn. Students from Affiliate institutions receive preferential admission and financial aid from SFS. Affiliate schools typically provide direct academic credit for SFS participation and have curricular input into our programs. Each Affiliate school has at least one SFS liaison who is available to provide on-campus advising on our programs. All applicants must obtain permission from their study abroad office or academic dean to participate in our programs. Applicants from Affiliate schools must obtain permission to participate from their campus Affiliate Representative. Please use the enclosed participation approval form.

Current SFS Affiliate Member Schools

Adelphi University
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Albion College
Ms. Lynn Del Cid-Neddo
Dr. Timothy Lincoln

Albright College
Dr. Stephen Klein
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South Paris, Maine

Alumni Profiles



LIAM CARR

TURKS AND CAICOS, SPRING 1997

Ph.D. Candidate, Geography, Texas A&M University

*B.S. Marine Biology, B.A. Environmental Studies; University of Southern California, 1999
M.F.S. Resource Economics; Yale University, 2001
M.Ed. Secondary Education; Sacred Heart University (in progress)*

"Had I not gone to South Caicos, I would be a failed medical student today," says Liam Carr, who instead is obtaining his Ph.D. in geography at Texas A&M. Liam nearly ended up on the Kenya Community Wildlife Management program, but thanks to the program being full, he enrolled in his back-up choice and spent the spring of 1997 in the Turks and Caicos Islands on the SFS

Marine Resource Management program. His path post-SFS has led him down some interesting roads and into some spectacular waters.

Prior to enrolling at Texas A&M, Liam worked for two years at the University of the Virgin Islands on St. Croix where he conducted research on coral reef health, sedimentation rates, and fish populations. The research followed a "day of diving, week of data analysis" schedule; there were times when his team was dragging the boat all over the island for dives, and other times where months went by without getting a toe wet. Long-term transects were set on various reefs where Liam and his team dove to record coral colony sizes and changes in health. They would conduct fish counts and invert counts (especially sea urchins), and video each transect and sometimes take still photos of certain coral heads. Finally, the team collected sediment traps which, along with everything else, went back to the lab, where there was a computer set up just to analyze the video and still images. Every round of diving would lead to 21,000 unique data points which needed to be identified and entered. And depending on what was happening to the reefs (bleaching was a big issue that year and as a result some of their video footage made the NBC evening news), the team repeated the process every three to six months. On top of that, Liam gave school presentations about marine debris, pollution, and sea turtles.

Liam credits his knowledge of Caribbean fish, inverts, and corals, which he gained during his semester with SFS, to his success with the University of the Virgin Islands. Those skills coupled with his independent research are what he believes set him apart from the other applicants for the available Ph.D. spot in the Texas A&M geography program. And from Belize to the Virgin Islands, he continues to draw on those skills today.



MARC HEISTERKAMP

COSTA RICA, SUMMER 2001

*MBA, George Washington University (Anticipated)
B.S. Biology and Natural Resources; Principia College*

Marc began investigating SFS as a potential study abroad program because he felt that it was imperative to get hands-on conservation experience in the developing world. In the summer of 2001 he found himself in the countryside of Costa Rica studying sustainable development issues with SFS. Today, Marc works for a nonprofit organization called the

U.S. Green Building Council, whose mission is to promote buildings that are environmentally responsible, profitable, and healthy places to live and work. The organization is best known for the Leadership in Energy & Environmental Design (LEED®) Green Building rating system which has set the standard for the design, construction, and operation of buildings to high environmental standards. He is currently leading the development of a voluntary partnership program where major real estate owners can utilize the LEED rating system throughout a large portion of their buildings. Marc works on program design; builds relationships with major companies, universities, and other real estate owners; deciphers technical building standards; and countless other activities. Working in a dynamic program at a fast growing organization means that his everyday work is continuously evolving.

Marc credits his time spent with SFS as an important role in his education and broader experience that has lead him to where he is today. Overall, he recognizes that his heavy science background has made him a strong analytical thinker, a skill that he has found incredibly valuable in the professional world.

Marc jokingly comments that, "In undergraduate (studies) I learned how to count bugs and in graduate school I learned how to count beans. It's actually an exciting combination that helps me bridge the traditional gap between the environmental and business communities. The viewpoints and needs on both sides aren't as divergent as most people think, however the terminology and mindset of each side causes an unnecessary disconnect."

KAIRA WAGONER

KENYA, SPRING 2005

B.S. Biology/Health Science; Guilford College

Kaira is the co-founder of the ClaySure Water Project (www.claysure.org) and will be heading to Maputo, Mozambique to build a sustainable water-filter factory aimed at providing access to safe drinking water. Her interest in water issues was piqued while enrolled in the spring of 2005 SFS Kenya Community Wildlife Management program. Upon request from a local Maasai woman, Kaira set out to fill two large carafes with water from the nearby stream. She was taught to be careful not to stir up the water but to skim from the top to avoid collecting dirt and silt in the carafe. As she skimmed, she thought about the use of the water, knowing it would be consumed and used for cooking, and also recognizing that it was the same water that she had seen the cattle, sheep, and goats drinking from and defecating in upstream. It was also the water that was quickly being depleted by agricultural irrigation

upstream and the water that would soon disappear, since the glaciers of Mount Kilimanjaro, the source of most water in the region, were disappearing at an alarming rate.

Kaira carried the full, heavy carafe on her back by looping its rope handle across her forehead. Making her way up the steep, muddy hill, she felt overwhelming respect for the Maasai women who did this task daily. Providing people with access to potable drinking water has become a mission for Kaira and she has extreme gratitude for SFS for providing her with an unforgettable, and no doubt, life changing experience.

Upon return to the states and armed with knowledge and motivation gained while on her SFS program, Kaira teamed up with Reynaldo Diaz and dreamed up a plan of establishing a water-filter factory which could supply safe and affordable drinking water to individuals in need. Following the model of the water-filter factory established by the organization Potters for Peace (www.pottersforpeace.org) the pair settled on Mozambique as their target country, where less than

40% of the population has access to safe drinking water.

The goal of the ClaySure Water Project is to abate waterborne disease in Mozambique by creating affordable access to potable water. There are three major components to the ClaySure Water Project. The first is the establishment of a sustainable factory, which will produce highly effective filters and will provide lucrative jobs in a country where 78.4% of the people live on under \$2 per day. The second component of the project is to hire and train individuals from rural villages to work in the ClaySure factory to build ceramic water filters. Not only will this provide entire rural communities with a method of attaining safe drinking water, but it will also provide potters with an additional source of income. The third component of the project is education. Potters for Peace has found that education is one of the most important tools in gaining acceptance for the filter. ClaySure will provide health and sanitation training to Mozambican communities by visiting schools and holding free community workshops.

SFS Glossary of Terms

Case study: Case studies provide an analysis of an actual local environmental situation or dilemma requiring both a decision and action. SFS uses local case studies to give students an interdisciplinary and holistic understanding of the background, context, and relevance of environmental issues surrounding the community. The center director and faculty develop two or three case study questions each semester. Within the case study format, the lecture courses provide the theoretical framework, background, and essential tools necessary for students to carry out their Directed Research projects. Faculty work with students so that students understand the case study problem and can identify potential solutions and alternatives.

Communal living: Students live and learn within a small group (20 to 35) alongside international staff. Students share a room with three to eight other students, share bathroom facilities, common areas, computer labs, and dining areas. Communal living at these facilities means everyone shares the responsibility for the upkeep and functionality of the station. Respect for one another and the facility is key.

Community involvement: SFS centers are located in small, remote villages, making community involvement an important element of our programs. Students spend approximately 20 hours per semester involved in various community service activities, such as tutoring in local schools. Our close relationship with the communities where we work were cultivated and continue to be strengthened by our strong involvement and commitment to the well-being of the local people.

Cross cultural competency: Cultural competence is defined as the ability of individuals and systems to work or respond effectively across cultures in a way that acknowledges and respects the culture of the person or organization being served. Culturally competent SFS students are aware and respectful of the values, beliefs, traditions, and customs of the countries where they are a guest.

Cultural immersion: Our definition of cultural immersion strays from the common perception of the term. At SFS, this means: 1) We live in, conduct research in, and give our time to bettering the communities where we are located; 2) We work with local stakeholders to design and perform research projects that directly benefit the local community; 3) Students present their research findings to the community at the end of the semester; 4) Students are guided, and in some cases take classes, on the

history and cultural practices of the community where they are studying (such as cultural field trips, weekend home stays, language instruction, participation in local festivals, etc.); 5) Students engage in community service projects with local community members and/or NGOs.

Directed research: SFS semester students conduct Directed Research projects and report their results to community stakeholders. The topics are defined by the centers' five-year research plans and are based upon the local communities needs. Each semester, students are presented with three or more possible Directed Research project options. After selecting an option, students then research and develop specific aspects of the project into their individual papers (see course description for more details).

Experiential learning: Students will learn by experiencing the topics firsthand. While you will receive some lectures in a classroom, you will also regularly venture out into the field for lectures, to conduct research, and to take field trips. On SFS programs, the field is your primary classroom. Lectures and classroom work support and enhance the work that you do in the field. Processing that information and applying it to your field work and research is key to our model.

Faculty mentoring: SFS students are closely mentored by our faculty teams — this is key to the SFS educational model. Every SFS field station is staffed with a center director and two or three full-time faculty who are trained in marine and terrestrial ecology, natural resource management, socioeconomics, and policy.

Field exercises: Hands-on activities that reinforce the academic material presented in classroom lectures, teach students field techniques, how to apply data analyses, and receive training required to prepare them for their Directed Research projects.

Field research: During field exercises and Directed Research, students will learn field research techniques necessary to design experiments and gather data in the field. In addition, students will also be expected to analyze their data and write up their research into a scientific report/paper.

Field station: Home to dozens of scientists and researchers devoted to the research topics of their respective stations. Students join these dedicated teams — living, eating, and researching with them in pursuit of solving real-world environmental problems. Our field

stations are remote, yet well-integrated into the community, fully operational laboratories. The living conditions are basic but have fully functional kitchens, running water, and electricity (including slow Internet connections).

Five-year research plan: Defined by SFS staff, a research advisory committee, local clients, and the community to develop research priorities and projects that address critical environmental problems. The purpose of the plan is to develop long-term research projects that utilize the expertise of SFS faculty while providing useful research to local stakeholders. The research direction also provides the community and students with a framework for the direction of student coursework and research projects and how such courses and research fit into the bigger picture of natural resource conservation.

Interdisciplinary: SFS draws from many fields of study in its programs to give students the most well-rounded, comprehensive view of the environmental problem and natural resource use solutions they are studying. Ecology, biology, economics, environmental studies, anthropology, culture, and language all come into play when studying on an SFS program.

Service learning: SFS is committed to identifying environmental issues critical to the communities where we work, researching these topics, providing results and recommendations to these community stakeholders, and also volunteering within the community on projects that are beneficial to its members. Such an integration of curriculum and service help our students understand the local community from a different viewpoint — instead of an outsider examining the community, the students are volunteering for the community and understanding community issues first hand. Examples of community service completed in past SFS programs include planting trees; beach clean-ups; sponsoring community festivals for local children; tutoring students in English, math, and science; and volunteering in local hospitals.

Sustainable living: At times, the constraints of operating in underdeveloped nations make living in a perfectly sustainably sound manner difficult and unreasonable. Sustainable living at our field station locations varies greatly from sustainable living in the U.S. Examples of how we live sustainably at some of our centers include students taking cold-water showers, composting, hanging clothes to dry, and using electronic PDFs for handouts and reports for classes.



10 Federal Street, Suite 24
Salem, MA 01970-3876

P: 800.989.4418
F: 978.741.3551

www.fieldstudies.org