

## Key to the World Biogeographical Provinces

|                                                                                   |                                                                                   |                                                                           |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------|
|  |  | Tropical Humid Forests                                                    |
|  |  | Subtropical and Temperate Rainforests or Woodlands                        |
|  |  | Temperate Broad-leaf Forests or Woodlands and Subpolar Deciduous Thickets |
|  |  | Temperate Needle-leaf Forests or Woodlands                                |
|  |  | Evergreen Sclerophyllous Forests, Scrub, or Woodlands                     |
|  |  | Tropical Dry or Deciduous Forests (including Monsoon Forests) or Woodland |
|  |  | Tropical Grasslands and Savannas                                          |
|  |  | Temperate Grasslands                                                      |
|  |  | Warm Deserts and Semideserts                                              |
|  |  | Cold-winter (continental) Deserts and Semideserts                         |
|  |  | Tundra Communities and Barren Artic Deserts                               |
|  |  | Mixed Mountain and Highland Systems with Complex Zonation                 |
|  |  | Mixed Island Systems                                                      |

## The School for Field Studies

1989

# A • N • N • U • A • L R • E • P • O • R • T



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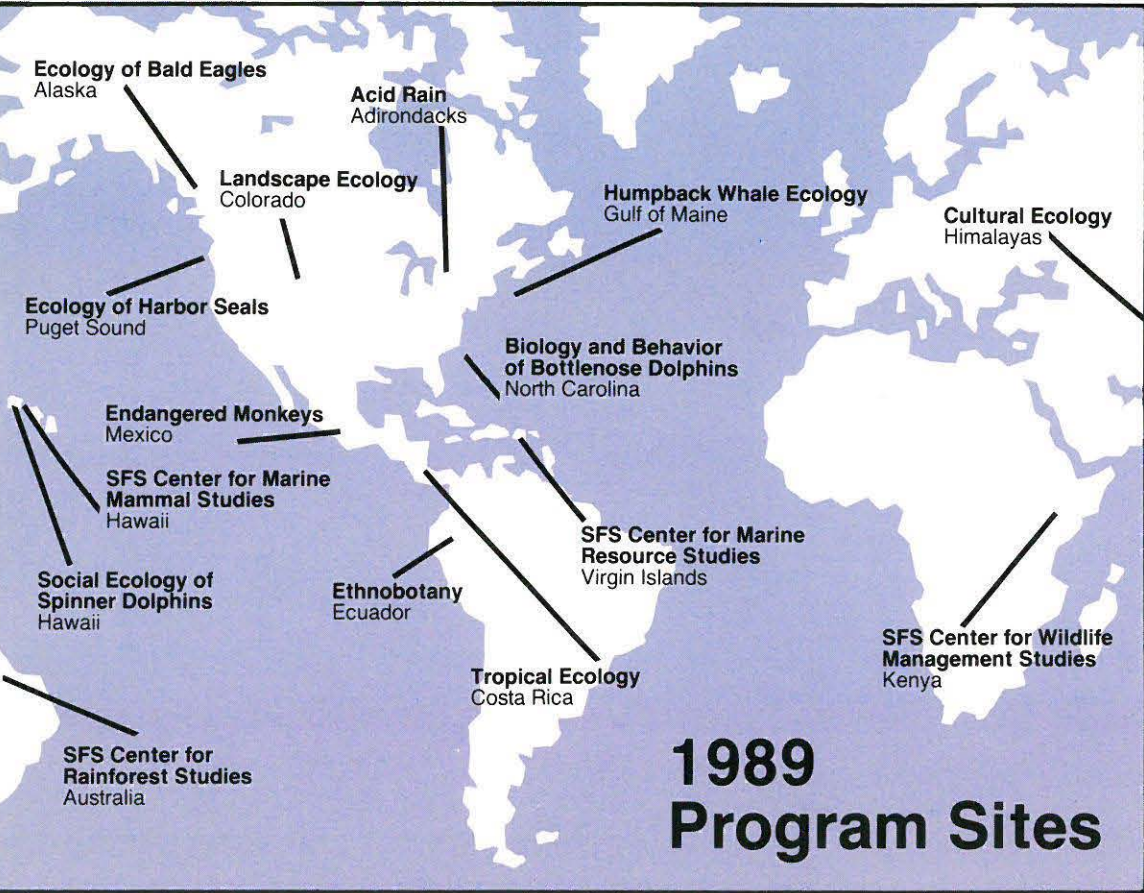
Cartography by T. Oberlander and J. Odenweller.

1988-1989 Curriculum

| Wildlife Ecology and Management                                      |   |   |   |   |   |
|----------------------------------------------------------------------|---|---|---|---|---|
| SFS Center for Wildlife Management Studies/Kenya                     |   |   |   |   |   |
| Wildlife Ecology and Management                                      | X | X |   | B | A |
| Wildlife Management                                                  |   |   |   | B | B |
| Cultural Ecology: Conflicts in Ecological Management/Himalayas       |   |   |   | A | B |
| Ecology of Bald Eagles/Alaska                                        |   |   |   |   |   |
| Marine Biology and Management                                        |   |   |   |   |   |
| SFS Center for Marine Resource Studies/U.S. Virgin Islands           |   |   |   |   |   |
| Marine Biology and Management                                        | X | X |   | A | A |
| Coral Reef Ecology                                                   |   |   |   | B | B |
| Marine Parks Management                                              |   |   |   |   |   |
| Plant Community and Ecosystem Ecology                                |   |   |   |   |   |
| SFS Center for Rainforest Studies/Australia                          |   |   |   |   |   |
| Biogeography: Patterns of Ecological Diversity                       | X | X |   | A | B |
| Tropical Species Diversity                                           |   |   |   |   |   |
| Acid Rain: Changing Aquatic Ecosystems/Adirondacks                   |   |   | B | A | A |
| Ethnobotany: Uses of Plants by Native Peoples/Ecuador                |   |   |   | B | B |
| Tropical Ecology: The Dynamics of Deforestation/Costa Rica           |   |   |   | A | A |
| Landscape Ecology: Designing Parks for Preservation/Colorado         |   |   |   | B | A |
| Animal Behavior and Conservation                                     |   |   |   |   |   |
| SFS Center for Marine Mammal Studies/Hawaii                          |   |   |   |   |   |
| Marine Mammal Biology and Conservation                               |   | X |   | A | B |
| Biology and Behavior of Bottlenose Dolphins/Beaufort, North Carolina |   |   |   |   | B |
| Ecology of Harbor Seals/Puget Sound                                  |   |   |   |   |   |
| Endangered Monkeys: Social Ecology of Stumptail Macaques/Mexico      |   |   | B | B | B |
| Social Ecology of Spinner Dolphins/Hawaii                            |   |   |   | B | A |
| Humpback Whale Ecology/North Atlantic                                |   |   |   | B | A |

A: Introductory

B: Advanced



Chairman and President's Letter

Public awareness of environmental problems increases daily. It is hard to think of a single popular or professional journal that has not devoted significant print to the subject. For most readers, the issues surrounding the environment seem overwhelming, beyond their control.

However, as shown by Gregg Easterbrook in a special *Newsweek* report on the environment, much of what we read is misleading. He writes, "In the aftermath of events like the Exxon Valdez oil spill, every reference to the environment is prefaced with the adjective 'fragile'." He goes on to explain that, in actuality, the environment is *not* fragile. Rather, the particular conditions which sustain human life are fragile; and if we continue to spoil them, other species will no doubt thrive and take our place.

SFS courses are designed to stand students in the face of the enormity of our environmental illiteracy and to challenge them to get their hands dirty unraveling the confounding factors concealing solutions. Their relationship to the Earth moves from one of the passive observer to active participant. They recognize that the problems they research are not likely to be resolved in their own lifetimes, but that their contribution, no matter how small it may seem, adds momentum to finding a solution.

A recent graduate of our **Deforestation** program reported, "We planted and measured trees, helping to increase the size of the endangered forests. I was helping! But most of all, I was learning more about why the destruction is occurring. I was finding out where the compromises need to be made, and how much depends on those." Our students take home an environmental ethic that will be with them as they grow to assume positions of influence in science, government, business and education.

That nature is fundamentally indifferent to the survival of our species, and that it is up to us to address and manage our impact on the environment, is a profoundly inescapable realization. It is just this realization which propels our students to investigate problems that are far bigger than themselves. They are challenged to wrestle with the fundamental question of how humankind might utilize natural resources in such a way to insure these resources are available to succeeding generations.

This question is increasingly in the forefront of the conservation

movement, as efforts to preserve nature come to be seen as only one method or tool of conservation, applicable in limited situations. Correspondingly, SFS has shifted our curriculum from a primarily ecological approach to a more comprehensive resource management focus, which includes an ecology/conservation biology component. Our programs are becoming interdisciplinary explorations of topics such as sustainable development.

And indeed this topic will be the focus of the School's fifth campus, scheduled to open in 1990. At the Center for Sustainable Development Studies in Zimbabwe, SFS students will research issues of resource utilization, conservation and competition, not just with a textbook or theoretical approach. They will see it, feel it and live it in a way that makes it real and vital ...worth worrying about.

It has been a year of change for SFS. We have a largely new staff and faculty, two new Centers ready to open, and a fresh, new group of students. In some ways, it feels like we are in a start-up mode, creating the organization all over again, and yet, we are gratified and astonished at how far we have come.

We have continued to emphasize expansion of the semester programs. Our pilot semester on marine mammals was successfully conducted in Hawaii, and we look forward to developing a permanent site in Baja, Mexico in 1990. At the Center for Rainforest Studies in Australia, we began construction of new academic and residential facilities. We launched the Master Teacher Program to strengthen our summer satellite courses, which will be phased in over the next three years. We continued a project to affiliate with major colleges and universities and added nine this year towards our goal of forty. Our National Science Foundation grant was renewed, creating a unique opportunity to support minorities and women interested in a science career.

We are grateful to the hundreds of people who make SFS possible, including students, staff, donors, advisors and Trustees. We especially want to acknowledge and thank our field staff and faculty, upon whose tireless efforts we rely to deliver the promise of SFS to our students. By all accounts, but most importantly that of the students, they have made an immeasurable contribution in the lives of 569 students this past year and nearly 3,000 students since we

began, 9 years ago. In particular, we want to thank Dr. Robert Singer as he leaves SFS. Over the past 6 years, Bob has been instrumental in virtually every aspect of the School's development.

Reflecting on this challenging year, full of change and uncertainty, we are drawn to what makes creating this school so worthwhile: the power of the SFS experience in the lives of our students. If we ever cease to be moved by their articulation of what they have learned and how they have grown and been challenged, then it will be time to close up shop and move along. Until then, we have just begun to touch the potential that SFS has to reach the young people of this country, and with your help, we will continue to do so.

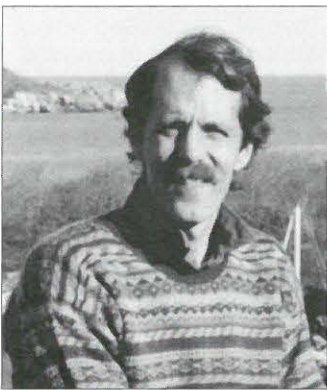
Sincerely,

*James L. Elder, Jr.*

**James L. Elder, Jr.**  
**President**

*Terry L. Andreas*

**Terry L. Andreas**  
**Chairman**



(Photo credit: Sally Padden)



(Photo Credit: James Elder)

## Background

**A**ppropriate management of our environment is fast emerging as a top international priority for the future well-being of humankind. We have limited natural resources and are faced with accelerating technological change. In order to make the rational choices necessary to maintain, and hopefully improve, the quality of life we now enjoy, we must understand the increasingly complex relationship between development and resource conservation.

If we are to prepare successfully tomorrow's leaders and decision makers to assume responsibility for the management of critical resources, we must act now to address a widespread environmental illiteracy among young people. We must educate young people about the complexities of real world environmental issues. We must assist and inspire them to make environmental issues their own.

The School for Field Studies (SFS) was founded in 1980 to address this need. SFS offers undergraduates the opportunity to learn firsthand about real world environmental issues. SFS's twelve-week semester and thirty-day summer programs are intense academic and scientific experiences, currently accepted for academic credit at over 100 colleges and universities nationwide. A unique combination of practical, experiential training and theoretical classwork results in a powerful synergy of learning where students become literally and figuratively immersed in their studies. Through SFS, students are actively engaged in the search for solutions to environmental problems.

SFS student research teams currently operate at 15 sites on five continents, including three year-round field research centers in the U.S. Virgin Islands, Kenya and Australia. The SFS Center for Marine Mammal Studies (temporarily based this year in Hawaii) is scheduled to open in the Spring of 1990 in Baja, Mexico. For the duration of their course, students are totally immersed in the ecosystem they are studying. The experience of spending a significant period of time as part of a small team, operating under rigorous field conditions, affords young adults a rare opportunity to reflect on their individual strengths and weaknesses as students, and more importantly, as people. The personal examination and growth experienced by SFS students is an integral compo-

nent, equal to that of the intellectual exercise.

### Operating Priorities

SFS has set forth an unusual ranking of priorities for resource allocation as part of our operating principles. They are:

#### *To Maximize the Quality of the Faculty/Student Relationship:*

We view the learning process as a "contact sport," in which knowledge is transferred as directly and immediately as possible from one who knows to one who wants to know. Thus, our highest priority is to refine our own understanding of who makes the very best teachers and how SFS can develop their talents further. It is our policy to keep student/faculty ratios very low (normally 7 to 1), and to have faculty available and involved on as close to a 24 hour per day basis as possible. We seek faculty who are mentors, role models and leaders in the fullest sense of the word. Academic degrees and scientific experience are important; the ability to inspire, challenge and motivate is critical.

#### *To Maximize the Educational Setting:*

The environment in which one learns is second in importance only to the people from whom one learns. The proper environment inspires curiosity, the highest impulse available for stimulating the urge to learn. The opportunity to live what one is learning

requires a dramatic, awe-inspiring setting, free from distractions. In the case of the natural sciences, it also requires unique ecological and biological features.

#### *To Maximize the Learning Process:*

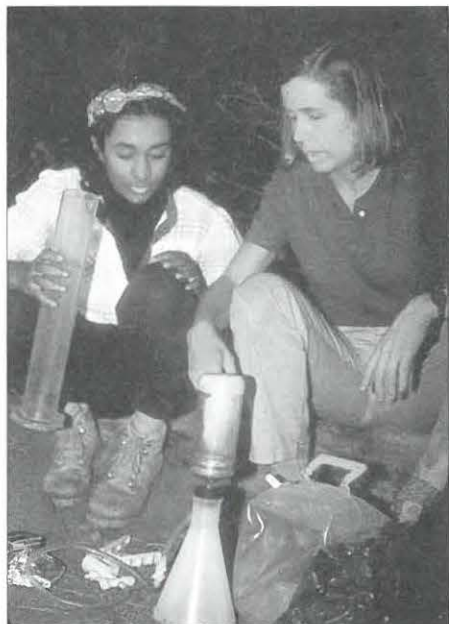
Most educational debate revolves around what subject material should be taught. Yet more important is how the subject material is to be taught. Learning from textbooks is incomplete. Opportunities to practice and test new concepts and information from what one reads must be immediately available for the learning process to be successful. Emotional engagement by the student is essential for learning to be valued and valuable. Thus, the subject material must be relevant to everyday concerns.

#### *To Maximize the Physical Hardware:*

Classroom buildings, laboratories, equipment and libraries are all important. For SFS, they are on the list of priorities, but are last, not first.

### Building for the Future

Our target for the School's eleventh anniversary in 1991 is to reach an enrollment of 800 students, 300 of whom participate in semester programs and 500 in satellite courses. This will require establishing a total of 6 year-round Centers and 12 satellite sites. In addition, we expect to continue to explore and test new markets, such as the potential for a year-long program and perhaps a 2 year major offered by SFS in conjunction with a consortium of four-year schools. We plan to continue to increase foreign student enrollment as part of our goal of reaching a truly international student body, and to increase the number of host country scholarships we award as part of our recognition of the need to provide opportunities for students from less advantaged countries to study their own resource management problems.



*A key component of the SFS educational model is the unique working relationship between undergraduates and faculty who share research goals.*

## Academic and Scientific Affairs

**A**s we review the accomplishments of the past year and note the directions shaping our future, we must acknowledge the central reason behind SFS: our faculty, our staff, and more importantly, our students are committed to an environmentally sound and sustainable future for our small planet. As the human population surpasses five billion people, demands on natural resources and conflicts between human needs and those of nature escalate. We are committed to conservation of nature in a form that enriches the lives of this and future generations. Our programs are the embodiment of that commitment.

Students with a variety of interests participate in SFS programs, but all come to SFS with a common goal: to gain a sophisticated understanding of conservation. Real understanding requires hands-on work. SFS believes that meaningful learning occurs in small groups of students working in the field; fieldwork is not an accessory to conventional classroom activities, but an essential and central aspect of education.

SFS implemented seven semester programs and 30 month-long courses during the 1989 academic year. Our curriculum incorporates four areas of concentration: **Animal Behavior and Conservation, Marine Biology and Management, Wildlife Ecology and Management, and Plant Community Ecosystem Ecology.** These programs served 569 students, for a total of 25,092 student field days.

SFS fills a need for colleges and universities that are unable to offer environmental fieldwork opportunities to their undergraduates. In order to build closer links to these institutions, we continued to develop the Affiliation Program. Thanks to its Director, Rick Wetzler, the Program, designed to link SFS with the Environmental Science

and Biology departments of 40 selective institutions, has had a successful start. Nine institutions (Case Western Reserve, Denison, Hiram College, Miami University, Davidson, Dickinson, Lang College, State University of New York and Wells College) enrolled in the resulting "Field Studies Consortium" during 1989, increasing opportunity and scholarship funding for students of Affiliated Schools.

This year, we implemented successful semester programs in Kenya, Hawaii, Australia and the Virgin Islands. The Hawaii program was our first full semester focussed on marine mammal biology and conservation. Students and faculty accomplished significant research on whales and dolphins off the Northwestern coast of the big island, under the leadership of Field Director, Beth Matthews. The Center for Marine Mammal Studies' scheduled move to Baja, Mexico this fall was unfortunately delayed by an unanticipated lack of government authorization; but thanks to Vice President, Joe Madison's efforts, we have recently entered a cooperative agreement with the Universidad Autonoma de Baja California Sur and expect to open the Mexico Center for the Spring semester of 1990.

An equally exciting new venture is the establishment of a Center for Sustainable Development Studies in Zimbabwe. SFS has joined forces with Brown University's Department of Environmental Studies to organize several colleges and universities into "The Sustainable Development Studies Consortium." Current members are: Allegheny, Bowdoin, Brown, Colby, Dickinson, Middlebury and Williams. The new Center's curriculum has evolved from a recognition that effective development efforts must be characterized by consideration of both human needs and demands on the environment which do

not degrade resources, and allow for their indefinite utilization. The semester program in Zimbabwe is scheduled to begin in Spring, 1990.

The direction of the Zimbabwe Center will also be reflected in our summer course offerings in 1990.

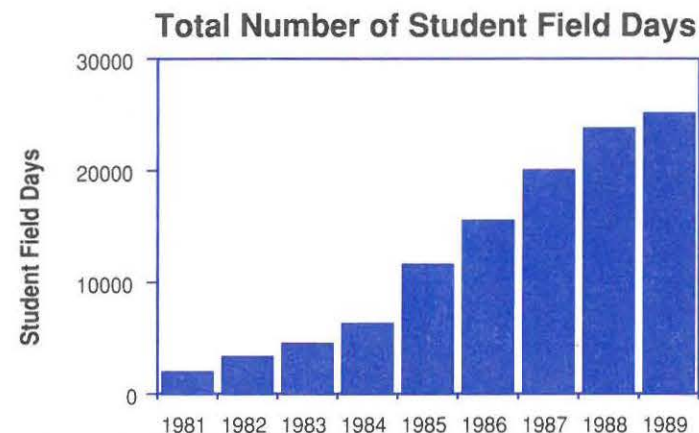
The Dean's Office is developing month-long programs that focus on the relationship between socio-economic change and conservation. Currently under consideration are courses which address the environmental challenges of development in South Asia and the conflict between wildlife and increasing populations in several U.S. locations. We have also worked closely with the Center for Marine Resource Studies Faculty to place greater emphasis on both the cultural context in which marine species and ecosystem conservation takes place and on the field of resource management. Each of our Centers will soon adopt a similar approach.

To broaden our base of high-quality teaching and to increase faculty retention, we initiated the "Master Teacher Program." Relatively senior scientists are invited to propose summer courses of their own design and conduct them for three to five consecutive years. In 1989, the Program's first year, 54 courses were proposed. In 1990, we will offer one Master Teacher course; its participants will research interaction between the honeyguide bird and local peoples in Kenya. We plan to replace 10 (or two thirds) of our summer courses with courses taught by Master Teachers by 1991.

Through our efforts to grow and adapt to current needs for conservation education and research, we strive to maintain our focus on teaching quality and student safety. Our faculty are among the best in the field, in terms of their effectiveness and their qualifications. All resident faculty recruited in 1989 for the current academic year hold Ph.D. degrees, and the three new Field Directors also have extensive experience in the regions of their respective Centers. None of this year's students were forced to withdraw because of accident or injury, a record we have maintained for several years now.

We look forward to 1990 with great confidence because of the talented faculty who have joined SFS and the progress we made in 1989 with the projects described above. Each of these efforts contributes to building the SFS curriculum into a component of our students' academic lives which has lasting value and impact.

**Shaun M. Bennett, Ph.D.**  
Dean



## Field Report

# The Center for Wildlife Management Studies: Kenya

**W**ildlife conservation is in the forefront of today's news from Africa. Destruction by rapidly expanding human populations of the natural habitats of countless species, and the direct destruction of species by hunting and poaching, are often portrayed as one-sided issues. However, SFS recognizes that human needs and local socio-economic factors must be taken into consideration in devising appropriate and effective conservation strategy. At our Kenya Center, participants study wildlife management from the perspective that wild plant and animal species *can* thrive as critical sources of human food and income, *if* innovative means to maintain species diversity and insure sustainable habitat use are created.

Student interest in conservation strategy options is increasing, and our program in Wildlife Management Studies continued to mature and expand in 1989. Total enrollment was 87 students, an increase of three students over the 1988 figure. Our current student evaluations indicate a high degree of enthusiasm for our unique wildlife management curriculum.

The Center semester staff was unchanged from 1988 (Drs. Paul Siegel, Field Director; Toni Milewski, Senior Faculty; with Toloumbaye Tadingar, Joshua Akong'a, Anne Fleuret, and Hussein Adan Isack, Associate Faculty). For the summer sessions, Dr. Rick Watson replaced Dr. Milewski as Senior Faculty. Dr. Watson brought a wealth of experience based on work in the Namib Desert in the ecology of semi-arid lands, and he inspired students with his love for birds of prey. Staff stability brought with it improved course coordination and allowed us to present students with a cohesive, interdisciplinary approach to many current environmental issues.

The focus of our research endeavors has likewise improved. This year, we examined a number of aspects of Game and Range Management with student projects concentrating on a wide variety of ecological issues such as competition, productivity and trophic ecology. Students examined forage availability in order to assess potential wildlife stocking rates on the ranch. Others studied niche overlap between various ungulate species; and still others examined the

effects of fire on savannah regrowth. In some fieldwork, we examined the consumption of primary production by harvester ants. Students also assessed scavengers' roles in the ecosystem and their behavior modifications which occur when artificially reliable feeding sources are available. A sampling of students' directed research projects includes: "The relationship between bite rates and seasonality of *Acacia drepanolobium*," "Phenology of *Balanites glabra* in relation to plant defense," "Soil texture along the landform catena at International Wildlife Ranching and Research," and "A comparison of adult female giraffe biting methods between *Acacia drepanolobium* and *Acacia seyal*."

Many of our research projects are coming to fruition. For example, Dr. Toni Milewski has had a study on ostrich nutrition accepted for publication in the *East African Journal of Ecology* and has plans for several more papers based on research that he has conducted with SFS students and colleagues.



*The end of a long day of fieldwork and lectures provides students with an opportunity to relax and get to know Ranch personnel on a personal basis. Leisure time, though limited by extensive research responsibilities and site chores, enhances the team spirit which is so crucial to successful group research. (Photo credit: Carrie Cox)*

Semester program highlights included our continued volunteer tradition at Lake Nakuru National Park, where SFS students have been involved with an assessment of flamingo mortality and carried out a total ground count of Rothschild's giraffes. Such activities, off the ranch where the Center is based, add significance and depth to our studies of land use conflicts, the outlook for sustainable development, the transition of culture from agricultural to urban, and the meaning of wildlife management strategies to local people.

A Center Advisory Board meeting was held in March to discuss ways in which SFS students could come into closer contact with their Kenyan counterparts. As a result of our discussions, contact has been established with Moi University in western Kenya, and we are examining the possibility for SFS-sponsored joint field exercises with Kenyan wildlife management students.

**Paul Siegel, Ph.D.**  
**Field Director**



*Students monitor giraffe browsing behavior in an effort to understand the habitat needs of this and other wildlife species living near the SFS Center. (Photo credit: Bob Singer)*

## Field Report

# The Center for Marine Resource Studies: U.S. Virgin Islands

**M**any people mistakenly believe that, since over 70% of the Earth's surface is covered by water, we can enjoy unlimited water resources. In reality, less than 0.2% of the Earth's oceans are productive, and water is just as vulnerable as land to exploitation, pollution and disturbance. The destruction of marine plant and animal species by industrial waste dumping and accidents like the 1989 Alaskan oil spill are only the beginning. These and other more casual sources of pollution and impact cause devastating destruction to the world's fishing economies.

Recognizing the crucial nature of issues such as overfishing and species diversity, SFS developed our Center for Marine Resource Studies in the Virgin Islands to provide young people with a unique focus on Marine Resource Management in one of the world's most interesting and awe-inspiring ocean regions. Student and faculty research generates necessary information for use in formulating management policies to insure sustainable utilization by local people of the life-supporting resources the nearshore waters currently provide.

The 1989 academic year was the seventh for SFS operations in the Virgin Islands. It marked completion of the eighth semester program at this site, and the fifth semester taught by the same team of faculty. Much of the progress which was made this year was due to the continuity of the resident staff (Drs. Robert Singer, Peter Edmunds, and Deborah Roberts). While only thirty students enrolled in the semester programs of the Center this year, this relatively small total allowed us to focus on implementing new curricular ideas which had evolved during our tenure.

The summer enrollment reached 57, which is about average for the past four years. The two sessions of each course (*Marine Parks Management* and *Coral Reef Ecology*) were taught by part-time faculty, including veteran SFS faculty Dr. Chris Neefus and Dr. Nanette Chadwick. They were joined by Dr. Phil Pepe and Laura Buckley.

Changes in academic content in the semester courses from the

previous year consisted primarily of achieving better integration of courses. The academic "modules," initiated last year, were expanded. This innovation involves clustering lectures from different courses together to approach topics like "Fisheries Management" and "Stresses on Coral Reefs" in a more interdisciplinary way.

This year's student research was built upon foundations set in the last few years, and emphasis was placed on the problems facing the region's resource managers. Our three years of data on the Queen Conch population of Lameshur Bay provide a very valuable documentation of this important Caribbean fishery. The Conch depend on undisturbed seagrass communities, as do sea turtles, and the biggest threat to the seagrasses in the U.S. Virgin Islands National Park comes from indiscriminate anchoring by pleasure boats. In cooperation with the U.S. National Park Service, SFS students measured growth rates of "turtle grass" in the presence and absence of anchoring. Their study, supervised by Drs. Deborah Roberts and Robert Singer, supports plans by the NPS to restrict anchoring to only a few bays.

Dr. Peter Edmunds led student research on the course of trauma to coral communities caused by Black Band Disease, Coral Bleaching and water quality. Some of these factors are natural, and some are caused by development; all are serious threats to

the coral reef community. A paper on findings of this work will be published by Dr. Edmunds in the *Bulletin of Marine Science* (Vol. 46:2, 1990).

Development of individual confidence and group cohesiveness have always been important SFS aims. A goal this year was to modify the program structure, schedule, camp routines and lines of authority to enhance this process. This was accomplished largely by empowering students to control a larger share of the semester programs. Faculty set guidelines to meet the academic and research goals and limits with regard to safety issues, while students made most of the routine decisions and worked together to achieve the goals. The result of these changes was the highest degree of student satisfaction in the program to date, with no compromise of academic standards.

The greatest challenge for the future is the acquisition and development of a permanent site for the Center. Toward this end, a Caribbean-wide search was undertaken, and Belize and the Turks and Caicos Islands were identified as the best countries in which to base the program. The acquisition of a suitable property in one of these two locations is expected in the next fiscal year.

**Robert Singer, Ph.D.**  
**Field Director**



*Student teams collect data on coral and other species living within a transect, which will contribute to a long-term study of damage by pleasure boat anchors on the floor of Lameshur Bay. (Photo credit: Christopher Neefus)*

## Field Report

# The Center for Rainforest Studies: Australia

**F**ew examples of environmental degradation affect as many plant and animal species at once as the depletion of the Earth's tropical rainforests. If current rates of the disruption of forest life continue, an estimated 20% of all species may be extinct by the year 2000. Rainforests worldwide are felled daily for lumber, agricultural production and livestock grazing. SFS recognizes both the crucial nature of this issue and the ignorance of most U.S. students regarding its significance in their lives. We have addressed this lack of understanding by establishing the SFS Center for Rainforest Studies in Northern Queensland, Australia.

The Center, now entering its third year of operation, is located on SFS-owned property that adjoins thousands of acres of forest which has been designated as a World Heritage Site. This remote location literally immerses students in one of the world's most outstanding ecosystems on a twenty-four hour basis. Students are only a short distance from heavily fragmented forest areas. The Center's unique location enhances their research on the effects of fragmentation on the behavior, breeding success and population size of various species.

In 1989, 46 students enrolled in the **Biogeography: Patterns of Ecological Diversity** semester program, and 18 participated in the summer course, **Tropical Species Diversity**. Dr. Mark Noble continued as Field Director through the Fall semes-

ter, at which time Dr. JoAnne Sharpe took over these responsibilities. Faculty for the semester programs included Dr. Jeff Klahn, Senior Resident Faculty, with Dr. John Duggin, Dr. John Grant and JoAnn Resing as Associate Faculty. Colin Matthews served in the capacity of Site Manager. All Senior and Associate Faculty also participated in the summer courses. Students reaped the benefits of a variety of guest lectures and field trips to meet with local resident groups and the local scientific community. We sought to enhance SFS's relations with its neighbors, and scientific cooperation was part of this effort. Several students and faculty volunteered their services to assist in the construction of the new Palmerston National Park.

Group research continued in the same direction as previous years' work, focusing on the effects of habitat fragmentation, and concurrent range restriction, on the well-being of rainforest vertebrates. We are doing this by monitoring population densities and patterns of habitat use by "indicator species."

In 1989, we studied two species, the musky rat kangaroo and a bird, the Northern logrunner. Both are obligate rainforest residents; they cannot escape the effects of range limitation by moving to non-forest habitats. Therefore, it is crucial to the survival of these species that we continue to document the effects of habitat fragmentation and resulting range restriction on population density

and behavior. Student research on these and other species was conducted both on SFS property and at Lake Barrine National Park, a short distance from campus. This year we continued to collect additional useful data on species habitat and hope to disseminate SFS's findings to the scientific and government sectors interested in rainforest management policy.

A brief sampling of 1989 student independent projects demonstrates the wealth of research opportunities the rainforest provides and the diversity of SFS student interests: "*Ropalidia cabeti*: effects of weather variation and disturbance on nest activity and trends in behavioral specialization;" "Rainforest floral density on steam-isolated boulders: an application of island biogeography;" "Tree planting as a land management option at Warrawee: revegetation and woodlots;" and "Non-breeding season flock composition and behavior of the Red-backed Fairy wren, *Malurus melanocephalus*."

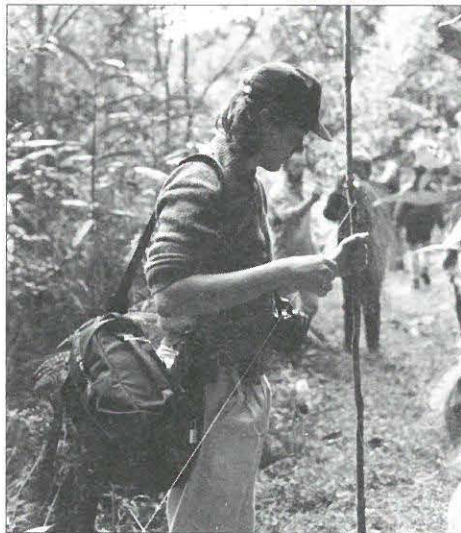
This past year was an especially challenging one due to the hurdles and opportunities presented by the move to our own base. Faculty met the double challenge of carrying full teaching responsibilities, while working with Headquarters to resolve the legal and administrative issues looming in our way. Thanks to their efforts, future participants and faculty will enjoy improved academic and residential facilities, currently under construction.

**Dr. Nicki Goudberg explains the physiology of a small marsupial and how the species is affected by habitat destruction and food source depletion.**

(Photo credit: Chip Isenhardt)

**Several students carefully construct mist-netting, which captures birds without harming them so that the SFS team can research their abilities to cope with change in their rainforest habitat.**

(Photo credit: Robert Brauman)



## Field Report

# SFS Satellite Sites Worldwide

**S**FS offers summer and January satellite courses in addition to Center programs in order to provide a broader range of course topics from which students can choose, and to give students who for various reasons are unable to participate in the longer semester programs during the school year, the opportunity to take an SFS course. Often, satellite courses attract non-science majors who want a short but intense learning experience in the field of environmental conservation.

This year's satellite curriculum included a total of eleven programs on three continents. Twenty-six faculty members and 12 interns taught the 317 students involved in these programs. Three courses each were held in Mexico and Ecuador, one course was held in Puget Sound and one in the Adirondacks, and two courses were held in the following field sites: Alaska, Colorado, Costa Rica, India, the Gulf of Maine, Hawaii, and North Carolina.

One highlight of this summer's courses was the discovery and rescue of a stranded mother-calf pair of pigmy sperm whales from a beach in Beaufort, North Carolina, by our group studying bottlenose dolphins in that area. This unexpected event was not

only an important learning experience for all of the students, but important data about a rarely observed whale species were also collected in cooperation with the Duke University Marine Laboratory.

Another exciting result of the summer's activities is the upcoming submission of a research report to the U.S. Fish and Wildlife Service in Juneau, Alaska, on the habitat use and management zones of bald eagles in the Juneau area by faculty and students from the **Ecology of Bald Eagles** course. It concludes that a larger management zone than currently exists is needed to protect adequately the bald eagle population in the Juneau area.

Dr. Brad Bennett, Senior Faculty of our **Ethnobotany** course, is preparing a book on novel uses of plants in Amazonian Ecuador, and data collected this summer by SFS students will be incorporated into it. Interestingly, it was learned that the local Quichuan people use the leaves of the coffee plant to treat the symptoms of malaria and other illnesses with fever. Data from this research will be submitted to the Ecuadorian National Museum of Science and to the Ministry of Agriculture.

Other satellite students were able to collect important new data on

the effects of acid rain on invertebrates. To date, there has been very little research of invertebrate species existing in Adirondack waters, and the students' research results have been requested by the New York Department of Environmental Conservation. In addition, this summer's extraordinarily heavy rainfall facilitated the students' research on the length of time required for stream water pH levels to rise after rain. The delayed effect that our SFS group documented has not previously been researched in depth, and the faculty plan to publish the findings in a research journal.

**Creighton Peet, Ph.D.**  
**Assistant Dean**



**Students learn to use sophisticated tracking equipment necessary for research of bottlenose dolphins and other marine mammals.** (Photo credit: N. Shapiro)

## Colleges and Universities Accepting or Awarding Credit for SFS Courses

### Allegheny College \*

American University  
Amherst College  
Augsburg College  
Barnard College  
Barry University  
Bates College  
Berea College  
Boston College  
Boston University  
Bowdoin College \*  
Brown University \*  
California Lutheran University  
California State College  
Carnegie Mellon University  
Case Western Reserve University \*\*  
Clark University  
Colby College \*  
Colgate University  
College of the Atlantic  
College of St. Thomas  
Colorado School of Mines  
Connecticut College  
Cornell University  
Dartmouth College  
Davidson College \*\*  
Denison University \*\*

### Dickinson College \*\*\*

Duke University  
Eastern Michigan University  
Emory University  
Evergreen State College  
Framingham State College  
Gettysburg College  
Green Mountain College  
Guilford College  
Hamilton College  
Harvard College  
Haverford College  
Huntingdon College  
Huron College  
Indiana State University  
Kansas State University  
Kent State University  
Kenyon College  
Lang College, New School for Social Research \*\*  
Macalester College  
Marlboro College  
Merrimack College  
Miami University \*\*  
Middlebury College \*  
Middlesex Community College  
Mount Holyoke College  
Mount Union College

New York University  
Northern Kentucky University  
Northwestern University  
Oberlin College  
Ohio State University  
Oregon State University  
Pennsylvania State University  
Prescott College  
Purdue University  
Randolph Macon College  
Saint Lawrence University  
Saint Olaf College  
Salem College  
Shimer College  
Simon's Rock of Bard College  
Smith College  
Southern Connecticut State University  
Stockton State College  
S.U.N.Y. College of Environmental Sciences and Forestry \*  
Trenton State College  
Tufts University  
Tulane University  
University of California  
University of Cincinnati  
University of Colorado  
University of Connecticut  
University of Iowa  
University of Kansas  
University of Miami

University of Maine  
University of Maryland  
University of Massachusetts  
University of Michigan  
University of New Hampshire  
University of North Carolina  
University of Pennsylvania  
University of Pittsburgh  
University of Puerto Rico  
University of Rhode Island  
University of Southern Indiana  
University of Southern Maine  
University of Utah  
University of Vermont  
University of Wisconsin  
Virginia Polytechnic Institute and State University  
Washington University  
Wellesley College  
Wells College \*\*  
William Smith College  
Williams College \*  
Wofford College  
Xavier College  
Yale College

\* Sustainable Development  
Studies Consortium  
\*\* Field Studies Consortium  
\*\*\* Member of both Consortia

Department Report

Admissions

The Admissions Department began the year with a goal to rebuild our momentum and firmly establish the recruiting efforts for our semester programs. As the year came to an end, applications to SFS programs were up almost 18% over the previous year, and topped the 1,000 mark for the first time. This represents the largest increase in application rates since 1985. At the same time, inquiries from students and educators seeking more information about SFS programs increased 10%, to over 13,000 for the year.

We enrolled a total of 569 students in 1988-89, an increase of 2% over the previous year. Twenty-four percent of these students participated in semester programs at SFS Centers. Semesters are our fastest growing programs, and students are now applying up to a year and a half before the start of the semester to guarantee a space in the program.

Our scholarship funds have increased to keep pace with our enrollment growth. In 1989, 26% of all

SFS participants received financial assistance from SFS, totalling more than \$200,000. One hundred and forty-five students received scholarship funding; 149 participants received no-interest loans from the Merck Family Revolving Loan Fund.

This year's participants came from 47 states, the District of Columbia (2), Puerto Rico (4), and 11 foreign countries. The students represented over 300 different colleges, universities and secondary schools. Institutions from which we received the greatest number of applications are Tufts, Middlebury, Williams, Denison, Cornell, Oberlin, Colby, Brown, Wellesley and Mount Holyoke.

Our goals at SFS include providing our students with significant field research experience, a knowledge of the complexities of environmental issues, and the inspiration to continue to address these critical issues after they leave SFS. We have recently heard from three alumni, whose accomplishments are strong testimony to our success in meeting these goals.

**Claudia Polsky** (Acid Rain, 1983; Environmental Geology, 1984) graduated from Harvard University in 1987. She subsequently received a Fulbright Scholarship to do graduate work in Environmental Resource Management at the University of Canterbury, in New Zealand.

**Brad Gould**, an alumnus of the 1987 Spinner Dolphin course, was chosen by *USA TODAY* as one of the top high school students in Georgia, and also was granted a full scholarship to study Marine Sciences at the University of Miami - both due in part to his SFS work.

**Cary Anne Cadman** (Coastal Ecology, 1988) graduated from the University of Michigan and is one of 17 students nationwide to be selected as a Bowman Scholar. Cary Anne will study translocation of endangered species in Brazil.

The following information provides a profile of the 1988-89 SFS participants. We are confident that these very special young men and women and future leaders, will go on to play critical roles in the ongoing effort to achieve a sustainable balance between development and conservation.

**Andrea C. Walgren**  
Director of Development/  
Marketing

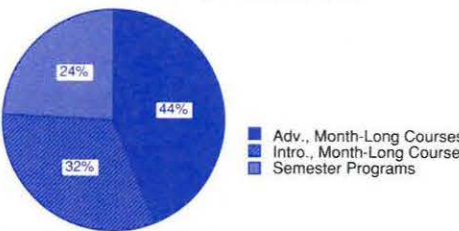
Percentage of Students Who Are, or Are Planning to Major in Science

69%

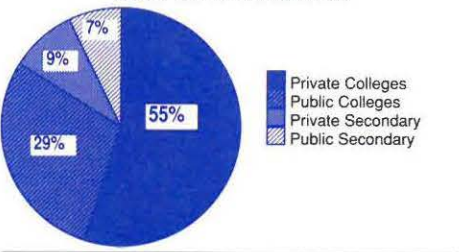
Male to Female Ratio

34% Males  
66% Females

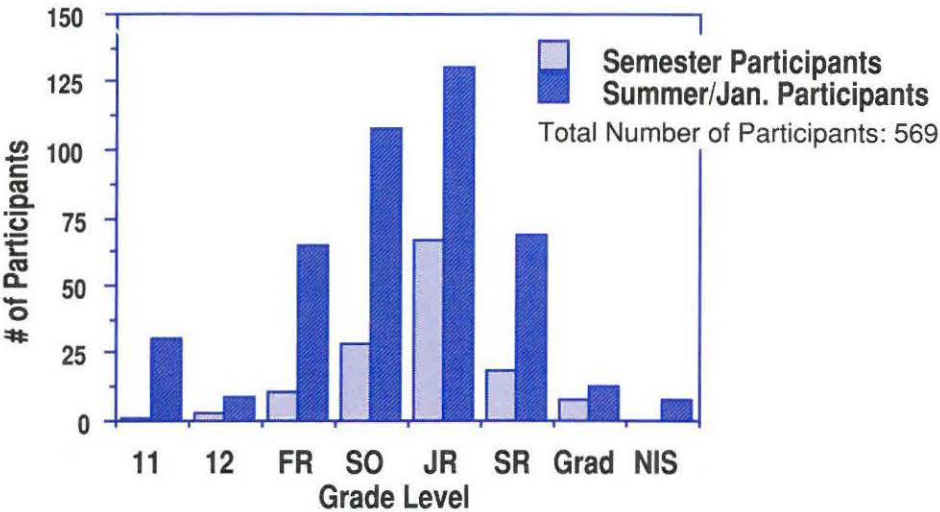
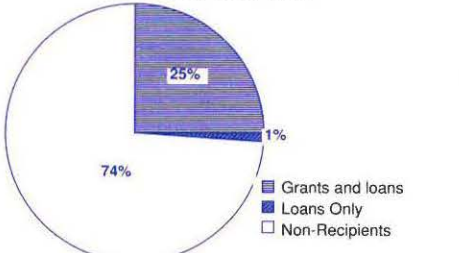
1989 SFS Enrollment



Schools Attended by 1989 SFS Students



1989 Students Receiving Financial Aid



Department Report

Operations

The Operations Department was established this year to create and maintain the necessary infrastructure in which SFS can successfully operate its programs. The Department is responsible to manage SFS's financial systems, contracts, Center and Satellite logistical issues, and equipment purchase and maintenance.

A primary goal is to improve the quality of our facilities, as well as to develop new ones. In FY89, we completed negotiations with local government for approval of our plans to upgrade the Center for Rainforest Studies in Australia. We also obtained a banking commitment to finance the construction of these improvements, which include new dormitories, faculty housing and classroom space. Construction is set to begin in Fall, 1989. SFS's long-range goal is to purchase and develop our own campuses that will adequately support our programs

and improve the working conditions for students and faculty. In FY89, a worldwide search was conducted to find a new home for our Center for Marine Resource Studies. A site in the Turks and Caicos Islands was selected and negotiations to purchase a new facility were underway by the year's end.

A second goal is to increase support to the field. In FY89, we provided over \$55,000 in new capital equipment to our academic programs. By providing adequate resources to our courses, we insured that there was little or no loss of educational time due to limited or faulty equipment or supplies. We anticipate that we will provide nearly \$200,000 in new equipment in FY90 to our field sites.

Managing our fiscal resources is the Department's highest priority. Three Centers completed the year within budget, inclusive of the summer programs run at each. Additionally,

our satellite programs came in on budget. Remaining courses required unusual and unanticipated expenditures to address safety issues and equipment failure.

Total fund balances decreased 4% to \$502,000 during FY89. Operating costs increased 12% to \$2,097,000. Tuition income also increased to \$1,903,000. We continue to maintain the goal of having tuition income cover all course operating expenses, thereby releasing all unrestricted contributions for program development expenses. We have achieved over 85% of that goal.

Copies of SFS's complete audited financial statements, which are the unqualified opinion of our independent auditor Peat, Marwick, Main and Company, are available from SFS upon request.

**Barry C. Canner**  
Director of Operations

SFS Financial Summary 1982 - 1989\*  
All figures are expressed in thousands

|                                           | FY 1982 | FY 1983 | FY 1984 | FY 1985 | FY 1986 | FY 1987 | FY 1988 | FY 1989<br>(Preliminary) | FY 1990<br>(Projected) |
|-------------------------------------------|---------|---------|---------|---------|---------|---------|---------|--------------------------|------------------------|
| <b>Fund Activity</b>                      |         |         |         |         |         |         |         |                          |                        |
| Tuition and Other Income                  | \$183   | \$217   | \$353   | \$612   | \$929   | \$1,328 | \$1,692 | \$1,903                  | \$2,384                |
| Restricted and Unrestricted Contributions | 107     | 147     | 235     | 306     | 399     | 492     | 414     | 271                      | 327                    |
| <b>Less:</b>                              |         |         |         |         |         |         |         |                          |                        |
| Operating Expenses                        | 275     | 355     | 510     | 848     | 1,198   | 1,484   | 1,876   | 2,097                    | 2,530                  |
| <b>Less:</b>                              |         |         |         |         |         |         |         |                          |                        |
| Scholarships Granted                      | 11      | 24      | 27      | 54      | 66      | 74      | 99      | 98                       | 105                    |
| Net Increase/(Decrease)                   | \$4     | \$(15)  | \$51    | \$16    | \$64    | \$262   | \$131   | \$(21)                   | \$76                   |
| <b>Fund Balances</b>                      |         |         |         |         |         |         |         |                          |                        |
| Beginning Balances                        | \$10    | \$14    | \$(1)   | \$50    | \$66    | \$130   | \$392   | \$523                    | \$502                  |
| Net Increases                             | 4       | (15)    | 51      | 16      | 64      | 262     | 131     | (21)                     | 76                     |
| Ending Balance                            | \$14    | \$(1)   | \$50    | \$66    | \$130   | \$392   | \$523   | \$502                    | \$578                  |
| <b>Working Capital</b>                    |         |         |         |         |         |         |         |                          |                        |
| Current Assets                            | \$21    | \$29    | \$81    | \$59    | \$114   | \$498   | \$661   | \$887                    | \$1,055                |
| <b>Less:</b>                              |         |         |         |         |         |         |         |                          |                        |
| Current Liabilities                       | 19      | 81      | 122     | 159     | 277     | 502     | 604     | 852                      | 1,029                  |
|                                           | \$2     | \$(52)  | \$(41)  | \$(100) | \$(163) | \$(4)   | \$57    | \$35                     | \$26                   |
| <b>Fixed Assets</b>                       |         |         |         |         |         |         |         |                          |                        |
| Fixed Assets (Prior Year)                 | \$12    | \$18    | \$61    | \$103   | \$184   | \$353   | \$418   | \$572                    | \$575                  |
| Capital Expenditures                      | 6       | 43      | 42      | 81      | 169     | 65      | 252     | 53                       | 485                    |
| <b>Less:</b>                              |         |         |         |         |         |         |         |                          |                        |
| Fixed Asset Sales                         | --      | --      | --      | --      | --      | --      | 98      | 50                       | 55                     |
| Total Fixed Assets                        | \$18    | \$61    | \$103   | \$184   | \$353   | \$418   | \$572   | \$575                    | \$1,005                |
| <b>Less:</b>                              |         |         |         |         |         |         |         |                          |                        |
| Accumulated Depreciation                  | 4       | 9       | 11      | 18      | 45      | 85      | 107     | 147                      | 205                    |
|                                           | \$14    | \$52    | \$92    | \$166   | \$308   | \$333   | \$465   | \$428                    | \$800                  |

\*The Fiscal year of SFS runs from September 1 to August 31. SFS was founded on October 20, 1980.

## Development

**O**n behalf of this year's 569 SFS graduates, we acknowledge and thank over 150 individuals, corporations and foundations, whose generous financial support of SFS and its students amounted to over \$271,000 in FY 1989.

A primary achievement of 1989 was the establishment of the **SFS Alumni Association** and the **Parents Association**. Active involvement with the School by these groups provides a broad base for ongoing support and allows us to gather invaluable insights from those most directly affected by our programs. We have already begun to see the results of working closely with alumni and their parents; in 1989, they formed over half of our total individual contributors. Their continued assistance will undoubtedly be the foundation of SFS's future growth and innovation.

The growth of the Affiliation Program would not have occurred without two very special grants. Continued support from **The Charles Engelhard Foundation** (totalling \$100,000 over three years) has helped to cover the Director's salary and several otherwise prohibitive costs. **The George Gund Foundation** has



With assistance from the Island Foundation and many others, SFS strives to meet the financial needs of each and every qualified young person who wishes to participate in the fieldwork opportunity of a lifetime.

(Photo credit: Tamara Kronenwetter)

been responsible for the progress of the Program in the Ohio area, through its most generous three year grant totalling \$73,125.

With the kind assistance of the **Archer Daniels Midland Company**, generous scholarship funds were available to our students at The Center for Rainforest Studies in Australia, and we were able to begin important work to improve the academic and residential facilities at this site.

The **Laurance S. Rockefeller Charitable Trust** has continued to contribute to the operating expenses at The Center for Marine Resource Studies on St. John, U.S.V.I. More importantly, several students who were unable to finance their SFS experience, benefitted from the foundation's generous scholarship funding.

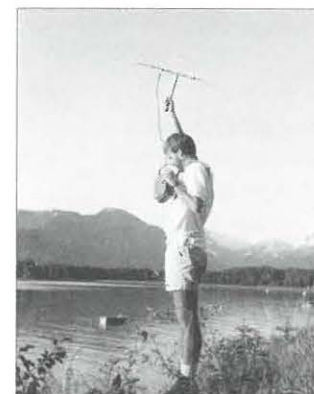
The **National Science Foundation** renewed its support of our Primates program in Mexico with a grant for \$39,975, creating a unique opportunity to support minorities and women in science. Eight exceptional NSF-SFS Scholars were chosen to participate in this year's **Endangered Monkeys** course and were awarded stipends by NSF.

The **Island Foundation** continued a tradition and kindly

contributed \$20,000 towards scholarship funds, perhaps the most crucial element of our efforts to enroll the most qualified student body.

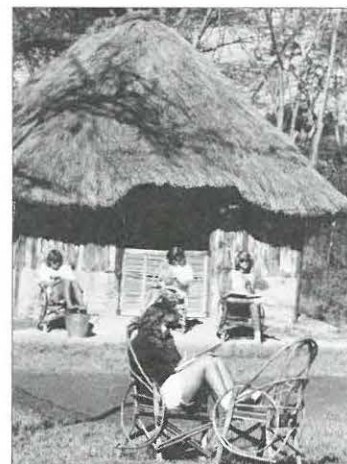
For the ninth consecutive year, **The Andreas Foundation** has continued to provide a generous base of support for our programs. The Foundation's unique role in SFS's development is highly appreciated by the Staff and Faculty. More importantly, hundreds of students reaped the benefits of this relationship in 1989.

The assistance of these foundations and of several very special individual donors, most notably **Astra Davis** and **Lowell Andreas**, is greatly appreciated by those who strive each day to make SFS work. Our students' experiences are greatly enhanced by the operations and scholarship funding made available by SFS contributors, who have truly committed themselves to quality environmental education.



Generous support by our contributors has provided the high quality scientific equipment that students need to develop and meet sophisticated research goals.

(Photo credit: Victor Lamoureux)



Student and faculty residences are rustic, but normally quite comfortable. At the Kenya Center, housing accommodations include "bandas," such as the one shown here. We constantly strive to improve the residential and academic facilities of our campuses, an effort that was kindly supported by the Alumni and Parents Associations in 1989. (Photo credit: Susan Bryant)

## 1989 Contributors

### Founding Donors

(\$25,000 or more since SFS's founding)

Terry L. Andreas  
Stephen Cohen\*  
Astra Davis  
Frederick Fisher\*  
E. Bates McKee\*  
Robert Meffort\*  
Willett Moore\*  
Laurance S. Rockefeller

Andreas Foundation  
Archer Daniels Midland Foundation  
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Digital Equipment Corporation  
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The George Gund Foundation  
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Island Foundation  
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National Science Foundation  
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(over \$5,000)

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Terry L. Andreas  
Astra Davis  
Anthony Kearney\*

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The George Gund Foundation  
Island Foundation  
National Science Foundation  
The Laurance S. Rockefeller Charitable Trust

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Richard B. Wilson

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(\$10 to \$99)

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Nicole Adimey  
Judith D. Albert  
Martina Lee Albright  
Dennis J. Begany  
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Elise Dubois Phillips  
M. Jaffray Phillips  
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Ruth Westfall  
Dr. Susan E. White  
Frederic Winthrop, Jr.  
Anne Zaldastani  
Heidi Zimmerman  
Anonymous

### \*Gifts in Kind

Our team in the Virgin Islands is exposed to the intricacies of the mangrove swamps by National Park Service personnel. We have allocated resources at each SFS site for the development of cooperative ventures between our students and the local scientific communities.

(Photo credit: Kenneth Andrasko)

## 1988-1989 Course Participants

SFS Center for  
Wildlife Manage-  
ment Studies,  
KenyaWildlife Ecology and  
Management

## Fall Semester, 1988

JoAnn Andrzejewski  
University of Pennsylvania  
Julia Barkman  
Mount Holyoke College  
Andrew Beckerman  
Tufts University  
Sylvanna Boccadori  
University of Pennsylvania  
Robert Carlson, Jr.  
Bucknell University  
Laura Deloatch  
Denison University  
Brian Doherty  
St. John's University  
Susan Fowle  
Brown University  
Robert Fuhrmann  
Lawrence University  
Lloyd R. Gamble  
Vassar College  
Sean Hinchey  
Boston University  
Andrea Jones  
University of Rhode Island  
Erin Maguire  
Brown University  
Marilyn Merkle  
St. Olaf College  
Sally Milliken  
Brown University  
Kalay Mordock  
New York University  
Nicolette Phear  
University of Pennsylvania  
Susan Pincus  
Goucher College  
Carla Robertson  
Bucknell University  
David Sime  
Keene State College  
John Tuxill  
Williams College  
Seth Wilner  
Clark University  
Lucy Wilson  
Johns Hopkins University

## Spring Semester, 1989

Susan Armknecht  
Tufts University  
Catherine Brown  
Wesleyan University  
Gardner Bryant  
Cohasset, Massachusetts  
Heidi Critchell  
Tufts University  
Francis Crouter  
Verde Valley School  
Sally Dominick  
University of Colorado  
Laing Foster  
Harvard University  
Kimberly Haddix  
Mount Holyoke College  
Lara Hutchinson  
University of Miami  
Annelisa Kilbourn  
University of Connecticut  
Allison McDonell  
Harvard University  
Beth McLaughlin  
Skidmore College  
Deborah Morris  
Bates College  
Cheryl Nath  
Wellesley College  
Jorge Negron  
Rice University

Karina Omark  
Hunter College  
Jennine Redick  
Barnard College  
Dan Taylor  
Northwest Technical College  
Alex Tobias  
Antioch College  
Chandra Triplett  
University of Colorado  
David Van Esselstyn  
Tufts University  
Sally Ward  
Wellesley College  
Matt Wormser  
Oberlin College  
Anne Young  
Wesleyan University

## Wildlife Management

## Level B

Jennifer Anthony  
Cabrillo College  
Holden Basch  
CUNY-Queens College  
Carrie Cox  
Washington and Lee University  
Mary Deindein  
Tulane University  
Robert Doctor  
New Mexico State University  
Christin Finn  
University of Rhode Island  
Michael Gillespie  
Fairfield University  
Michael Heaphy  
Yale College  
Kim Henry  
University of Pennsylvania  
Pamela Ito  
Lewis and Clark University  
Lori Kieffer  
Juniata College  
Jennifer Levitsky  
Bowdoin College  
Laura McMahon  
Ohio Wesleyan University  
Kristen Montgomery  
University of Vermont  
Lucy Newton  
University of Maine  
Eileen Oden  
St. Xavier  
Margaret Pease-Fergusson  
Marymont University  
Ashley Quarrier  
Sweet Briar College  
Julie Terrell  
James Madison University  
Jennifer Woodruff  
University of Arizona

## Level A

Jeffrey Barnes  
University of Michigan  
Jessica Bennett  
Columbia University  
D. Matthew Bushley  
Dartmouth College  
Victoria Chiou  
Phillips Exeter Academy  
Elizabeth Gilbert  
New York University  
Peter Gottesman  
Scarsdale High School  
Britta Haberer  
University of Michigan  
Scott Johnson  
Scarsdale High School  
Nancy Jones  
Franklin Pierce College  
Rachel Kerner  
Cherryhill High School East  
Julie Lewis  
University of Washington  
Paige Lieberman  
Indiana University

Urania Lloyd  
Macalester College  
Andrew Malk  
La Jolla High School  
Elizabeth Moss  
Mount Holyoke College  
Sarah Prior  
Stuyvesant High School  
Crystal Reul  
Miraleste High School  
Lisette Rivera  
Latin School of Chicago  
Paul Seaton  
Middle Tennessee State University  
Emily Triebs  
Wheelock College

SFS Center for  
Marine Resource  
Studies,  
Virgin IslandsMarine Biology and  
Management

## Fall Semester, 1988

Carolyn Baker  
Colby College  
Nikos Boutis  
Oberlin College  
Linnea Bredenberg  
Wellesley College  
Maya Conrad  
Bennington College  
Michael S. Dulay, II  
U.C. San Diego  
Garo Eldemi  
U.C. Berkeley  
James Holmes  
Lewis and Clark College  
Peter Howser  
Tufts University  
Cynthia Lehman  
Connecticut College  
Kimberly Levin  
Harvard University  
Blaire Luscombe  
Fraser Valler College  
C. Nicholas Moore  
Denison University  
Donald Norton  
Trinity University  
Wendy Roosevelt  
University of New Hampshire  
Diana Wood  
Denison University  
Elisabeth Young  
Macalester College

## Spring Semester, 1989

Michael Balsam  
University of New Hampshire  
Mary Cottone  
Carleton College  
Ann Grier Cutter  
Lewis and Clark University  
Sarah Fangman  
Middlebury College  
Molly Fayfield  
St. Olaf College  
Michelle Gottlieb  
Barnard College  
Jessica Harvey  
University of Michigan  
Kimberly Kelley  
University of New Hampshire  
Robin Levin  
Bates College  
Julie Livers  
James Madison University  
Lisa Pelstring  
Hamilton College  
Thalia Polychronakis  
Villanova University  
Thomas Scilacci  
U.C. Santa Barbara

Quincey Tidey  
University of California

## Coral Reef Ecology

## Level A; Section I

Matt Bell  
Western New Mexico University  
Michael Cohn  
Albany Academy  
Diane Gardella  
St. George's School  
Susan Good  
New Trier High School  
Carman Hayes  
Andrews High School  
Rod Hester  
Westminster School  
Brooke Jamieson  
Stephens College  
Lauren Newbury Joy  
Franklin Pierce College  
Stephanie Mairs  
Bates College  
Phillip Miller  
LaGrange Academy  
Janet Rumble  
University of Maryland  
Kristen Spenser  
University of Washington  
David Tibbetts  
Beloit College  
Kristine Tucker  
University of Washington

## Level A; Section II

Tina Cheng  
Cornell University  
Stewart Colby  
Denison University  
Matthew Duvall  
Interlochen Arts Academy  
Isaac Graf  
Bloomfield High School  
Eric Grasser  
The Nichols School  
Amy Kim  
Bronx School of Science  
Jennifer Lyne  
James Madison University  
Ross Nussbaum  
Horace Mann School  
Elise Williams O'Connell  
Denison University  
Kelly Ross  
Arizona State University  
Eric Smith  
McGill University  
Jeffrey Steinwachs  
The Nichols School  
Katrinka VanderLinden  
Clayton High School  
Jennifer Verhoog  
Evanston High School  
Jennifer Wilderman  
The Harrisburg Academy

SFS Center for  
Rainforest Studies,  
AustraliaBiogeography - Patterns  
of Ecological Diversity

## Fall Semester, 1988

Andrew Aulisi  
Bucknell University  
Nicholas Baer  
University of Vermont  
Alexandra Blynn  
University of Vermont  
Courtney Boyd  
Denison University  
Deron Chang  
Middlebury College  
Jeffrey Christie  
Bowdoin College  
Carol deNeufville  
Tufts University  
Danielle Dixon  
Williams College  
Marcie Hechler  
Colorado College  
Rebecca Heintz  
University of Vermont  
Julie Hoberman  
Emory University  
Andrea Isaacs  
University of Michigan  
Gillian Lyons  
Oberlin College  
David Manahan  
Gustavus Adolphus College  
Michael Mars  
Duke University  
Christopher Meyer  
Williams College  
Craig Miercort  
Colorado College  
Karl Miller  
Guilford College

## Marine Parks Management

## Level B; Section I

Amy Jo Bishel  
Southern Illinois University  
Margaret Bentlage  
University of Missouri  
Kari Bloomquist  
Concordia College  
Cynthia Clark  
Ramapo State College  
Michael Denby  
Emory University  
Janet Doran  
Wittenberg University  
Cheryl Frew  
Gannon University  
Beth Kartman  
University of Wisconsin

Carolina Nyanady  
Bolton, Connecticut  
Michael Ott  
Davidson College  
Becky Palmberg  
Westmar College  
Wendy Robins  
University of California  
Carole Starita  
University of Florida  
Matt Warneke  
Beloit College  
Mark Weber  
Dana College

## Level B; Section II

Andrew Branagh  
U.C. Davis  
Ann Brandenburger  
Denison University  
Lori Lach  
Boston University  
Amy Moran  
Bates College  
Jennifer Moyer  
Dickinson College  
Laura O'Neal  
Colorado College  
Amy Reynolds  
Yarmouth High School  
Anthony Shaya  
Lahser High School  
Leslie Shriner  
Gettysburg College  
Annabelle Snyder  
SUNY-Binghamton  
Hetty Snyder  
Smith College  
Mark Spenser  
Bowdoin College  
Michele Sullivan  
Barnard College  
Harry Tsomides  
Clark University  
Tim Watkins  
Vassar College  
Seneca Webb  
Tufts University  
Susan Webster  
Temple University

Melissa Perera  
Oberlin College  
Sara Rimm  
University of Madison  
Andrew Solomon  
Bowdoin College  
John Watson  
Middlebury College

## Spring Semester, 1989

Christopher Booth  
University of Chicago  
Eileen Brady  
Union College  
Scott Crawford  
Tufts University  
Jennifer Despres  
Spring Lake High School  
Stephen Driker  
Tufts University  
Christopher Fullerton  
University of Redlands  
Laurie Grigg  
Colorado College  
Christine Hall  
Duke University  
Christopher Klein  
Holderness School  
Lori Lach  
Boston University  
Amy Moran  
Bates College  
Jennifer Moyer  
Dickinson College  
Laura O'Neal  
Colorado College  
Amy Reynolds  
Yarmouth High School  
Anthony Shaya  
Lahser High School  
Leslie Shriner  
Gettysburg College  
Annabelle Snyder  
SUNY-Binghamton  
Hetty Snyder  
Smith College  
Mark Spenser  
Bowdoin College  
Michele Sullivan  
Barnard College  
Harry Tsomides  
Clark University  
Tim Watkins  
Vassar College  
Seneca Webb  
Tufts University  
Susan Webster  
Temple University

Tropical Species  
Diversity

## Level A

Todd Baird  
Denison University  
Christian Bradeen  
Phillips Brooks Academy  
Kelly Ann Carroll  
College of St. Elizabeth  
Amy Blair Collins  
Miami University  
Stephanie Cole  
University of North Carolina  
Lisa Houseman  
Ohio State University  
Valerie Mitchell  
Yale College  
Michael Pembroke  
Claremont McKenna College  
Alison Rich  
Kansas State University  
C. Carlton Smith  
The Taft School

## Level B

Robert Brauman  
Ramapo College  
Cynthia Chin  
U.C. San Diego  
Joshua Dunsby  
Wesleyan University  
Neil Flynn  
Simon's Rock of Bard College  
Patricia Galkowski  
Wayne State University

Heather McCurdy  
Washington University  
Derek Morris, Jr.  
Monmouth College  
Monica Ngu  
Denison University  
Scott Whittle  
Northwestern University

SFS Center for Marine  
Mammal Studies,  
HawaiiMarine Mammal Biology and  
Conservation

## Spring Semester, 1989

Jennifer Andrus  
Bowdoin College  
Elizabeth Causey  
Lewis and Clark University  
Annie Farris  
University of Colorado  
Kristen Garzone  
Denison University  
Roseanne Gentilin  
Pennsylvania State University  
John Monroe  
SUNY-Purchase  
Heidi Neilson  
Reed College  
Jordan O'Rylee  
The Evergreen State College  
Michael Pearlman  
University of Colorado  
Alisa Pearson  
Oberlin College  
Matthew Pearson  
Thiel College  
JulieAnne Sanders  
Wesleyan University  
Toby Sprunk  
Guilford College  
Andrew Storfer  
SUNY-Binghamton

## SFS Satellite Courses

Acid Rain: Changing Aquatic  
Ecosystems

## Level A

Sondra Albert  
Midwood High School  
Beth Chimera  
Stuyvesant High School  
David Corn  
Clark University  
Ron Falong  
Hackettstown High School  
Sophie Frishkopf  
McGill University  
Andrea Gager  
Princeton High School  
Amy Goldstein  
SUNY-Stonybrook  
Robert Gramlich  
Colby College  
Stuart Grandy  
The Chewonki Foundation  
Douglas Lubben  
University of Iowa  
Cesar Ramos  
University of Puerto Rico  
Colleen Ryan  
Phillips Academy  
Jackson Tam  
Poly Preparatory School  
Alfred Zee  
New Hampton School

Biology and Behavior of  
Bottlenose Dolphins

## Level A

Dede Binder  
Western Maryland College  
Eileen Cho  
The Ethel Walker School  
Elizabeth Dardzinski  
Trenton State College

## Ecology of Bald Eagles

## Level A

Richard Beaver  
Dartmouth College  
Dyan Harden  
Grand Rapids Junior College  
Gus Heck  
Sharon High School  
Diane Horowitz  
Oberlin College  
Victor Lamoureux  
State University of New York  
Mary Anne Meadows  
Dickinson College  
Lindsey Pease  
University of New Hampshire  
Tracy Phillips  
Clark University  
Earl Robert Snodgrass  
Webb School of California  
Jeremy Wintersteen  
Hobart College  
Daryl Victor  
Mercer University  
Jonathan Winawer  
Hunter College High School

## Level B

Peter Aengst  
Williams College  
Gillian Backus  
Mount Holyoke College  
Tammy Bodner  
SUNY-Plattsburgh  
Catherine Bramley  
University of New Hampshire  
Marcus Cole  
U.C. Berkeley  
Michael Dana  
Hobart College  
Cheri Good  
Virginia Polytechnic Institute  
Greg Klein  
Muhlenberg College  
Brooke Lehman  
The Brearley School  
Laurel Moore  
University of Vermont  
Erika Pankow  
Union College  
Christopher Regan  
Moravian College  
Nader Shaikh  
McGill University  
Linda Swift  
SUNY-Oswego

## Ecology of Harbor Seals

## Level B

Mary Barczak  
Michigan State University  
Maura Berslyn  
Boston College  
Amy Coes  
Simmons College  
Lynn Forsyth  
Keene State College  
Jennifer Glueck  
Rutgers University  
Katherine Kohler  
Union College  
Patricia Murray  
Stockton State College  
Michael Schwartz  
Colby College  
Arloa Sikkema  
Wheaton College  
Mary Withrow  
Wittenberg University

Endangered Monkeys:  
Social Ecology of Stump-  
tail Macaques

## January

Stacey Benton  
Williams College  
Donna Bramlett  
Cook College  
Evan Buxbaum  
Williams College

Brian Connelly  
Drew University  
Heather Devermann  
St. Olaf College  
Terry Erthal  
Villanova University  
Adrienne Georgia  
Cook College  
Kevin Hamill  
Cornell University  
Elizabeth Hendricks  
Cornell University  
Matthew Johnson  
Pacific Lutheran University  
Lon Knappenberger  
SUNY-Fredonia  
Jacqueline Masterson  
Berea College  
Jorie Moran  
Minois Wesleyan University  
Christine Steinmann  
Cornell University  
Joe Whittaker  
DePauw University

## Level B; Section I

Nicole Boxer  
University of Michigan  
Maria del Rosario Rodriguez  
Pan American University  
Dave Harewood  
Lincoln University  
Michelle Henneman  
Cornell University  
Amina LaCour  
U.C. Davis  
Julie Larson  
University of Wisconsin  
Kelly Mello  
Southeastern Massachusetts  
University  
Shelly Nelson  
Reed College  
Diana Luz Ordenez  
North Carolina State University  
Debbie Rice  
University of Wisconsin  
Jennifer Sawka  
Mount Holyoke College  
Mary Volpe  
University of Texas  
Tara Wilfong  
University of Florida  
Alexander Wolf  
Muhlenberg College

## Level B; Section II

Andrew Berns  
University of Wisconsin  
Nichelle Cobb  
College of William and Mary  
Mark Doran  
University of Pennsylvania  
Noella Elizondo  
Pan American University  
Sandra Fernandez  
Columbia University  
Rachel Gockley  
Lynchburg College  
Roberto Goren  
Pan American University  
David Jolly  
University of Ontario  
Jennifer Lapham  
Emory University  
Juliet Nachman  
Tufts University  
Albie Nash-Mothersol  
Kenyon College  
Irene O'Connell  
University of Guelph  
Eileen Riordan  
University of Washington  
Sophie St. Hilaire  
University of Prince Edward Island  
Christine Underwood  
Duke University  
Michael Weinstein  
North Carolina State University

Ethnobotany: Uses of  
Plants by Native Peoples

## January

Genevieve Aldridge  
St. Mary's College

**Caroline Bishop**  
Mount Holyoke College  
**Alex Blumberg**  
Oberlin College  
**Nicole Cintas**  
Simon's Rock of Bard College  
**Philip Couling**  
Williams College  
**Kim Della Vecchia**  
University of Rhode Island  
**Jenny Fanning**  
Simon's Rock of Bard College  
**John Fenderson**  
Tennessee State University  
**David Gaeta**  
Roger Williams College  
**Erica Kesenheimer**  
Simon's Rock of Bard College  
**Lisa Klein**  
University of Washington  
**Cynthia McPherson**  
Williams College  
**Joya Melissa**  
University of California  
**Michael Stremel**  
Vassar College  
**Jennifer Tawczynski**  
Simon's Rock of Bard College  
**Stephen Walker**  
Brown University  
**Rebecca Wittenberg**  
Bard College

Level A

**Sarah Andre**  
Rhodes College  
**Elizabeth Buckley**  
Lexington, Kentucky  
**Philip Cho**  
Cheltenham High School  
**Dana de Vallier McGowan**  
Northeastern University  
**Christina Giorgio**  
University of Rhode Island  
**Leslie Goldberg**  
Torrey Pines High School  
**Paul Hill**  
Harvard University  
**Audra Lehman**  
Northwestern University  
**Jessica Levine**  
Southwest Secondary School  
**Susan McRoy**  
Evergreen State College  
**Maia Netteship**  
Athens High School  
**Kristin Robinson**  
Bryn Mawr School  
**Joanne Sciuilli**  
Barnard College  
**Kevin Taffe**  
Boston College  
**Jeremy Tejirian**  
Lewis and Clark University

Level B

**Holden Basch**  
CUNY-Queen's College  
**Roxanne Bogart**  
Potomac, Maryland  
**Julianne Bradford**  
Humbolt State University  
**Anthony Corballis**  
Evergreen State College  
**Janet Gould**  
University of Minneapolis  
**Heath Graham**  
American University  
**Dominique Gustin**  
Sterling College  
**John Hollingsworth**  
Colorado College  
**Barbara Isak**  
University of Maine  
**Michael McCrory**  
University of New Hampshire  
**Jennifer Neavolls**  
Miami University  
**Paul Neidhart**  
Wright State University  
**Steven Pawlyshyn**  
Michigan State University  
**James Porter**  
College of William and Mary  
**Natalie Springuel**  
Allegheny College  
**Heather Stretzier**  
Miami University

Humpback Whale Ecology

Level B

**Chrissie Anderson**  
National Cathedral School  
**Tara Blumer**  
University of Minnesota  
**Ann Flage**  
University of Iowa  
**Carol Foerster**  
Northeast Missouri State University  
**Jennifer Holmes**  
Mount Holyoke College  
**Katherine Kohler**  
Union College  
**Julie McElroy**  
Immaculata College  
**Greta Meyer**  
University of North Carolina  
**Mark Peterson**  
University of Colorado  
**Robin Phyliky**  
University of Minnesota  
**William Reboul**  
Lehigh University  
**Michelle Rudin**  
University of Rhode Island  
**Karen Sayles**  
University of Minnesota  
**Cara Schoeppner**  
Denison University  
**Susan Soesbe**  
University of Texas

Level A

**Steve Blood**  
Ridgewood High School  
**Megan Christenson**  
Boulder High School  
**Eric Goldfarb**  
Little Silver, New Jersey  
**Stephanie Haus**  
Lenox, Massachusetts  
**Emily Kaufman**  
Upper Arlington High School  
**Mitzi Moore**  
University of Kansas  
**Suzanne Oppenheimer**  
Occidental College  
**Jennifer Reed**  
Washington University  
**Rachel Rosen**  
The Bryn Mawr School  
**Dawn Shattuck**  
Fitchburg State College  
**Aimee Sherer**  
Suffield Academy  
**Amy Stubblefield**  
Oberlin College  
**Yuka Suzuki**  
International Christian University  
**Daniel Tauss**  
Scarsdale High School  
**Cynthia Williams**  
American University

Landscape Ecology: Designing Parks for Preservation

Level B

**Michael Arnold**  
Alma College  
**Robyn Binder**  
Brandeis University  
**Amy Collins**  
Keene State College  
**Kara Fanning**  
Anne Arundel Community College  
**Ellen Gamerman**  
Swarthmore College  
**Kathleen Kelly**  
University of Colorado  
**Catherine Mall**  
Vanderbilt University  
**Greg Mazer**  
Cornell University  
**Kerry Ann McBride**  
Keene State College  
**Linda Michaels**  
Keene State College  
**Laura Pasuth**  
Southern Connecticut State University  
**Angel Ramos**  
University of Puerto Rico

**Stephanie Smart**  
Wellesley College  
**Catherine Wickerham**  
Haverford College  
**Joan Witherspoon**  
Auburn University

Level A

**Philipp Busse**  
Middlebury College  
**Jean Louise Crothers**  
Evergreen State University  
**Sarah Dunham**  
Yale College  
**Caroline Hirsh**  
Shipley High School  
**Laura Johnston**  
University of Delaware  
**Timothy Keyes**  
St. Mark's School  
**Katherine Lederer**  
St. Paul's School  
**Dan Martin**  
Stonehill College  
**Elizabeth Payson**  
University of Vermont  
**Tamara Peters**  
International School of Geneva  
**Doug Rose**  
University of Wisconsin  
**Joseph Schwartz**  
St. Lawrence University  
**Kalpana Singh**  
Francis Parker School  
**Daniel Welsh**  
Edinboro University

Social Ecology of Spinner Dolphins

Level B

**Bernard Bierman**  
Haverford College  
**Christy Carello**  
U.C. Santa Cruz  
**Deborah Colbert**  
Central Connecticut State University  
**Diane Donahue**  
Ohio State University  
**Francine Elmaleh**  
University of Pennsylvania  
**William Fagan**  
University of Delaware  
**Jennifer Goodman**  
Earlham College  
**Cynthia Hertwick**  
Framingham State College  
**Wendy Howard**  
University of North Carolina  
**Lisa Karpinski**  
University of Wisconsin  
**Robert Klaffer**  
University of Pennsylvania  
**Tracey LaFland**  
University of New Hampshire  
**Leslie McLean**  
Smith College  
**Laura Millett**  
SUNY-Binghamton  
**Courtney Morrison**  
Brown University  
**Lizabeth Osnes**  
Mankato State University  
**Sonja Sax**  
Wellesley College  
**Laura Stoland**  
Vassar College  
**Stephanie Vos**  
University of New Hampshire  
**Lesia Wilder**  
Wesleyan University  
**Lynn Wulf**  
Douglass College  
**Kristen Zajicek**  
Purdue University

Level A

**Nanette Bloomfield**  
Poly Prep C.D.S.  
**Drew Diamond**  
University of Arizona  
**Kerry Dinneen**  
Boston College  
**Jennifer Frisbie**  
Miss Porter's School

**Beryl Gao**  
Stuyvesant High School  
**Jennifer Hamner**  
Ovachita Baptist University  
**Kirsten Hardiman**  
Amherst College  
**Jason Hutton**  
Colorado Mountain College  
**Joanne Hydman**  
Reed College  
**Ariana Jaegle**  
U.C. Irvine  
**Stacey Jones**  
Canterbury High School  
**Ian Kennelly**  
Webb School for Boys  
**Virginia Murphy**  
Bryn Mawr College  
**Rebecca Perlman**  
Clark University  
**Ahmed Rahman**  
Webb School for Boys  
**Kelly Roberts**  
Kearney State College  
**Varalaxmi Samudrala**  
University of Michigan  
**Kimberly Thompson**  
Southern Methodist University  
**Diana Tsao**  
Stuyvesant High School  
**Isabella Leith Warlick**  
Bates College  
**Diane Whitmarsh**  
Beverly, Massachusetts  
**Randi Winter**  
East Brunswick High School

Tropical Ecology: The Dynamics of Deforestation

Level B

**Dan Ardia**  
Tufts University  
**Curtis Daehler**  
Lafayette College  
**Hillery Bowen Gibson**  
Hollins College  
**Andrea Goldoff**  
Brandeis University  
**Annette Heist**  
West Chester University  
**Kristen Hendricks**  
Earlham College  
**Demetrius Jinnio**  
University of Vermont  
**Deb Josefson**  
Brandeis University  
**Karen Levy**  
Columbia College  
**Alexander Moore**  
Denison University  
**Benjamin Pargman**  
University of Florida



Each SFS program provides first-hand knowledge of the rigors of field science, not the least of which is the challenge of preparing lunch for two dozen hungry colleagues after a morning of fieldwork.  
(Photo credit: Chip Isenhardt)

**Brendan Shane**  
Franklin & Marshall College  
**Anne Smyth**  
St. George's School  
**Maryellen Snyder**  
University of Houston

Level A

**Amy Avant-Kuehl**  
Iowa State University  
**Rachel Beattie**  
Yale College  
**Jennifer Dawson**  
Skidmore College  
**Christina Hanhardt**  
Stuyvesant High School  
**Hanes Heller, Jr.**  
Middlebury College  
**Gary Herman**  
Newark Academy  
**Susan Hoffmeister**  
University of Colorado  
**Miguel Luke Jones**  
Rutgers University  
**Joseph Kiser**  
Colby College  
**Maria Knight**  
Clark University  
**Jeremy Liu**  
Berkeley High School  
**Ziadee Price**  
Simon's Rock of Bard College  
**Josh Tosteson**  
Milton Academy  
**Karrin Winn**  
Sacramento City College

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SFS is a member of the International Union for the Conservation of Nature and Natural Resources (IUCN).

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The School for Field Studies

Selected Research Papers Resulting from SFS Field Courses

Plant Community and Ecosystem Ecology Group

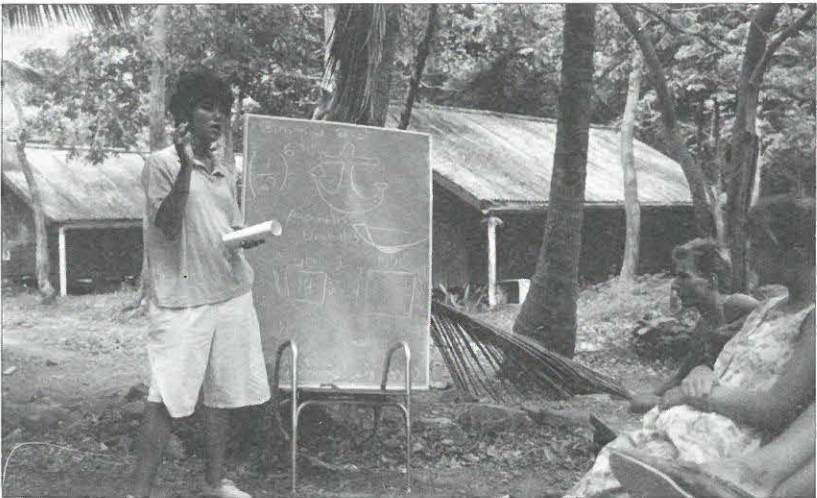
**Community Ecology, Mount St. Helens, 1982, 1983, 1984**  
ADAMS\*, A.B., and V.H. DALE  
"Vegetative succession following glacial and volcanic disturbances in the Cascade mountain range of Washington, USA." In Mount Saint Helens 1980 Botanical Consequences of the Explosive Eruptions. D.E. Bilderback (ed.), Los Angeles; University of California Press; pp. 70-147.

**Ecology and National Park Planning, Atacama Desert, Chile, 1983**  
RAEDEKE\*, K.J., and J.A. SIMONETTI  
Food habits of guanaco in the Atacama desert of northern Chile. *Journal of Mammalogy*, 1988.

**Hazardous Waste and Coastal Ecology, Chesapeake Bay, 1985**  
JACQUES, L., K. KRISHNAN\*\*, and W. HATCH\*  
Calcification of saltmarsh periwinkle shells in pristine and polluted environments. Presented to the 54th Congress of the Franco-Canadian Association for the Advancement of Science; May 14, 1986.

**Acid Rain, Adirondack Mountains, New York, 1983**  
SINGER\*, R., D.A. ROBERTS\*, and C.W. BOYLEN  
Biological effects of acidification on small oligotrophic Adirondack lakes. Proceedings of the Second New York State Symposium on Acid Deposition; Ithaca, New York, 1983.

**Maya Archaeology, Belize, 1985, 1986**  
GIBSON\*, E., L. SHAW\*, and D. FINAMORE\*  
Early evidence of Maya hieroglyphic writing at Kichpanha, Belize. Center for Archaeological Research, University of Texas at San Antonio; *Working Papers in Archaeology*, No. 2, 1986.



A participant in the Marine Biology and Management program presents research findings to her colleagues on St. John at the end of the semester. In each SFS course, students are required to design and implement independent field research that is closely supervised by the faculty.  
(Photo credit: Heather Gutheue)

**Arctic Biology, Brooks Range, Alaska, 1982, 1983**  
CHAPIN, F.S., III. N. FETCHER\*, K. KIEL-LAND, K.R. EVERETT, and A.E. LINKINS  
Productivity and nutrient cycling of Alaskan tundra: enhancement by flowing soil water. *Ecology*, 69(3):693-702; 1988.

**Veterinary Ecology: Pronghorn Antelope Population Collapse, Wyoming, 1988**  
REEVE, A.F\*  
Pronghorn productivity studies in the Fifteenmile herd unit. Prepared for the U.S. Bureau of Land Management and the Wyoming Game and Fish Department; 1988.

Animal Behavior and Conservation Group

**Marine Mammal Biology and Conservation, Glacier Bay and Kenai Peninsula, Alaska, 1982, 1983, 1984, 1986, 1987**  
CALAMBOKIDIS\*, J., and G.H. STEIGER\*\*  
Bald eagles (*Haliaeetus leucocephalus*) consumption of harbor seal (*Phoca vitulina*) placenta in Glacier Bay, Alaska. *Raptor Research*, 19:(2); 1985.

CALAMBOKIDIS\*, J., B.L. TAYLOR\*, S.D. CARTER\*, G.H. STEIGER\*\*, P.K. DAWSON\*, and L. ANTRIM\*  
Distribution and haul-out behavior of harbor seals in Glacier Bay, Alaska. *Canadian Journal of Zoology*, 65:1391-1396, 1987.

**Dolphin Biology and Behavior, Florida Keys and Alabama, 1985, 1986, 1987**  
HEIMLICH-BORAN\*, J., and S. HEIMLICH-BORAN\*  
Population estimation and seasonal habitat use patterns of bottlenose dolphins (*Tursiops truncatus*) off the Gulf coast of Alabama. Presented at the Seventh Biennial Conference on the Biology of Marine Mammals; December 5-9, 1987.

**Primate Social Behavior, Costa Rica; Endangered Monkeys, Panama 1984, 1985, 1986**  
CLARKE\*, M.R., E. ZUCKER\*, and R. SCOTT  
Population trends in the howler monkey (*Alouatta palliata*) in Costa Rica. *American Journal of Primatology*, 1986.

RASMUSSEN\*, D.  
Social ecology and conservation of Panamanian tamarins (*Saguinus oedipus goeffroy*). The Nature of Panama. IUCIV, in press.

Wildlife Ecology and Management Group

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Students assess how the rate of regeneration affects the genetic diversity of disturbed species in the Costa Rican rainforest.  
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