

OTS Strategic Goals and Initiatives 2015-2020

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The tropics host more than 80% of the world's biodiversity and 40% of its human population, while the region's economy is growing 20% faster than that of the rest of the world. In this context, the need to understand and better manage natural and human-influenced tropical ecosystems has become ever more pressing. Given the Organization for Tropical Studies' 50 years of leadership in tropical field education and the role that its research stations have played in shaping our scientific understanding of tropical

OTS' mission is to provide leadership in education, research, and the responsible use of natural resources in the tropics.

ecosystems, the organization is poised to make important contributions to tackling these challenges. Indeed, as a result of OTS' previous strategic plan (2006-15), the organization expanded its undergraduate and graduate programs to address a wide range of issues related to conservation and global health and began to

identify and catalyze research in emerging frontiers in tropical science. Yet the need for field sciences continues to grow since we need to better understand the consequences of global change for biodiversity in the tropics. Coupled with international trends in education and research that reduce emphasis on field studies and diminish funding to biological research in general, these developments mandate an energetic response by OTS to maintain its leadership role in tropical science and education.

This strategic plan challenges OTS to play a more proactive role in directing research and education within OTS stations towards 'emerging challenges in tropical sciences.' The expectation is that by the end of this plan's tenure (2020), OTS will have expanded the disciplinary breadth of both its educational and research programs to address compelling tropical science themes in both basic and environmental sciences. By meeting the goals of this strategic plan, OTS will emerge in a stronger position to address the research and educational challenges of a rapidly changing world and will broaden the audience for its courses and field stations.

OTS will focus its strategic efforts on achieving three significant goals during the next five years: (1) expanding research on Emerging Challenges in Tropical Science (ECTS) at our field stations; (2) creating innovative, research-based educational programs for an increasingly diverse audience; and (3) reducing the environmental impact of OTS facilities and programs. For each goal, we will focus our efforts on a few specific initiatives.

Research Goal: OTS will facilitate and catalyze research on emerging challenges in tropical science

Throughout its history, OTS has seen its research role primarily as a facilitator—bringing scientists together to gain an understanding of the fundamental processes that govern tropical ecosystems through basic and applied research. OTS also has provided the physical facilities (e.g. field stations, major instrumentation, study sites) and services (e.g. permitting, logistical support, GIS services) that enabled individual investigators to conduct research in the tropics. During its first 50 years, OTS relied on external (non-staff) investigators to conduct research and generate databases and monitoring programs fundamental to the development of modern research programs. This model proved successful in placing OTS research stations among the most scientifically productive in the tropical world.



Under this strategic plan, OTS will take a more proactive approach to building and integrating basic and environmentally-focused research at its field stations. OTS faces a challenge to identify, initiate and support research projects that will both build on our 50-year legacy of tropical research and expand our capacity to address emerging and critical science challenges for the foreseeable future. The two initiatives outlined below are designed to guide OTS as it attempts to facilitate and catalyze research on emerging challenges in tropical science, financially sustain this research capacity, and integrate it into our education programs. Through successful implementation of these initiatives OTS will endeavor to increase station usage by researchers by 30%.

Initiative 1: Expand OTS station research by focusing on Emerging Challenges in Tropical Science (ECTS)

Outcome: ECTSs will serve as focal points for increasing research at OTS Stations

Strategies:

1. Identify 2-3 timely and significant high-impact Emerging Challenges in Tropical Science for each OTS station (La Selva, Palo Verde, and Las Cruces in Costa Rica; Skukuza in South Africa)
2. Develop a fellowship program, focused primarily on research and data capture related to ECTSs and open to all researchers and students, but especially targeting early career researchers
3. Continue to support (and potentially expand) the *Emerging Frontiers in Tropical Science* program, with the aim of developing multi-institutional and multi-disciplinary research teams and opportunities for undergraduate and graduate student participation
4. Develop an annual OTS symposium series, focused primarily on ECTSs to be held at OTS field stations as well as at Costa Rican and South African universities.
5. Provide greater interaction between research programs and our graduate and undergraduate educational programs, primarily focused on ECTSs
6. Create a funding mechanism such as a research endowment to fund research under this initiative

Initiative 2: Develop a core cyberinfrastructure (CI) program that supports discovery, management, and preservation of research data that pertain to OTS stations

Outcome: OTS CI will attract and support researchers through data discovery, data management, and data preservation services and policies

Strategies:

1. Develop a core OTS CI program for data that pertain to OTS stations
2. Create a data management training program
3. Create incentives to identify, capture, and make available 'legacy datasets' that can be used to attract and contribute to future research at OTS stations
4. Establish and implement baseline data policies that promote and enhance the OTS research legacy

Education Goal: OTS will provide expanded research-based educational opportunities to a diverse audience

For 52 years, OTS has provided leadership in education and training in the tropics. This strategic plan will focus our efforts on maintaining this leadership through innovation in new program delivery mechanisms and targeting new participant audiences. OTS will accomplish this through education initiatives that provide the research tools and critical thinking skills to address Emerging Challenges in Tropical Science. In doing this, OTS will strive to expand the organization's impact by providing novel educational opportunities that push the boundaries of science and society, that diversify our constituencies, and that support the needs of OTS member institutions. Finally, OTS education will emphasize the societal and environmental impacts associated with our mission and research.



The success of these initiatives and programs will be measured through the expansion of our teaching and course implementation models and diversification of course participants. These successes will also be demonstrated through positive and measurable impacts on the career paths and professional development of our participants. Through a successful implementation of this ambitious endeavor we will strive to increase student enrollment by 25% and our station usage by courses by 25%.

Initiative 1: Re-envision the role of field stations in advancing and integrating research into OTS educational activities

Outcome: OTS will create greater synergy between education and research at its stations

Strategies:

1. Develop descriptions of station-specific ECTSs, strengths, needs, and strategies relevant to research-based education programs at each station
2. Develop undergraduate and graduate educational opportunities that provide research training, capitalize on the strengths of OTS stations, and encourage long-term and continuing participation in OTS
3. Create station-based education positions that can liaise with station personnel and researchers and encourage investment in and access to research infrastructure (space, equipment, study sites) and data for educational activities

Initiative 2: Develop new undergraduate and graduate education programs with an emphasis on research related to natural-human systems

Outcome: Education programs will strengthen our course offering, impacts, and enrollments

Strategies:

1. Develop novel educational opportunities within existing and new OTS education programs that highlight the growing intersection between science and society, Emerging Challenges in Tropical Science, and the interdisciplinary fields of conservation, land use policy, and global health
2. Encourage and facilitate faculty-led academic programs (courses or workshops) and provide opportunities for student and faculty research on tropical design and green architecture that draw on OTS stations
3. Conduct an assessment of graduate and undergraduate courses to ensure that they reflect the needs of a new generation of scientists (student learning, professional development, and impacts on their future careers)
4. Develop on-line educational opportunities that have an important tropical field component

Initiative 3: Incorporate broader student audiences (underrepresented U.S., African, Latin American, and non-traditional students) in OTS education programs

Outcome: OTS will further diversify participants in its undergraduate, graduate courses, and post-graduate courses

Strategies:

1. Develop programs and courses that encourage participation of diverse graduate and undergraduate audiences among our constituencies and consortium members (e.g. global health, Native America and Pacific Island Research Experience for Undergraduates)
2. Develop, and seek funding for, courses designed for non-traditional students (e.g. teachers, policy makers, NGO staff)



3. Invest in scholarship and funding development to support students and program development

Greening Goal: Model green design and operations at all OTS facilities

Recognizing that the consumption of electricity is a significant contributor to climate change, is central to the OTS Environmental Policy, and represents a substantial and growing cost to the organization, OTS will model green operations by decreasing electricity usage by 40% at all major facilities, seek innovative approaches to funding, and incorporate efforts to reduce resource consumption into research and education programs. Throughout the organization OTS also will seek to reduce consumption and waste of all resources (fuel, water, materials, etc.).

Initiative 1: Invest in physical and behavioral modifications to reduce electrical consumption at all four OTS stations

Outcome: OTS will reduce its electrical consumption by 40% in the next five years

Strategies:

1. Reduce electricity through a comprehensive plan that includes encouraging innovative conservation initiatives, modeling conservation behavior, providing regular staff training, retrofitting existing facilities, replacing and reducing the use of inefficient equipment, using landscaping effectively, maximizing use of day-lighting, and installing solar water heaters
2. Where net metering is available at attractive rates, seek to install photovoltaic panels
3. Monitor electrical usage to assess effectiveness of conservation projects, determine the priority of projects receiving support, and provide real time feedback to staff and users
4. Identify a coordinator for sustainability projects in Costa Rica to develop an environmental management strategy for the stations and CRO, keep electrical conservation initiatives in the forefront of priorities, insure consistency of reporting among facilities, leverage OTS purchasing and fundraising, and minimize challenges of multiple competing demands
5. Incorporate green design in the use of electricity, water, materials, and waste in the development of new facilities
6. Mount public education campaigns to encourage conservation behavior, enlist support from users, and model OTS facilities

Initiative 2: Develop innovative programs to fund new sustainability initiatives

Outcome: OTS will develop a financially sustainable means of supporting its greening initiatives

Strategies:

1. Explore the feasibility of establishing a Green Revolving Fund(s) from savings generated by reducing consumption to provide timely financial support for electrical conservation initiatives
2. Incorporate sustainability projects into public relations, marketing, billing, and fundraising campaigns to raise awareness of OTS environmental leadership and education on green design and to raise financial support for green operations' projects