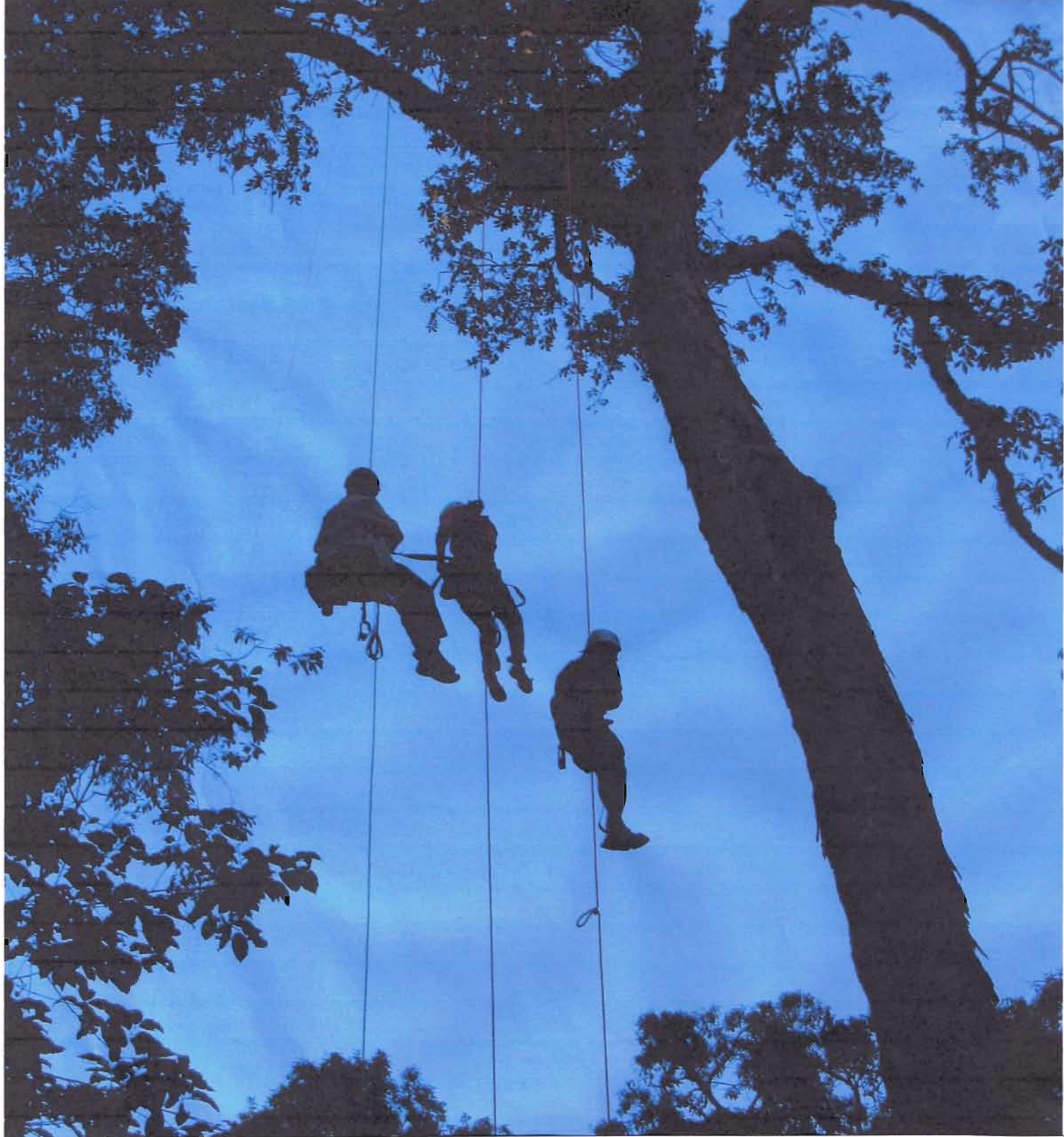




TREE Foundation Annual Report

November 2009

Compiled by Dr. Meg Lowman, Executive Director

Annual Meeting – November 12, New College Foundation Boardroom 5 PM

Cover: Canopy access workshop for students at 5th International Forest Canopy Conference in Bangalore India, co-sponsored by TREE Foundation

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2874 Riverbank Dr NW
Isanti MN 55040

Bryson Voirin, Research Associate (non-voting)

Graduate student research associate
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Germany

Dr. Soubadra Devy (non-voting)
Research Associate
Ashoka Trust for Ecology and the Environment (ATREE)
Bangalore, India

Dr. Alemayehu Wassie Eshete, Research Associate (non-voting)
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Professor of Biology and Environmental Studies
New College of Florida
5800 Bay Shore Road Sarasota FL 34243

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888 Second Street
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Student Interns (Center for Canopy Ecology)

Dayna Lazarus	Salome Graslans
Elizabeth Crate	Erik Wallimaa
Pamela Montero Alvarez	Guillermo Sanchez
David Mitre	Marcos Oversluijs Vasquez
Ricardo Rifulgo	Marcos Oversluijs
Hannah Wilkins	



TREE FOUNDATION

Dr. Thomas E. Lovejoy, President, The H. John Heinz III Center for Science, Economics, and the Environment
Honorary Board Chairman

TREE Foundation Highlights for 2009

Despite the economic downturn of the past year, TREE is pleased to report new initiatives and solid support of existing initiatives. Now, more than ever, both local and global governments and citizens recognize the value of our environment and the services that ecosystems provide for humankind. The role of the TREE Foundation to conserve forests and to educate the public about our environment provides a critical function, and your support is essential to our mission. Thank you to all TREE supporters for your great achievements during the past year.

1. TREE co-sponsored the 5th international forest canopy conference in Bangalore, India, the culmination of four years of efforts to bring together forest scientists from 35 countries. This conference focused on the future conservation of the world's forests, and inspired important research efforts in India, home of four biodiversity hotspots including the last remaining tigers, Indian elephants, and many other species of plants and animals. (Note the TREE logo next to Tata Cars in the conference banner – see photos attached). Dr. Lowman co-chaired the conference with Dr. Kamal Bawa of University of Massachusetts – Boston.
2. Dr. Lowman received a National Science Foundation grant to fund three critical elements of program at the Canopy Conference in India: 1. key scientists to give plenary talks, 2. young postdoctoral fellows and assistant professors to attend the conference representing the next generation of canopy scientists, and 3. a student workshop to train the next generation of India's canopy biologists.
3. Our National Science Foundation exhibit, Out on a Limb, circulated to schools for six months, and then spent six months on display at New College of Florida. Its bilingual activities, games, and educational lessons, in both English and Spanish, continue to educate thousands of students in SW Florida about the value of tropical rain forests.
4. The Fedder lecture series celebrated Charles Darwin's 200th birthday in February with a gala lecture by world Darwin historian, Dr. Tim Berra, author of the recent book "Charles Darwin: The Concise History of an Extraordinary Man. A full house enjoyed Berra's talk, and ate the enormous Darwin birthday cake afterward! Thanks to Joel and Ellen Fedder for funding our community lecture series.
5. TREE hosted two research associates from India, Dr. Soubadra Devy and Dr. T. Ganesh. Devy is India's top canopy scientist, and has made important discoveries about pollination and canopy biodiversity. Ganesh is an expert on tigers and other animals of India's forests, and both served as coordinators for the canopy conference. Thanks to the Booths for funding our global intern program.

6. TREE hosted several additional community lectures this year as a result of our expanding programs. Our research associate DC Randle (K-12 teacher and role model for minority students) presented on “Science Education Outreach – role models and field activities as methods to inspire the next generation.” TREE also co-hosted a lecture with Environmental Defense, entitled “Save the Rainforest, Cool the Planet” featuring Dr. Christina McCain (EDF, Washington DC) and Mr. John Carter (founder, Allanca da Terra, Brazil).
7. TREE has launched its second flagship education project: the creation of a TREEhouse for local children and families. A successful fund-raiser was hosted at the home of Susanne and Henry Rodriguez on Casey Key, raising over \$10,000. This amount will be matched in a subsequent grant or fund-raiser by The Crowley Nature Center, where the TREEhouse is scheduled for construction in 2010. Our website now accepts online donations. Committee members Laura Peters, Carolyn Johnson, and Susanne Rodriguez are to be congratulated for one of our first gala fund-raising events!
8. Our original flagship project, the Myakka River State Park canopy walkway, continues to achieve national recognition and hosts hundreds of thousands of annual visitors. New signage reflecting an updated map of canopy walkways of the world, plus a new conservation sign, are underway. The long-term bromeliad data monitoring program – undertaken by local elementary school students and representing the longest-term data collection in the forests of Sarasota County – is now posted on the TREE website. Check out the wonderful illustrations and field notes of local fifth graders tracking the growth of their bromeliads! Frequent guided walks are hosted by TREE Foundation throughout the year, including our (now infamous) fifth annual Boxing Day canopy walk. Thanks to the Spurlino Foundation for continuing to fund the walkway and these local education programs.
9. A new forest research and conservation project was launched, “Saving the Church Forests of Ethiopia” under the leadership of Dr. Lowman and our Ethiopian research associate, Dr. Alemayehu Wassie Eshete. Currently, Ethiopia’s last remaining forests are housed in the church yards of approximately 31,000 Coptic (or Orthodox Christian) churches, but they are fast shrinking due to the pressures of timber-gathering and agriculture. Working with the local bishops, TREE Foundation hosted a workshop for the clergy last January 2009 to educate them about the value of their forests, especially the ecosystems services of trees such as pollinators and as the major supplier of fresh water springs. The church is enthusiastic and grateful to work with TREE Foundation, as well as the local villagers, to undertake conservation efforts to conserve their last forests as an important part of their economy, spirituality and health. A big thanks to TRIAD Foundation for providing seed funding to launch this important global initiative, and to the Jarzens for the lead gift toward the biodiversity expedition in 2010.
10. TREE Foundation has a grant pending with National Geographic for funding to conserve the church forests of Ethiopia. In addition, approximately 8 professional scientists have volunteered their time (and funds) for August 2010 to participate in an expedition to explore the biodiversity of Ethiopian church forests, in particular to identify the important pollinators of local crops.

11. TREE Foundation partnered with Dr. Francis Gatz of Environmental Expeditions to create the “Amazon Amigos Program”. Similar in structure to Heifer International, this conservation initiative specifically targets forest “hands-on” conservation activities in the upper Amazon. Teachers and students who have attended workshops with EE or TREE can make donations to fund local conservation programs, including sustainable furniture-making, fish farms, and providing fresh water in villages. All of the funds support basic needs, conservation, environmental education, and sustainable development for Amazon villages.
12. Meanwhile, in our own backyards, TREE was instrumental in sounding the alarm about invasive Burmese and African rock pythons. These enormous reptiles currently pose a serious threat to Florida’s forests and watercourses. Initially thought to have been released by unsuspecting pet owners, pythons now number >30,000 in the Florida Everglades and > 2,000 in Myakka River State Park. Lowman organized a workshop of nationally-recognized herpetologists to educate Sarasota County staff about invasive reptiles. In addition, TREE’s website features an online component to identify all of the 44 invasive reptiles in Florida. While gigantic pythons may not appear to be related to a Foundation whose mission is trees, the impact of these 200-pound invasives on our forest ecosystems is extremely threatening, especially to native wildlife. TREE hopes to work with the Garden Club in 2010 to bring a rapid response training class to Southwest Florida, since the County not budgeted for this issue.
13. TREE students, interns and research associates continue to disseminate important information about trees. Students at New College produced a guide to the world’s rain forests, now available on our website as a series of powerpoints. TREE research associate, Bryson Voirin, was recently funded by the Booths to attend the canopy conference; Bryson is currently a graduate student with the Max Planck Institute in Germany, where he continues his forest canopy career doing a PhD in sloth sleep research! Research associate Leon Kaganowsky has worked with students to create a computer model about herbivory on the TREE website.
14. Executive Director, Dr. Meg Lowman, made numerous local and national presentations about forest conservation and education outreach, including a joint presentation with marine explorer, Eugenie Clark; invited lectures at University of South Carolina, University of Santa Barbara – California; Atlanta Botanical Garden; Valencia Community College; University of Florida; Audubon Society; St. Olaf’s College; and University of Wyoming.
15. Executive Director, Dr. Meg Lowman, received the 2009 ACE award (Achievements in Canopy Ecology) for her global education and research activities. This was presented to her by our Honorary Board Chairman, Dr. Thomas Lovejoy, in Bangalore India on 28 October 2009.
16. TREE has entered into an MOU (memorandum of understanding) to participate in a forest conservation initiative for Viet Nam, which currently has no national parks and hopes to undertake a program called 4-E: education, ecology, energy, and economics on a country-wide scale.
17. Three student interns were funded for research on the Amazon forest canopies. Congratulations to Salome Grasland, Dayna Lazarus, and Elizabeth Crate. TREE

also funded Amazon research projects, including an ethnobotany brochure, for several students who worked on these as college tutorials. Thanks to the Nellie Mae grant for funding important New College student environmental projects.

18. TREE continues to distribute canopy books to students in developing countries, including Ethiopia, Brazil, Peru, Belize, and India. As a result of the canopy conference, approximately 40 books were presented to Indian biology students, who were thrilled to receive this gift! Thanks to the Booths for making this possible.
19. Nature's Secrets, a fortnightly science column in the Herald Tribune, continues to communicate the message and mission of the TREE Foundation, especially fostering an appreciation for Florida's natural treasures.
20. TREE Foundation will have a presence at the upcoming Copenhagen meetings in December 2009, where Dr. Lowman will work with other forest-based NGOs and non-profits to communicate information to the delegates about the value of global forests. Lowman will also write for the Herald Tribune about the activities of policy-makers. Stay tuned!
21. TREE and the Myakka canopy walkway have our tenth birthday in 2010. We are planning a gala moonlight pig roast under the walkway, and will hope for your support to celebrate this milestone.
22. And last but not least, your Executive Director ("Canopymeg") would like to express her heartfelt thanks to our President, Gerri Aaron, whose enthusiasm and support for all things unspoken that really make the TREE Foundation such a highly productive foundation.



International Canopy Conference 2009

FOREST CANOPIES

Conservation

Climate Change

Sustainable Use

October 25-31, 2009,
Bangalore, India

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5th International Canopy Conference 2009

Forest canopies : Conservation, Climate change and Sustainable use

October 25th - 31st, 2009, Bangalore, India

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www.atree.org

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Important notice - click below to view details

Abstract submission : Closed

3rd July 2009 — 17th August 2009

Registrations open

Approved abstracts list view here

Canopy access : Inviting contributions

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Forest canopies are the least explored habitats in the world. They not only support high terrestrial biodiversity, but also represent a critical interface between the atmosphere and the earth. Forest canopies also provide goods and services to support diverse human communities and offer opportunities to explore sustainable use of such resources for local livelihood generation. All this makes it vital for environmental policies to foster conservation, sustainable use of resources and the resultant impact on the health of global climate.

Researchers investigating the facets of forest canopies from various parts of the globe need a common platform under which interactions can be fostered and synthesized. Till date, four international conferences have been organized, at intervals of four to five years, hosted by different venues across the globe. The meetings have successfully convened scientists, environmental managers, arborists, and policy-makers concerned with the discovery and sustainable use of forests around the world. The 5th international canopy conference will be organized by the Ashoka Trust for Research in Ecology and the Environment, (ATREE), in Bangalore, India.

The goals of the conference are to highlight the relevance of canopy research with respect to important global challenges, especially climate change, sustainability and conservation. Hence, the integration of canopy science with natural science, social science and information technology is critical. The conference provides an opportunity to build networks across continents, which will facilitate capacity building and foster collaboration using information from multiple sites, within countries and across continents.

3. Please await confirmation from the conference organizers over e-mail and all related queries can be posted to info@canopy2009.org

INDIAN PARTICIPANTS: All Indian participants are requested to follow the below mentioned steps to register.

CAUTION: Indian participants are strictly advised not to transfer any amount to the FRCA account applicable for foreign participants.

1. Please draw a demand draft (cheques will not be accepted) for the applicable amount mentioned in the registration fee table. Demand draft should be in favour of Ashoka Trust for Research in Ecology and the Environment, Bangalore
2. Please fill the online application form and obtain a reference number which should be quoted for all further references- [Application form](#)
3. Please write the "reference number on the blank back side of the demand draft" mentioning "Canopy conference registration" and post it to the following address:

Ashoka Trust for Research in Ecology and the Environment (ATREE),
Royal Enclave, Srirampura, Jakkur post,
Bangalore-64, India
Phone: +91-80-23635555

4. Please await confirmation from the conference organizers over e-mail and all related queries can be posted to info@canopy2009.org

environment &
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School of Ecology
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UAS



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National Science
Foundation, USA



Tree Foundation



Global Canopy
Programme



International
Canopy Network



Institute of Wood
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5th International Canopy Conference 2009

Forest canopies : Conservation, Climate change and Sustainable use

October 25th - 31st, 2009, Bangalore, India

Ashoka Trust for Research in Ecology and the Environment
www.atree.org

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Keynote and Plenary Speakers

Keynote:

The keynote address for the conference will be delivered by **Thomas Lovejoy**, the renowned conservation biologist. Tom Lovejoy's appreciation for wildlife and nature began at an early age. He has devoted his career to the environment, from studying biodiversity to creating the concept of debt-for-nature swaps and founding the PBS show 'Nature'. During the nearly 40 years Tom has maintained a research camp in the Amazon, he has hosted countless politicians, celebrities, and individuals who are eager to learn about the rainforest and how it is changing. Information, picture courtesy and more on <http://www.heinzctr.org/About/lovejoy/index.shtml>



Plenary speakers:

Andrew Mitchell- Is a leading authority on forest canopies and related climate change issues. He has extensive field experience in Asia, Africa and Latin America, combined with a thirty year career spanning research, journalism, broadcasting, policy and global project management. In 2001, he founded the Global Canopy Programme (GCP), an international network linking 38 leading scientific institutions in 19 countries engaged in research, conservation and education, investigating the impact of climate change on biodiversity and ecosystem services in forest canopies. Information, picture courtesy and more on <http://globalcanopy.org/themedia/file/PDFs/Press%20Kit/AndrewMitchellBiography.pdf>



Kamal Bawa- Is a distinguished professor at the University of Massachusetts, Boston, and is the founder and President of the Ashoka Trust for Research in Ecology and the Environment. He is interested in developing new paradigms of conservation that take into account the need to alleviate poverty in biodiversity rich areas through sustainable use of biodiversity. He also remains interested in the sustainable use of ecosystem services including such provisioning services as non-timber forest products. Since he founded ATREE, and cofounded the Centre for Interdisciplinary Studies in the Environment and Development (CISED), Bangalore, India, he is particularly interested in institutional building to foster conservation and sustainability science. Information, picture courtesy and more on <http://www.atree.org/kbawa.html>

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Nalini Nadkarni- Is a Member of the Faculty at The Evergreen State College, in Olympia, Washington, where she teaches in the Environmental Studies program. Her research is focused on the ecology of tropical and temperate forest canopies, particularly the role that canopy-dwelling plants play in forests at the ecosystem level. She carries out field research in Washington State and in Monteverde, Costa Rica with the support of the National Science Foundation and the National Geographic Society. In 1994, she co-founded and is President of the International Canopy Network, a non-profit organization that fosters communication among researchers, educators, and conservationists concerned with forest canopies. Information, picture courtesy and more on

<http://academic.evergreen.edu/n/nadkarni/>



National Science
Foundation, USA



TREE FOUNDATION

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Global Canopy
Programme



International
Canopy Network

Raman Sukumar- Prof Raman Sukumar is the current chairman of the Centre for Ecological Sciences, Indian Institute of Science, Bangalore. He is a leading ecologist who has made significant contributions towards Asian elephant ecology and conservation, climate change and tropical forest ecology. He was a former Chair of the Asian Elephant Specialist Group IUCN/Species Survival Commission (1997-2004). Research in his lab currently spans the following broad topics of wildlife ecology, Asian elephant ecology and management, population dynamics and wildlife-human conflict including tropical forest ecology. Information, picture courtesy and more on

<http://ces.iisc.ernet.in/rsukumar/>



Steve Turton- Is the Executive Director of the JCU/CSIRO Tropical Landscapes Joint Venture at James Cook University in Cairns. His research interests include tropical climatology, rainforest ecology, urban ecology and natural resource management. Steve's research has a strong emphasis on sustainable use, planning and management of tropical forest landscapes in north Queensland, Southeast Asia and Melanesia. In 2008, he was appointed to lead the national research team for the Sustainable Tourism Cooperative Research Centre Climate Change Destinations Adaptation Project and was also appointed as Team leader for the Cairns case study region. Information, picture courtesy and more on

http://www.jcu.edu.au/ees/staff/academic/JCUDEV_014397.html



Institute of Wood
Science and
Technology

Vojtech Novotny: Is currently serving at the Biology Center, Institute of Entomology, Czech Academy of Sciences, Czech Republic. He was associated with various professional appointments in the Czech republic, USA, Australia, Papua New Guinea and now continues to be interested in community and evolutionary ecology of insect herbivores, especially in rainforest ecosystems. The main areas of his interest include local and regional patterns of tropical insect diversity, organisation of insect communities, and insect-plant interactions, as well as the methodology of biodiversity surveys, biodiversity conservation, environmental education and parataxonomist training. Information, picture courtesy and more on

<http://www.entu.cas.cz/png/cv-novotny-vojtech.html>



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William Laurance : Is currently associated with the Smithsonian Institution, USA and his research interests include: - assessing the impacts of intensive land-uses, such as habitat fragmentation, logging, and fires, on tropical ecosystems Tropical plant and vegetation ecology Ecosystem science, especially relating to carbon storage in tropical forests; assessing the effects of global-change phenomena on tropical communities Land-use and conservation policy -

[Picture courtesy and more information](#)



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Sharachchandra Lélé – Is a senior fellow at the Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore. Sharad has worked at the Pacific Institute for Studies in Development, Environment, and Security, Oakland and at the Tata Energy Research Institute, before co-founding the Centre for Interdisciplinary Studies in Environment and Development, which recently merged with ATREE. Sharad's research interests include conceptual issues in sustainable development and sustainability, and analyses of institutional, economic, ecological and technological issues in forest, energy and water resource management. He attempts to incorporate strong inter-disciplinarity in his own research and teaching, which straddles ecology, economics and political science.



Public Lectures:

Ganeshiah KN –Is a trustee and member, of the executive board, Ashoka Trust for Research in Ecology and the Environment. His research interests range from Evolutionary ecology of plants and insects to analyses of stock markets to biodiversity and conservation. At present, he is working on mapping and measuring biodiversity, insect plant mutualism and application of the concept of self-organisation to explain growth and development of plants. In evolutionary ecology of plants, he has been working on the sexual selection and parent-offspring conflict and the evolution of plant reproductive strategies. More information on <http://www.atree.org/kng.html#4>



Mark Moffett – Is an ecologist, explorer and a photojournalist. From the top of the world's tallest tree to deep in unexplored caves, Mark Moffett has discovered new species and behavior while risking life and limb to find stories that make people fall in love with the unexpected in nature. Research on canopy biology likewise takes Mark around the world, such as on the expeditions of the French canopy raft, Opération Canopée. He lectures on conceptual frameworks for canopy biology, especially the idea that forest experts can learn from studying systems such as coral reefs, kelp forests, algal mats, grasslands and biofilms. Information, picture courtesy and more on http://www.doctorbugs.com/Dr_Bugs_Web.html

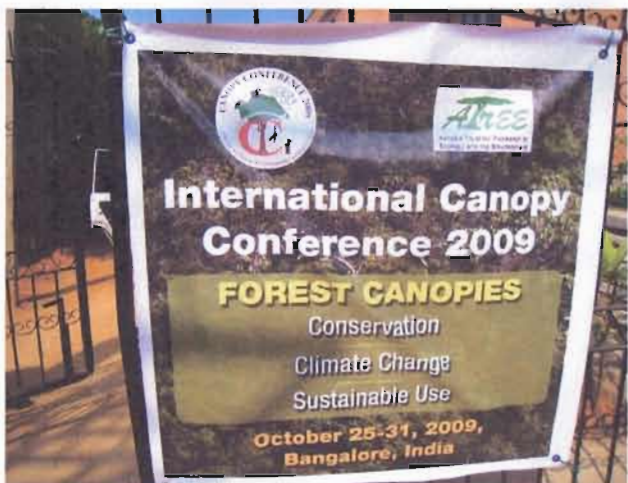
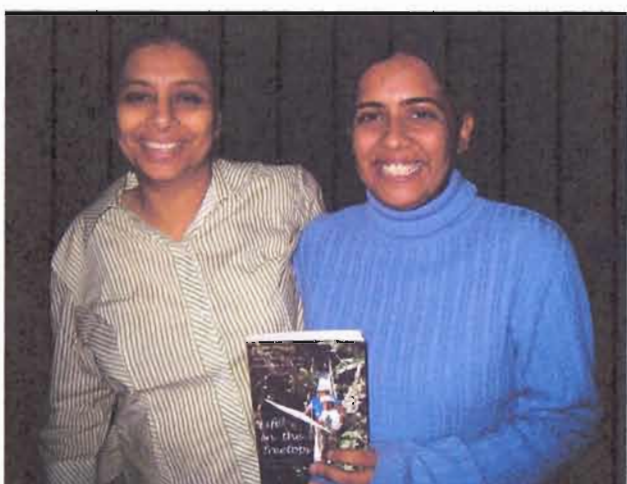


Margaret Lowman – Is currently the Director of Environmental Initiatives and Professor of Biology and Environmental Studies at New College of Florida. Meg Lowman pioneered the science of canopy ecology. For 30 years, she has designed hot-air balloons and walkways for treetop exploration to solve mysteries in the world's forests, with special expertise on the links between insect pests and ecosystem health. She currently serves as Vice President of The Explorers Club; Vice President of the Ecological Society of America; Treasurer of the Association for Tropical Biology and Conservation; Executive Director of Florida's TREE Foundation; and Cluster Chair for the Sarasota Economic Development Corporation. Information, picture courtesy and more on <http://www.canopymeg.com/index.htm>





Workshop to train Indian students about forest conservation and canopy ecology.



Deccan Herald
24th Oct 09

Meet on forest canopy

About 150 scientists from across the globe to assemble

BANGALORE: Ashoka Trust for Research On Ecology And Environment (ATREE), Bangalore is hosting fifth international conference on forest canopy from Oct 26.

The 6-day event to be held at JN Tata Auditorium, IISc Campus, covers various subjects including conservation of canopies, climate change and sustainable use.

About 150 eminent scientists, environmental managers, arborists, and policy-makers from across the world engaged in the science and sustainable use of forests will take part in the conference.

Canopy science has made advances only in the last 20 years, with the installation of crane technology that enables access



to non-climbing experts also, over bigger expanses of the canopy. However, India, a mega diversity, with the Western Ghats and Andaman and Nicobar and NE forests - does not have such facility for access, resulting in a canopy that is poorly explored, says a press release from ATREE.

Compared to Malaysia, with two cranes over their canopy for the past several years, and China, Brazil, Ghana, Madagascar also in the process of investing in crane installations, Indian institutions still have to employ the limiting, single-rope access method. It is time that India enables its scientists, to approach canopies in safer ways.

Dr Thomas Lovjoy will deliver the keynote address, and Andrew Mitchell, Kamal Bawa, Steve Turton, Vojtech Novotny and William Laurance will deliver plenary talks. Meg Lowman, K N Ganeshaiah and Dr Bugs-Mark Moffett will deliver public lectures. For the programme details visit www.canopy2009.org
DH News Service

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Tim Berra talk at New College - "Charles Darwin at 200" - 2/4/09 at 7 PM

The Joel and Ellen Fedder Lecture Series of the TREE Foundation presents: "Charles Darwin at 200: The Concise Story of An Extraordinary Man" by Tim Berra

On Wednesday, February 4, 2009, New College will host the third lecture in the New Topics series. Professor [Tim Berra](#), professor emeritus of Evolution, Ecology and Organismal Biology at the Ohio State University, will discuss the life and legacy of Charles Darwin. The event will take place at the [Mildred Sainer Pavilion](#) and begins at 7:00 pm. (Address: 5313 Bay Shore Road, Sarasota, FL, 34243 - [Campus Map](#))

Berra is the author of over 75 scientific papers and six books, including *Evolution and the Myth of Creationism* and *A Natural History of Australia*. His latest book, *Charles Darwin: The Concise Story of an Extraordinary Man*, will be published by Johns Hopkins University Press in November 2008 and features 60 black and white illustrations and 16 color plates.

Sponsored by New College of Florida and Joel and Ellen Fedder Lecture Series of the TREE Foundation, the series pairs prominent national speakers with New College faculty for stimulating discussions on relevant topics of our time. The final program is entitled "Crystal Bailing the Economy" and will be held on March 11.

New Topics New College is the successor to the New College Foundation's successful Hot Topics series, which started on campus in 2004. The series sponsor for this year's programming is once again U.S. Trust, Bank of America Private Wealth Management. The Fedder Lecture Series of the TREE Foundation is also underwriting the lecture on Charles Darwin.

You may view the complete program at <http://www.ncf.edu/new-topics-new-college/2008-2009-program>.

Tickets are \$15. The event is free for New College faculty, students and staff. The For more information and to reserve tickets, contact Greg Hite, special events coordinator, at (941) 487-4155 or events@ncf.edu

Links:

- [New College Lecture series schedule](#)
- [Dr. Tim Berra](#)
- [Dr. Meg Lowman](#)
- [Mildred Sainer Pavilion](#)

Source: <http://www.ncf.edu/news/?p=1091>

Darwin cake at the event:



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NATURAL SCIENCES SEMINAR

**FRIDAY, NOVEMBER 14, 2008
3:30 PM
CHAE AUDITORIUM
NEW COLLEGE OF FLORIDA**

Dr. Soubadra Devy

**Senior Scientist, ATREE
Ashoka Trust for Research on Ecology & Environment
Awarded the Lowell Thomas Medal for International
Biodiversity Achievements, 2007**

Title:

**The Ecology of the Western Ghats Biodiversity Hotspot
in India**

*Everyone is warmly invited to attend.
Refreshments available at 3:25 P.M.*



Natural Science Seminar

FRIDAY, FEBRUARY 27, 2009

3:30 PM

CHAE AUDITORIUM.

D.C. Randle

Title:

Science Education Outreach – Role Models and Field Activities as Methods to Inspire the Next Generation

DC Randle: High school educator of biological science, natural history, and wildlife management.

Jason Project educator (1994) leading students on expedition with explorer/educator Dr. Robert Ballard to the Belize tropics; research associate for Dr. Meg Lowman over the past 15 years in the Amazonian Tropics studying herbivory, leaf tagging, and tropical bromeliads and recently looking at environments in tank bromeliads; coordinator of the Blanding turtle project for high school students in Minnesota; outreach with high school students on rehabilitating injured raptors with the University of Minnesota's world famous Raptor Center; EHRC (education and human resources committee) for Ecological Society of America; mentor teacher for Sarasota Boys and Girls Club.

DC taught 25 years in St. Francis Minnesota at Crossroads School for EBD students (Emotionally Behavior Disordered students) and at St Francis High School with main stream students. In addition, he works on immersion ecology education with K-6 teachers and students yearly with rain forest outreach as well as outdoor ecology activities.

Abstract: With America's looming challenges in science education, it is important to create programs to mentor teachers and students in science education. Through field trips, I have inspired K-12 educators and students to foster connections to science, especially conservation and ecology. In my talk, I will discuss why mentoring works, ways to encourage K-12 students that they are scientist from day one, and how to foster that desire for science as a life long skill.

Everyone is warmly invited to attend.

Refreshments available at 3:15 P.M.

Suitable thematic snacks will be served (meaning ant candy, of course!)



Monday, November 9th 2009
4:00-6:00

University of South Florida
Institute of Public Policy and Leadership

Selby Auditorium
8350 N Tamiami Trail, Sarasota, FL

Refreshments will be served

Save the Rainforest, Cool the Planet

Environmental Defense Fund (EDF), partners and colleagues invite you

INTRODUCTIONS:

Dr. Margaret Lowman, New College of Florida

BRIEF PRESENTATION

Dr. Christina McCain, EDF

Tropical Forests & Climate Change: A brief overview

INVITED SPEAKER:

Mr. John Carter

Founder, Aliança da Terra, Brazil

Amazon Deforestation: A view from the trenches

Coined the "Amazon Cowboy" by Brian Williams' on MSNBC, John Cain Carter is truly unique champion of tropical forest conservation. A former Army Ranger and now a cattle rancher, John Carter moved to Mato Grosso Brazil in 1996 from his home of Texas. He was so shocked by the rapid deforestation occurring in the Amazon, he founded the organization Aliança da Terra to provide economic incentives for farmers and ranchers to preserve tropical forests adjacent to their lands. Working from his 8,100 hectare (20,000 acre) ranch near the Xingu river basin in the Brazilian state of Mato Grosso, he has gained international notoriety of late for his calling attention to the challenges that many of the Brazilian farmers face in attempting to protect their land ownership rights against illegal loggers. Mr. Carter has been interviewed by MSNBC, the New York Times, and even appeared on Late Night with David Letterman.

An engaging and passionate speaker, and an on-the-ground expert on Amazon deforestation, Mr. Carter is sure to stimulate an informative and intriguing discussion.

Contact for RSVP: Trey Lord, jlord@edf.org

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« Two Women: Two Extraordinary Scientists with Meg Lowman, March 24
Building a better tree house »

New ecology education project: "A TREEhouse for Every Child...."

TREE Foundation is proud to announce a new project linking kids to nature for Southwest Florida. The TREE treehouse will be built at Crowley Nature Reserve (exit on Fruitville Road off Interstate 75) as soon as the fund-raising is completed. This "kids-dream-come-true" will feature natural materials, an eagle's nest upper view spot, environmental educational hands-on activities inside and out, and construction amidst native Florida forest vegetation. TREE Foundation and Crowley Board of Directors are proud to co-sponsor the TREE treehouse, and encourage all local families, philanthropists, and businesses to become part of this special legacy to the next generation of Floridians. Our motto is "a treehouse for every child...." and if successful, this model may be replicated in other neighborhoods.

- PLEDGE CARD -

Name _____
Address _____
E-mail _____
Pledge Donation _____

\$10,000 or more	Naming Opportunity
\$5,000 - \$9,999	Swiss Family Robinson
\$1,000 - \$4,999	Tarzan & Jane
\$500 - \$999	Vine
\$100 - \$499	Air Plant
\$1 - \$99	Leaf

All donations of greater than \$1,000
get a prominent leaf plaque on the treehouse wall.

For more information, contact: Dr. Meg Lowman, Executive Director
www.treefoundation.org

You can make a pledge and be part of this exciting project. Just click on the graphic above to view a printable PDF version of the pledge card. You can then fill it out and mail it, along with your check, to:

TREE Foundation
P.O. Box 48839
Sarasota, FL 34230-5839

or

donate online using PayPal:



As Meg Lowman explained in her [Nature's Secrets column](#), treehouses serve several important biological functions for children who are fortunate enough to experience them:

Treehouses exemplify biophilia, an important term coined by E.O. Wilson that reflects our innate human desire to connect with the natural world. In an evolutionary sense, humans descended from ancestors in the treetops. Anyone who pauses at the zoo to watch a monkey cavorting in the branches is amused, inspired and subtly reminded of something inside that tugs on our evolutionary memory banks.

Treehouses also bring kids into contact with the hotspots of the forest — flowers, new leaves, pollinators, birds, arboreal mammals and millions of beetles. The essence of energy from sunlight all converges in this region high above the forest floor.

Third, canopies undoubtedly produce the purest air on the planet, emanating fresh from greenery that transforms carbon dioxide into useful energy. Oxygen is just one of the byproducts of this important process of photosynthesis. Just as patients appreciate plants in hospitals, perhaps kids benefit from the clean, fresh atmosphere enveloping a treehouse.

Fourth, treehouses are safe sanctuaries in a world of chaos and technology, and elicit the creative energy of youth. (And don't overlook the fact that they make cozy spots for sleep-overs with best friends!)

This entry was posted on Friday, March 27th, 2009 at 9:56 am and is filed under [ANNOUNCEMENTS](#), [EDUCATION](#). You can follow any responses to this entry through the [RSS 2.0](#) feed. Both comments and pings are currently closed.

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Under the leadership of President Gerri Aaron and Executive Director, Dr. Meg Lowman, the tree house committee, chaired by Carolyn Johnson, Laura Peters, and Susanne Rodriguez, undertook several projects throughout the year.



A tree house launching party was generously hosted at the home of Henry and Susanne Rodriguez on April 5, raising approximately \$10,000 in donations. John McCarthy, general manager Sarasota County Parks and Recreation, designed and built a replica of the planned tree house for the event.

In May, TREE Foundation partnered with Crowley Museum and Nature Center to build the tree house along their Childs Path, a learning path connecting several historic and educational sites. Erica Moore created the initial design, Michael Carlson an architect

who has worked with Crowley on several projects, will oversee the final design and building of the tree house.

TREE Foundation, Crowley Museum and Nature Center, and Ringling College of Art and Design have joined forces to apply for a three-way grant, with John Michele, a volunteer from Crowley, working to see the grant request through.

Our new efforts include a pamphlet for donations, creating and hosting a new fundraiser, and ensuring the completion and maintenance of the tree house.

Laura Peters



Activity #10



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« [Building a better tree house](#)
[5th International Canopy Conference 2009](#) »

[Saving the Church Forests of Ethiopia](#)

Dr. Lowman talks about her recent project involving the church forests of Ethiopia:

One of my most recent projects involved global conservation of African forests. During January, I traveled to Bahir Dar, Ethiopia, a center of the Coptic or Christian Orthodox churches in this proud country. Working with the one (and only!) forest conservationist in northern Ethiopia, I presented a workshop to the church clergy, explaining the value of the forests surrounding their churches. In Ethiopia, a church is not considered to be serving its mission unless it is surrounded by a forest. As a consequence, some forest patches are over 1500 years old (as are the churches.... some amazing architecture!). (When I think of our Florida churches, usually surrounded by cement parking lots, I am quite embarrassed!) Ethiopia's landscape is predominantly cleared for agriculture, and also deforested for fuel; so these church forests house their last remaining biodiversity. This includes pollinators (important for their crops), birds, animals, and trees many of which are already listed by the United Nations as endangered species. Even more important, springs of fresh water are often housed in these forest patches, providing the only clean water supply, thanks to the surrounding trees.

Together, my colleague and I asked for the blessing of the bishops for our conservation project. When I showed them photos of their church forests using Google Earth, they gasped. They had never seen Google Earth, much less a computer! They understood that NO OTHER forests existed within miles of their own sanctuary, and they could also see the rings of soil color changes, indicating rapid shrinking of their property due to encroaching agriculture. They fervently asked for our support, because maintaining these forests (not just the building itself) is part of the responsibility of the clergy.

One simple solution is barbed wire fences. For approximately \$10,000 we can create perimeter delineation for at least 10 churches since labor is almost free. TREE Foundation generously funded this workshop for the bishops, and now we seek additional funding to help Ethiopia save its important biodiversity. Who knows if the cure for cancer exists in their unstudied vines or tree canopies! If anyone has any thoughts about philanthropy that supports religion and/or environmental issues, this project is a real win/win/win for the donors, the church, and the planet!



(Click to enlarge.)

This entry was posted on Wednesday, April 22nd, 2009 at 3:28 pm and is filed under [EDUCATION](#), [RAIN FORESTS](#). You can follow any responses to this entry through the [RSS 2.0](#) feed. Both comments and pings are currently closed.

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Date 7/10/08

Dear Margaret D. Lowman, PhD

Director of Environmental Initiatives

Professor of Biology and Environmental Studies

New College of Florida

5800 Bayshore Road

Sarasota FL 34243

As you are well aware I have been doing extensive research on the remnant dry afro-montane forests of Ethiopia which have been protected by Ethiopian Orthodox Churches. These forests are the last and the only patches that refuge many indigenous plants and animal species. Unfortunately these forests need urgent attention to safeguard their survival for future generation.

According to my findings the local community, local government and international community have a stake for their survival. The findings have been presented for the scientific community but not to local officials and church administration.

Therefore preparing a seminar for local stakeholders about the status and conservation needs of these forests has become a crucial task. I have been looking for a funding to launch the seminar. Along financing, a person with international expertise and exposure is also valuable to give weight for the seminar.

Accordingly I found you as the appropriate person for your outstanding expertise in worldwide conservation matter and rich professional wisdom both from scientific point of view and capacity to communicate indigenous people.

Therefore here I kindly request your help for searching and processing funds to the seminar and your time for personal appearance in the seminar to motivate participants. The seminar is planned to be held in Deber-Tabor, Amhara Region, Ethiopia in January/2009. The Arc-Bishop as well as the local church and government officials is so eager to share your wisdom.

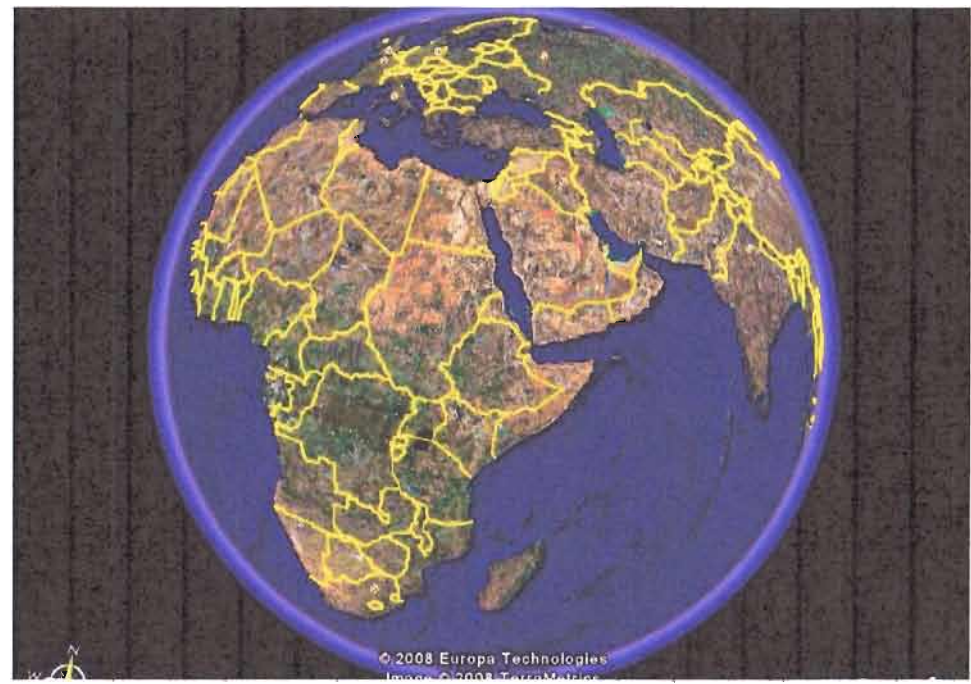
Please find the attached detail proposal of the seminar

Best regards

Alemayehu Wassie (PhD)

Ecologist and church forest specialist

Organization for Rehabilitation and Development in Amhara Region (ORDA)



#9/#10



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Amazon Amigos Report for TREE Foundation 10.14.09

The TREE Foundation's co-sponsorship of the Amazon Amigos donation program had a good launch in its first year. Contributions totaled over \$10,000 in support of the Peruvian non-profit Conservación de la Naturaleza Amazónica del Perú, A.C (CONAPAC). Contributors were primarily teachers, students, and parents who had first hand experience in the Amazon Rainforest and personal knowledge of CONAPAC's track record. Travelers most often become acquainted with CONAPAC's work through their hands-on involvement on volunteer service days.



Marcos Oversluijs, a TREE Foundation intern in 2007, continues to direct the Amazon Amigos sponsored projects at CONAPAC. As a trained scientist, Marcos infuses his knowledge about the environment into the execution of on-the-ground initiatives. CONAPAC's approach to conservation in the Amazon relies on a holistic approach to ecological education, sustainable development, and reducing poverty among local people who live in the Rainforest along the Amazon and its tributaries near Iquitos, Peru.



During the year, CONAPAC staged village workshops, managed service projects, planted trees, and worked hand-in-hand with community members to encourage them to live in harmony with their environment.



While logging interests continue to put pressure on vital trees, CONAPAC's presence and environmental values-based education over the last 13 years pays off each year in ways that are evident through personal anecdotes. During a service project in the village of Yanamono II, it was discovered that a logging company had approached the village with promises of a weed



whacker in exchange for allowing them to cut down some of the nearby old growth trees. Cutting grass is labor intensive as villagers use machetes to keep the grass and plant life short around community buildings and on soccer fields. A weed whacker would make life much easier. This village chose their trees over the lawn equipment.

Part of Amazon Amigos' contributions will support clean water, a basic need for Amazonians. Since the spring of 2009, CONAPAC has installed five new water treatment plants in villages along the Amazon and hosted five water workshops. The first workshop was conducted in July in the community of Santa Teresa with approximately 200 people from the community attending (from a population of about 350 or 75 families). CONAPAC's simple system to create water plants starts with parts readily available in Iquitos. The four-stage filter system is partially assembled in Iquitos and transported by boat to the community for final construction involving community and volunteers.

CONAPAC's multi-pronged approach supporting basic needs, conservation, environmental education, and sustainable development continues to score high marks where the effect of every dollar is multiplied several times over. We look forward to another year in support of this worthy initiative.



(submitted by Frances Gatz)

Amazon Amigos - a new program co-sponsored by The TREE Foundation

Conservation in the Amazon depends on a holistic approach to ecological education, sustainable development, and reducing poverty among local Amazonians who consider the Rainforest to be their own back yard. The rate of deforestation of the Amazon Rainforest and the subsequent decline of Earth's biodiversity calls for models of sustainable practices that benefit local people. The TREE Foundation is responding to this need.

The TREE Foundation's co-sponsorship of the Amazon Amigos donation program promotes science-based environmental awareness, conservation, and the sustainable use of resources among the local people in the Amazon. Contributions go directly to advance conservation of the Amazon's natural resources through a hands-on approach involving the local people who live in the forest and on the Amazon River's edge.

The Amazon Amigos funding program offers a way for individuals to support the Peruvian non-profit Conservación de la Naturaleza Amazónica del Perú, A.C (CONAPAC) and its ongoing sustainable initiatives directly. Amazon Amigos' launch was made possible by the TREE Foundation and Environmental Expeditions, with thanks to the Amazon Explorama Lodges who provides much logistical support to CONAPAC, and Ecoprint of Silver Spring, Maryland who donated printing and mailing.

The TREE Foundation, through Dr. Meg Lowman, has been involved in canopy research and education in the Amazon since the mid 1990's. Each year, Meg educates and inspires students and travelers through her leadership in the Amazon Rainforest Workshops. She teaches of the importance of science in conserving the Rainforest. These travel programs have reached hundreds of U.S. teachers and students. In this incubation stage, Amazon Amigos contributors are participants from this Rainforest Workshop program hosted by Environmental Expeditions.

The TREE Foundation's support of Amazon Amigos is an outgrowth of Meg's involvement in the Peruvian Amazon and association with Environmental Expeditions and CONAPAC. Through the TREE Foundation, the Amazon Amigos funding program supports the work of Marcos Oversluijs, a TREE Foundation intern in 2007 who directs the Amazon Amigos sponsored projects at CONAPAC.

As a trained scientist, Marcos infuses his knowledge about the environment into the execution of on-the-ground initiatives. CONAPAC's approach is one of relationship building and creating incentives that benefit local people. Marcos's keen understanding of the local culture, network of village contacts, and passion for his work add mightily to the success of CONAPAC's sustainable development projects.



Exploitive logging, slash and burn agriculture, and the harvesting of wildlife have depleted many rich natural resources in the Amazon. Most villagers live “hand to mouth” having neither the skills nor capital to build a sustainable future for themselves. It is next to impossible to estimate the average income of the local people of the Amazon Rainforest. Most families fish from the river, hunt in the forest, and till a small plot of land for food. Community members work together to build their homes with materials readily available from their environment. They need currency to buy essentials for their survival and their opportunity for earning money for these essentials is limited. The Amazon Rainforest is the resource in their backyard. Because there is a lack of monitoring of forest reserves, they are easily seduced to allocate nearby forested land to loggers. They need clean water, education infused with environmental values, and sustainable options for economic development.

Background

Now in its 15th year, CONAPAC’s story began with the first Educator’s Rainforest Workshop expedition to the Amazon attended by 50 U.S. teachers in 1992. Partners in this workshop program supported the launch of the Adopt-a-School program in Peru. The school assistance program grew into a Peruvian non-profit (CONAPAC), who subsequently partnered with other U.S. based organizations including the Detroit Zoo. The non-profit expanded its mission to include environmental education, service, and sustainable development projects now in over 72 communities and reaches over 4,200 school children along the Amazon each year.

The ongoing goodwill created by this school program and other service projects organized by CONAPAC provides a network of community leaders to further expand development and assistance efforts. CONAPAC provides the incentive of sustainable opportunities and teaches environmental values and self reliance. Contributions donated through the Amazon Amigos through the TREE Foundation go directly to fund the nonprofit CONAPAC, the organization spearheading these education and assistance projects on the ground in Peru. No bureaucracy, just a cadre of committed individuals wanting to make a change in their communities.

Here is a sampling of Amazon Amigos sponsored project options:

SUSTAINABLE DEVELOPMENT PROJECTS

Family Fish Farm

Creating and stocking small fish ponds allows individual families to raise fish for home and market. The cost of food for the fish is nominal as many types of fish eat algae and others eat fruits or insects which can be easily gathered in the forest. Supplies for creating fish ponds are kept by the community. Constructing the ponds is similar to barn raising and can increase the standard of living for many families in a village.

Flower Farm

Flowers are a treasured gift and symbol of compassion, hope, joy, and love. Growing beautiful tropical flowers for local distribution and export, like the many varieties of Heliconias and Gingers found growing naturally in the forest, is an emerging economic opportunity, offering sustainable income to families and rewarding jobs for young people.

Carpentry Center



Loggers are unsustainably extracting the Amazon's richest forest resources. When villagers selectively add value to timber products through their woodworking skills, they multiply the value of their local trees by 10. A generator, tools, and trainer are needed for a Carpentry Center. Skilled woodworkers market crafted wood products to village schools and local governments as well as provide their homes with basic furniture such as beds, chairs and tables that would otherwise be impossible to purchase.

Agouti Herd and Fencing

Agoutis are small rabbit-like animals weighing 6-10 pounds. These plant-eating forest dwellers have been over-hunted. Through a micro-livestock approach, agoutis can thrive to provide an excellent, low-impact protein source that Amazonians consider quite tasty. A small herd of agoutis also provides a family with income without destroying the forests to create cattle pastures.

Mini Bakery



Bread and baked goods are scarce in the Amazon, but are a desirable and nutritional complement to the usual diet of fish and boiled plantains. Investment in a commercial brick oven enables a community bakery to produce bread from corn, manioc, and wheat. Baked goods are sold alongside jams produced from local fruits such as camu camu, papaya, and mango.

Camu Camu Patch

Camu camu, a fruit with 30 times more Vitamin C than oranges, can be processed into many products including juice and jam and many other products for market. Native to the Amazon, the small riverside bushy camu camu tree can live several decades and be cultivated to produce as much as a ton of fruit per acre. Currently, the over-harvesting of wild camu camu threatens to make it an endangered species.

COMMUNITY PROJECTS

Water Purification Plant

While plentiful, the river water that children drink contains parasites that cause them to become ill and malnourished. During the low water season, water quality decreases even further when rivers, streams, and ponds shrink and often recede distances from villages. Small water treatment centers can produce clean water for small villages and make a significant difference in the community's health. The use of recyclable bottles makes this an environmentally friendly venture.



Community Center

A Community Center is an open air communal house for village meetings. Each village has three main authorities, the mayor, municipal agent and Principal of the school. Meetings with the village leaders and community members are important for the organization of activities and projects. Communal buildings also serve as extended classrooms for teachers dividing grades from one room schoolhouses, meeting places for the PTA and women's clubs, and for workshops held in the villages.

* * * * *

The time to introduce practical ideas of community and sustainable development is now. Peru has not yet suffered the devastating destruction of their rainforests as Brazil and other neighbors. However there are signs of compromise, as we see each year more and more logs floated on barges en route to lumber mills, more land being cleared along the rivers for cattle farms, and more meat of endangered species in the market place. With options in place to counteract these pressures, the Peruvian Amazon stands a better chance of growing a sustainable economy and preserving its vital natural resources.



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FIELD GUIDES

How to Identify Invasive Reptiles in SW Florida

Thursday, January 22nd, 2009

Black Spiny-Tailed Iguana (*Ctenosaura similis*)

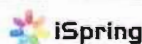


Region: Native to Mexico and Central America. Introduced to Florida through the pet trade.

Identification: Can reach lengths of five feet. Have distinctive spiny scales on tail, as well as along their back. Males are more colourful, and often have orange or peach scales near their head. Juveniles are bright green (top left insert), and have dark bands across their backs, but may also be brown.

Behaviour: May climb trees to predates. They prefer dry, rocky habitats with many places to hide. They are diurnal (active during the day) and are not usually aggressive. They will lash their tails, or bite, when threatened or cornered. They can run very quickly, at about 20 miles per hour. Mating Occurs in the spring, females dig nests, and lay up to 30 eggs. Eggs hatch in 3 months.

Diet: Adults primarily eat vegetation (flowers, leaves, berries), but young iguanas frequently eat insects. They are opportunistic eaters, and will eat small animals or eggs, which may pose a threat to endangered native species.



iSpring



1 / 7

00:00 / 01:45



How to Identify Invasive Reptiles in SW Florida Power Point slideshow compiled by Ecology students at New College of Florida.

Invasive reptiles covered in this guide

- Black Spiny-Tailed Iguana (*Ctenosaura similis*)
- Brown Basilisk (*Basiliscus vittatus*)
- Burmese Python (*Python molurus bivittatus*)
- Nile Monitor (*Varanus niloticus* or *Varanus niloticus ornatiss*)
- Savannah Monitor (*Varanus exanthematicus*)

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Sat. May 30 '09

SARASOTA Herald-Tribune

Diane H. McFarlin, Publisher

Michael K. Connelly, Executive Editor Thomas Lee Tryon, Opinion Editor

EDITORIALS

Beware of pythons

Government should invest now in eradication efforts

Florida and its counties spent millions of dollars to eradicate the Brazilian pepper tree after it spread through the state — even though this invasive species doesn't eat birds, wildlife ranging from rabbits to alligators, or cats and dogs.

Burmese pythons can and do consume animals — small and large, domestic and wild — in large quantities. Python populations also multiply like rabbits, or faster, and can quickly expand their range.

For example, Meg Lowman, a biologist based in Sarasota County, reported that about 200 pythons were captured in or near the Everglades National Park from 2002 to 2005. By 2006, the number was 418. By last year, the python population in the Glades was out of control and biologists estimated there were at least 30,000 of them.

Lowman is director of Environmental Initiatives at New College of Florida. In a bi-weekly column Lowman writes for the Herald-Tribune op-ed page, she warned last year that state and local governments need to begin serious efforts to contain the python and other creatures, such as iguanas, Nile monitors and spiny-tailed lizards.

Those species aren't native to Florida and, as a result, aren't beneficial components of natural food chains.

Risks to wildlife and parks

Pythons, in particular, can ravage native bird and wildlife populations. The impact on ecosystems is reason enough to invest in preventive efforts to contain the python.

But, as Lowman warns, an exponential surge in the number of pythons and the expansion of their range also pose risks to state and local parks, which attract tourists and visitors. We agree with her that park attendance could quickly be diminished if python sightings become routine.

Lowman, working as a consultant to Sara-

sota County government, suggested funding an eradication program that targets pythons and other reptiles. Budgets are tight but spending, say, \$50,000 to help contain the spread of pythons — before they become too numerous to control — would be a cost-effective investment.

If the benefits to the environment and parks aren't enough, consider this: Imagine the public outcry that will occur if pythons spread into areas near subdivisions and begin to prey on pets. Wildlife-control officers will be called to trap the snakes and devastated pet owners will ask why no one did anything to prevent the invasion of reptiles capable of feeding on Fluffy and Fido.

The alligator model

Such scenarios already occur occasionally when alligators devour domestic animals. It costs time and money to capture and remove alligators, and the experience unnerves entire neighborhoods.

Unlike pythons, alligators are a native species and play an important role in maintaining ecosystems. Still, state government takes steps to control the gator population — for example, allowing a limited amount of strictly regulated hunting.

Frank Mazzotti, a researcher allied with the home of the Gators, the University of Florida, said last year: "We really need to be addressing the spread of these pythons. They're capable of surviving anywhere in Florida, they're capable of incredible movement — and in a relatively short period."

Too many times, our state has waited too long to control invasive species that harm the environment and, in many cases, humans. The results have been ugly and more expensive to repair.

Floridians should consider ourselves warned that we can pay now to control exotic reptiles or pay more later.

Report from the Field: **Bryson Voirin**

At the moment I am analyzing data recorded over the summer at the Smithsonian Tropical Research Institute in Panama. The project I am working on is recording sleep in wild three-toed sloths in Panama. Using new micrologger sleep recorders, I am studying the how an animal's sleep patterns change under various environmental and biological conditions. The main variables I am testing are predation pressure, learning, body temperature, and immune strength. As all mammals sleep, using sloths as a study animal can yield results that are valid across the mammalian genre. By better understanding how and why natural sleep is affected by certain situations in wild animals, we can hopefully gain insight into sleep disorders in humans, and their potential causes.

My most recent field season was over the summer, where I studied sloths living in two very different areas. One population was living in an area with a large number of natural and introduced predators, including as ocelots, eagles, dogs and humans. The other sloth population was on an isolated island with no predators, natural or introduced. By examining how different the two populations sleep, we are understanding how nervous behavior and worrying can impact a species' natural sleep pattern.

Thanks in part to funding by the TREE Foundation, the data is being presented at the 5th International Canopy Conference in Bangalore India. There, I am giving two lectures on my sleep research, with a special focus on the new miniaturized technology that enables me to study sleep in the wild. To date, we are the only group of scientists able to study animal sleep in a natural setting.



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[◀ Rain Forests of the World - Panama](#)

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Rain Forests of the World - South Pacific Islands

Slide show by Christine Bowden

The South Pacific Islands

The Solomon Islands

- 27,540 km² land area – slightly smaller than Maryland
- Population 581,318
- Biodiversity
 - Of the 400 species present on the island, 20.9% are endemic and 11.7% threatened
 - 1172 species vascular plants, 0.9% of which are endemic
- 77.6% of land area covered in rainforest
 - Most forest on steep slopes and rugged terrain – inaccessible to loggers
 - Logging began in 1990s – Islands lost 21.7% (596,000 ha) of their forest from 1990-2005
 - Annual deforestation change 1990-2005: -1.63%
 - Annual deforestation change 2000-2005: -1.64%
 - World's 10th largest exporter of hardwood logs
- Corrupt government officials not able to help conservation efforts









Rain Forests of the world summaries compiled by the Introduction to Tropical Ecology students at New College of Florida.

This entry was posted on Tuesday, January 20th, 2008 at 4:22 pm and is filed under [EDUCATION](#), [RAIN FORESTS](#). You can follow any responses to this entry through the [RSS 2.0 feed](#). Both comments and pings are currently closed.

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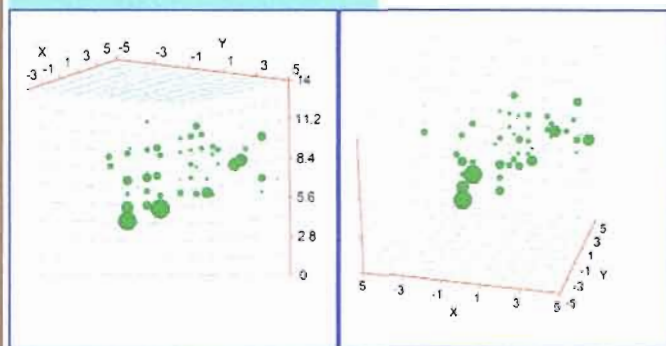
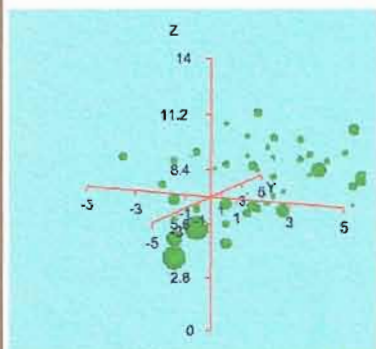
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« [Dr. Meg Lowman to Speak at VAAS Dinner on March 15th, 2009](#)
Two Women: Two Extraordinary Scientists with Meg Lowman, March 24 »

Herbivory – Using Leaf Damage to Teach Students about Statistics and Experimental Design



The data was collected from a single Eucalyptus tree in the early 80s by Margaret Lowman in conjunction with an Earthwatch expedition. The leaves were gathered from the top down with the aid of a cherry picker, bagged, weighed, and sorted. Since all of the leaves were removed at roughly the same period in the tree's life this creates a snapshot of that tree's foliage. Originally the data was used to determine the distribution of insect damage in its foliage, as well as the distribution of the that foliage over the whole of the tree. The current work we are doing with the data set, represented by the 3-D graph, is to determine how much of a tree's canopy needs to be sampled in order to obtain an accurate picture of it's health with the intent of harvesting only as much as is statistically needed. A recent analysis of the data shows that much of the insect damage is concentrated at the lowest heights of foliage and the areas close to the trunk. The damage shows a trend of becoming less severe out into the branches. From this graph, one can therefore determine that it would be an inaccurate sampling technique to gather only the most easily accessible leaves to represent that tree. They would have a higher probability of suffering from more damage as compared to the rest of the canopy. It is in our hopes that students can use this data set as a real world example to learn some of the principles of good sampling techniques and statistical analysis.

Lowman M.D., Burgess A.D., and Higgins W.D. 1987. The biomass of New England peppermint (*Eucalyptus nova-anglica*) in relation to insect damage associated with rural dieback. *Australian Journal of Ecology* (12): 361-371

This entry was posted on Tuesday, March 10th, 2009 at 5:33 pm and is filed under [EDUCATION](#). You can follow any responses to this entry through the [RSS 2.0 feed](#). Both comments and pings are currently closed.

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Two Women: Two Extraordinary Scientists with Meg Lowman, March 24



From [New College News](#):

Professor of Biology and Director of Environmental Initiatives at New College Meg Lowman, a.k.a. "[Canopy Meg](#)," will speak at United Nations Association, Sarasota-Manatee Chapter, on March 24 at 6:00 pm. Professor Lowman will be joined by [Dr. Eugenie "the Shark Lady" Clark](#). The event is entitled "Two Women: Two Extraordinary Scientists" and will be held at the Herald Tribune Building, 1741 Main Street, in the first floor Community Room.

For more information, please contact Catherine Seress at (941) 928-1187. Please note that seating is limited.

This entry was posted on Friday, March 13th, 2009 at 4:23 pm and is filed under [Uncategorized](#). You can follow any responses to this entry through the [RSS 2.0](#) feed. Both comments and pings are currently closed.

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Dr. Meg Lowman to Speak at VAAS Dinner

Topic: Conservation for the Next Generation

The Venice Area Audubon Society is privileged to have the renowned scientist Dr. Meg Lowman speak at the VAAS fundraising dinner Sunday, March 15th at 5:00 PM at the Crossroads American Grille.

Dr. Lowman has recently returned from speaking at the Ecological Society of Australia Conference in Sydney, Australia, where she was interviewed by ABC Radio National. During the interview she discussed the mysterious world of the canopy and remarked that over half of the life on earth lives in the tops of trees which includes millions of insects and thousands of birds. Dr. Lowman stressed the urgency to uncover the secrets of the rain forest before we lose the forests.

Meg Lowman pioneered the science of canopy ecology. For 30 years, she has designed hot-air balloons and walkways for treetop exploration to solve mysteries in the world's forests, with special

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expertise on the links between insect pests and ecosystem health. Meg is affectionately called the grandmother of canopy research as one of the first scientists to explore this "eighth continent". She relentlessly works to "map" the canopy for biodiversity and to champion forest conservation in Florida as well as around the world. Her academic training included Williams College (BA, Biology); Aberdeen University (MSc, Ecology); Sydney University (PhD, Botany); and Tuck School of Business (Executive Management).

Her first book, *Life in the Treetops*, received a cover review in the New York Times Sunday Book Review. Working tirelessly on sustainability initiatives at home and abroad, she recently received the Lifetime Achievement Award for Conservation from Sarasota County.

"Canopymeg" is currently Director of Environmental Initiatives and Professor of Biology and Environmental Studies at New College of Florida. She also serves as the Science Advisor for Climate Change to Florida's CFO, Alex Sink. Previously she has served as CEO of The Marie Selby Botanical Gardens, was Professor of Biology and Environmental Studies at Williams College, and co-managed a sheep and cattle station in outback Australia. Meg is married to attorney Michael Brown. They are the proud parents of Eddie, research associate at Environmental Defense working on urban environmental policy; and James, applied math major at Princeton University who is modeling forests as global carbon sinks. Reflecting her love for linking kids to nature, Meg's personal mantra is "No child left indoors." Tickets for this event are \$29 each. Tables for 10 or eight are available.

Sign up Now! Limited Seating Please fill out the form below and send a check to the Venice Area Audubon Society to: Norma Lee Rhines, 710 Fording Bridge Way, Osprey, Florida 34229

Name: _____

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BIOTROPICA

THE JOURNAL OF TROPICAL BIOLOGY AND CONSERVATION

Volume 41 • Number 5 • September 2009

Special Section: Sharing Ecological Knowledge:
Conquering the Research-Implementation Gap



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Responsibilities of 21st-Century Scientists

Thomas E. Lovejoy

MOST OF US WERE ATTRACTED TO SCIENCE BY A FASCINATION with nature and the excitement of inquiry. In my case that started with temperate ecosystems and biodiversity, but clearly intensified the moment I set foot in the tropics. My aim in life was to have scientific adventures in far away places and return to my institutional base only with sufficient frequency to justify continued support.

But then I grew up, not only in the sense of realizing there was public responsibility involved in sharing the knowledge I was gaining, but also in recognizing human impact on the biosphere was gaining in momentum and magnitude. We are the ones with, in effect, 'stethoscopes' closest to the pulse of the tropics and hence the most recent and in-depth knowledge.

We are at the moment of ultimate reconciliation between humanity and the living world. Biology is changing all over the planet because of climate change and other human impacts. That changes both our science and how we should share our insights—the subject of this special section of *Biotropica*.

One level of knowledge sharing is of course built into the scientific enterprise, namely standard publication in peer-reviewed journals. That is taken as a given, but the point of this special issue is we need to share knowledge beyond professional colleagues, and for that matter, the students who brighten our lives and our science.

We certainly have a responsibility to share knowledge with public officials and other leaders. Otherwise how can we possibly expect policies that logically derive from the work? That requires very different language, *i.e.*, simple and straightforward, whereas our normal implication is to present things with great complexity with all kinds of ifs, buts and maybes.

For example, when I talk about the implications of habitat fragmentation, I tell people fragments lose or leak species and be-

come simpler once they are no longer part of a continuous forest. Or I give them the very concrete result that fragments of 100 ha lose half of the forest interior bird species in < 15 yr. In other words I save the complications for the technocrats.

Public officials are more likely to do the right thing if they have a sense that the larger public is supportive, so we need to spend time sharing knowledge with the general public. That is most easily done through the media, print and electronic. That, of course, is a world that is changing rapidly, and so to invest time and energy well we need to understand that dynamic. This kind of communication requires art as well as science and is certainly not something we are trained for. There are programs like the Aldo Leopold program started by the Ecological Society of America, which can help develop those skills.

Almost all coverage helps. An exception is the deliberately incorrigible contrarian. In my view trying to address or correct their misstatements often draws more attention to them.

Lastly it is important to share our knowledge with people who live in the vicinity of our research. They in the end have a very personal stake in our results and can often be great advocates once the work and implications are understood. Dan Janzen's work over the decades in Guanacaste is a classic example as is Pat Wright's work in Madagascar.

Most of us are better at some kinds of knowledge sharing than others, and some are better at it overall than others. But at the very heart of this matter of whether we devote some of our time and energy to knowledge sharing is that very sense of adventure and excitement in science that attracted us to start with. It would seem just natural to share that thrill: what better way to make the knowledge itself even more appealing?

Canopy Walkways for Conservation: A Tropical Biologist's Panacea or Fuzzy Metrics to Justify Ecotourism

Margaret Lowman^{1,2,3}

¹ New College of Florida, 5800 Bayshore Road, Sarasota, FL 34243-2197, U.S.A.

² TREE Foundation, PO Box 48839, Sarasota, FL 34230-5839, U.S.A.

DESPITE EXTENSIVE SCIENTIFIC RESEARCH undertaken in tropical ecosystems over the last few decades, approximately half of tropical forests have been destroyed and rates of deforestation continue to accelerate worldwide (Curran *et al.* 2004). Thousands of indigenous cultures and millions of local people need these deteriorating forest resources for their livelihoods, and the challenges of tropical forest conservation looms as a global priority (Laurance & Perez 2006). Meanwhile, the conventional metric used to gauge the success of professional academics in tropical biology is the publication of technical papers, which seems all too disconnected from the metrics of forest conservation. A new consciousness is sorely needed (Leiserowitz & Fernandez 2008; but see Webb 2005, Büscher 2008). Most tropical biologists admittedly enter the profession with a hope to contribute to conservation of these systems, but their hundreds of thousands of hours dedicated to field research and publications do not seem proportional to reversing conservation. If conventional business formulae were applied to tropical research, a likely outcome would be downsizing the industry. New metrics that incorporate conservation benchmarks and facilitate sharing best practices between professional scientists and local stakeholders could foster forest conservation through actions that create sustainable economies.

Canopy research appeared to offer an ideal case study to examine the socioeconomic plus scientific metrics of success, with its spin-off ecotourism operations such as skywalks and ziplines providing data sets to quantify their benefits to local stakeholders (Lowman 2004a). In short, can canopy access tools contribute to local economies and stimulate forest conservation? And second, can projects that promote forest conservation provide acceptable metrics to gauge success among scientific researchers (see also Garnett *et al.* 2009, Sunderland *et al.* 2009)?

Canopy ecology is a relatively new component of tropical forest research, with a toolkit of creative access techniques developed over the last two decades (Lowman 2004b). Business ventures involving canopy exploration are often incorporated into large-scale eco-developments that include bird-watching, education-based nature tours, spas, and holistic medicine (Weaver 2001). These ecotourism opportunities usually meet with generic approval under the guise of 'green businesses'. In this commentary, I grapple with the apparent oxymoron of working as a biological researcher yet build-

ing canopy walkways to achieve conservation. Such structures are not the conventional metrics of academic success, but can conservation actions gain traction as metrics of success in our admittedly rigorous academic community of scientists?

Ranging in cost from US\$100 to US\$3000/m, canopy walkways generate revenues for local stakeholders, and provide ecology education to a broad visitorship (Lowman & Bouricius 1995, Lowman 2004b). Over 20 canopy walkways currently operate in tropical forests around the world serving research, education, and ecotourism (Lowman 2009). Most sites are operated by local stakeholders without sophisticated spreadsheets to quantify their operations. Some sites received initial grants from NGOs or other well-meaning organizations in developed countries to undertake construction in the name of conservation, and others attract 'operators' from developed countries that spawn additional ecotourism activities, thereby making the metrics of the canopy attraction impossible to analyze in isolation.

The first canopy walkway in the world was built in Lamington National Park, Queensland, Australia, at O'Reillys Rain Forest Lodge (Lowman *et al.* 2006). In a developed country such as Australia, one would expect a rigorous business plan calculating the economic success of this structure. However, when asked to provide metrics about the economic success of his skywalk, owner Peter O'Reilly commented, 'I am certain that the canopy walkway contributed greatly to the increase in visitors to our lodge. But it is impossible to isolate the walkway from other amenities that were built simultaneously—improvements to the road, our liquor license, expanding the dining services, and better marketing. We could not create metrics to assess it (canopy walkway) in isolation, but we locals felt strongly that it was critical to our ecotourism success'.

In short, the Australians could not generate enough data to satisfy even a brief note in a journal, but yet they are intuitively confident that their walkways aided conservation. If an expertly run business in a developed country cannot provide accurate metrics about the exact formulae for commercializing rain forest conservation, then how can indigenous villages do so?

Today, over 1.6 billion people from all cultures and all walks of life participate in different avenues of tourism, spending over US\$2 trillion (Hawkins & Lamoureux 2001). On a global scale, ecotourism is growing because of its international appeal, educational opportunities, and social appeal to advocate a conservation ethic. As human-dominated ecosystems become the norm,

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³Corresponding author; e-mail: canopymeg@aol.com

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ecological research and its education outreach through ecotourism become critical at both continental and local scales to inspire the sustainability of earth's dwindling resources (Palmer *et al.* 2005, Peters *et al.* 2008). Canopy research promotes forest conservation at three scales: through biological discoveries published in the scientific literature, by offering innovative sustainable economic opportunities for local stakeholders such as canopy walkways, and through educating a broader visitorship through ecotourism. Despite the existence of over 20 canopy walkways around the world for research and education, and several dozen more for ecotourism alone, accurate records are not often kept by local operators. In addition, local labor and materials mask the true costs of the structure; other amenities cloud the ability to isolate economic metrics; and the broader-scale impact of educating a global audience of visitors is not easy to quantify. Although Büscher (2008) reminded conservation biologists not to ignore their 'rigorous empirical research' training, should we sometimes rejoice about conservation 'wins' such as canopy walkways despite a lack of rigorous data sets to justify their existence (see also Sunderland *et al.* 2009)?

AMAZON CASE STUDY

In the Amazon, tropical rain forests are disappearing at unprecedented rates. But the Amazon provides essential ecosystem services on a global scale: pollination, flood control, carbon sequestration, regulation of fresh water, regulation of atmosphere, amelioration of disease, genetic libraries that include food and other biodiversity, and prevention of soil erosion (Foley *et al.* 2007). Almost 10 yr ago, nearly 15 percent of the Amazon basin was already cleared (Nepstad *et al.* 1999). Perhaps more urgently than other tropical forests, economic incentives for local stakeholders to conserve forests in the Amazon represent a win-win.

In 1993, a canopy walkway was constructed along the Sucasari tributary of the Rio Napo downstream from Iquitos, Peru (Table 1). Hardwood canopy trees were utilized as supports for a series of 13 connected bridges, at a cost of approximately US\$100/m (P. Jensen, pers. comm.). With the use of local labor and materials, this cost was significantly less expensive than structures built on telephone poles or other imported structures that can cost up to US\$3000/m (<http://www.canopyconstruction.com>). Explorama Lodges, partnering with CONEPEC (a Peruvian conservation group), maintains this canopy walkway as an ecotourism and research destination called Amazon Conservatory for Tropical Studies (ACTS). In 2007, 2625 eco-tourists paid US\$150 to tour the canopy, totaling US\$393,750 (with approximately US\$30/person distributed to travel agents). The remaining profit (estimated at US\$315,000) and associated services provided jobs for approximately 212 local villagers representing over 100 families (P. Becur & P. Jensen, owners of Explorama Lodge, pers. comm.). Over 8000 visitors come to Explorama annually; by rough calculations at US\$150 per visitor, gross revenues for the walkways exceed US\$1 million. This not only employs local people but also provides career livelihoods from ecotourism instead of logging (Fig. S1). Even more difficult to quantify, this cadre of international visitors return to their home countries with a first-hand education about the complexity of tropical rain forests. The ACTS walkway also inspired a major science education program called the Jason Expedition, where approximately 3 million middle school students around the world studied canopy ecology via satellite technologies (Lowman *et al.* 2006; <http://www.jason.org>). As a consequence, the ACTS walkway is now the destination of choice of countless teachers, families, and school groups (<http://www.environmentalexpeditions.org>). The metrics are fuzzy, but the conservation success is evident.

TABLE 1. Metrics for three canopy walkways illustrating the variability with regard to obtaining accurate metrics from which to gauge success. Potential benefits: 1 = conservation education; 2 = income; 3 = employs locals; 4 = reduced logging or clearing pressure. Potential drawbacks: 1 = destruction of local ecosystems; 2 = extinction of species; 3 = addition of human infrastructure; 4 = no drawbacks observed.

Site	Samoa	Peru	Florida
Initial cost	US\$75,000	US\$250,000	US\$120,000
Visitors	~240/yr	> 8000/yr	> 298,749/yr
Revenue/yr	~US\$12,000 ^a	US\$1.2 million ^b	~US\$750,000 ^c
Major benefits	2, 3, 4	1, 2, 3, 4	1, 4
Drawbacks	4	4	3
Reference	Elmqvist <i>et al.</i> (1993)	P. Jensen & P. Betencur, pers. comm.	Lowman <i>et al.</i> (2006)

^aWalkway organizer Paul Cox estimated a revenue of US\$12,000/yr. With a fee of US\$50 per visitor, the estimated number of visitors was calculated based at 240.

^bExplorama charges US\$150 for a one-day trip to their walkway. If 8000 lodge visitors paid this fee, the revenue would be US\$1.2 million. But again, this revenue has many ancillary costs attached. A better metric might be to cite employees, '200 families who do not earn their living by cutting down trees to provide their food or earn their money to survive' (Peter Jensen, co-owner of Explorama Lodges).

^cApproximately 300,000 visitors come to the park in 2005; if each car holds two visitors, the revenue (at US\$5/carload) is estimated at US\$750,000. Obviously many factors such as weather and family size and marketing will influence these estimates. Hence, even at a state park in a developed country, it is difficult if not impossible to calculate the isolated economic benefits of one ecotourism operation in the midst of a region with existing tourism. In short, rigorous metrics are hard to come by.

FLORIDA CASE STUDY

North America's first public canopy walkway was constructed in Florida in 2000 (Table 1). Similar to tropical rain forests, the sub-tropical hammocks of Florida are declining due to human activities, and hence conservation education was an important goal. Built in 10 d, the Myakka River Canopy Walkway cost US\$90,000 for a 33 m bridge (approximately US\$3000/m) connecting two platforms, plus approximately US\$30,000 for a tower (Lowman *et al.* 2006). Maintenance has been minimal with the exception of graffiti cleaning (P. Benschoff, pers. comm.). Perhaps the biggest success of the Florida canopy project was a significant increase in park visitorship. During a decade where visitors to both state and national parks declined precipitously (Louv 2005), the Myakka state park visitorship increased by at least 26 percent from 236,552 in 1995 to 298,749 in 2005, including repeated visits by local schools, churches, and other citizen groups to the walkway. On weekends, volunteers have logged up to 200 canopy visitors/h (totaling over US\$500 in gate fees at US\$5/car and assuming two people/carload). Despite best efforts, even Florida state government math was fuzzy for the skywalk. Issues such as staff shortfalls, weather, cutbacks in park infrastructure, and inability to separate walkway visitors from fisherman or boaters precluded a rigorous analysis. Like its Australian counterpart, the Myakka walkway has proven enormously successful in education outreach (<http://www.treefoundation.org>).

Despite its shortfall in rigorous metrics, canopy access has been embraced by local stakeholders as an economic opportunity for forest conservation. Two priorities are important as tropical forests continue to undergo deterioration: (1) promote a new ethic, whereby biologists are encouraged to contribute their tools and discoveries to inspire sustainable economic ventures for local stakeholders; and (2) configure metrics for success in conservation activities in terms of socioeconomic as well as scientific acceptance. When constructed and operated locally, canopy access systems may inspire useful outcomes: to facilitate critical ecological research, to bolster local economy, to inspire environmental education, and ultimately to encourage forest conservation at both local and global scales.

ACKNOWLEDGMENTS

Thanks are due to the operators of the canopy access sites in Western Samoa, Peru, and Florida who scrambled to collect some metrics for their ecotourism operations, despite the enormity of this request. Also, thanks to the following community foundations: TREE, Triad, Gulf Coast, Selby, Schoenbaum, and Seacology, who have funded canopy walkways and outreach to foster conservation and education in local communities.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

FIGURE S1. Willy Sanchez Flores, a local villager from the Rio Napo region in Peru, supports his family with employment as a

fulltime guide for a growing local ecotourism industry centered around the canopy walkway.

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Myakka project was nation's first

The Myakka River State Park canopy walkway will officially turn 9 years old on Feb. 7. To celebrate her birthday, this is the second of a three-part series about the history of forest canopy access around the world.

Never doubt that a small group of thoughtful committed citizens can change the world. Indeed, it's the only thing that ever has.

— **Margaret Mead**, American anthropologist and writer

On Feb. 7, 2000, construction officially began of the Myakka River State Park canopy walkway. This project had many local heroes behind the scenes — real estate developer Bob Richardson for inspiring the fundraising, local CPA Mike Pender for creating the TREE Foundation (www.treefoundation.org) to enable tax-deductible donations, Canopy Construction Associates for building it, park biologist Paula Benschoff for masterminding several grants, many Myakka volunteers who provided on-the-ground labor, and the community of Sarasota for embracing North America's first public skywalk.

Canopy walkways were pioneered in Australia and Asia during the 1980s. North America's first walkway was constructed in 1992 at Williams College's research forest in Massachusetts, but was not open to the public except on special occasions. A second walkway was built at Hampshire College (also in Massachusetts) and soon after, a third in New York state at Millbrook School, where high school science students had exclusive use of the structure to study bird migration. Meanwhile, multiple walkways were constructed for ecotourism in Peru, Ecuador, Costa Rica and other tropical forests. Somehow, developed countries with their temperate forests were slow to develop structures to view life in the treetops, despite the fact that treetops supposedly house more than 50 percent of the planet's biodiversity.

With the rapid destruction of Florida forests during the 20th century (almost no primary forest in Florida remains today), a few businessmen and

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CALLING ALL TEACHERS

Elementary or middle school teachers interested in having New College environmental science students give classroom presentations on the forest canopy and other topics during spring semester, please call Jenna on 487-4365.

conservationists in Sarasota County championed this educational project. Raising over \$100,000, Bob Richardson's team not only funded the walkway and adjacent tower, but also scholarships for 24 children from the local Boys and Girls Club and Girls Inc. to visit one of the world's tallest canopies, along the Amazon River. These students traveled with local leaders during Thanksgiving break of 1999 for the trip of a lifetime: to explore the tropical treetops of the jungles in Amazonian Peru. One of the humbling highlights of the trip was when our tall, gangling American teenagers took on the younger children of a remote jungle village in a soccer match — and were soundly beaten by these Peruvian kids with no shoes. Such memories were no doubt worth a hundred hours of conventional school geography.

Donations for the Myakka project came from all walks of life (no pun intended). A fifth-grade bake sale, a birthday tribute, a 50th wedding anniversary, a love note. All donors of \$100 or more who purchase some "real estate in the sky" receive inscribed planks on the walkway, and their stories reveal a wonderful community spirit. One woman surprised her husband on his 80th birthday, a granddaughter inscribed a memorial to her grandmother, and many service clubs donated in exchange for a lecture about the canopy.

Romance, death and good Samaritans are reflected on each board of the Myakka skywalk. Donors of \$1,000 or more have the privilege of "owning" an upright support, with a larger plaque. Sponsoring a section of the structure helps to fund maintenance as well as education outreach programs about the Florida forest canopy.

Construction of America's first public canopy walkway took only 10 days from start to finish, but permitting in Tallahassee took almost two years. This is quite a contrast to skywalks built in the heart of tropical jungles, where permitting takes a few hours (usually by asking the village chief), but construction takes up to two years (in the absence of electric tools or generators). The skilled team of builders (Canopy Construction Associates, www.canopyaccess.com) executed what looked like a ballet dangling on ropes, carefully climbing around tree limbs to artistically fabricate a structure winding through a natural canopy setting. The official opening took place in June 2000, with a special ceremony hosted by our Peruvian ambassador, local scientists and leaders, park staff and volunteers, and Florida state park director Fran Mainella (note: Soon afterward, she assumed the national directorship).

Today, families travel from all over the country to experience Sarasota's skywalk. Where else can one see all kinds of air plants growing in a native forest, look down on birds flying, and see a 360-degree sunset without high-rises obscuring the horizon?

This unique attraction has created a welcome surge in local tourism, with Myakka staff estimating a threefold increase in annual visitorship. Skywalks in other states are under construction, including in Maryland, Georgia and Washington. But Florida can lay claim to having the first public canopy walkway in North America, and giving her visitors a close encounter with one of the most complex and diverse ecosystems of the world — the forest canopy.

Margaret Lowman is director of Environmental Initiatives at New College of Florida. On the Web: www.canopymeg.com

Saving Ethiopia's church forests

#19

"Conservation International currently estimates that one species is now going extinct every 20 minutes, which is a thousand times faster than the norm during most of the earth's history. It is understandably hard to imagine what it means that we humans are causing something in the natural realm to happen a thousand times faster than normal. That is a big number."

— Tom Friedman, "Hot, Flat and Crowded"

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Ethiopia boasts a rich and colorful history — home to the ancient bones of our most famous hominoid ancestor, Lucy; headwaters of the mysterious Blue Nile; the only African country to retain independence throughout its history; home to eight World Heritage sites; and now a global example of a unique partnership between church and conservation. This east African country has 70 million people and occupies an area about twice the size of Texas.

As in most countries where residents seek a higher standard of living, much of Ethiopia's natural landscape has been cleared for agriculture and timber. One notable exception is the green swath surrounding churches protected as sacred sanctuaries, some over 1,500 years old. In Ethiopia, the Orthodox church advocates that part of its mission is to retain a green necklace around the place of worship, a veritable "home for all God's creatures." Now jeopardized by encroaching human activities, these church forests have become the centerpiece for conservation of the country's last remaining biodiversity.

Over 31,000 churches exist throughout Ethiopia, most surrounded by forest. The church site of Hiruy dates back to 360 A.D., arguably some of the oldest forests in the world. In contrast, few churches in America directly conserve biodiversity as part of their mission, and over 99 percent of our primary forest has been cut down. Many American churches feature enormous concrete parking lots, quite the antithesis of biodiversity conservation.

It makes good sense to surround churches with forests. As true stewards of biodiversity, Ethiopian churches not only serve as spiritual centers, but also as living museums ranging in size from 15 to just over 650 acres. Flying over this developing country, I was awed by the green spheres dotting the landscape amid expanses of brown,

under threat. Villagers plant coffee in the understory or harvest timber. Even more threatening, neighboring farmers till around the church forests, shrinking the perimeter with every planting. In a country where resources are extremely scarce, there are no funds to buy fences for these biological treasure troves. But thanks to Google Earth, it is now apparent that these last remaining biodiversity sanctuaries may disappear within the next two decades.

What are the solutions? First and foremost, the local people need educating about the role of church forests to enhance their quality of life. These green necklaces provide important ecosystem services: conservation and purification of water (many church forests also house the local spring); pollinators of crops (that often spend part of their life cycle in forest canopies); homes to birds and animals that otherwise would be extinct; prevention of soil erosion; and, of course, a vital spiritual place.

I recently was given the opportunity to present an educational workshop to the priests of the south Gondor district of the Ethiopian Orthodox Church. More than 80 priests walked long distances, took public buses, or hitched rides to the dusty town of Deber Tabor for their first workshop on church forest conservation. Not only was the sight of a lone, white, woman scientist unique to these clergy, but my aerial Google Earth images of their church

forests both astounded and delighted them. Perhaps the most sobering observation was the evidence of shifting boundaries — Google Earth highlighted the changes in soil color that reflected the shrinking boundaries of their church forests.

After the workshop, I visited the church forest called Gebrse-na just outside this town. This cool, shady oasis was literally buzzing with insects and birds, an obvious contrast to the parched fields surrounding it. Many native and endangered tree species are found nowhere else except in these church forests, and are justifiably listed on the United Nations red list. What other secrets of mother nature exist in these shrinking green necklaces?

Ethiopian ecology is vastly uncharted, with few professional ecologists per square mile. Surveys, conservation action and public education are desperately needed to save their irreplaceable genetic libraries.

Can the Ethiopian Orthodox church find funds for the relatively simple solution of fencing church forests? Could Sunday school children become young stewards of the forest, trained to survey biodiversity? Can agricultural practices use new technologies to increase productivity so that church forests are not threatened?

Deforestation is an insidious force in Africa, as well as on other continents where human populations exceed the carrying capacity of the landscape. The loss of biodiversity is a global challenge that requires global solutions shouldered by all of us, not just those who live nearby. As Tom Friedman explains, the world is not only flat in terms of its economy, but also with regard to the global consequences of its biodiversity conservation.

23 Feb '09

Margaret Lowman is director of Environmental Initiatives at New College of Florida. Web: www.canopymeg.com



PROVIDED BY MEG LOWMAN

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Environmental hot topics

"We will restore science to its rightful place."

— President Obama,
2009 inaugural address

In 2007, the National Academy of Sciences identified six critical environmental-science issues that will drive 21st-century America. These topics impact local and national economies, as well as ecology, and their solutions will significantly enhance our quality of life. The six issues are: biodiversity, climate change, biogeochemistry (meaning the biological, geological and chemical cycles regulating our ecosystems, which include water), land use, infectious diseases and invasive species. The last issue alone is estimated to cost America more than \$150 billion per year, and most current invasive-species control efforts are akin to the proverbial needle in a haystack.

Florida has the dubious distinction of boasting all six of the National Academy's grand science challenges. In Florida — with our subtropical climate, location in Hurricane Alley, and high density of coastal populations — we have created a crossroads for these ecological bottlenecks. North Dakota, for example, does not suffer the immediate threats of land use, invasive species, or biodiversity loss; and subsequently, its regional governments do not have the financial burden of paying for their solutions.

Predictions indicate that issues such as tropical infectious diseases will hit Florida before they threaten North Dakota. So does that mean we should move to North Dakota? With all due respect to North Dakota, the answer is "no." But it certainly means that Floridians need to be vigilant about environmental issues, and to prioritize them for long-range planning and policy solutions.

The importance of investing in research and of integrating ecological science with policymaking cannot be understated for Florida in the next few decades. It is sometimes easy to overlook the direct links between quality of environment and human health. A short list of science "hot topics" for Florida's future includes:

- Sea level rise
- Carbon storage
- Salt water intrusion
- Cap-and-trade
- Water conservation
- Biological field station

- Mass transit
- Pollen
- Adaptation
- Soil nutrition
- Mitigation
- Agricultural practices
- Climate change
- Mangrove conservation
- Air quality
- Locavory
- Noise pollution
- Science education
- Invasive species
- Fisheries
- Infectious diseases
- Aquaculture
- Land use
- Toxins
- Biodiversity
- Hurricane-proof construction
- Offshore drilling
- Hurricane predictions
- Energy
- Weather forecasting
- Coral reef decline
- Endangered species
- Ocean acidification
- Home insurance
- Tourism
- Fire ecology
- Urban sprawl
- 2050 growth planning
- Storm-water runoff
- Fertilizer applications
- Health and nutrition
- Allergies
- Urban heat islands
- Ecosystem restoration
- Beach renourishment
- Health

This list is just a beginning! While these scientific challenges put Florida at risk under ordinary circumstances, they also provide opportunities for research initiatives and solutions in our state: to pilot new clean energy, to find new ways to eradicate invasive species, and other projects leading to an updated economy grounded in sound science and technology. A veritable testing ground lies outside our door, if we have the vision to initiate economic opportunities that seek solutions using science-based technologies. No other state boasts these six hot environmental-science topics operating synergistically in its own backyards. As the adage says, says, if you get lemons, make lemonade!

Margaret Lowman is director of Environmental Initiatives at New College of Florida. Her column appears twice a month. Web: www.canopymeg.com



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18 May 2009

20 JULY 2009

Sex sizzles in the summer

The earth laughs in flowers.

— Ralph Waldo Emerson, 1803-1882

An idyllic summer evening in nature evokes a smorgasbord of sights, smells and sounds — golden sunsets, chirping crickets, light shows by blinking fireflies and wafts of floral perfumes. For anyone who grew up in New England, this summer imagery may conjure a halcyon nostalgia of childhood. Now in adulthood, I sometimes get a fleeting glimpse back into my youth when a sensory perception evokes those bygone summer memories. One such evocative reminder is the sound of crickets, who create surround-sound symphonies during sultry summer evenings throughout many parts of the world, not just the New England of my childhood.



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Shrouded in the naïveté of my youth, I never realized that a cricket symphony — like most of the sights, smells and sounds of nature — represents sex, lust and courtship. An entomologist friend, who travels the world in pursuit of six-legged critters for the Smithsonian Institution, reminded me recently that a field of chirping crickets is an enormous cacophony of mating calls. To chirp, crickets do not utilize vocal cords at all, but rub their legs together, creating a long-evolved, high-pitched noise called “stridulation,” and this chirping is unique to each species of cricket.

Crickets in a chirping frenzy

In a midsummer pasture, insects are frantically calling for a mate, not — as we humans imagine — singing softly as a soothing backdrop for families sitting on the front porch or roasting marshmallows by a fire. The short mating season of a New England cricket requires a strategy to “make hay while the sun shines,” gaining full advantage of long days and short nights, warm weather and abundance of summer foliage.

In several short weeks, crickets and their relatives must court, mate, lay eggs, hatch offspring who in turn feed voraciously on leaves, and undergo metamorphosis that triggers the cycle all over again the following year.

As kids, we estimated air temperature by counting the number of cricket chirps for one minute, and then calculating a simple formula. Who needed television or computers — we had our own personalized weather forecasters with six legs! And we never once suspected that their chirping frenzy was all about sex.

Similarly, we collected fireflies in bottles, admired their bright abdomens with joy, and then released them. Few children understand that the abdominal light of fireflies is another of Mother Nature’s sex symbols, used to attract a mate during the all-too-short summer season of courtship, sex and child-rearing. Allegedly, the brightest and most frequent semaphores ensure the best success for attracting the opposite sex.

Birds are not much different. Singing peaks in early summer, when the competition for mates is most intense. Presumably, the loudest, most lyrical or most elegant songs attract the fittest mate. In the feathered world, humans are simply voyeurs with the good fortune of overhearing the symphonies of bird courtship in the canopy overhead.

Deception, bribes and persuasion

Meanwhile, underfoot, the scents and colors of summer wildflowers — clover, buttercups, mints, Queen Anne’s lace, daisy and yarrow, to name just a few — serve as sensory sentinels similar to the red lights of a brothel. Color is a flower’s way of announcing “I am open for business — pollen and pistils available for any willing bumblebee.”

The competition is fierce. Due to a plant’s inability to move to actively seek pollinators, flowers create lures of odor or color or form to attract insects, which in turn ensure a good seed set. The world of plants, as viewed from the eyes of their pollinators, is essentially one of deception, bribes and persuasion — there is nothing innocent or Victorian about a summer wildflower bouquet.

I sometimes wish that I never trained to become a scientist — instead retaining my simple childhood notions that a field of wildflowers was a profoundly beautiful application of God’s paintbrush, that bird songs were an almost-celestial symphony emanating from tiny bundles of feathers, and that cricket chirping was a great way to calculate the air temperature. But, science teaches us an overwhelming respect for Mother Nature: Her world is a precision machine operating in synchrony at all levels. Such a complex engineering design deserves a moment of appreciation and awe on a summer evening — so don’t forget to pause and applaud the crickets, inhale the floral perfumes, and admire the exquisite melodies of the day’s last birdsong.

Margaret Lowman is director of Environmental Initiatives at New College of Florida. Web: www.canopymeg.com

31 AUGUST 2009

Rigors of feeding a family

In every walk with nature one receives far more than he seeks.

— **John Muir**, Scottish-born American naturalist (1838-1914)

I spent the better part of a morning watching yellow-bellied sapsuckers feeding their young. Not exactly a conventional tourist activity for my weeklong vacation in Vermont but an extraordinary glimpse into nature's secrets, particularly the concept of survival of the fittest.



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The hills of New England in summer are greener than green — as a Floridian, it is inspirational to breathe under the Northern forest canopies, spewing out oxygen from their billions of deciduous leaves. Is it my imagination, or is there a biological advantage to standing adjacent to these tiny, oxygen-producing factories we call leaves?

Carbon dioxide in, and oxygen out. One could speculate that the air in a healthy forest is perhaps more pure and healthy than almost anywhere else on earth. A morning hike in a Vermont wood ensures exclusive inhalation of this forest elixir.

Playing 'nature detective'

Traipsing through the tranquil greenery, I heard the shrill cries of four babies — incessant screeching at the top of their lungs, although slightly muffled by dense canopy foliage. Stalking around the understory, I came closer to the source of the mayhem, seeking clues as I played "nature detective" along the verdant hillside.

The screeches stopped momentarily; I halted dead in my tracks. Approximately 30 seconds later, the clamor resumed even louder and longer. At regular intervals, the screeches stopped and then restarted. The curious naturalist in me could not resist searching — perhaps a forest marauder? Or maybe avian parental abuse?

Binoculars in hand, I finally detected a hole overhead in a hemlock trunk with tell-tale signs of fresh sawdust below. Keeping an eye on this eyrie, I was soon rewarded with answers.

Mama yellow-bellied sapsucker arrived at the tree hole with a mouthful of live crickets, the sushi of the bird world. Perched against the tree with her zygodactyl feet (translation: woodpeckers have two toes in front and two toes facing backward, allowing them to grasp vertical trunks with ease), she jabbed her insectivorous snacks into four protruding beaks.

Silence reigned for precious seconds. Soon thereafter, Papa arrived with a similar snack. Mama left, bound for another foraging expedition, working as quickly as any mother would to satisfy her hungry family. Feeding young in a tree hole is no easy task.

These parent sapsuckers led an exhausting morning, repeating their ordeal day after day, with their offspring requiring more and more bug-sushi as they grew bigger. What a daunting task.

Most human beings in America have it relatively easy — our biggest dilemma in feeding our offspring is usually deciding what to buy at the grocery store or what to pack in school lunch boxes — a stark contrast to foraging for grubs in a New England forest, and feeding quadruplets in a canopy tree hole.

The rain barrier

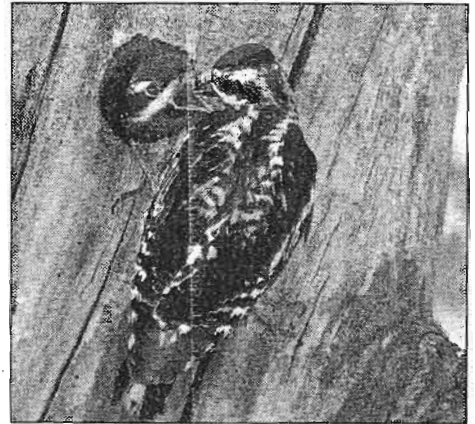
To make matters worse for the sapsucker parents, it rained for the next five days. As I retreated to my cozy cabin, with a fire burning cheerfully while writing this column, I wondered about the sapsuckers. How could the parents feed their hungry brood during inclement weather? And did the babies understand that dinner is canceled when it rains?

I have never seen birds foraging for food during a storm — their metabolism is unlikely to tolerate such a wet, cold experience. And all naturalists know that insects become invisible when it rains, another one of nature's secrets. I did not envy those parents trying to explain that dinner was canceled for the rest of the week in their wet, dark tree hole.

On the sixth day, sunshine returned. I anxiously returned to the base of the tree, only to find silence. Did the babies fledge, I wondered? Or was the fast simply too long and too arduous for them to endure?

In the world of Mother Nature, survival of the fittest means finding worms and crickets regardless of weather, pesticides, chain saws or predators. I hold hope that the sapsucker family had success in finding food, and raising their babies to adulthood.

Margaret Lowman is director of Environmental Initiatives at New College of Florida. Web: www.canopymeg.com



Red-naped sapsuckers, above, are Western relatives of the yellow-bellied birds more familiar to Floridians. ASSOCIATED PRESS ARCHIVE

Getting to the heartwood

SEP 14, 2009

#19

*I think that I shall never see a poem lovely
as a tree.*

— **Joyce Kilmer**, American poet

If a tree falls in the forest and no one is present to listen, does it make a sound?

This was a curious puzzle frequently debated at Girl Scout camp-outs or slumber parties of my childhood. In those long-ago and faraway days of the 1960s, when baby boomers were kids, our view of forests was relatively simple: Trees grew to provide seemingly endless supplies of timber, paper and pencils.



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Scientists had not yet discovered that these vast expanses of green were home to millions of species, moderated global climate and served as enormous sinks for carbon dioxide. Today's modern version

of this childhood treefall conundrum might be: If one tree is logged in a woods, will the surrounding forest remain healthy?

Last July, an international conference in Marburg, Germany, found some of the top tropical rain forest scientists debating the crisis of deforestation. The conference theme, *Impacts of Global Change on Tropical Forest Ecosystems*, attracted hundreds of attendees from over 30 countries. Not surprisingly, when scientists come together, they eat, drink, breathe and talk nonstop about their science. In this case, almost no issue engaged more discussion than the accelerating rates of forest degradation.

Although Florida residents live many miles from true tropical jungles, we are invariably drawn into the controversies about the carnage of tropical forests. The current degradation of the Amazon by petroleum extraction, desertification of Africa, and large-scale burning of Indonesian forests all relate directly to our health and raise important questions: Is tropical deforestation irreversible? Is logging sustainable? And will it harm our children?

Insidious, global malaise

The sustainable harvest of timber is important to global economy. But logging is not always conducted with scientific rigor and sensitivity to the future. In fact, much tropical deforestation is recognized as an insidious, global malaise. It is tough to measure, often illegal, rife with corruption, and threatens tomorrow more than today.

Historically, logging was monitored through records kept by timber mills, but as supply dwindled and demand increased, corrupt book-keeping underestimated removal of rare and endangered timbers. Satellite imagery was considered an honest solution, creating a high-technology metric for assessing land-use changes. But the challenges of interpreting aerial images still prove daunting: How can selective cutting be identified among the remaining green canopy? Can satellite imagery differentiate between primary and secondary forests? What about cloud cover, which obscures the land below?

Even worse, recent research reveals that measurements about canopy cover do not accurately explain the whole story. Losses of mammal and bird populations, the influx

of erosion from new roads, and the structural weakening of forest edges near selective logging are not easy to determine. Research indicates that the recovery of animal populations hunted out by timber-getters will take hundreds — even thousands — of years.

Whether temperate or tropical, primary forests are dwindling treasure troves of biodiversity, representing unique genetic museums on planet Earth. Similar to the Taj Mahal or the Ringling Museum of Art, primary forests are extraordinary collections that — once gone — cannot be restored for future generations.

Essential machinery for life

Even more valuable than art collections, collections of tropical forest species carry out critical processes essential to the quality of our life on Earth. From the production of energy (from sunlight) to air purification, all life on Earth depends upon healthy forests. While temperate forests shut down during winter, tropical forests operate year-round. Forests are not just museums for cultural and spiritual enrichment; they are also essential machinery for life to Earth.

At the conference in Marburg, tropical biologists learned about a recent cause of forest degradation: climate change. In Australia and Costa Rica, biologists have monitored rising temperatures with great alarm. As temperatures warm, tree canopies are stressed by drought and increasing incidents of insect outbreaks.

But these pressures are affecting more than just the foliage: Many animal populations are shifting uphill, leaving their ancestral homes in the valleys in pursuit of cooler cloud forests toward the mountaintops. This elevational migration represents a logical "escape" for species that seek cooler weather conditions for survival. But what happens as temperatures continue to rise, and the animals become stranded at the tops of the mountains?

Australian scientists have predicted that many native Queensland animals will become extinct before this century is over, since they will have nowhere to escape the warmer, drier conditions.

And what happens to creatures living in flat habitats, such as subtropical Florida? They cannot migrate short distances up the slopes, but are potentially doomed if conditions continue to heat up. (Species from the Everglades may need to migrate hundreds of miles northward to find cooler habitat.)

Canopies essential

Scientists now predict that the warming of tropical forests will trigger a serious global extinction during our children's lifetimes. One thing remains clear: Keeping the valuable tree canopies of the tropics not only provides refuge for millions of species, but also provides critical services to human beings. We cannot afford to continue the Wild West mentality of past tropical forest policies that stated: "If it grows, cut it down; if it moves, shoot it." Creative solutions are required.

Margaret Lowman is director of Environmental Initiatives at New College of Florida. Web: www.canopymeg.com

12 OCT 2009 #19

Seeing REDD to save trees

Destroying a tropical rain forest and other species-rich ecosystems for profit is like burning all the paintings of the Louvre to cook dinner.

— E.O. Wilson

REDD is pronounced just like the color in the American flag, and similarly, it may represent the next big patriotic symbol. Most Americans hope to leave the legacy of a high quality of life for their children and grandchildren (as did our parents and grandparents); REDD contributes directly to that aspiration. REDD is also the new buzz word circulating among international policy and conservation circles. It stands for Reducing Emissions from Deforestation and forest Degradation.



At the international level, REDD is central to discussions at the upcoming United Nations Framework Convention on Climate Change, scheduled this December in Copenhagen, Denmark. Within the United States, the House of Representatives has passed a climate and energy bill that included a REDD component. And the Senate will soon be voting on similar measures. For many developing countries that have not yet sold the logging rights to their tropical forests, REDD represents a unique rescue plan that takes both conservation and economics into consideration.

Currently, tropical deforestation contributes more than 15 percent of global carbon emissions, because the burning and clearing of forests contribute enormous amounts of carbon dioxide to the atmosphere. Not only does deforestation contribute to the warming of our planet, but the loss of these forests eliminates significant amounts of "natural capital" for future generations. International policies to conserve forests represent patriotic actions that benefit the next generation, and also offer a win-win scenario to both developed and developing countries.

Ecosystem services

What is REDD and how can citizens support it? REDD represents a policy that will essentially pay countries to conserve their forests. Currently, the forests of Madagascar, New Guinea, Peru, Brazil and many others have the potential to provide important short-term livelihoods to their citizens through selling timber and clearing for agriculture. However, these forests provide an important service to people beyond the borders of their home country.

In the process of photosynthesis, trees (especially tropical forests) absorb large amounts of carbon dioxide from our atmosphere, and then release oxygen while storing the carbon as trunks and root material. Carbon storage by forests is called an "ecosystem service," meaning that the trees provide a benefit to humankind through their natural metabolism.

Action item

TREE Foundation and Environmental Defense Fund will host a REDD lecture on Nov. 9 at 4 p.m. in the USF Policy Center, Selby Auditorium, 8350 North Tamiami Trail in Sarasota. Free! Speaker John Carter, founder of Alianca da Terra and also a farmer in Brazil, will speak about the current issues of deforestation in South America.

These important functions are worth billions of dollars, and include such services as oxygen production, soil erosion control, freshwater storage, homes for biodiversity, and sources of medicine, foods and building materials. Because carbon storage by trees slows the warming of our atmosphere, this ecosystem service buffers us from weather extremes such as floods and hurricanes, thereby saving money and lives.

Old-growth (or primary) forests tend to store more carbon than young plantations. But most primary forests in developed countries such as America, Australia and Europe have been cut down. On the other hand, developing countries such as New Guinea and Peru still have vast expanses of original forests that are extremely valuable in terms of providing ecosystem services to the entire planet.

An important bargaining chip

By paying these countries to conserve their forests, the REDD policy offers an important bargaining chip for international climate change negotiations. REDD also upholds environmental justice: It offers compensation to indigenous peoples who will safeguard their forest resources for the long-term benefit of the entire planet, instead of selling them for logs or soybean plantations.

But REDD is not easy to enforce. Who will ensure that these forests remain intact, and who will police the payments from developed countries to developing countries?

Such issues create complex negotiations at the international level. But with each year of delay, more of the world's carbon storage capacity (i.e. tropical forests) is cut down. The implementation of REDD represents important first steps to establish economic values for irreplaceable natural resources such as long-lived trees.

Will the 21st century be looked upon in history books as the crisis era, whereby global emissions become irreversible? Will global initiatives such as REDD serve as a catalyst for living sustainably?

With the increasing incidence of climatic extremes, businesses are beginning to include nature's services in their accounting ledgers. Forests not only represent carbon storage but they also provide flood control and biodiversity libraries, benefits that offset insurance and health costs. In short, forests are worth more alive than dead.

Margaret Lowman is director of Environmental Initiatives at New College of Florida. Web: www.canopymeg.com

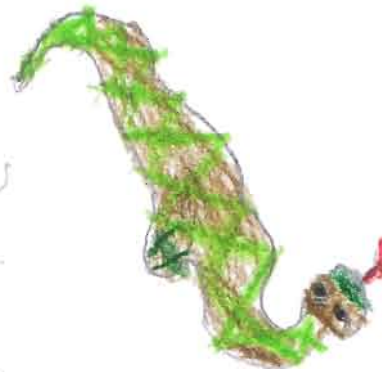
Save the Rainforest!

Dear Tree Foundation,

Thank you for letting us

use the scale model. My three favorite things in the scale model are the Leaf Cutter Ants nest, the blimp

and the canopy walk-way. I like the Leaf Cutter Ant nest because it was bigger than a full grown man. I liked the blimp because you can see a man that was connected to a rope that had jumped off of the blimp onto a trampoline platform. I liked the canopy walk-way because compared to the people it is humongous.



Thank you also for letting us use the kiosk. My three favorite pictures on the kiosk are the the Male Tailless Whip-scorpion because of its massive pinchers, the Wet-casting spider because of its blue web, and last but not least, I liked the Wavy-lined Pleasing Fungus beetle because of its colors of black and orange.

Thank for your Generosity.

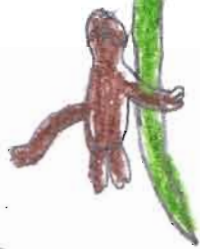
Sincerely,
Maxwell Miller



Save the Rainforest!




Dear Tree Foundation,
 thanks for letting us use the kiosk
 and scale modle. I loved the
 kiosk. There were manny
 sound affects and picturs of
 animals. There were manny
 fun puzzles. There were cool
 videos about animals.



I loved the scale modle.
 I think we found all the
 animals. I never knew there
 were so many animals in the
 rain forest. Thanks!

Sincerely,
 Emily Kacprzak



Out on a Limb

Forest Canopies an Informal Science Education Exhibit

Authors: Charissa Jones 1,2; Meg Lowman 1,2; Jessica Wheeler 1; Evan Miller 1,2;
Fabiana Silva 1,2; and Colleen Mitchell 2 Affiliation:
1 New College of Florida; 2 TREE Foundation

Abstract

"Out on a Limb - Forest Canopies" is an informal science education exhibit developed to educate people about forest canopies and illustrate the challenges of canopy access by scientists. A traveling rain forest diorama - with scaled models of scientists exploring the canopy and accompanying graphic panels and interactive activities - will circulate to community venues in southwest Florida, increasing public awareness of how forest canopies are important to life on earth. Canopy research provides a highly visual, exploratory approach to scientific inquiry that can be effectively communicated to school groups and the general public. The intellectual merit of our exhibit is to provide public education about forest biodiversity, how the treetops provide energy for all life, links between treetops and tree floor, and why citizens should conserve forests. In this poster, we map out the action plan for creating a community exhibit and planning out diverse venues for its display to maximize public science education.

Project Goals

Take home messages for viewers:

- Biodiversity in forest canopies
- Knowledge about linkages from the treetops to the forest floor
- The challenges scientists face while conducting research in the canopy
- The role that the public can play in conservation
- The importance of forests to all life on earth

Focus of National Science Foundation-funded research:

- Scientific inquiry to ask questions about ecosystems
- How scientists use technology to answer important questions that relate to our daily lives
- Classification of biodiversity in the canopy and on the forest floor
- How the canopy is linked to the forest floor via herbivore-related activities

Other goals:

- To dispel the notion of scientists as stereotypical men in white lab coats and research as narrow and dry
- To inspire under-served and minority students to become interested in science, possibly seeking it as a career
- Show the exciting field work Margaret Lowman has done as a role-model for young women

Impact

Audience

- Residents and visitors to southwest Florida
- School children
- Senior citizens
- University students
- Families and adult groups
- Amateur and professional naturalists

The diorama will be housed at many public venues, where a diverse range of people will have the opportunity to view it, including:

- Banks
- Libraries
- Malls
- Events, (eg. art and reading festivals, Duke Talent Identification Programs)
- Myakka River State Park
- Public Schools

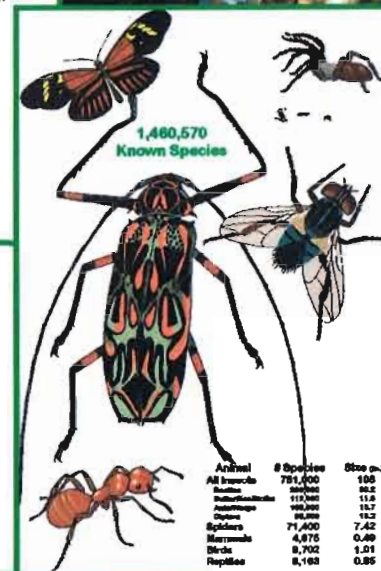
Touring time: 12- 18 months

Impact: >250,000 people

Project Design

Overall, the 100-square foot mobile exhibit will include:

- 5x3x5 to-scale mini-diorama of an Amazonian tropical rainforest which will include scientists engaged in canopy research using a hot air balloon and raft, canopy platform and bridges, and climbing ropes. The featured forest will be a Peruvian lowland rainforest at a scale of 1:100. It will have a key of the diorama and viewers will partake in a "Where's Waldo" exercise to increase their powers of observation.
- An entrance walkway designed to imitate the canopy suspension walkways, though this one will be only 14 inches off the ground.
- Four colorful graphic panels (3.5'x2') will educate visitors about forest biodiversity, nutrient cycling and other links from treetops to forest floor, the importance of forest canopies to life on earth, and a panel on citizens' roles in conservation.
- A touch screen kiosk will show video images of scientists using technology to study the treetops and will interpret the diorama in greater detail
- Take-home activities for schools and teachers



Science Outreach for Students

New Initiatives Connecting Schools to Ecology

Project Design

The SOS program is currently structured as a full semester, student-run, professor-sponsored, college-level course at New College of Florida. Its members pursue a rigorous schedule of training, public speaking, and researching different environmental topics, culminating in the presentation of hands-on lectures to local K-12 schools, the leading of community nature walks, and an outdoor, day-long teacher workshop. Members of the SOS program create original lectures relating to different topics for twelve southwest Florida schools in addition to local chapters of the Boys and Girls Club, Girls, Inc., and the GWIZ Museum. For each lecture students are required to turn in a written outline and self-evaluation, and provide a teacher evaluation from the school teacher who hosted his or her visit. Members are also required to create, administer to, and grade a minimum of one set of pre and post quizzes per semester for each K-12 lecture. The midterm or final examination consists of one outdoor teacher workshop for 15-20 local teachers in the Myakka River State Nature Park. For this workshop, students work in groups to create and present ecology focused activities and guided walks as part of the workshop.



Adaptation

The design of the SOS program has been established and adapted through the Action Research method. The Action Research method focuses on improving practical affairs in a particular social system (Emery, 2000) by fully involving the researcher in it, and continually adapting the system according to a continuous evaluation of its success in meeting needs which emerge over time. In this instance, the "system" is the SOS program, and the "researcher" is the Teacher's Assistant (Student Leader) responsible for running the program during a given time period. The design of the SOS program is constantly adapted to newly emerging needs, such as the need for standardized result collection and measurement, and for efficacy assessment of each member.

Replication

The SOS program has been well received in Southwest Florida and has produced positive results. This program is being presented here in hopes of replicating it in other universities and institutions worldwide. Using the Action Research method (see "Adaptation"), this program can successfully be adapted to any community with a handful of motivated and inspired students.



Reflecting for the Future

Goals for:

SOS and the State Wide Community

Publishing of original student lessons and distribution through the Florida Education Association in order to encourage the use of environmental science and ecology as a teaching tool
Establishment of additional chapters of SOS in other Florida universities

SOS and the National Community

Establishment of additional chapters of SOS in universities of different states

Establishment of a regular communication network
Annual meetings to share innovations in program design and progress within their communities

Online **registry** of SOS chapters with contact information to facilitate communication between the schools

SOS and the International Community

Establishment of additional chapters of SOS in universities of different countries

Establishment of a sister school program to foster continued communication between U.S. schools, and schools of other nations. The sister school program would facilitate communication between the schools, establishing a strong network from which chapters can draw support and ideas for themselves.

Abstract

1 New College of Florida 2 The TREE Foundation, Sarasota, FL
Fabiana Silva 1, 2; Margaret Lowman 1, 2; Jessica Wheeler 1; Charissa Jones 1, 2; Colleen Mitchell 2; Evan Miller 1, 2

Science Magazine recently advocated for an emphasis on science education and outreach if America is to remain economically competitive in a "flat world." In response, New College of Florida developed a regional outreach and mentoring program appropriately titled SOS (Science Outreach for Students) to link college students with K-12 students. This award-winning outreach program aims to enhance K-12 education and transform the public's awareness and understanding of environmental science and ecology by connecting communities and schools to the enthusiasm for and knowledge of science abundantly available in their local universities. Since its inception in 2004, 4,700 people have received science education through outreach by SOS participants. SOS not only impacts the community, it also changes the outlook of many of its participating science students. Over 50 undergraduate students taught science in K-12, and over thirty percent of these students were inspired to consider careers in science education. We present this model as an opportunity for other college campuses to utilize our methodology and replicate this program elsewhere.

Key words: science outreach, environmental education, community service

Results

Community Recognition:

Awarded \$11,000 by the Sarasota Community Foundation
Sarasota County Conservation Award for Excellence in Environmental Education and Outreach
Inducted into Sarasota Community Video Archives for Excellence in Volunteerism

Community Impact:

4,700 people reached by SOS efforts
15.6 point average improvement from pre-quizzes to post-quizzes for classroom visits
More than 500 community members participated community nature walks

SOS Student Member Impact

Members inspired to continue working in education and/or Outreach
Most students reported improvement in communication skills and public speaking
Mentorship relationships developed with K-12 students

Propagation

The SOS program perpetuates itself through a Student Leader apprentice process, wherein the presiding T.A. chooses and trains one member to become the T.A. for the next year or semester. Because this program is essentially student run, the apprentice period is necessary to build upon previous improvements and avoid a new T.A. having to create an entirely new program. Through this process, the continuity of the program is maintained, and proper leadership of the program is ensured for the future.

Emery, M.; (2000) *The Current Version of Emery's Open Systems Theory: Systemic Practice and Action Research*, Vol. 13, (4): 5



Opportunities for TREE programs 2009-10

LOCAL education outreach and environmental issues

- | | |
|---|------------------------|
| 1. Sarasota Community environmental lecture series | \$3000 |
| 2. Myakka canopy walkway – “mysteries of the treetops” | \$5500 |
| Includes new brochures (\$2000), new conservation signage (\$2500), website updates (\$500), and creation of metrics for visitors (install a counter @ \$500) | |
| 3. Education outreach “no child left indoors” | \$5000 |
| Includes 3 rd and 5 th grade bromeliad project at Pine View, leading 2 public hikes and training New College environmental education students, local lectures to service clubs and churches, book distributions to middle school kids | |
| 4. TREEhouse fun | \$3000 |
| Includes website updates, working on education interpretation exhibits with New College students, and fund-raising materials/activities to assist Crowley | |
| 5. Invasive species – students saving the ecosystem | \$2000 |
| Equipment and tracking and research program for invasive pythons | |
| 6. Local environmental issues - keep Florida healthy | \$5000 |
| including research for newspaper columns, advising Alex Sink at State Cabinet, participation in Copenhagen meetings to bring back environmental protocols to local level, weighing in on issues such as offshore drilling, seal level rise, and creating a carbon model to evaluation carbon sequestration in local vegetation and training students to use it. | |
| 7. Myakka walkway sunset fund-raiser birthday party | \$3500 |
| Celebration of 10 th anniversary of the canopy walkway, and associated media plus website updates | |
| 8. Center for Canopy Ecology – TREE’s data basecamp | \$2000 |
| Update walkway data base, scan research papers for student availability around the world, operate office including correspondence and mailings | |
| 9. TREE clerical assistance – our machinery | \$3000 |
| Grant-writing, canopy information, accounting, donor data bases and filing | |
| 10. Rainy day opportunities | \$3000 |
| 11. Intern from a tropical rain forest region | \$5000 |
| <u>TOTAL</u> | <u>\$40,000</u> |

National and International TREE projects

1. **Meg Lowman treetops camp – *science ROCKS!*** \$1000
Lowman to lecture, book distribution to at-risk teenage girls, hand-outs
 2. **5th International Canopy conference, India *"going global"*** \$5000
Lowman to attend as co-chair, plus one student presenter; conduct public talks to Indian citizens, lead canopy workshop after conference, assist with Indian biodiversity hotspot canopy research programs.
 3. **Amazon canopy research expedition for NCF undergraduates** \$2500
January 2010 expedition for 15 undergraduates and community leaders to experience a life-changing environmental education opportunity and experience the world's greatest array of biodiversity
 4. **Ethnobotany brochure *"medicines from plants"*** \$2000
Print brochure created by undergraduates for the local shaman in the Amazon to sell to ecotourists to fund rain forest conservation
 5. **Conservation of Ethiopian church forests** \$8000
Airfare for Lowman to conduct biodiversity surveys, travel to fund-raise for fencing materials, seed funding for fencing project, submission of National Geographic grant (fencing project will require \$25,000, but requires a contact with someone such as John Deere, Pew Charitable Trust, or another dedicated donor)
 6. **Canopy methods book *"sharing our recipes"*** \$5000
Research, artist fees, printing of drafts, indexing, web-editing, meeting with authors at ESA conference
-
- TOTAL** **\$23,500**

INTERNAL REVENUE SERVICE
P. O. BOX 2508
CINCINNATI, OH 45201

DEPARTMENT OF THE TREASURY

Date: OCT 01 2003

TREE FOUNDATION INC
C/O MICHAEL R PENDER JR
2381 FRUITVILLE RD
SARASOTA, FL 34237-0000

Employer Identification Number:
65-0904869
DLN:
17053249734003
Contact Person:
CASSANDRA L KNOX ID# 31469
Contact Telephone Number:
(877) 829-5500
Public Charity Status:
170(b) (1) (A) (vi)

Dear Applicant:

Our letter dated July 13, 1999, stated you would be exempt from Federal income tax under section 501(c)(3) of the Internal Revenue Code, and you would be treated as a public charity during an advance ruling period.

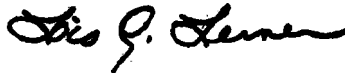
Based on our records and on the information you submitted, we are pleased to confirm that you are exempt under section 501(c)(3) of the Code, and you are classified as a public charity under the Code section listed in the heading of this letter.

Publication 557, Tax-Exempt Status for Your Organization, provides detailed information about your rights and responsibilities as an exempt organization. You may request a copy by calling the toll-free number for forms, (800) 829-3676. Information is also available on our Internet Web Site at www.irs.gov.

If you have general questions about exempt organizations, please call our toll-free number shown in the heading between 8:00 a.m. - 6:30 p.m. Eastern time.

Please keep this letter in your permanent records.

Sincerely yours,



Lois G. Lerner
Director, Exempt Organizations
Rulings and Agreements

Letter 1050 (DO/CG)