TREE Foundation Annual Report November 2006

Compiled by Dr. Meg Lowman, Executive Director

Annual Meeting: December 5, 2006
New College Foundation Board Room
New College of Florida
5:00 – 6:30 PM

SUMMARY

The accomplishments of TREE Foundation during 2006 can best be summarized as: partnerships; science education outreach; and interns. Our programs continue to expand significantly with outreach at local, regional, and international scales. Our new canopy exhibit for families was launched at the Sarasota Reading Festival, to an audience of 16,000 enthusiastic viewers. Our new office on the campus of New College now has a fulltime research assistant, Colleen Mitchell, and the Foundation assisted 6 interns to achieve their lifelong goals as students in conservation biology and canopy ecology. Never has the need for science outreach been so great among student and public audiences, and never has the mission to discover the secrets of our forest ecosystems been so urgent. We are grateful to our supporters who have made TREE undertakings so successful.

Local Canopy Ecology Activities

1. Led 12 educational walks for the public on forest ecology, and trained over 53 student guides. TREE student guides won the Sarasota County 2006 Conservation Award for Environmental Education.
2. Obtained grant from Community Foundation to fund science teacher workshop on local ecology; and to fund audio-visual equipment for presenting programs in local elementary and middle school science classes.
3. Continued leadership in development of Base Camp Sarasota (biological field station to study subtropical Florida ecology and land use issues)

International Canopy Ecology Activities

1. Hosted three interns from tropical countries – two from Panama, one from Mexico
2. Funded four women/minority interns to attend the Ecological Society of America conference in Memphis, Tennessee and present their work on science education; and to conduct work in Amazonian Peru.
3. Received funding from National Science Foundation to construct a hands-on exhibit for families and students in southwest Florida entitled **Out on a Limb – Forest Canopies** that features the tropical rain forests of the Amazon.
4. Expanded web site for use by students from other countries as a resource for canopy information

Public Science Outreach about Forest Canopies

1. Hosted two community lectures – Dr. Adina Paytan from Stanford University and Dr. JoAnn Burkholder, both marine biologists who spoke on regional environmental issues of marine pollution and red tide outbreaks, respectively
2. International Center for Canopy Ecology – maintenance of files, office and education outreach programs at new office in Keating Center, New College, and hired assistant, Colleen Mitchell, MS in Biology from Philadelphia PA
3. Canopy exhibits – Launched the **Out on a Limb -Forest Canopies** exhibit at the Sarasota Reading Festival, with 16,000 attendees
4. Published 26 newspaper columns to educate public about natural history

LOCAL Canopy Ecology Activities

1. TREE led 12 hikes ranging from 25 – 150 participants per hike to Red Bug Slough, Myakka River State Park, Carlton Reserve, and Highlands Hammock with approximately 53 trained student naturalists assisting from New College conservation biology and environmental education classes. A special ecology workshop was hosted for local middle school science teachers at Myakk River State Park, using the canopy walkway facility. Participants in the hikes totaled 2712.

Hike topics included:
It's a Bug's Life
Tools of Ecologists
Dusk in the Florida Canopy
Life in the Oak Hammocks
Canopy Access Techniques
Leaf Detectives – Learning about Nature from Leaves
Natural History of Red Bug Slough
The Ecology of Florida Forest Canopies
Bug Lovers Hike
Life in the Wetlands

2. TREE student outreach volunteers visited six schools, the Boys and Girls Club, and GWIZ Science Museum and presented programs ranging from Ecology of Mangroves, to Canopy Ecology, to Climate Change. Approximately 4169 students were exposed to science outreach activities through our programs. Sarasota County awarded the New College/TREE Foundation SOS (student outreach in science) program their 2006 Conservation Award in Environmental Education for this outstanding volunteerism in science education.

3. Students are working on a TREE grant application for publishing an SOS guide to be distributed to other colleges throughout the country, to share the SOS model with other communities. SOS student and TREE intern Charissa Jones was hired by Manatee County to write a science curriculum and design science outreach programs. SOS student and TREE volunteer Nalowa Malafa was hired by Girls Inc to teach science outreach after school, and now seeks further studies to become a science teacher. SOS veteran from last year Katie Hannon is at college training in environmental education. SOS and TREE volunteer Topher Lawton counseled one at-risk student at Booker Middle School, and according to the principal, "miraculously turned his behavior around". Bryson Voirin and Wendy Webber presented to the hancicapped children at Sarasota Memorial Hospital, and their director wrote back with a half-page, single-spaced thank you.

4. TREE continued to partner with New College, Sarasota County, Economic Development Corporation, and a consortium of Florida educational institutions to create a Biological Field Station in southwest Florida. Thanks to funding from the

TRIAD Foundation, TREE hosted the science advisory committee to launch the Florida initiative entitled Base Camp Sarasota, and the EDC subsequently funded TREE to organize the architectural design charettes. Dr. Lowman spoke about the proposed biological field station at the Sustainable Construction Conference, held in Sarasota with delegates from 16 countries during September 2006. As a result of networking there, the graduate students of two architecture schools (University of Florida, and Lincoln University in UK) are creating designs for Base Camp Sarasota as their senior project. Site selection has been finalized at Carlton Reserve; and the science plan is currently in progress, with TREE taking a leadership role to coordinate the partners in this important project.

INTERNATIONAL Canopy Ecology Activities

1. TREE hosted three interns from developing countries to empower them as future conservationists and to provide educational opportunities not available in their home country:

   David Mitre, botanist from Panama, visited to learn about canopy research and see the vegetation types in Florida. David aspires to attend graduate school in restoration ecology, and visited graduate schools during his visit.

   David made two presentations during his time in Florida, to college biology students and to public school science classes. Thanks to the networking of the TREE Foundation, David enjoyed his first trip out of Panama.

   Guillermo Sanchez, from Panama, is self-trained and passionate about ants. During his internship in Sarasota, Guillermo presented lectures at New College and at regional schools. He also visited University of Florida, and Florida State University, where he met with ant biologists. Thanks to the networking of the TREE Foundation, Guillermo has sponsors for a graduate program in the Czech Republic, working with famous ant biologists.

   Eduardo Covarubbias from Mexico, is a student of architecture, and hopes to bring green design and sustainable architecture practices to Mexico. He visited and worked with architects during his TREE internship, and also visited Chicago, California and Colorado as part of his green-design tour of USA. Eduardo worked in the past with Elderhostel, and many of his former students contributed to TREE in order to fund Eduardo's opportunities in America. He returned home with a suitcaseful of architecture books!

   Charissa Jones, Evan Miller, Jessica Wheeler, Fabiana Silva, and Colleen Mitchell were recipients of TREE internships to attend the Ecological Society of America (ESA) , and present the SOS teaching model to the broader scientific community. Boasting 10,000 members,

ESA offers a great forum for aspiring ecologists, especially for women and minorities who are sorely needed as role models for the next generation of scientists. TREE not only funded these five students to attend this exciting conference, but also funded Jessica Wheeler to participate in her research on canopy herbivory in the Amazon region of Peru. TREE partnered with The Explorers Club to sponsor Jessica, and she made subsequent presentations to both organizations.

PUBLIC SCIENCE OUTREACH about Forest Canopies and Ecology

1. Hosted two community lectures:
   Dr. Adina Paytan, Stanford University – All of the water (and everything that drains into it) ends up in the ocean

   Dr. JoAnn Burkholder, North Carolina State University – The Ecology of HAB (Harmful Algal Blooms)

2. Center for Canopy Ecology offices – oversaw national lectures on canopy ecology and outreach, fund-raising lectures for canopy programs and walkways around the country, and continued dissemination of canopy books and information to developing countries and students.

3. Website (www.treefoundaion.org) now has greatly expanded features to disseminate canopy information worldwide. We have paypal for direct donations, special instructions for intern scholarship applications, blog space for discussions about canopy discoveries or climbing techniques, and more conventional activities such as canopy publications, lectures and grants.

4. Awards –

   - Sarasota Conservation Award for Environmental Education Achievements
   - Lifetime Conservation Achievement
   - Lowell Thomas Medal for "discoveries in the canopy"
   - Video Archives – foundation selected for annual recognition
   - Smithsonian Magazine, NPR, and myriad newspapers and magazines have featured the Myakka walkway, canopy research, and TREE foundation scientists at work
   - It's a Jungle Up There – numerous book reviews around the world, including translation into Korean and Chinese

TREE FOUNDATION

TREE RESEARCH, EXPLORATION & EDUCATION

TREE Foundation at Sarasota Reading Festival

November 8th, 2006

On Saturday November 4, 2006 the TREE Foundation participated in the Sarasota Reading Festival an The booth featured the 1-100 scale diorama of life and research in a rainforest, a section of canopy wal We interacted with over 300 people at the festival and children and adults had great fun walking on the Students from New College (Kelsey, Bethany, and Bryson) explained the intrigue of eating bugs, forest creator and engineer (Dr. Phil) of the diorama and walkway explained every inch and answered questio The Sarasota Reading Festival was a success and the TREE Foundation was able to reach the Saraso

Posted in EVENTS | Comments Off

David Katz Climbing 8

November 8th, 2006

Tree Training in Smith Woods

Another great fall day in the hometown Smith Woods. Huge trees. I swear the trunks are actuall of bodies..
We taught a two day tree-climbing training this weekend for future tree-instructors at COE. The quite cool. Fall weather, 100 off the deck

Posted in TREE CLIMBING | Comments Off

Author Richard Louv visits the treetop walkway

November 7th, 2006

Louv was in Florida to talk at the Sarasota Reading Festival about his book, Last Child in the Woods (A Burgess, and James Burgess) and renowned children's author Lynne Cherry. The fivesome discussed southwest Florida. Watch for this development!

Click thumbnails to enlarge photos.

Photo Descriptions:
1. Eddie and James Burgess and Richard Louv on the Myakka tower
2. Richard and Kathy Louv on walkway bridge
3. Meg Lowman and Richard Louv on the treetop bridge

Posted in EVENTS | Comments Off

David Katz Climbing 7

October 22nd, 2006

101 Urban Tree Climbs

From Ginkgo to Elm, from street-side to urban forest style, from 3 to 80′ tall, Eric Tartter and D

Starting around 10am and climbing continuously until around 5PM, we challenged our climbing t feet of the ground. There were some falls, but mainly just sore muscles and shredded skin.

In an attempt to inspire a connection with trees and urban-type-natural areas, Eric and I set out city this time of year, we could share the love and respect for trees with a lot of people, just by cl time we got to central park, Eric decided to kick it up a notch on a Chestnut Oak. While previous trunks of numerous trees: bouldering style. For a few of the trees, I stood at the base pondering

Around tree # 35 (English Elm) Eric wanted a harder challenge. He found hard "problems" on sc Unfortunately for me, I had to follow suit in huge winter boots! It wasn't until tree #73 (Red Oak) and "Only Children Climb Trees…" For the following three trees we were a little discouraged, bu central park, key word "Don't fall!" 90-95 were tall white pines with a billion of ladder-rung-type b sequence of moves on an Elm tree. I almost feel out of the tree, completely exhausted, but man

The trees we could identify: Red Oak, Chestnut Oak, English Elm, Ginkgo, White Pine, Red Pin Locust, Little Leaf Linden, Black Cherry, and Sweet Birch.

Although we've climbed almost all of the species before, the individuals in central park had uniq park is on the horizon…

Posted in TREE CLIMBING | Comments Off

David Katz Climbing 6

October 22nd, 2006

Smith Woods Top Out!

TREE FOUNDATION

TREE RESEARCH, EXPLORATION & EDUCATION

"If nothing is done, the rain forests of the world will no longer exist in 25 years."
- Dr. Margaret Lowman, Canopy Biologist

Days	Hours	Mins	Secs
6612	23	36	43

LOCAL CANOPY ECOLOGY INTERNSHIPS

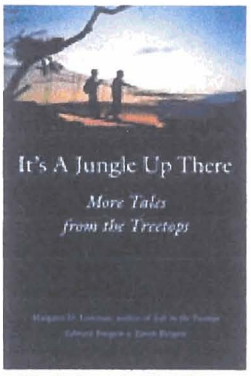
Colleen Mitchell
Myakka State Park research on tardigrades, NSF Funded Grant Out on a Limb, Science Outreach for Students

Fabiana Silvia
Science Outreach for Students, NSF Funded Grant Out on a Limb

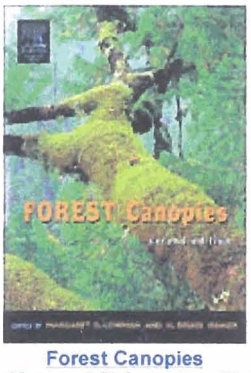
Jessica Wheeler
Science Outreach for Students, NSF Funded Grant Out on a Limb

Charissa Jones
NSF Funded Grant Out on a Limb, Science Outreach for Students

Recommended Reading



It's A Jungle Up There
by Margaret D. Lowman, Edward Burgess and James Burgess



Forest Canopies
by Margaret D. Lowman, Ph.D. and H. Bruce Rinker, Ph.D.

View All

Evan Miller

NSF Funded Grant Out on a Limb, Science Outreach for Students

Jose Guillermo Sanchez

from Panama will be in residence in Sarasota, Florida and New College, training in entomological methods and also presenting talks on the natural history of Panama to K-12 science classes.

David Mitre

from Panama, will be studying invasive species and subtropical botany with Dr. Lowman, as well as visiting different Florida university faculty during the spring term.

Eduardo Courrobas Montoya

from Cuernavaca, Mexico has received a scholarship to visit the United States during 2006 as an educational intern with TREE. Thanks to some generous donations from a local Elderhostel Spanish class, Eduardo will visit several cities in the United States with a special focus on environmental architecture. Eduardo will learn about green building design and building materials in subtropical climates during his stay in Sarasota, Florida and then travel to several other destinations with specific educational opportunities to augment his university training in Mexico.

A message from Eduardo:

> *Many thanks to the Tree Foundation for giving me the opportunity to be part of a marvelous experience of cultural interchange that I was able to experience in various US cities and allowed me to look at architecture in a totally different way. I*

especially appreciated the comparisons for taking full advantage of materials available, the use of gardens, the concept of green buildings, urban forest, water conservation, and other concepts that made me think more consciously about what we need to do in my own country.

This interchange has changed my thinking about the design and execution of Mexican architecture, so that now when I practice my profession I will put into practice things I learned during my visit to the US.

While I realize that every city responds to different challenges from a local perspective, architects have to prepare themselves with a variety of perspectives searching for the ideal solutions in accord with the physical and natural ambiance of the local area, always taking into account the humanizing elements that need to be served.

I am very grateful to all who made this trip possible, and it will always remain in my heart and mind what you have done for me and I hope you can do one day for someone else. This has been the single most important and eye-opening experience of my life and you can be sure it will be a part of me for years to come.

Marcos Vasquez
is a conservation biology student from Iquitos, Peru who will work with New College conservation biology and Florida ecology during spring 2007.

Pamela Montero
from Iquitos, Peru.

Intern "Thank you" Letter

Subj: **carta**
Date: 10/25/2006 12:49:02 PM Eastern Standard Time
From: meexit@hotmail.com
To: Canopymeg@aol.com

this is for the web site in tree foundation.

Many thanks to the Tree Foundation for giving me the opportunity to be part of a marvelous experience of cultural interchange that I was able to experience in various US cities and allowed me to look at architecture in a totally different way. I especially appreciated the comparisons for taking full advantage of materials available, the use of gardens, the concept of green buildings, urban forest, water conservation, and other concepts that made me think more consciously about what we need to do in my own country.

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Sincerely,
Your friend
Eduardo Covarrubias Montoya

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

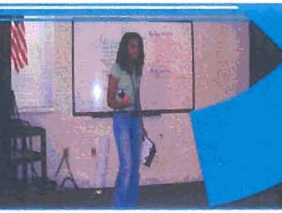
The design of the SOS program has been established and adapted through the Action Research method. The Action Research method focuses on improving practical affairs in a particular social system (Emery, 2000) by fully involving the researcher in it, and continually adapting the system according to a 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.

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



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 System's Theory*, Systemic Practice and Action Research, Vol. 13, No. 5

Reflecting for the Future

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.

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.

Results

Community Recognition:

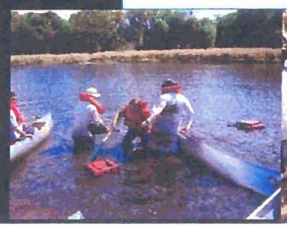
Awarded $11,000 by the Sarasota Community Foundation
Sarasota County Conservation Award for Excellence in Environmental Education and Outreach
Inducted into Sarasota Community Video Archives for Excellence in Volunteerism

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



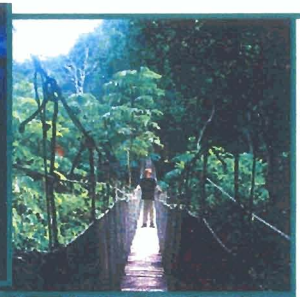
Student Poster Presented at Ecological Society

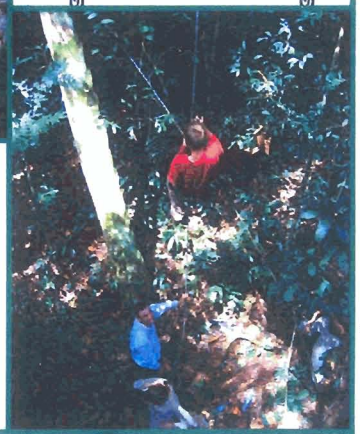
Out on a Limb

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:

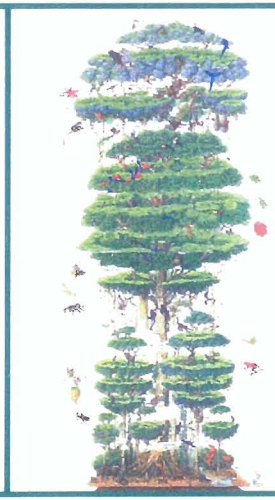
- Biodiversity in forest canopies
- Knowledge about linkages from the treetops to the forest floor
- The challenges scientists face while conducting research in the canopy
- The role that the public can play in conservation
- The importance of forests to all life on earth

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

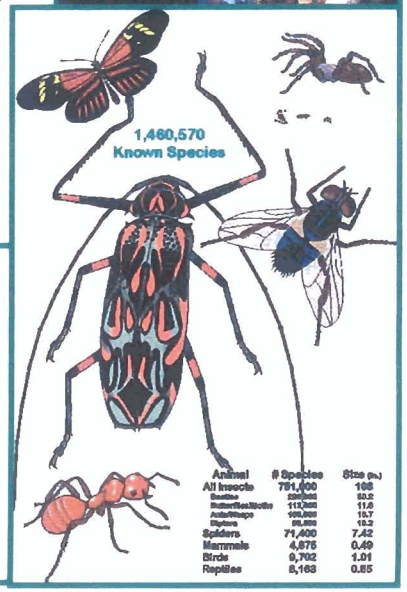
Audience

- 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

Student Poster #2 presented at ESA

Location of Base Camp Sarasota in Carlton

A Taxonomy for Communities - The Four System Layers

SOCIAL
- Governance and Decision-making
- Education
- Health
- Culture
- Worship
- Family and Informal Association

ECONOMIC
- Business
- Markets
- Economies
- Currencies
- Technological Innovations
- Extractive and Value-added Processes

BUILT
- Buildings and Infrastructure
- Water
- Waste
- Energy Transportation
- Communication Systems

NATURAL
- Solar Energy
- Atmosphere
- Animal and Plant Communities
- Water
- Geology

Visualization of Value of Biological Data

TREE FOUNDATION

TREE RESEARCH, EXPLORATION & EDUCATION

Thank you for your interest in supporting the TREE Foundation. Help us today through a donation. You can do so by mail or electronically using PayPal.

MAIL

Send checks or money-orders, in US funds, to:

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

PAYPAL

Make a donation with PayPal — it's fast, free and completely secure! With this convenient online payment system, The TREE Foundation will be electronically notified of your payment, and you'll automatically receive an email receipt of your donation. All you have to do is enter your payment information. Now a simple click is all it takes to help the TREE Foundation with their mission. Just click on the button below to start the donation process.

Make a Donation

MYAKKA WALKWAY "NAME A PLANK" DONATION

Put your name atop Myakka River State Park and fund research and education projects at the Myakka Canopy Walkway by having your inscription put on a plank or column.

If intersted please fill out this PDF form, then print and mail along with your check to:

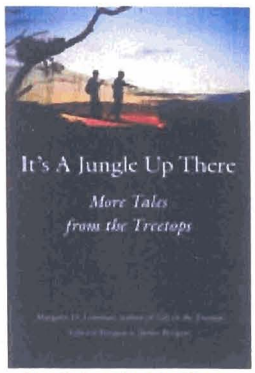
TREE Foundation
P.O. Box 48839
Sarasota, FL 34230-5839

All payments are tax deductible (in the USA) since the TREE Foundation is a 501(c) 3 corporation.

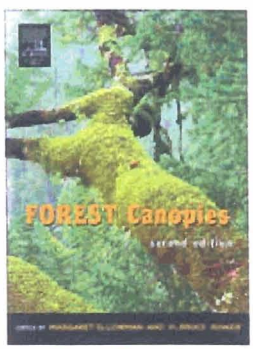
"If nothing is done, the rain forests of the world will no longer exist in 25 years."
- Dr. Margaret Lowman, Canopy Biologist

Days	Hours	Mins	Secs
6617	02	38	35

Recommended Reading



It's A Jungle Up There
by Margaret D. Lowman, Edward Burgess and James Burgess



Forest Canopies
by Margaret D. Lowman, Ph.D. and H. Bruce Rinker, Ph.D.

View All

Fostering partnerships between regional government and ecology

Margaret Lowman

We boarded a Lear jet, and the co-pilot offered us champagne from a full bar as we settled into plush leather seats with expansive leg room. For a tropical biologist who expects to find no flush toilets at her field sites, I was overwhelmed. I was the token scientist for a special meeting with Florida's Governor, Jeb Bush, flying to Tallahassee with a state senator, a college president, a county commissioner, and two lobbyists. After we landed, a waiting limousine whisked us to the capitol building, where we found ourselves in a boardroom exchanging jokes with the Governor. He claimed to remember me from a prior meeting to discuss ways to enhance Florida middle school science education with distance learning. Whereas biologists are great at bandying about Latin names of ants or plants, politicians become expert at matching human faces with names and party loyalties. I listened in awe as our state senator skillfully navigated the conversation. Like a captain steering a ship through a maze of reefs, he incorporated stories and "hooks" into the conversation, elegantly leading up to our funding request. I knew that I was learning from a pro about how to effectively communicate with regional government. At the end of the meeting, our message was delivered and the response was enthusiastic. We emerged after an hour with a pledge from the conservative Republican Governor to support our vision for a center of excellence to research best practices in land use and ecological management in subtropical Florida and beyond.

In just one short meeting with a state policymaker, we made great strides forward, turning the dream of an integrative research center focusing on land use ecology, the Florida Land Institute (FLI), into a reality. During the meeting, we communicated one important message to the Governor: that our project would enhance the quality of life for his constituents. This was strengthened by linking effective land use to Florida's economy. If Florida saves 1% of GSP (gross state product) from our FLI initiatives, over $5 billion would be accrued annually (S Mulkey pers comm). The stakes are high – an estimated 900 people move to the Sunshine State every day. Ironically, they move to Florida because of its natural environment; so implementing effective ecological management translates into revenue from real estate, health care, and tourism. FLI will engage professionals in transportation ecology, sustainable construction, hurricane-resistant building, renewable energy, and ecosystem management.

In mid-career, I find my role as an ecologist shifting away from the comfort zone of conventional research, writing technical reports, and communicating almost exclusively to colleagues at annual meetings. Ecologists are increasingly being drawn into "a new social contract of active engagement" (Bradshaw and Bekoff 2001), where issues of sustainability, land use, ecosystem services, and restoration ecology demand an interface between scientists and other community stakeholders. Ecologists are inevitably called upon to include humans in ecosystem analyses and to expand our formerly reductionist views to a whole-systems approach. In Florida, the development of best practices in land use represents a good example where professional ecologists need to be at the table with developers, businessmen, and policy makers. Recently, ecologists and developers joined together to formulate a plan for the development of a sustainable community on Babcock Ranch, the largest state-owned land parcel in south Florida. With encouragement and scientific expertise, the Babcock development will include a large conservation tract (Lowman 2006). Governor Bush signed the Babcock parcel over to state ownership in May 2006 (Figure 1).

How do concerned ecologists juggle an emerging new duality as objective scientists and engaged citizens at a regional level? Over the past decade, ecologists have successfully entered the policy arena on global issues such as climate change, biodiversity conservation, and pollution through groups such as the International Panel for Climate Change, National Academy of Science, and national ecosystem assessments (eg Heinz 2002). But at a local level, the distinction between scientist and citizen can easily blur (Hammond and Bradshaw 2001). The politicization of science, termed "scientizing" (Sarewitz 2004), can also undermine positive environmental outcomes. Alpert and Keller (2003) define a two-hat strategy, whereby ecologists increasingly provide objectivity and neutrality wearing a science hat, but advocate policy as private citizens. Scientists have been defined as the early warning system in regional communities (Pouyat 1999), the equivalent of the canary in the coal mine, whereby their views strike a balance between objectivity and concern (Rykiel 2001).

The Aldo Leopold Leadership Program (ALLP) trains scientists to become effective communicators to policy makers and to the public (Lubchenco *et al.* 1998). Three simple communication tips from my ALLP training facilitate my ability to translate science to regional policy makers in Florida: (1) keep it simple and without jargon; (2) tell a story; and (3) link science to economics and/or human health. Economic- and health-related platforms were essential to the success of our conversation with Governor Bush. The ALLP also recommends that communication of science to regional government (or other non-scientific audiences) should be delivered in short, simple

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Governor Jeb Bush announces the creation of a regional conservation tract on Babcock Ranch in South Florida.

stories or soundbytes. (For example, my technical research on nutrient cycling between canopy and forest floor processes via herbivory was translated by local journalists into "the scoop on poop".)

States are beginning to assume a larger role in science policy, probably as a consequence of the growing costs of regional environmental issues (eg invasive species, infectious disease, and land use). Nonetheless, state funding for science has declined from 8.1% to 6.6% of total spending for university research and development between 1990 and 2004 (Andres 2006). A few states, such as Oregon, have appointed science advisors to link environmentally sound stewardship with policy. With growing populations and development, regional governments face increasing pressure to use ecologically based decision making. In Florida, a leadership group (www.leadershipflorida.org) provides statewide networking to facilitate policy decisions. Ecologists remain a minority (albeit growing) voice in this group of predominantly bank presidents, mayors, attorneys, and business leaders. Other states have similar leadership groups.

Scientists historically solved issues like disease, and explained actions such as gravity or earthquakes. Now, ecologists are called upon to respond to complex environmental problems and create multi-scale and multi-cultural predictions of outcomes. Ecologists of the next generation will therefore require new training in public outreach, new job descriptions, the ability to communicate science to policy makers, and the skill needed to play effective roles in regional decision making. A 21st century mission statement for ecologists was defined by Alpert and Keller (2003): "to provide the most useful scientific information possible for making the legislative and administration decisions that affect society and nature, by meshing their interests with those of policy makers."

A growing number of ecologists recognize the need for a stronger link between science and policy (Schlesinger 2005). At the 2006 ESA annual meeting in Memphis, TN, plenary speaker Ron Sims quoted former Speaker of the House Tip O'Neill by saying, "All politics is local". Sims, the County Administrator for King's County, WA, recently received the prestigious 2006 Edgar Wayburn award from the Sierra Club for outstanding service to the environment by someone in government. In speaking about his initiatives, Sims called King's County a "living laboratory of innovation" where he "listens first to scientists and then to policy makers". With staff scientists fully engaged in research and think-tank activities, Sims' team has restored the habitat of endangered salmon, built the largest hybrid articulated bus fleet in the country, and implemented some of the most progressive land use policies in the US.

More and more ecologists are serving their local communities by bringing science into regional decision making. Some write newspaper columns to educate their public sector (W Schlesinger and S Pickett pers comm). Others serve as leaders in science education, raising the science literacy of youth and contributing to future decision making (Brewer 2002a,b). Programs such as neighborhood nest watch lead to tangible political action and awareness "one backyard at a time" (Evans *et al.* 2005). Others have forged partnerships in multi-state geographical areas, leading to the establishment of marine reserves (Lubchenco *et al.* 2006). Even when conservation policies are initiated at a national level, the practice and execution often remain local (eg Chatre and Saberwal 2005).

What will your community look like in the year 2050? Getting involved in regional government as an ecologist is one important way to shape that outcome.

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Out on a Limb – Forest Canopies

An NSF informal science education grant was received to "translate" to the public the technical results of a larger DEB grant which studied insect herbivores in tropical rain forest canopies and its trickle-down effect to biodiversity on the forest floor. For this outreach grant, Dr. Lowman designed a diorama of the Amazonian tropical rain forest, with canopy scientists engaged in field work. A studio in Orlando, Florida constructed the diorama. The purpose of the display is to inspire students about the wonder of tropical rain forests, and to use canopy research as a "hook" to inspire students (especially women and minorities) to consider science as a career. The education message of the exhibit explains the importance of forests to our lives, and how the public can conserve forests for future generation.

The diorama features a "where's Waldo?" approach, whereby students and families search through the canopy to find ants, beetles, birds, vines, sloths and other creatures that are accurately depicted under plexi-glass. A computer kiosk accompanies the display, where students can scroll from canopy to forest floor, and gather more detailed information about the creatures of the rain forest. A mini-canopy bridge was constructed so students can imagine that they too might be canopy scientists accompanying Dr. Lowman into the Amazon jungles. Teacher packets and Spanish translations are available. The exhibit was launched on November 4, and approximately 16,000 visitors to the Sarasota County Reading Festival "toured" the rain forest and learned about the ecosystem services provided by forests


THE MOST BIODIVERSE

Photo Legends for the following page:

1. Out on a Limb – exhibit launched at Sarasota Reading Festival November 4 2006

2. Close-up of Great Kapok tree (built at 1:100 scale in the rain forest canopy diorama

3. Liz Booth and Meg Lowman learn about Panama's conservation programs from intern David Mitre

4. Renowned author Richard Louv enjoys the TREE Foundation's flagship project, Myakka Canopy walkway, and wrote a column for the San Diego Sentinel about his experience in the treetops

5. Richard Louv with canopy authors Eddie and James Burgess hike across the canopy bridge, Myakka River State Park

6. Women and minority interns funded by TREE to present a canopy poster at the Ecological Society of America annual meeting in Memphis, Tennessee

7. Approximately 16,000 people enjoyed the Sarasota Reading Festival where our Out on a Limb canopy exhibit was displayed.

8. Mexican intern Eduardo Correlobius tours the canopy of Florida with New College student intern, Trevor Caughlin

9. Students exclaim with delight in finding different plants and animals in the rain forest canopy exhibit

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INTERVIEW

MARGARET LOWMAN

ECOLOGIST, SARASOTA, FLORIDA

CARLTON WARD JR

Bugs in trees and kids in labs get their due in a new book by "Canopy Meg"

BY MARIAN SMITH HOLMES

Margaret Lowman, of the New College of Florida, pioneered forest ecology by building the first canopy walkway in North America, in 1991. She recalls her adventures as a scientist and single parent in *It's a Jungle Up There.*

WHY SPEND TIME IN TREES? Almost 50 percent of life on earth is estimated to live in tree canopies, yet this was an unexplored region until about 25 years ago. Much of my work has involved solving the challenge of just getting into the treetops: inventing gadgets, refining hot air balloon design, creating canopy walkways, working from cherry pickers and construction cranes. Once up there, I discovered that insects eat four times more leaf material than we imagined.

IS THAT IMPORTANT? Lots of things stress forests. And with forests becoming warmer, drier and more fragmented, insect outbreaks are predictably one of the first responses to climate change.

YOU'VE TAKEN YOUR TWO SONS, NOW STUDENTS AT PRINCETON, ON RESEARCH TRIPS. Often I had to. When they were 7 and 5, we flew on an old prop plane into the jungles of Belize, where I was building a canopy walkway. We've slept under tarantulas clinging to the thatched ceiling of our hut and done research projects in Australia and Peru. But scientists weren't always tolerant of my children. They were kicked out of Biosphere 2 in Arizona, where I was building a canopy access system. One colleague would not let them near the microscopes in a joint project, even though my children were very adept at identifying bugs. That attitude strengthened my conviction that women need to muscle into the science world.

IT HAS BEEN SAID THAT THE MOTHERS OF YOUNG CHILDREN ARE UNDERREPRESENTED IN THE SCIENCES BECAUSE THEY CAN'T PUT IN THE LONG HOURS. I have experienced chapters in my life when juggling parenting and career put me at a disadvantage. Science needs the brains of women. And since women are the only half of society that can bear children, our system needs to accommodate that. For example, listing child care in a grant budget would be a way to give women more opportunity.

YOUR CANOPY WALKWAYS ARE USED IN SOME PLACES TO PROMOTE TOURISM. WON'T THAT HARM THESE FRAGILE ECOSYSTEMS? Canopy walkways have become a great opportunity for local people to create an income from a forest without logging it, and this is a success for conservation.

YOU SAY YOU MAKE A LIVING CLIMBING TREES. HOW DID YOU GET INTERESTED IN THAT? As a little girl in Elmira, New York, I made tree forts with my best friend, Betsy Hilfiger. We used to rescue birds fallen from their nests. Meanwhile, Betsy's brother Tommy was in their basement stitching bell-bottom jeans. He went on to develop a clothing empire. Now the Hilfigers and I raise funds for the Meg Lowman Treetops Camp for disadvantaged girls, in Elmira, hoping to inspire them in science careers. ●

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TREE "mantra" for 2007

No child left indoors

Meg Lowman
Professor of Biology and Environmental Studies,
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Vice President for Education, ESA

Coming home late one Halloween eve after a long laboratory class, I stopped at the mailbox and found a hand-written note in my then 6-year-old son James's nearly illegible script. It read "Caution – black widow inside". At first, I thought it was a prank, but squinting hard, I was flabbergasted to see the characteristic tiny red hourglass of this venomous spider in the beam of my flashlight. James was delighted. I never knew that black widow spiders habitually seek out mailboxes in Florida until we looked it up in the encyclopedia that night. My son proudly told me that he had learned to identify spiders from our family walks in the woods, peering at insects and studying their colorful markings. This bit of nature knowledge proved to be a potentially life-saving skill.

Kids need to know about nature. It nurtures and educates them, as well as instilling a sense of stewardship for the environment. A survey (Balmford *et al.* 2002; *Science* **295**: 2367) found that more children knew the characters in the electronic game Pokémon than could identify an otter, a beetle, or an oak tree. Nationwide, the science literacy of citizens – both young and old – has been eroded. Federal funding for science education has not kept pace with other science-dependent portfolios such as homeland security or petroleum exploration. The implications of this oversight represent a critical global challenge which our country cannot afford to overlook.

Richard Louv's recent book, *Last child in the woods – saving our children from nature-deficit disorder* (Algonquin Books 2005) analyzes the societal problems that have arisen in the latest generations of children, who have essentially lost contact with nature. Louv quotes a fifth grader, who stated, "I like to play indoors better 'cause that's where all the electrical outlets are". The author cites recent studies where environmental education programs provided important therapeutic value to troubled youth, substantial reduction in symptoms of attention-deficit disorder, and statistical gains in academic grades, problem solving, and SAT scores. Nature-deficit disorder not only damages children, but also affects adults, families, even whole communities, and inevitably shapes the future of nature itself. In the ESA report, *Profiles of ecologists – results of a survey of the membership of the ESA* (http://esa.org/education/diversity/), 58% of the respondents developed a passion for ecology before college, and 38% were hooked by the sixth grade. Almost 70% cited experiences not connected with a classroom or teacher that led to their love for science. In summary, early experiences outside of school influenced many ecologists to seek a nature-based career. In my recent book, *It's a jungle up there* (Yale University Press [2006], co-authored with my two sons) we expand Louv's platform by advocating nature-based immersion for entire families, not just children, to encourage a family conservation ethic.

When baby boomers think back to their childhood, they can probably recall a tree house, a scout camping trip, or neighborhood picnics. In today's world, many parents are rightfully reluctant to give their children unsupervised time outdoors, due to dangers ranging from global threats to distrust of strangers. But knowledge of nature is their best weapon if young people are to ultimately make good decisions about personal health, climate change, and land-use management. They need to touch flowers and know why some plants cannot survive without insect pollinators, walk in a forest and understand how many millions of years were required to create petroleum from dead plants – and it doesn't hurt to know how to identify a venomous spider!

As ecologists, we must lead by example in order to prioritize linking young people with their environment. This can be achieved by dedicating a portion of our research time to ecology education and outreach to youth. Science outreach activities can be planned in conjunction with ongoing research, and range from leading hikes for families, creating a nature trail at a local park, championing ecotourism, or bringing an insect collection to your child's science class. Over the next 2 years, the ESA annual meetings will feature informal science education sessions, where innovative case studies will illustrate how ecologists can promote K–12 and citizen science education as part of their work ethic. Our goal is to have "no child left indoors" by 2015. Please join the ESA Education and Human Resource Committee in working together as responsible ecologists to meet this target. Not only will the next generation benefit, but the future of the planet depends on it.

Short Grant History of TREE Foundation, Funding our Mission to Conduct Local and International Canopy Projects
(approximate costs only)

1. Myakka Canopy Walkway project – 1999-2001 with a total of $128,853.86 raised from private and grant sources, plus five foundations (see list):

Selby Foundation	$30,000
Community Foundation	$10,000
Nations Bank Foundation	$10,000
Gulf Coast Foundation	$25,000

2. Canopy Ecology Research in the tropical rain forests of Puerto Rico – 1999-2004 with funding from National Science Foundation totaling $419,976 (grant attached) plus additional sums for students ($59,932) totaling $ 479,908.
3. Herbivory protocols using canopy cranes - 2003-4, Global Canopy Program, $26,178
4. Canopy Ecology for middle school students – 1999, 2004 - Jason Project for Education for direct support of $20,000 in 1999 for canopy studies of the Amazonian Peru and $25,000 in 2004 for canopy studies in tropical rain forests of Panama, plus in-kind contributions of over $1,000,000 for the distance learning hardware and support staff.
5. Out on a Limb – 2005, canopy ecology exhibit for the public, grant pending from National Science Foundation for $74,950.
6. TREE website development and overhead – 2004, Aaron Foundation for $10,000
7. Canopy intern program for college students – 2004, Booths for $3000
8. **Forest Canopies**, textbook for professionals and college courses – 2004 published by Elsevier Publishers. $2000 distribution to developing countries.
9. **Life in the Treetops**, public outreach book on canopy ecology – 1999-2001 (hard cover and paperback editions) published by Yale University Press with special funding from the Mary Cady Tew Memorial Foundation (undisclosed sum). $1000 distribution to minority students.
10. Canopy Ecology programs in Southwest Florida and beyond – Triad Foundation 2004 for $30,000 to fund training of interns, community lecture series, publications (7 and 8 above), research and education programs in Florida canopies, interpretive signage and brochures at the Myakka River State Park canopy walkway, and science education outreach in local schools.
11. Canopy Ecology programs in Southwest Florida and beyond – 2005, with $35,000 pending from Triad Foundation.
12. Canopy Ecology programs in Myakka River State Park – ongoing fund-raising for annual maintenance and education programs averaging $3000 per year
13. Canopy outreach programs in local schools – 2005, $11,000 grant from Community Foundation to fund school outreach programs in ecology.
14. Canopy Ecology in the Amazon – 2005, $20,000 scholarships from New College Foundation for six students to study and initiate research programs in Amazonian Peru on ethnobotany, canopy access, soil ecology, herbivory and allelopathy.
15. Canopy Ecology conferences in Australia, India, Panama, Costa Rica, Miami – 1999-2004 outside funded donations approximately $30,000.

16. Canopy ecology student internships for students from Panama and Peru to attend classes at New College, learn canopy ecology at the Center for Canopy Ecology and apply for graduate stipends during their stay in USA – 2005, $2500
17. Continued distribution of **Forest Canopies** textbook to field stations and tropical students in developing countries - 2005, $2000
18. Continued student outreach to promote science education in middle schools, with approximately 24 New College students participating in this program – 2005
19. Participation in 4th International Canopy Conference by 3 TREE Research Associates and 3 student interns - $8000
20. Creation of a national science advisory committee who convened in September in Sarasota County and selected a site and criteria for an international biological field station, partnering with Sarasota County, New College of Florida, Gulf Coast University, University of Florida, Manatee Community College, University of South Florida, and the Organization for Biological Field Stations - $10,000
21. Creation of web site with high visibility including a blog 2006 - $15,500
22. Funding of two local interns for their subtropical canopy research, and one Peruvian and one Panamanian intern for tropical ecology training - 2005 $5000
23. Publications of conference materials – 2005 $2000
24. Successful local canopy ecology hikes with publication of 2 field guides -2006 $2000
25. Publication of **It's a Jungle Up There** – by M. Lowman, E. Burgess and J. Burgess including a chapter on the construction of our Myakka canopy walkway 2006 – distribution of books to students in developing countries $1000
26. Student science outreach volunteers receive Sarasota County Conservation award for environmental education, 2006
27. Meg Lowman received Sarasota County Lifetime Achievement in Conservation award, 2006
28. NSF grant "Out on a Limb – Forest Canopies" completed at New College for $75,000 in a partnership with TREE for display and dissemination of the final project. Six students worked part-time on the research and fact-finding for the rain forest information, including six women and four minority students. Four students presented the project as a poster at the annual meeting of the Ecological Society of America, funded by TREE 2006- $7500.
29. TREE Foundation funded one Mexican intern and two Panamanian interns - 2006$7500
30. TREE Foundation hosts the NSF grant at their booth for the Sarasota Reading festival, whereby 16,000 attendees viewed and enjoyed learning about rain forest canopies from the diorama and mini-canopy bridge 2006 $1000
31. TREE Foundation launches its next initiative: the design and construction of a treehouse for children 2006 - $5000 design phase.