

## Tupper 4pm seminar

Tuesday, January 8, 4pm seminar speaker will be Phillip Fearnside, National Institute for Research in the Amazon

**Why hydropower is not clean energy: Brazil's Amazonian dams as sources of green-house emissions**

## Bambi seminar

Thursday, January 10, Bambi seminar speaker will be Alex Cheesman, University of Florida

**Organic phosphorus in wetlands; San san pond sak and the use of 31P NMR**

## Arrivals

Noelle Beckman, University of Minnesota, to study the relative roles of mammals, insects, and pathogens in seed removal and seed survival at the pre-dispersal stage, on BCI, Gamboa and Tupper.

Ben Hirsch, SI National Zoological Park, to study rodents as conditional mutualists of trees, on BCI.

Participants of McGill-STRI Panama Field Semester Program with instructors Katrina Robinson, Rachel Labbe-Bellas, Susan Bragg, Jillian Friedman and Louis-Philippe Potvin.

Jorien van Koten, Wageningen University & Research Centre, The Netherlands, to study rodents as conditional mutualists of trees, on BCI.

Alexa Schmitz, Pennsylvania, to study the interactions between mycorrhizal fungi and *Rhizobium* bacteria and their influence on host success, on BCI.



Smithsonian Tropical Research Institute, Panamá

[www.stri.org](http://www.stri.org)

January 4, 2008

STRI faced new challenges, changes and opportunities in 2007. I would like to share some of our most recent news with you. As a world-renowned research and education center dedicated to increasing knowledge of tropical ecosystems, STRI has become the headquarters for several important scientific initiatives whose findings I hope and expect will have far-reaching global impacts.

First among these is the Smithsonian Institution Global Earth Observatories (SIGEO), which is an extraordinary one-of-a-kind platform for examining the impacts of climate change on forest ecosystem function, carbon storage and biodiversity.

SIGEO is an outgrowth of our Center for Tropical Forest Science (CTFS), a program that 27 years ago began monitoring trees and forest health on Barro Colorado Island in Panama, and with the Biological Dynamics of Forest Fragments Program (BDFFP) in the heart of the Amazon. That program now encompasses more than 20 forest plots in 17 countries around the globe, and represents the best observational platform in the world for evaluating how forests --and their remarkable biological diversity-- respond to global climate change. The transformation of the



Partners in the HSBC initiative to study and mitigate the effects of global warming met in Shanghai in December to launch the program in China. Pouring water into the globe are representatives from HSBC, The Climate Group, Earthwatch Institute, STRI and Worldwide Fund for Nature (WWF).

Photo: Courtesy of HSBC

Los socios en la iniciativa del HSBC para estudiar y mitigar los efectos del calentamiento global se reunieron en Shanghai en diciembre para lanzar el programa en China. Echando agua dentro del globo aparecen (desde la izquierda) los representantes de HSBC, The Climate Group, Earthwatch Institute, STRI y Worldwide Fund for Nature (WWF).

tree-focused CTFS to the more biologically comprehensive SIGEO recognizes the importance of field-based observations in understanding the dynamics of forest ecosystems over time.

SIGEO's mission looks more broadly at ecosystem benefits provided by forests, such as uptake of carbon from the atmosphere, and evaluates biodiversity more comprehensively by monitoring insects and vertebrates in addition to trees. SIGEO also extends our work into the temperate zone; now the same methodologies we have used throughout the tropics will be

employed at higher latitudes, enabling us to draw comparisons between forests from tropical and temperate regions of the world.

This past year our host nation announced plans to expand the Panama Canal by building a third set of locks with the capacity to serve a new, larger class of post-Panamax vessels.

The planned expansion of the Canal will provide STRI scientists a once-in-a-century opportunity to study new geological exposures and the fossils they contain. The construction of the Panama Canal in the early 1900s

## More arrivals

Marie-Soleil Turmel and Melody Fears, McGill University, to study soil nutrient dynamics, at Tupper.

Patrick Jansen and Jasper Ruijff, University of Groningen, to study contagious seed dispersal and shared natural enemies, on BCI.

Roland Kays, New York State Museum to study rodents as conditional mutualists of trees: When are agoutis effective seed dispersers?, on BCI

Heinrich Krause, Heinrich-Heine University Duesseldorf, to continue studies on the physiological responses of tropical plants to high solar radiation, at Tupper.

Brian Wysor, University of Louisiana at Lafayette, to conduct preliminary investigations for a NSF proposal to study marine algal diversity.

Caitlin Younts, Oberlin College, to study the roles of the Panama Canal in species invasions, at Naos

James Klaus and Donald McNeill, university of Miami, to study the geology of Isla Colon, at Bocas.

## Departures

John Christy and Rachel Collin to San Antonio, to attend the Annual Meeting of the Society for Integrative & Comparative Biology. Christy will also meet with collaborators and students to evaluate students application for research and travel support from the Society.



provided scientists from the Smithsonian and other institutions a remarkable first exposure to the geological history of the Isthmus of Panama.

We anticipate the second exposure, investigated with new methods and research approaches, will permit fresh insights into the geological and geographical history of the isthmus. The new research will also lead to refined interpretation of the role that the Isthmus of Panama played in establishing contemporary patterns of tropical biological diversity when it rose and separated the Eastern Pacific Ocean from the Caribbean Sea, and linked the North American continent to South America, which had existed in "Splendid Isolation" (to borrow a phrase from George Gaylord Simpson) since its separation from the African continent many millennia before.

We have also recently embarked on a twenty-year study of landscape management in the Panama Canal, which we have named the Panama Canal Watershed Experiment. We aim to tie the basic research that is STRI's hallmark to an experimental manipulation that will enable us to quantify the full range of ecosystem benefits that forested and non-forested landscapes provide the Panama Canal under different management strategies. Scientifically informed

management of the Canal's water resources is critical to the people of Panama who rely on the Canal as a primary source of their drinking water, and to international commerce for which the waterway serves as one of the world's great shipping hubs. No watershed experiment has ever been conducted on this scale and scope in the tropics, and we anticipate that governments, scientists and policy makers concerned with global climate change, biodiversity loss and the availability of fresh water necessary to operate the Panama Canal will closely follow the results of this seminal study.

I would like to welcome Helene Muller Landau as lead scientist of the CTFS carbon dynamics program, and congratulate Nancy Knowlton who accepted the Sant Chair of Marine Science at the SI National Museum of Natural History.

Training the next generation of investigators focused on tropical science and conservation has always been a central focus for our Institute. We have been very fortunate this year to endow two new funds supporting education.

The Board of Regents officially established the A. Stanley Rand Fellowship, which honors one of our own recently deceased and most revered scientists and educators, and provides support for students beginning their careers as tropical biologists.

In addition, we were able to establish a new endowment for Latin American scholars through the generous support of the Andrew W. Mellon Foundation and of an individual member of the Smithsonian National Board. This fellowship was the outgrowth of a successful and hugely supportive visit to STRI by the Smithsonian National Board in January of this year. It follows on the heels of the Adelante fellowships established by a group of Central American businessmen aiming to support the research by young scientists from the region.

We selected 93 fellows, 133 interns and selected 11 Adelante fellows/interns in 2007. We also received funds to establish fellowship and internship programs specifically targeted to applicants from Colon to work at our Galeta Marine Facility.

The importance of these endowments in advancing science and education cannot be overstated, and we are grateful to have dedicated friends who have recognized the significance of young scholars to the future of the tropics.

I am happy to report that the research initiatives touched on here, as well as others, will be supported by a new state-of-the-science campus in Gamboa. The Panamanian government has granted the Smithsonian a concession of 156 acres of forest abutting

## New publications

Benfield, Sarah L., Guzman, Hector M., Mair, James M., and Young, J. Peter W. 2007. "Mapping the distribution of coral reefs and associated sublittoral habitats in Pacific Panama: a comparison of optical satellite sensors and classification methodologies." *International Journal of Remote Sensing* 28(22): 5047-5070.

Blum, M.J. 2008. "Ecological and genetic associations across a *Heliconius* hybrid zone." *Journal of Evolutionary Biology* 21(1): 330-341.

Daws, Matthew I., Ballard, Christopher, Mullins, Christopher E., Garwood, Nancy C., Murray, Brian, Pearson, Timothy R.H., and Burslem, David F.R.P. 2007. "Allometric relationships between seed mass and seedling characteristics reveal trade-offs for neotropical gap-dependent species." *Oecologia* 154(3): 445-454.

Floeter, S.R., Rocha, Luiz A., Robertson, D. Ross, Joyeux, J.C., Smith-Vaniz, W.F., Edwards, A.J., Barreiros, J.P., Ferreira, C.E.L., Gasparini, Joao Luiz, Brito, A., Falcon, J.M., Bowen, Brian W., and Bernardi, Giacome. 2008. "Atlantic reef fish biogeography and evolution." *Journal of Biogeography* 35(1): 22-47.

Gonzalez, Luis M., and D'Croze, Luis. 2007. "Variabilidad espacial del afloramiento en el Golfo de Panamá." *Revista Tecnociencias* 9: 107-119.

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212-8211**

Soberania National Park, whose roughly 50,000 acres and well-conserved flora and fauna have long served as a natural laboratory for STRI, including more than three decades of continuous study of avian population dynamics.

The Gamboa campus already serves as the site of our Native Species Reforestation nursery and our outdoor laboratories for investigating plant physiological response to increased temperatures, CO<sub>2</sub> and drought stress. The development of the Gamboa campus is a wonderful opportunity for STRI, and coupled with the research that will be carried forward at the site will help to insure that STRI continues to be an extraordinarily important voice in tropical research, conservation and education.

Haris Lessios has joined the Director's Office as Acting Deputy Director and brings his superb reputation as a marine ecologist and evolutionary biologist to the administration of STRI. It required someone of Haris' caliber and years of service to help STRI compensate for the move of Ira Rubinoff to Washington where he serves as the Undersecretary for Science for Cristián Samper, the Acting Secretary of the Smithsonian. The Smithsonian and STRI are already benefitting from the

refreshed scientific vision and leadership provided by Ira and Cristián, and their shared passion for research at the Institution.

More than 320 publications by STRI researchers have been registered to this date for 2007, including 64 articles in high impact journals. We published a compendium of STRI papers in Spanish *Ecología y evolución en los trópicos* that will make STRI research accessible to students and professionals throughout the region. We provided a base and logistical support for 1,026 visiting researchers at our various facilities, representing an increase from 2006 (963).

During 2007 STRI solicited and received \$11,203,661 in gifts and private non-government grants and \$1,776,427 in government grants. Our largest grant was \$8 million from HSBC to study climate change and expand the CTFSS network to temperate sites, as well as conduct an experiment to study environmental services in the Panama Canal Watershed. We completed our strategic plan 2007-2012 and initiated our Facilities Master Planning Process.

STRI accomplishments are the direct result of the work and dedication of every one of its members. No scientist can do science without the support of the many people involved in every one of their activities, the

vision of their leaders and the sacrifices of their families. In order to ensure that STRI can continue to attract and retain the best local employees to support its mission, we contracted KPMG to revise positions descriptions and update our local salary scale. This project will be completed in 2008 and is important to secure additional base funding.

Lest it seem that we are in "stand-by" mode while so many are in interim positions at the Smithsonian and STRI, I wanted to share with you a copy of STRI's Strategic Plan for the next five years, and assure you that we continue to advance the frontiers of scientific research on tropical ecosystems and their role in the biology of our planet as a whole. The Strategic Plan can be read at: <http://www.stri.org/strategioplan.pdf>

I hope that the New Year brings you health, happiness and great adventure.

*Eldredge Bermingham  
Acting Director*

### Nota del editor:

La traducción al español del mensaje de año nuevo del director encargado de STRI, Eldredge Bermingham será publicada la próxima semana. Nos disculpamos por cualquier inconveniente que esto pueda ocasionar.



## More publications

Jansen, Patrick A., Bohlman, Stephanie A., Garzon-Lopez, Carol X., Olf, Han, Muller-Landau, Helene C., and Wright, S. Joseph. 2008. "Large-scale spatial variation in palm fruit abundance across a tropical moist forest estimated from high-resolution aerial photographs." *Ecography* Online.

Laurance, William F. 2008. "Global warming and amphibian extinctions in eastern Australia." *Austral Ecology* 33(1): 1-9.

Laurance, William F. 2007. "Switch to corn promotes Amazon deforestation." *Science* 318(5857): 1721.

Russo, Sabrina E., Brown, Patrick, Tan, Sylvester, and Davies, Stuart James. 2008. "Interspecific demographic trade-offs and soil-related habitat associations of tree species along resource gradients." *Journal of Ecology* 96(1): 192-203.

Sakai, Shoko, and Wright, S. Joseph. 2008. "Reproductive ecology of 21 coexisting Psychotria species (Rubiaceae): when is heterostyly lost?" *Biological Journal of the Linnean Society* 93(1): 125-134.

Sayer, Emma J., Powers, Jennifer S., and Tanner, Edmund V.J. 2007. "Increased litterfall in tropical forests boosts the transfer of soil CO<sub>2</sub> to the atmosphere." *PLoS ONE* 2(12): e1299.

Scharlemann, Jorn P.W., and Laurance, William F. 2008. "How green are biofuels?" *Science* 318(5858): 52-53.



## Scharlemann and Laurance highlight environmental impacts of biofuels

Biofuels reduce greenhouse-gas emissions in comparison to fossil fuels. In the January 4 issue of *Science*, STRI researchers highlight a new study that factors in environmental costs of biofuel production. Corn, soy and sugarcane come up short. The authors urge governments to be far more selective about which biofuels they support, as not all are more environmentally friendly than fossil fuels.

Because fossil fuels contribute to global warming and supplies are dwindling, more eco-friendly alternatives are required. However, biofuels may not be superior if their production results in environmental destruction, pollution and damage to human health, argue STRI postdoctoral fellow Jörn Scharlemann and staff scientist William Laurance.

A new study by Zah *et al.*, commissioned by the Swiss government, calculates the relative merits of 26 biofuels based on relative reduction of greenhouse-gas emissions and an environmental-impact index, which includes damages to human health and

ecosystems and natural resource depletion.

The Swiss study identifies striking differences in the environmental costs of different biofuels. Fuels made from US corn, Brazilian soy and Malaysian palm oil may be worse overall than fossil fuels.

The best alternatives include biofuels from residual products, such as recycled cooking oil and ethanol from grass or wood.

The Zah *et al.* study falls short in that it fails to consider secondary consequences of biofuels, such as rising food costs, but it is a big step forward in providing a way to compare the environmental benefits and costs of dozens of different biofuels.

"Different biofuels vary enormously in how eco-friendly they are," said Laurance. "We need to be smart and promote the right biofuels, or we won't be helping the environment much at all."

The article was distributed by STRI's Neal G. Smith. It can also be obtained from calderom@si.edu

## More publications

Swain, Timothy D., and Wulff, Janie L. 2007. "Diversity and specificity of Caribbean sponge-zoanthid symbioses: a foundation for understanding the adaptive significance of symbioses and generating hypotheses about higher-order systematics." *Biological Journal of the Linnean Society* 92(4): 695-711.

## STRI in the news

Bali delegates agree to support forests-for-climate (REDD) plan. 2007. *Mongabay.com*: December 16.

Palming us off. The government has committed itself far too hastily to biofuels without auditing their full environmental cost, by Andy Tate. 2008. *Guardian Unlimited*: January 4.

Scientist: U.S. corn subsidies drive deforestation in the Amazon. 2008. *Biopact*: January 4.

## Volunteers needed

If you enjoy the outdoors and sharing with others, Punta Culebra Nature Center invites you to participate as a volunteer during 2008 summer activities. Interested please contact Lidia at 212-8794 or e-mail: valencil@si.edu

Si te gusta estar al aire libre y compartir con otras personas, el Centro Natural Punta Culebra te invita a participar como voluntario/a durante las actividades de verano 2008. Interesados favor contactar a Lidia al 212-8794 o al correo: valencil@si.edu