



STRINNEWS

JUNE 15, 2012



Photo by Rhett A. Butler, monqabay.com

Was the Amazon a manufactured landscape?

Population estimates for the Amazon Basin before Europeans arrived range from 2-10 million people. A new reconstruction of Amazonian prehistory by STRI's Dolores R. Piperno and colleagues suggests that large areas of western Amazonia were sparsely inhabited.

Their data clash with the belief that most of Amazonia, including forests far removed from major rivers, was heavily occupied and modified by humans. The team's research is published in the June 15 issue of Science.

First author Crystal McMichael, from the Florida Institute of Technology, sampled soil across the Peruvian and Brazilian Amazon. A lack of charcoal indicated that the few fires caused by humans did not result in much structural damage. Plants typical of human disturbance like grasses were scarce in the phytolith record.

"Planners may assume that Amazonian forests were resilient

in the face of heavy prehistoric human modification," said Piperno. "These views are gaining currency. Hopefully, our evidence to the contrary will help to place these questions into a more rigorous empirical context."

¿Era el Amazonas un paisaje fabricado?

Se calcula que las poblaciones en la cuenca del Amazonas antes de la llegada de los europeos podrían tener alrededor de 2 a 10 millones de personas. Una reciente reconstrucción de la prehistoria amazónica realizada por Dolores Piperno del Smithsonian en Panamá y colegas, sugiere que grandes áreas de la amazonia occidental estaban escasamente habitadas.

Sus datos contrastan con la creencia de que la mayoría de la amazonia, incluyendo los bosques alejados de rios principales, estaba excesivamente ocupada y modificada por los humanos. Esta investigación se publicó el 15 de junio en la revista Science.

Su principal autora, Crystal McMichael, de la Florida Institute of Technology muestreó suelos a lo largo de la amazonia peruana y brasileña. La ausencia de carbón vegetal indica que los pocos fuegos causados por humanos no causaron mucho daño. En los récords de fitolitos, los restos de plantas típicas por la alteración causada por humanos, como la hierba por ejemplo, eran escasas.

"Los planificadores actuales pueden asumir que los bosques de la amazonia se recuperaban fácilmente ante modificaciones masivas hechas por humanos prehistóricos," comenta Piperno. "Estas opiniones están ganando aceptación popular. Esperamos que nuestra evidencia de lo contrario ayude a colocar estas preguntas en un contexto empírico más riguroso."

McMichael, C.H., Piperno, D.R., Bush, M.B., Silman, M.R., Zimmerman, A.R., Raczka, M.F., Lobato, L.C. 2012. Sparse pre-Columbian human habitation in Western Amazonia. Science 336(6087):1429-1431 doi:10.1126/science.1219982

◀ Peruvian Amazon
Amazona Peruana



SEMINARS

GAMBOA SEMINAR

Mon., Jun. 18, 4pm

Paul Wennekes

Uppsala University

Gamboa schoolhouse

The ecology of fear: predation risk and daily activity patterns

CTFS TALK

Tues., Jun. 19, 10:30am

Marjolein Bruijnning

Radboud University

Tupper Large Meeting Room

Quantifying the costs and benefits of dioecy as a reproductive strategy

BEHAVIOR

DISCUSSION GROUP

Tues., Jun. 19., 2pm

Teague O'Mara

Arizona State University

Tupper Large Meeting Room

Information and sociality: Do tent-making bats use roosts as information centers?

TUPPER SEMINAR

Tues., Jun. 19, 4pm

Michael J. Ryan

University of Texas, STRI

Tupper Auditorium

Molecular genetics, behavioral and evolution of alternative reproductive tactics in a live bearing fish

BAMBI SEMINAR

Thurs, Jun. 21, 7:15pm

Ummat Somjee

University of Florida

Barro Colorado Island

Dynamic sexual selection in wild populations

NEW PUBLICATIONS

Collin, R., 2012. Temperature-mediated trade-offs and changes in life-history integration in two slipper limpets (Gastropoda: Calyptraeidae) with planktotrophic development. *Biological Journal of the Linnean Society*, doi: 10.1111/j.1095-8312.2012.01908.x

Drexler, J.F., Seleen, A., Corman, V.M., Tatenno, A.F., Cottontail, V., Melim Zerbinati, R., Gloza-Rausch, F.G., Klose, S.M., Adu-Sarkodie, Y., Opong, S.K., Kalko, E.K.V., Osterman, A., Rasche, A., Adam, A., Müller, M.A., Ulrich, R.G., Leroy, E.M., Lukashov, A.N., Drosten, C. 2012. Bats worldwide carry hepatitis E-related viruses that form a putative novel genus within the family *Heperviridae*. *J. Virol.* doi: 10.1128/JVI.00800-12

Perego, U.A., Lancioni, H., Tribaldos, M., Angerhofer, N., Ekins, J.E., Olivieri, A., Woodward, S.R., Pascale, J.M., Cooke, R., Motta, J., Achilli, Alessandro. 2012. Decrypting the mitochondrial gene pool of modern Panamanians. *PLoS One*. 7(6)1-10.

DEPARTURES

Eldredge Bermingham

Hong Kong
To meet with Merlin Swire, executives from HSBC and Global Sources, Ltd, and staff from the University of Hong Kong
Los Angeles
To continue advancement activities

Stuart Davies

Hong Kong
To visit CTFS- SIGEO plot and partners; meet Merlin Swire and HSBC executives; and visit marine labs for SI's Marine GEO initiative

Allen Herre

Ribeirao Preto, Brazil
To present at the VIII International Fig Symposium and attend the Association for Tropical Biology and Conservation Annual Meeting

Ben Turner

To Ascona, Switzerland
Invited speaker: IsoPhos 2012



Do pests keep rare tree species from becoming common?

In the ongoing search for the fundamental causes of tropical tree biodiversity, STRI ecologist Stephen Hubbell proposes that plant enemies, disease-causing microbes and pests, play an important role in keeping rare species from becoming locally common. Hubbell will put the Enemy Susceptibility Hypothesis to the test over a five-year period on Panama's Barro Colorado Island with a \$2 million National Sciences Foundation research grant.

Hubbell, who co-founded the first tropical forest monitoring plot of the Smithsonian's 47-plot Global Earth Observatory network says his hypothesis predicts rare tree species will have a greater percentage of hollow-trunk trees and harbor more pathogenic fungal species than common trees. Rare trees should also share more of these pathogens with other trees.

The other principal investigators on the project include STRI research associates Greg Gilbert of UC Santa Cruz, and Travis Glenn from the University of Georgia, and UCLA's Brant Faircloth. Megan Saunders from UC Santa Cruz rounds out the senior personnel on the team.

Field courses for high school and college students, as well as U.S. and Panamanian teachers, will be held during the first three years of the project.

"If the Enemy Susceptibility Hypothesis holds up to these tests, it may prove to be a general explanation for the high diversity and rarity of tree species in tropical forests worldwide," says Hubbell.

¿Evitan las plagas que especies de árboles poco comunes se vuelvan comunes?

En la búsqueda de la causa fundamental de la diversidad de árboles tropicales, Stephen Hubbell, ecologista del Smithsonian en Panamá, propone que los enemigos de las plantas, microbios y plagas causantes de enfermedades, juegan un importante papel al mantener especies poco comunes de convertirse en localmente comunes. Hubbell pondrá a prueba la hipótesis de "susceptibilidad del enemigo" por un periodo de 5 años en la Isla Barro Colorado en Panamá, gracias a una beca de investigación de 2 millones de dólares otorgada por la National Sciences Foundation.

Hubbell, co-fundador de la primera parcela tropical de monitoreo de la Red de

Observatorios Globales de la Tierra de la Institución Smithsonian comenta que su hipótesis predice que especies poco comunes de árboles tendrán un mayor porcentaje de troncos huecos y a su vez albergan más especies de patógenos micóticos que los árboles comunes. Los árboles poco comunes deben también compartir más de estos patógenos con otros.

Otro investigador principal de este proyecto es el Investigador asociado del Smithsonian en Panamá es Greg Gilbert de la University of California Santa Cruz, Travis Glenn de la University of Georgia y Brant Faircloth de la University of California, Los Angeles. Megan Saunders de la University of California Santa Cruz conforma el personal sénior del equipo. Durante los primeros tres años del proyecto se dictarán cursos de campo para estudiantes de colegios secundarios y universidades además de maestros de los EE. UU. y Panamá.

"Si la hipótesis de "susceptibilidad del enemigo" sostiene estos experimentos, esta puede llegar a ser una explicación general de alta diversidad y la rareza de especies de árboles en bosques tropicales alrededor del mundo," comenta Hubbell.



Dave Marvin awarded NASA funds for liana study

STRI fellow Dave Marvin has been chosen to receive a NASA Earth and Space Science Fellowship for his doctoral dissertation research on vines.

The discovery that these lianas have increased in size and abundance in tropical forests suggests that the composition and carbon storage capacity of tropical forests are changing. Dave will use airborne and

satellite remote sensing imagery along with field-based forest censuses to distinguish, tree canopy cover from vine cover, and monitor its changes and effects liana coverage from tree canopy cover to monitor change in liana cover and its effects.

Stefan Schnitzer, from the University of Wisconsin; Jennifer Powers, from the University of Minnesota and STRI's Joe Wright removed all lianas from a set of experimental areas on Gigante Peninsula in Panama's Barro Colorado Nature Monument in 2011. Dave will develop and test methods to classify varying

amounts of liana canopy cover based, in part, in comparisons of adjacent areas with these plots. Dave is a student at the University of Michigan where he works with Robyn Burnham.

Dave Marvin recibe fondos de la NASA para estudiar las lianas

Dave Marvin, becario el Smithsonian en Panamá fue seleccionado para recibir una beca de la *National Aeronautics and Space Administration* (NASA) para su tesis doctoral sobre lianas.

El descubrimiento de que estas enredaderas leñosas han aumentado en tamaño y abundancia en bosques tropicales sugiere que de composición y la capacidad almacenamiento de carbono en bosques tropicales está cambiando. Dave utilizará imágenes aéreas y de

teledetección junto con censos de bosques basados en trabajo de campo para distinguir la cobertura de lianas de la cobertura de árboles para poder monitorear el cambio y sus efectos.

Stefan Schnitzer de la *University of Wisconsin*, Jennifer Powers, de la *University of Minnesota* y Joe Wright del Smithsonian en Panamá sustrajeron en el 2011 todas las lianas de un grupo de áreas experimentales en la Península de Gigante en el Monumento Natural Barro Colorado en Panamá.

Dave desarrollará y probará métodos para clasificar las cantidades variantes de lianas que cubren el dosel, basados, en parte, en comparaciones de áreas adyacentes con estas parcelas.

Actualmente, Dave es estudiante de la *University of Michigan* donde trabaja con Robyn Burnham.

<http://www.lianaecologyproject.com/about-us>

Canada supports doctoral research

Javier Luque, STRI intern in Carlos Jaramillo's lab, received an Alexander Graham Bell Canada Graduate Scholarship from Canada's Natural Sciences and Engineering Research Council. The funds will support his doctoral program for three years and will allow him to fully concentrate on his studies and to choose his own research mentor.

Canadá apoya investigación doctoral

Javier Luque, pasante del Smithsonian en Panamá en el laboratorio del Carlos Jaramillo, recibió la beca Alexander Graham Bell Canada Graduate Scholarship del Natural Sciences and Engineering Research Council. Los fondos apoyarán su programa doctoral durante tres años y le permitirá concentrarse de lleno en sus estudios y escoger un tutor.



R to L. STRI Staff Scientist, Carlos Jaramillo; Smithsonian Secretary, G. Wayne Clough; STRI intern, Javier Luque.

De derecha a izquierda: Carlos Jaramillo, científico de planta, G. Wayne Clough, Secretario del Smithsonian y el pasante Javier Luque.

Is hunting boosting liana growth?

Woody vines known as lianas are rapidly increasing in tropical forests. While they are a beneficial component of a forest's biodiversity, in abundance they can increase tree mortality. Some scientists fear lianas could drastically alter tropical rainforests.

Some researchers point to rising atmospheric CO₂ levels as a driver of liana expansion. STRI staff scientist Joe Wright sees another possible factor – the bush meat crisis that is decimating fruit-eating animals that disperse many tree seeds.

Many tree seeds need to be dispersed over long distances to have a chance at reproducing. Where there are a lack of frugivores like monkeys and deer, seeds pile up beneath the fruit-bearing parent where they have a lesser chance of survival due, in part, to host-specific pathogens.

Liana seeds, in contrast, are largely dispersed by wind and their reproductive cycles are not equally threatened by hunting.

“Hunting is having a big impact on these forests with many consequences we are only beginning to understand,” says Wright.



¿Está la cacería aumentando el crecimiento de las lianas?

Las enredaderas leñosas conocidas como lianas están aumentando rápidamente en los bosques tropicales. A pesar de que éstas son un componente beneficioso a la biodiversidad de los bosques, su abundancia puede aumentar la mortalidad de los árboles. Algunos científicos temen que las lianas alteren drásticamente los bosques tropicales.

Algunos investigadores señalan que los niveles en aumento de CO₂ atmosféricos son propulsores de la expansión de las lianas. Joe Wright, científico de planta del Smithsonian en Panamá, ve otro factor posible—una crisis por “carne de monte” que está decimando a los animales que se alimentan de frutas y son dispersores de muchas semillas.

Para tener oportunidad de reproducirse, muchas semillas de árboles necesitan ser dispersadas a través de grandes distancias. Donde hay escasez de frugívoros como monos y venados, las semillas se amontonan bajo el árbol que las produce donde tienen menos oportunidades de sobrevivir debido en parte a patógenos específicos a esa especie.

En contraste, las semillas de lianas son por lo general dispersadas por el viento y sus ciclos reproductivos no son amenazados de la misma forma por la cacería.

“La cacería tiene un gran impacto en estos bosques con muchas consecuencias que apenas empezamos a entender,” comenta Wright.

Photo by Sean Matison

Marcy Balunas

University of Connecticut
ICBG: Training, conservation and drug discovery using Panamanian microorganisms
Tupper

Laura Bravo Valencia

Universidad de los Andes
Parent-embryo interactions in Neotropical glassfrogs (Centrolenidae)
Gamboa

Jessica Stapley, Stuart Dennis

University of Sheffield
Adaptive evolution and regeneration in Panamanian anole lizards
Bocas del Toro

Charlotte Jorgensen

University of Southern Denmark
Soil nutrient dynamics
Tupper

Barrett Klein

University of Konstanz
Unlocking the mysteries of sleep: improved learning as a shared functional benefit
Gamboa

Luis Mejia

STRI
Biosystematics of *Sordariomycetes* fungi associated diseases of forest trees in Panama
Naos Marine Lab, Gamboa

Andy Van Alst

University of St. Thomas
Toward a stoichiometric theory of ant ecology: from colony performance to community composition
Barro Colorado Island

Douglas Hooton

University of California-Los Angeles
Dimensions: Testing the potential of pathogenic fungi to control the diversity, distribution, and abundance of tree species in a Neotropical forest community
Barro Colorado Island

Susan Finkbeiner

University of California, Irvine
Heliconius roost recruitment and resource sharing
Gamboa

Claire Giuliano, Justin Houck

University of Mississippi
Brain and behavior relationships in birds: Part B
Gamboa

Lee Hyeunji

Ewha Women's University
The evolution of terrestrial reproduction in *Dendropsophus*
Gamboa

Virginia Schutte

University of Georgia
Reduced structural complexity in a hierarchically engineered system affects ecosystem function
Bocas del Toro

Amando Dominguez, Sara Feider, Sara Oszuscik, Sue Browne Pezanoski

University of Wisconsin-Milwaukee
Do lianas cause chronic disturbance and alter successional trajectories in tropical forests?
Barro Colorado Island

Jacques Rifkind

Natural History Museum of Los Angeles County
Enoclerus (Coleoptera: Cleridae) of Panamanian highlands: new species and notes on biology and ecology
Panama highlands

Brett Seymoure

Arizona State University
The evolution of mimicry in *Heliconius*
Gamboa

Victoria Weaver

California State University Northridge
Investigating the effects of radio collars on the grooming behavior of female spider monkeys
Barro Colorado Island

Kim Diver

Wesleyan University
Diversity, spatial distribution, and conservation of the flora in the Coiba National Park and its Special Zone of Marine Protection World Heritage Site
Tupper



◀ Left: STRI's George Angehr, Curator of Exhibitions for Panama's Biomuseo, views model of The Great Biotic Interchange exhibit in 2007.

Izquierda: George Angehr del Smithsonian en Panamá, curador de exhibiciones del Biomuseo, vistas de la exhibición The Great Biotic Interchange en el 2007.

Right: Recently, George traveled to Minneapolis, Minnesota to review production of the full-sized animal sculptures for the gallery. ▶

Derecha: Recientemente George viajó a Minneapolis, Minnesota, EE.UU. para examinar la producción de esculturas de animales en tamaño natural para la galería.

Photos from George Angehr

