Gamboa seminar

Monday, July 26 at 12pm, Gamboa seminar series speaker will be Patrica Jones, University of Texas at Austin
Variation in bat foraging behavior across scales: species, communities, seasons and prey

Tupper 4pm seminar

Tuesday, July 27, Tupper seminar speaker will be Lars Hedin, Princeton University
Tropical forests, nutrients and climate change: Do we need to reconcile individuals and ecosystems?

BDG meeting

Tuesday, July 27 at 2pm, the Behavior Discussion Group will meet with Jonathan Shik, University of Oklahoma
Size, scaling and traits of ant colonies

Bambi seminar

Thursday, July 29, Bambi seminar speaker will be Lars Hedin, Princeton University
Title to be announced

Arrivals

Justin McAlister and Elizabeth Whitehill, Clemson University, to study the evolution of life histories in geminate echinoderms: A comparative approach to unscrambling the relationships among environment, egg size, and the energetics of development, at Naos and Galeta.

Safety number: 212-8122

STRI news 2010

Smithsonian Tropical Research Institute, Panamá www.stri.org July 23, 2010

Frog killer caught in the act: Measuring life's data loss in Panama by barcoding

The first before-and-after view of an amphibian die-off has just been published by scientists working at STRI. Like a wave, the fungal disease that wipes out frogs — chytridiomycosis— advances through the Central America highlands at a rate of about 30 kilometers per year. After the disappearance of Costa Rica's golden frogs in the 1980s, Karen Lips, associate professor at the University of Maryland, quickly established a monitoring program at untouched sites in neighboring Panama.

Of the 63 species that she identified during surveys of Panama's Omar Torrijos National Park located in El Copé from 1998 to 2004, 25 species disappeared from the site in the subsequent epidemic. As of 2008, none of these species had reappeared there.

Were there additional species in the park -"cryptic" diversity not previously known to science? To find out, the authors used a genetic technique called DNA barcoding to quickly estimate that another 11 unnamed or "candidate" species were also present. Combining the field and genetic information, the authors discovered that five of these unnamed species were also wiped out.

"It's sadly ironic that we are discovering new species nearly as fast as we are losing them," said Andrew Crawford, former postdoctoral fellow at STRI and member of the Círculo Herpetológico de Panamá, now at the University of the Andes in Colombia. "Our DNA barcode data reveal new species even at this relatively well-studied site, yet the field sampling shows that many of these species new to science are already gone here."

An epidemic that wipes out a whole group of organisms is like the fire that burned the famous library of Alexandria. It destroys a huge amount of accumulated information about how life has coped with change in the past. Species surveys are like counting the number of different titles in the library, whereas a genetic survey is like counting the number of different words.

"When you lose the words, you lose the potential to make new books," said Lips. "It's like the extinction of the dinosaurs. The areas where the disease has passed through are like graveyards; there's a void to be filled and we don't know what will happen as a result."

"This is the first time that we've used genetic barcodes — DNA sequences unique to a given species— to characterize an entire amphibian community," said Eldredge Bermingham, STRI director and co-author. "STRI has also done barcoding on this

More arrivals

Georg Welzel, Thomas Liebenstein, Andreas Makiola, University of Bayreuth, Germany, to make comparisons of behavior, physiology, and ecology of sympatric bat species, on BCI.

Benjamin Fuchs, University of Wuerzburg, Germany, to make comparisons of behavior, physiology, and ecology of sympatric bat species, on BCI.

Erin Meyer and Michael Beetham, University of California at Berkeley, to study the phylogeography, ecology and habitat modeling of *Cittarium pica* in Panama.

Joyce Fassbender, City University of New York, to assist in the project "Panama Canal Amplification: Making the best of a clear-cut situation," on BCI.

Katrin Heer, University of Ulm, Germany, to join the comparative community studies of bats, on BCI.

Sebastián Henao Zapata, Universidad Nacional de Colombia, to work in the Panama Canal Salvage Paleontology/Geology Project, at the CTPA.

Amy Moran, Clemson University, to study the evolution of life histories in geminate echinoderms: a comparative approach to unscrambling the relationships among environment, egg size, and the energetics of development, at Naos Island Laboratories.

scale for tropical trees in our forest dynamics monitoring plot in Panama. The before-and-after approach we took with the frogs tells us exactly what was lost to this deadly disease 33: percent of their evolutionary history."

Un grupo de científicos que trabajan en STRI publicaron la primera descripción del antes-y-después de la muerte de un anfibio. La enfermedad causada por un hongo que está arrasando con las ranas, la quitridiomicosis, avanza a través de las tierras altas de América Central en una medida de 30 kilómetros por año. Luego de la desaparición de las ranas doradas de Costa Rica en 1980, Karen Lips, de la Universidad de Maryland, estableció rápidamente un programa de monitoreo en lugares no afectados por la enfermedad los alrededores de Panamá.

De las 63 especies identificadas en censos llevados a cabo dentro del Parque Nacional Omar Torrijos que se encuentra en el Copé, de 1998 hasta 2004, 25 especies habían desaparecido del lugar debido a la epidemia. En 2008, ninguna de estas especies ha reaparecido en el lugar.

¿Habrían en el parque especies adicionales de diversidad "críptica" que no eran conocidas por la ciencia? Para saberlo, los autores utilizaron la técnica genética llamada código de barras del ADN que puede calcular rápidamente que otras 11 especies "candidatas" o desconocidas también se encontraban presentes. Al combinar la información de campo con la genética, los autores descubrieron que había cinco de estas especies que tambien habían desaparecido hasta ese momento.

"Es tristemente irónico saber que estamos descubriendo nuevas especies al mismo tiempo que las perdemos" comentó Andrew Crawford, ex-becario postdoctoral de STRI y miembro del Círculo Herpetológico de Panamá, quien actualmente trabaja en la Unviersidad de Los Andes en Colombia. "La información que obtuvimos con el código de barras revela nuevas especies en un lugar relativamente bien estudiado, pero el trabajo en el campo nos muestra que muchas de estas ranas ya se han ido."

Una epidemia que acaba con todo un grupo de organismos es como el fuego que quemó la famosa Biblioteca de Alexandria. Destruyó una enorme cantidad de información acumulada sobre cómo la vida ha cambiado en el pasado. Los censos de las especies es como contar el número de los diferentes títulos en la biblioteca, mientras que los censos genéticos son como contar el número de diferentes palabras.

"Cuando se pierden las palabras, se pierde la posibilidad de hacer nuevos libros" dijo Lips. "Es como la extinción de los dinosaurios. Las áreas donde la enfermedad ha pasado parecen cementerios; hay un espacio vacío, y no sabemos cuál será el resultado de este vacío."

"Esta es la primera vez que hemos usado las secuencias genéticas de códigos de barra del ADN para caracterizar una comunidad entera de anfibios," dijo Eldredge Bermingham, director de STRI y coautor del artículo. "STRI también ha usado códigos de barra a esta escala para árboles tropicales en nuestra parcela de dinámica de bosques en Panamá. El método de antes y después que usamos con las ranas nos dice exactamente que lo que perdimos debido a esta enfermedad es el 33% de la historia de la vida evolutiva de estas especies.

More arrivals

Sebastian Voß, Germany, to work in the Agua Salud Project-Hydrologic Studies.

Cian Gill, University College Cork, to study conflicts among members of interacting symbioses: How do symbiotic fungi influence plant defense against leaf-cutting ants? In Gamboa.

Scott Whattam, Rutgers University, to work in the Panama Canal Salvage Paleontology/Geology Project, at the CTPA

Frank Jones, Imperial College, to join a collaborative research on seed dispersal by wind and plant recruitment in tropical forests, an interdisciplinary investigation across multiple scales, at Naos Island Laboratories.

Brook Swanson, Kathleen Cloughesy, Gina Contolini and Scott Parmely, Gonzaga University, to study the behavior, ecology and evolution of fiddler crabs genus *Uca*, at Naos Island Laboratories.

STRI in the news

"Amphibians wiped out before they are discovered Fungal disease drives the loss of 30 species in Panama" by Janet Fang . 2010. *Nature* (July 19): http://www.nature.com/news/2010/100719/full/news.2010.360.html

New publications

Bastien-Henri, Sara, Park, Andrew, Ashton, Mark, and Messier, Christian. 2010. "Biomass distribution among tropical tree species grown under differing regional climates." *Forest Ecology and Management* 260(3): 403-410.

Bittleston, L.S., Brockmann, F., Wcislo, William T., and Van Bael, Sunshine A. 2010. "Endophytic fungi reduce leaf-cutting ant damage to seedlings." *Biology Letters* Online.

Cadena, Edwin A., Bloch, Jonathan I., and Jaramillo, Carlos A. 2010. "New Podocnemidid turtle (Testudines: Pleurodira) from the Middle-Upper Paleocene of South America." *Journal of Vertebrate Paleontology* 30(2): 367-382.

Landeiro, Victor L., Hamada, Neusa, Godoy, Bruno S., and Melo, Adriano S. 2010. "Effects of litter patch area on macroinvertebrate assemblage structure and leaf breakdown in Central Amazonian streams." *Hydrobiologia* 649(1): 355-363.

Ramirez, Santiago R., Roubik, David W., Skov, Charlotte, and Pierce, Naomi E. 2010. "Phylogeny, diversification patterns and historical biogeography of euglossine orchid bees (Hymenoptera: Apidae)." *Biological Journal of The Linnean Society* 100(3): 552-572.

Ryan, Michael J., Bernal, Ximena E., and Rand, A. Stanley. 2010. "Female mate choice and the potential for ornament evolution in tungara frogs *Physalaemus pustulosus*." Current Zoology 56(3): 343-357.

Native species kit awarded by EuropeAid

Adriana Sautu from the Biomuseo, Wendy Tribaldos from *La Prensa* and Mónica Alvarado from STRI were awarded for a supplement, in the category of dissemination of scientific information in written press. Tomás Paredes (right), from the City of Knowledge, presented the award. The publications is a brochure with information for teachers and students on native tree species studied by PRORENA at Agua Salud, with support from the HSBC Climate Partnership. The brochure is a part of a school kit distributed throughout Panama.

Adriana Sautu, Biomuseo, Wendy Tribaldos, *La Prensa* y Mónica Alvarado de STRI, fueron premiadas por la producción de un suplemento, en la categoría de divulgación científica en la prensa escrita. Tomás Paredes (a la derecha), de la Ciudad del Saber hizo entrega del premio. La publicación es un panfleto con información para maestros y estudiantes sobre especies nativas estudiadas por PRORENA en Agua Salud, con el apoyo del HSBC Climate Partnership. El panfleto es parte de un kit escolar que se distribuye a todo lo largo de Panamá.

Introduction to Biology course

The participants of the 2008 and 2009 Introduction to Biology course received the certificates of participation on July 16, at the Tupper Center.

The annual introductory course on field biology is organized by STRI with the support of the University of Panama. On both years, 2008 and 2009, students from the Central American region participated in this course.

Carlos Ramos from the University of Panama encouraged the students to commit to their career and studies. Nelida Gómez, Hermógenes Fernández, STRI postdoctoral fellow and coordinator of the course in 2009 invited the students to use all research opportunities provided by STRI and other institutions.

Los participantes de los cursos de Introducción a la Biología de Campo de STRI en 2008 y 2009 recibieron sus certificados de participación el 16 de julio.

STRI organiza anualmente el curso introductorio de biología de campo con el apoyo de la Universidad de Panamá. En los cursos de ambos años, 2008 y 2009, también hubo participación de estudiantes de la región centroamericana.

Carlos Ramos, de la Universidad de Panamá exhortó a los estudiantes para que se comprometan con su carrera y sus estudios. Nélida Gómez, coordinadora académica de STRI y el becario postdoctoral, Hermógenes Ferández, coordinador del curso en 2009 invitó a los estudiantes a utilizar todas las oportunidades de investigación que ofrecen STRI y otras instituciones.

New publications

Vargas, Sergio, Eitel, Michael, Breedy, Odalisca, and Schierwater, Bernd. 2010. "Molecules match morphology: Mitochondrial DNA supports Bayer's Lytreia-Bebryce-Heterogorgia (Alcyonacea: Octocorallia) clade hypothesis." *Invertebrate Systematics* 24(1): 23-31.

Viviani, Carlos A., Hiller, Alexandra, and Werding, Bernd. 2010. "Swarming in open space in the rocky intertidal: a new population-settlement strategy in the Eastern Pacific porcellanid crab, Allopetrolisthes punctatus (Decapoda, Anomura, Porcellanidae)." *Crustaceana* 83(4): 435-442.

Voigt-Heucke, Silke L., Taborsky, Michael, and Dechmann, Dina K.N. 2010. "A dual function of echolocation: Bats use echolocation calls to identify familiar and unfamiliar individuals." *Animal Behaviour* 80(1): 59-67.

2009 update

Milton, Katharine, Lozier, Jeffrey, and Lacey, Eileen. 2009. "Genetic structure of an isolated population of mantled howler monkeys (Alouatta palliata) on Barro Colorado Island, Panama." *Conservation Genetics* 10(2): 347-358.

Roubik, David Ward. 2009. "Ecological impact on native bees by the invasive africanized honey bee. Abejas cleptoparasitas, con énfasis en las abejas hospederas colectoras de aceites (Hymenoptera: Apoidea)." *Acta Biologica Colombiana* 14(2): 115-124.

Donation by TERPEL

TERPEL general manager Jorge Usuga Loaiza (fourth from the left) and Maria Eugenia Charris visited STRI´s Punta Culebra Nature Center on Sunday, July 18, to renew their support to Fundación Smithsonian de Panamá. In the photo (from the left) are educational specialist Lidia de Valencia, senior scientist emeritus Anthony Coates and Joseph Salterio of Fundación Smithsonian, accepting accept the donation.

In 2009 Punta Culebra´s educational program reached a maximum of students to this date, thanks to the support of TERPEL.

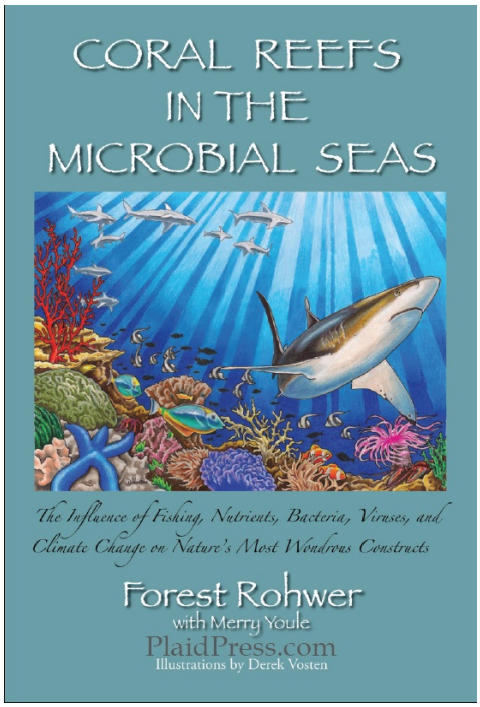
Jorge Usuga Loaiza, gerente general de TERPEL (cuarto desde la izquierda) y Maria Eugenia Charris visitaron Punta Culebra el domingo 18 de julio para renovar su apoyo a la Fundación Smithsonian de Panamá. En la foto, desde la izquierda, aparecen Lidia de Valencia y Anthony Coates, de STRI, y Joseph Salterio de la Fundación Smithsonian, quienes aceptaron la donación. En 2009, el programa educativo de Punta Culebra alcanzó el máximo de estudiantes a la fecha, gracias al apoyo de TERPEL.

Book inspired by STRI scientists

Plaid Pres.com has published *Coral reefs in the microbial seas*, a book partly inspired by Nancy Knowlton, Jeremy Jackson and David Kline, when they worked in Panama with STRI. Neilan Kuntz, a former student at STRI working with Biff Bermingham, is the book´s publisher and owner of Plaid Multimedia.

The author is Forest Rohwer, who tells the story of coral reefs that has puzzled investigators for decades... "this book brilliantly captures the lives of both coral reefs and the scientists that study them. It is a 21st century version of the Log from the Sea of Cortez –full of wisdom and humor," praises Nancy Knowlton, SI´s Sant Chair in Marine Science at the SI´s NMNH

Plaid Press.com publicó *Coral reefs in the microbial seas* [Arrecifes coralinos en los mares microbiales], un libro inspirado en parte por científicos de STRI Nancy Knowlton, Jeremy Jackson y David Kline cuando trabajaron en Panama con STRI. Neilan Kuntz, un antiguo estudiante de Biff Bermingham publicó el libro y es el dueño de Plaid Multimedia.



El autor es Forest Rohwer, quien cuenta la historia de los arrecifes coralinos que han intrigado a los investigadores por décadas... "este libro captura de manera brillante las vidas de tanto los corales como los científicos que los estudian. Es una versión del siglo 21 de *Log from the Sea of Cortez*, lleno de sabiduría y sentido del humor" escribió Nancy Knowlton, quien ostenta una posición directiva en el Museo de Historia Natural del Smithsonian.