



Smithsonian

100 years of science in Panama



Smithsonian Tropical Research Institute, Panamá

STRI news

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November 19, 2010

Tupper seminar

Tuesday, November 23, 4pm seminar speaker will be John Layne, University of Cincinnati
Why do fiddler crabs use the worst possible navigation mechanism to find home?

Paleo-Talk

Wednesday, November 24, Paleo-talk speaker will be Alexis Rojas, STRI intern
Selectivity of naticid predators: from modern experiments to the fossil record and back

Bambi seminar

Thursday, November 25 is Thanksgiving Day, and there will be no Bambi seminar on Barro Colorado Island.

Arrivals

Mario De Stefano, to study the biodiversity of the epiphytic diatom community in Panama Seagrasses and macroalgae: A taxonomical and ultra-structural analysis, on BCI.

Frank Baese, University of Postdam, Germany, to join the Agua Salud Project - Hydrological Studies, in Gamboa.

2005 heat stress on Caribbean corals: Worst on record

Caribbean reef ecosystems may not survive repeated stress

In 2005, coral reefs suffered record losses as a consequence of high ocean temperatures in the tropical Atlantic and Caribbean, according to the most comprehensive documentation of basin-scale bleaching to date.

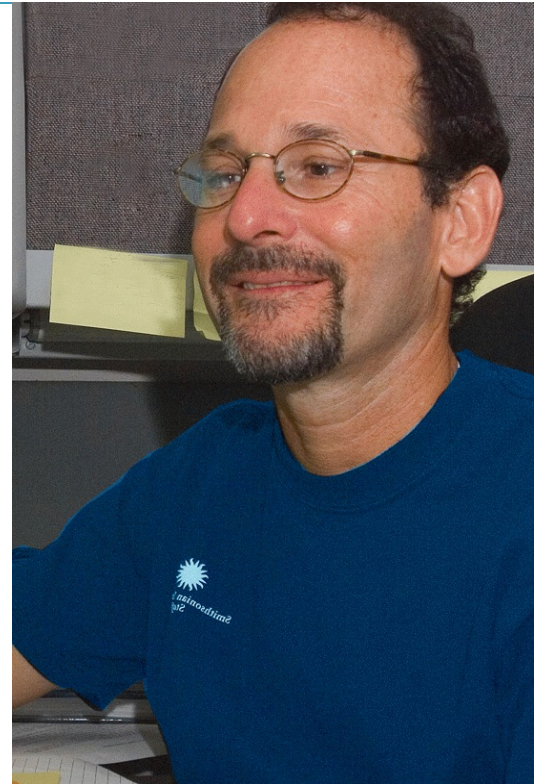
Collaborators from 22 countries including STRI's Héctor Guzmán, report that more than 80% of surveyed corals bleached and over 40% of the total surveyed died, making this the most severe bleaching event ever recorded in the basin. The study appeared in *PLoS ONE*, on November 15, 2010.

Satellite-based tools from NOAA's Coral Reef Watch Program guided site selection for field observations conducted across the greater Caribbean region from June to October 2005. Field surveys of bleaching and mortality in this study surpass prior efforts in both detail and extent. This study also substantially raised the standards for documenting the effects of bleaching and for testing satellite and forecast products. Coral bleaching occurs when stress causes corals to expel their symbiotic algae, or zooxanthellae. If

prolonged or particularly severe, it may result in coral death.

“Heat stress during the 2005 event exceeded any observed in the Caribbean in the prior 20 years, and regionally-averaged temperatures were the warmest in at least 150 years,” said Mark Eakin, coordinator of NOAA's Coral Reef Watch Program, and former STRI fellow. “This severe, widespread bleaching and mortality will undoubtedly have long-term consequences for reef ecosystems, and events like this are likely to become more common as the climate warms.”

The Caribbean is suffering severe bleaching again this year, and in some locations, this bleaching event is worse than the event in 2005. (See *STRInews* of October 1st and 15th). Not only are temperatures causing further damage to reefs hit hard during the 2005 event, but new locations have also been impacted.



Héctor Guzmán, 2007

The decline and loss of coral reefs has significant social, cultural, economic and ecological impacts on people and communities throughout the world. As the “rainforests of the sea,” coral reefs provide economic services —jobs, food and tourism —estimated to be worth as much as \$375 billion each year.

Information taken from NOAA. You may obtain the article from calderom@i.edu

En 2005, los arrecifes coralinos sufrieron grandes pérdidas como consecuencia de altas temperaturas en el Atlántico tropical y el Caribe, de acuerdo

More arrivals

Geisel Sanchez, Instituto Técnico de Costa Rica, to participate in a field course on Ecology and Coastal Management, at the Galeta Marine Laboratory.

Pablo Aguilar, Costa Rica, to participate in a field course on Ecology and Coastal Management, at Galeta.

Carol Cano Camacho, Universidad Latina de Costa Rica, to participate in a field course on Ecology and Coastal Management, at the Galeta Marine Laboratory.

Carlos Trejos Jiménez, Ecology Project International, to participate as instructor in a field course on Ecology and Coastal Management, at Galeta.

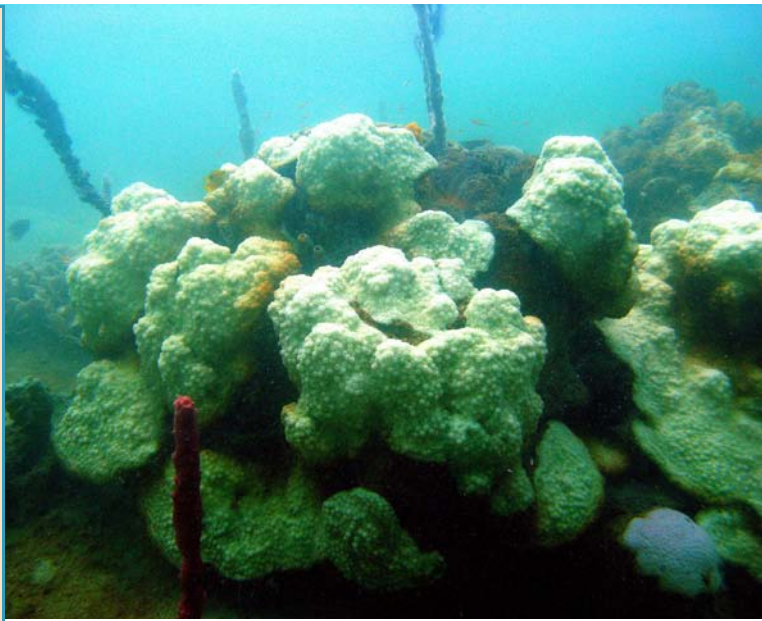
Johiner Prescott and Daisy Ayarza, Universidad de Panamá, to participate in a field course on Ecology and Coastal Management, at Galeta.

New publications

Cardona, Agustin, Valencia, Victor A., Bustamante, C., Garcia-Casco, A., Ojeda, G., Ruiz, J., Saldarriaga, M., and Weber, M. 2010.

"Tectonomagmatic setting and provenance of the Santa Marta Schists, Northern Colombia: Insights on the growth and approach of Cretaceous Caribbean oceanic terranes to the South American continent." *Journal of South American Earth Sciences* 29(4): 784-804.

Cheesman, Alexander W., Turner, Benjamin L., and Reddy, K. Ramesh. 2010. "Interaction of phosphorus compounds with anion-exchange membranes: Implications for soil analysis." *Soil Science Society of America Journal* 74(5): 1607-1612.



a la documentación más completa que se haya obtenido y publicado sobre blanqueamientos coralinos hasta la fecha.

Colaboradores de 22 países incluyendo a Héctor Guzmán, de STRI, informan que más del 80% de los corales observados presentaron blanqueamiento y más del 40% del total estudiado murieron, lo que indica que este fue el evento de blanqueamiento más severo que se ha registrado en la cuenca. El estudio apareció en *PlosONE*, el 15 de noviembre de 2010.

La localización de los sitios de estudios se basó en tomas satelitales del Programa de Monitoreo de Arrecifes Coralinos de NOAA en el Caribe de junio a octubre de 2005. Este estudio ha elevado los estándares para la documentación de los efectos de blanqueamiento, así como para pruebas y predicciones satelitales. El blanqueamiento de los corales ocurre cuando éstos liberan sus algas simbióticas o la zooxantela debido al estrés. Si esto se prolonga, el coral muere.

“El estrés causado por el evento de calor durante 2005 excedió todo lo que se había observado en el Caribe en 20

años, y la temperatura promedio en la región fue la más alta en 150 años” aseguró C. Mark Eakin, coordinador del Programa de Monitoreo de NOAA, y ex-becario de STRI. “Este severo y extenso blanqueamiento y mortandad sin duda tendrá consecuencias a largo plazo en los ecosistemas de arrecifes coralinos, y eventos como éste serán cada vez más comunes al aumentar la temperatura del clima.”

El Caribe está sufriendo blanqueamientos severos este año también y en ciertos lugares éste es peor que el evento de 2005. (Ver *STRInews* del 1ro y el 15 de octubre). Las temperaturas no solo están causando aún más daño a arrecifes afectados por el evento de 2005, sino que otros lugares están recibiendo el impacto.

La disminución y pérdida de arrecifes coralinos tienen impactos sociales, culturales, económicos y ecológicos en la gente y en las comunidades alrededor del mundo. Como los “bosques tropicales del mar” los arrecifes coralinos suministran servicios económicos —trabajos, alimento y turismo— con un valor calculado en \$375 billones de dólares cada año.

New publications

Eakin, C. Mark, Morgan, Jessica A., Heron, Scott F., Smith, Tyler B., Liu, Gang, Alvarez-Filip, Lorenzo, Baca, Bart, Bartels, E., Bastidas, C., Bouchon, C., Brandt, Marilyn, Bruckner, Andrew W., Bunkley-Williams, Lucy, Cameron, A, Causey, Billy D., Chiappone, Mark, Christensen, Tyler R.L., Crabbe, M. James C., Day, Owen, de la Guardia, Elena, Diaz-Pulido, Guillermo, DiResta, Daniel, Gil-Agudelo, Diego L., Gilliam, David S., Ginsburg, Robert N., Gore, Shannon, Guzman, Hector M., Hendee, James C., Hernandez-Delgado, Edwin A., Husain, Ellen, Jeffrey, Christopher F. G., Jones, Ross J., Jordan-Dahlgren, Eric, Kaufman, Les S., Kline, David I., Kramer, Philip A., Lang, Judith C., Lirman, Diego, Mallela, Jennie, Manfrino, Carrie, Marachal, Jean-Philippe, Marks, Ken, Mihaly, Jennifer, Miller, W. Jeff, Mueller, Erich M., Muller, Erinn M., Orozco Toro, Carlos A., Oxenford, Hazel A., Ponce-Taylor, Daniel, Quinn, Norman, Ritchie, Kim B., Rodriguez, Sebastian, Ramirez, Alberto Rodriguez, Romano, Sandra, Samhoury, Jameal F., SÁnchez, Juan A., Schmahl, George P., Shank, Burton V., Skirving, William J., Steiner, Sascha C. C., Villamizar, Estrella, Walsh, Sheila M., Walter, Cory, Weil, Ernesto, Williams, Ernest H., Roberson, Kimberly Woody, and Yusuf, Yusri. 2010. "Caribbean corals in crisis: Record thermal stress, bleaching, and mortality in 2005." *PLoS ONE* 5(11): e13969.

Fernandez-Marin, Hermogenes, and Wcislo, William T. 2010. "Hormigas cultivadoras de hongos." *Investigacion y Ciencia*: 12-13.

New publications

Harper, Sarah J.M., Bates, C. Richard, Guzman, Hector M., and Mair, James M. 2010. "Acoustic mapping of fish aggregation areas to improve fisheries management in Las Perlas Archipelago, Pacific Panama." *Ocean & Coastal Management* 53(10): 615-623.

Hirsch, Ben T., and Maldonado, Jesus E. 2010. "Familiarity breeds progeny: sociality increases reproductive success in adult male ring-tailed coatis (*Nasua nasua*)." *Molecular Ecology* Online.


Madden, D., Garber, Paul A., Madden, S.L., and Snyder, C.A. 2010. "Rain-forest canopy-connectivity and habitat selection by a small Neotropical primate, Geoffroy's tamarin (*Saguinus geoffroyi*)." *Journal of Tropical Ecology* 26(6): 637-644.

Molecular Ecology Resources Primer Development, Consortium, 2010. "Permanent Genetic Resources added to Molecular Ecology Resources Database 1 April 2010 – 31 May 2010." *Molecular Ecology Resources* 10(6): 1098-1105.

Opresko, Dennis M., and Breedy, Odalisca. 2010. "A new species of antipatharian coral (Cnidaria: Anthozoa: Antipatharia: Schizopathidae) from the Pacific coast of Costa Rica." *Proceedings of the Biological Society of Washington* 123(3): 234-241.

Parra, Mauricio, Mora, Andres, Jaramillo, Carlos, Torres, Vladimir, Zeilinger, Gerold, and Strecker, Manfred R. 2010. "Tectonic controls on Cenozoic foreland basin development in the north-eastern Andes, Colombia." *Basin Research* 22(6): 874-903.

National Zoo and partners first to breed critically endangered tree frog



As frogs around the world continue to disappear—many killed by a rapidly spreading disease called chytridiomycosis, which attacks the skin cells of amphibians, one critically endangered species has received an encouraging boost. Although the La Loma tree frog, *Hyloscirtus colymba*, is very difficult to care for in captivity, the Panama Amphibian Rescue and Conservation Project is the first to successfully breed this species. "Through a little bit of guesswork, attention to detail and collaboration with other husbandry experts—we've managed to breed them" said Brian Gratwicke, international coordinator for the project and a research biologist at the Smithsonian's National Zoo, one of nine project partners. Project participants also include Africam Safari, ANAM, Cheyenne Mountain Zoo, Defenders of Wildlife, El Valle Amphibian Conservation Center, Houston Zoo, STRI, Summit Municipal Park and Zoo New England.

The rescue project currently has 28 adult La Loma tree frogs and four tadpoles at the Summit Municipal Park outside of Panama City, Panama. In addition to the La Loma tree frog, the project also has successfully bred the endangered Limosa harlequin frog, *Atelopus limosus*. Keepers will continue to carefully monitor the tadpoles of both species.

Mientras las ranas alrededor del mundo desaparecen, muchas de ellas víctimas de la quitridiomycosis que ataca las células de la piel de los anfibios, una especie en peligro muestra grandes esperanzas. A pesar de que la rana arborea de La Loma, *Hyloscirtus colymba* es especialmente difícil de cuidar en cautiverio, el Proyecto de Conservación y Rescate de Anfibios de Panamá logró criar exitosamente la especie. "Adivinando un poco, prestando mucha atención a los detalles y en colaboración con otros expertos, logramos reproducirlas" indicó Brian Gratwicke, coordinador internacional del proyecto e investigador del Zoológico Nacional del Smithsonian, uno de los nuevos socios del proyecto. Otros participantes del proyecto son Africam Safari, ANAM, Cheyenne Mountain Zoo, Defenders of Wildlife, El Valle Amphibian Conservation Center, Houston Zoo, STRI, Summit Municipal Park y Zoo New England.

El proyecto de rescate tiene 28 adultos de las ranas arbóreas de La Loma y cuatro están en el Parque Municipal Summit, en los alrededores de la Ciudad de Panamá. Además de esta rana, el proyecto también ha logrado criar la rana Limosa harlequin, *Atelopus limosus*. Los cuidadores monitorean cuidadosamente a las crías de ambas especies.

New publications

Puerta-Pinero, Carolina. 2010. "Intermediate spatial variations on acorn predation shapes Holm oak establishment within a Mediterranean landscape context." *Plant Ecology* 210(2): 213-224.

Riehl, Christina. 2010. "Living with strangers: direct benefits favour non-kin cooperation in a communally nesting bird." *Proceedings of the Royal Society B: Biological Sciences* Online.

Santana, Sharlene E., and Dumont, Elizabeth R. 2010. "Do roost-excavating bats have stronger skulls?" *Biological Journal of The Linnean Society* Online.

Uriarte, María, Swenson, Nathan G., Chazdon, Robin L., Comita, Liza S., John Kress, W., Erickson, David, Forero-Montaña, Jimena, Zimmerman, Jess K., and Thompson, Jill. 2010. "Trait similarity, shared ancestry and the structure of neighborhood interactions in a subtropical wet forest: implications for community assembly." *Ecology Letters* 13(12): 1503-1514.

Vanderelst, Dieter, De Mey, Fons, Peremans, Herbert, Geipel, Inga, Kalko, Elisabeth K.V., and Firzlauff, Uwe. 2010. "What noseleaves do for FM bats depends on their degree of sensorial specialization." *PLoS ONE* 5(8): e11893.

Zimmermann, Alexander, Zimmermann, Beate, and Elsenbeer, Helmut. 2010. "Comment on "Spatial throughfall heterogeneity in a montane rain forest in Ecuador: Extent, temporal stability and drivers" by Wullaert et al. [J. Hydrol. 377 (2009) 71-79]." *Journal of Hydrology* 395(1-2): 133-136.



Educational Exchange between USA and Panamanian Schools

Punta Culebra Nature Center
November 2010



Technology brings children from Panama and the US together at Culebra

Students from Panama and the United States completed a highly successful educational exchange through videoconferencing at STRI's Punta Culebra Nature Center this week, under the coordination of STRI's educational specialist Lidia de Valencia.

The learning season focused on the symbiosis among leaf cutter ants, plants and funguses. The sessions, which included role-playing games, were led from Panama by STRI researchers Sunshine Van Bael and William T. Wcislo, with the assistance of Andrea Concepción. The sessions also incorporated a coloring book designed by Damond A. Kylo.

The Panamanian participants came from Escuela Arabe de Libia, República de Alemania, Tsynesaburo Makiguchi, Manuel Higuero and Balboa Academy, with their counterparts from Canyon Ridge Elementary, Arizona, Thornton Creek Elementary in Seattle, Higgins Elementary, Michigan, Mobile School, Arizona and La Escuela Fratney, Wisconsin, in the US.

The Offices of BioInformatics and Information Technology provided the technology necessary for the videoconferences. Culebra guides Francis Torres and Alvaro Gonzalez were instrumental to carry out the project.

Estudiantes de Panamá y los Estados Unidos completaron un exitoso programa educativo de intercambio a través de videoconferencias en el Centro Natural de Punta Culebra de STRI esta semana, bajo la coordinación de Lidia de Valencia, especialista en educación de STRI.

Las sesiones de aprendizaje, se centraron en la simbiosis entre las arrieras, las plantas y los hongos. Estas incluyeron juegos de simulación de caracteres liderado desde Panamá por los investigadores Sunshine Van Bael y William T. Wcislo, con la asistencia de Andrea Concepción. También se usó un libro de colorear diseñado por Damond A. Kylo.

Los participantes de las escuelas panameñas son estudiantes de las escuelas Arabe de Libia, República de Alemania, Tsynesaburo Makiguchi, Manuel Higuero y Balboa Academy, y sus contrapartes pertenecen a Canyon Ridge Elementary, Arizona, Thornton Creek Elementary in Seattle, Higgins Elementary, Michigan, Mobile School, Arizona y La Escuela Fratney, Wisconsin, en los Estados Unidos.

El equipo necesario para las videoconferencias fueron suministrados por las oficinas de BioInformática y OIT. Los guías de Culebra Francis Torres y Alvaro González fueron de gran ayuda para el proyecto.