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## **Smithsonian Inaugurates Landscape Study of Tropical Forest Ecosystem Services**

The Center for Tropical Forest Science of the Smithsonian Tropical Research Institute officially inaugurated one of the largest experiments ever attempted to understand ecosystem services—water, carbon and biodiversity—provided by tropical forests. The findings of this long-term study, launched June 21 in Panama, will have major implications for tropical land use worldwide.

The 3.3-square-mile study site in the Agua Salud and its adjacent watersheds between Panama's Soberania National Park and Transisthmian Highway form part of the Panama Canal watershed. The area includes protected mature forests and a wide variety of typical rural land uses.

"The Agua Salud project will teach us how to improve reforestation in the Panama Canal watershed so that it can contribute to local and global economies and to a healthy environment in one of the world's major biological hot spots," said Jefferson Hall, director of applied ecology at the Center for Tropical Forest Science.

The project will explore how reforestation and other land-management practices can optimize ecosystem services such as forest productivity, carbon storage and biodiversity. Research will examine how groundwater storage—thought to be critical for maintaining dry-season flow—can be maximized, thus helping to ensure the full operation of the Panama Canal during exceptionally severe draughts. The project also seeks to address the social and economic value of different land uses such as reforestation with teak versus reforestation with native tree species.

Water from the Panama Canal watershed guarantees the operation of the Panama Canal, which is central to world commerce. This route of transportation significantly reduces fuel use and carbon dioxide emissions from ships taking shorter voyages through the canal. Runoff from the watershed provides clean drinking water for Panama's two largest cities, Panama and Colon, and generates hydroelectricity for canal operations and the national power grid. The watershed's rainforests harbor tremendous biodiversity, represent vast reservoirs of carbon and attract tens of thousands of tourists per year.

Major partners in the Agua Salud Project are the Panama Canal Authority, Panama's National Authority for the Environment, and the Smithsonian Tropical Research Institute. Primary funding for the project was provided by HSBC's Climate Partnership and the Agua Salud Foundation, supported by

Fundación Emily Motta and Frank Levinson. The Agua Salud project is part of the Smithsonian's Global Earth Observatory program, an international long-term experiment to understand the global implications of tropical forests to biodiversity and climate change supported by HSBC's Climate Partnership.

According to Eldredge Bermingham, acting director of the Smithsonian Tropical Research Institute, "Nearly 100 years of Smithsonian research in Panama—knowledge about tropical forests, plant physiology, geology and hydrology—coalesce as we discover how our decisions about land use can be tailored to protect the environmental services vital to the operation of the Panama Canal."

The Smithsonian Tropical Research Institute, headquartered in Panama City, Panama, is a unit of the Smithsonian Institution. The institute furthers the understanding of tropical nature and its importance to human welfare, trains students to conduct research in the tropics and promotes conservation by increasing public awareness of the beauty and importance of tropical ecosystems. For more information, visit [www.stri.org](http://www.stri.org).

The Center for Tropical Forest Science of the Smithsonian Tropical Research Institute monitors some of the most astonishing forests on the planet. The world's largest tropical forest research program, CTFS comprises a global network of large-scale, long-term studies that together track the growth and survival of more than 3 million tropical trees. For more information, visit <http://www.ctfs.si.edu/doc/index.php>.

The HSBC Climate Partnership is a five-year, \$100 million partnership between The Climate Group, Earthwatch Institute, Smithsonian Tropical Research Institute, and World Wildlife Fund. The Partnership will deliver far-reaching results through direct investment in research, education and leadership programs, with a specific goal of combating climate change. For more information, [www.hsbccommittochange.com](http://www.hsbccommittochange.com).

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