Interview with Dr. Matthew C. Larsen Director Smithsonian Tropical Research Institute, Republic of Panama

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Figure 1. Dr. Mathew Larsen.
Fuente: https://www.si.edu/about/bios/matthew-larsen

Matthew C. Larsen is the Director of the Smithsonian Tropical Research Institute, headquartered in Panama City, Panama. 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. In addition to its resident scientists, the Institute's facilities are used annually by some 1,300 visiting scientists, pre- and postdoctoral fellows and interns from academic and research institutions who come from a quarter of all nations on Earth. From 2010 to 2014, Dr. Larsen was the U.S. Geological Survey Associate Director for Climate and Land Use Change, where he led science programs focused on climate change, land use change, and a national ecological carbon sequestration assessment. Additionally, Dr. Larsen managed the Landsat satellite program and the National Climate Change and Wildlife Science Center. From 2005 to 2014, Dr. Larsen led U.S. Geological Survey Water Resources programs and served as Chair of the US National Committee for UNESCO International Hydrological Programme. Larsen's 90+ publications are in the fields of natural hazards, water resources, climate change, ecosystem services, and marine geology. Dr. Larsen earned a B.S. in Geology from Antioch College, Yellow Springs, Ohio, and a PhD in Geography at the University of Colorado in Boulder.

Could the Kyoto protocol (1997) and the Paris agreement (2015), be instruments sufficient for the solution to climate change or it is necessary a more global effort?

The Kyoto protocol and Paris agreement are a good start to solving our global climate change challenge, but by themselves, they are insufficient to stop or significantly slow down the rise in carbon dioxide and other greenhouse gases in our atmosphere. This is partly because the international agreements are not aggressive enough, but also because not all nations have made the necessary commitments to reduce emissions. Worse yet, the United States, one of the top greenhouse gas producers in the world, withdrew from the Paris agreement. I hope that, as the community of nations works through the current Covid19 crisis, we learn some lessons about how we can join together to address the critical challenges facing life on earth.

According to Google Scholar, your have an extensive list of scientific publications in topics like: global change, water availability, use energy, quality water. What effects is having the climate change on agriculture, on access to water, on the health of the environment and even on the way of life of the human being on planet earth?

The list of effects is a long one, so I will focus on a few examples related to rainfall and water supply. We in Panamá are all aware of how important rainfall is to the national economy. The Panamá canal is entirely dependent on the annual rainfall that fills our reservoirs, Alajuela and Gatun, each year. The canal requires approximately 200,000 cubic meters of water for each ship transit. With as many transits as 15,000 per year, the canal used about 3.2 cubic kilometers of water for locking ships through in 2018. This is a massive amount of freshwater! With increasing global warming, we seem to be seeing more intense

El Niño effects. A strong El Niño brings drought to Central America, including Panamá. This means that during drought years, the ACP must require that ships transit the canal with less cargo, which impacts ACP income and income for the Republic of Panamá. The increasing intensity of El Niño related droughts also has a major impact on agriculture in Panamá, which is highly dependent on rainfall because we don't have much irrigated land in Panamá. Cattle ranchers are particularly impacted by these strong droughts, losing many cattle because of the lack of water.

Could you indicate to us some basic mitigation measures that we could perform as individuals to counteract climate change and thus achieve a more sustainable economy?

Many of us think that our personal actions have little impact, but if taken as a whole, we truly can make a difference. One example is our use of bottled water. Each one liter bottle of water that we buy consumes about one third of a liter in petroleum products (to make and transport the bottled water). Ironically, tap water in most of Panamá is perfectly adequate to drink. It is the only water that I drink in Panamá, unless I am in a very remote area. Furthermore, public water supply producers generally have to meet a higher standard of water quality testing than water bottling companies. Aside from the waste of petroleum products, much of this plastic ends up in the ocean, where it is a contaminant and contributes to the degradation global fisheries. Another action we can take is to walk, bicycle, or use public transit as much as possible. Each gallon of gas we use in our car introduces 20 pounds of carbon dioxide into the atmosphere.

Could you share some experience that has been especially memorable in your scientific career?

Serving as the director of the Smithsonian Tropical Research Institute in Panamá has been a particularly gratifying experience for me. We have more than 400 staff on our team, and more than 90% of them are Panamanians. I appreciate their passion and great dedication to our mission, which is: "The increase and diffusion of knowledge of the past, present and future of tropical biodiversity and its relevance to human welfare." The people of the Republic of Panamá and the generosity of the government of Panama are integral to our success.

Our scientific researchers are a truly international group, with 14 nations represented in their group. During our 100+ years in Panamá we have produced more than 14,000 scientific publications, and in 2019, had our best year ever, with more than 500 science papers released, an average of one paper every 17 hours! This work is a mixture of basic research as well as highly applied work, such as research on conservation of a national symbol, the golden frog (Rana Dorada), which is extinct in the wild because of a global fungal disease. Fortunately, we have enough of these amphibians in our quarantine facility in Gamboa where we can breed them for future release back into the wild.

Figure 2. Golden frog.
Fuente:
https://www.google.com/search?q=smithsonian+panama&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiRqeSO5dToAhUJY6wKHWocC8IQ_AUoAXoECA0QAw&biw=1536&bih=674#imgrc=IX1EmYiLoXRNGM

Panamá is a wonderful place to work and I have enjoyed my time here, getting to know the rich and diverse culture that has developed here, at the crossroads of the world.

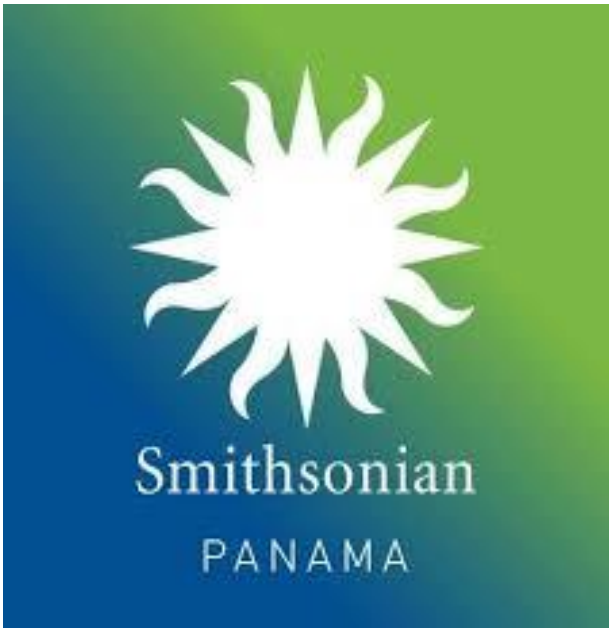

Figure 3. Logo of del Smithsonian Institute Panama.
Fuente: https://www.facebook.com/SmithsonianPanama/