

Mapping the Natural History of the Panama Canal Zone

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Overview

This research investigates change in land cover and natural history in the Panama Canal Zone. A comprehensive and extensive record is derived by using historic aerial photography from 1927–1983, contemporary satellite data from 1972–2013, and recently collected photography from the **International Space Station SERVIR Environmental Research and Visualization System (ISERV) Pathfinder** camera.

Impact

I focus on the Panama Canal Zone, occupying a narrow isthmus between Central and South America because of the ecological and economical importance of this region. This area extending five miles on either side of Lake Gatun serves as a natural corridor for species between the two continents and has a profound impact on global market commerce.

Explanation

This research highlights two important aspects of the space technology and science community. Collaborative research between multiple international agencies and universities results in interesting scientific research and promotes Earth Observation capabilities as solutions to environmental decision making. The second aspect is the promotion of intrinsically valuable historic data to illustrate the advancement of remote sensing technology and the science of Earth Observation.

Key Findings

The black-and-white aerial photographs present an interesting juxtaposition against my ongoing research working with the ISERV Pathfinder testbed camera system developed at and currently on board the ISS. Since the 1980s, the **Smithsonian Tropical Research Institute** collected 952 analog aerial photographs from 1927 to 1983 covering most of the Panama Canal Watershed. Digitization and processing of this intrinsically valuable dataset for object oriented classification results in a pre-satellite historical record of forest cover change in the ecologically dynamic Panamanian rainforest.



Image Courtesy of nasa.gov

Landsat provides one of the longest records of Earth Observation satellite imagery. The first Landsat was in 1972 and in 2013, the **Landsat Data Continuity Mission** was launched. This data offers a unique comparison to the historic aerial photography for better understanding of the changing landscape in the Panama Canal.



Image Courtesy of stri.si.edu



© 1927-12-18-1927 (1-12-29) THE LONG EAGLE, TRIPS over a FRANCE FIELD AIRPORT OVER GATUN LAKE, C.Z. 6-1-47 A.C.



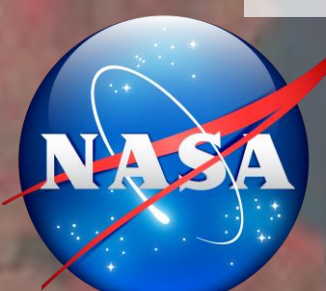
Image Courtesy of serviglobal.net

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The ISERV module is a testbed camera system onboard the ISS designed to provide data for disaster response and environmental decision making. ISERV images were an addition to other NASA Earth observation satellites to provide a more contemporary view of the Panama Canal Watershed.