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EARTH OBSERVATION SYMPOSIUM (B1)
Improving Earth Observation thru Data Sharing (6)

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PROTECTING THE PANAMA CANAL WATERSHED THROUGH THE EXCHANGE OF GEOSPATIAL DATA

Abstract

The relevance of our project outlines a strategy to enhance the understanding of tropical forest deforestation and land use change in the Panama Canal Watershed and its impact on the environment. The Panama Canal Watershed contains a rich source of biodiversity and is faced with environmental hazards such as unplanned deforestation and urbanization. Working with certain organizations in Panama City, Panama such as Smithsonian Tropical Research Institute (STRI) and NASA's Mesoamerican Regional Visualization and Monitoring System (SERVIR) we are able to collect and exchange large amounts of data relevant to this topic. In 2010, our group has digitized over nine hundred aerial photographs covering a time period from 1948 to 1983 and collected sets of satellite imagery ranging from 1979 to 2010 in the Panama Canal Watershed. Interpreting images of the Panama Canal watershed over this expanse time provides invaluable information for an investigation into the spread or recession of urban development, land cover dynamics, ecosystem variability, and water level changes. The project is asking two research questions (1) how do different landscapes and climate influence water flow into the watershed (2) how to geospatially identify the invasive grass species Saccharum Spontaneum in both satellite imagery and aerial photography. Sections of the watershed are undergoing rapid alterations in land use. We believe that these variations have also led to changes in the climatic trends and water flow into the watershed. Each image is classified, based on land cover, as forested, deforested, urban, etc. After this, precipitation and geospatial data will be gathered for land cover modeling. Once all of the data is compiled, comparisons will be made on increasing or decreasing rates of precipitation, changes in land cover and how this affects water flow into the watershed. The watershed has also experienced an invasion of a grass species known as Saccharum Spontaneum which impacts the local biodiversity by taking over deforested lands and agricultural fields. Analysis of processed satellite data will show the actual extent of the invasion and ultimately lead to the ability to generate land cover maps focusing on Canal Grass. With the investigation of the invasive grass species, climatic trends, and changes to land cover with the aid of remote sensing guide's users of how to maintain an environmentally friendly watershed to maintain the economic benefits provided by the Panama Canal.