INTER-AMERICAN INSTITUTE FOR GLOBAL CHANGE RESEARCH

Caribbean Coastal Scenarios (CCS): an integrated analysis of inland-coastal linkages to guide sustainable use and protection of coastal ecosystems (CRN2061)

The island nations of the Caribbean are highly vulnerable to environmental change. This project is quantifying the impacts of inland activities on coastal resources under different scenarios of development and climate change, by applying scientific knowledge to the modelling and evaluation of possible futures for Cuba, Dominican Republic, Hispaniola, Jamaica, and Puerto Rico.

Goals

- Characterize island watersheds, and factors that affect the flow of water, sediments, and contaminants to costal ecosystems
- Estimate the impact of flow from inland waters on coastal resources
- In a stakeholder dialogue, construct scenarios for future development, management, conservation and restoration of coastal ecosystems. Support island nations in assessing, anticipating and adapting to current and future coastal environmental problems.

First results

- Land-cover and soils in 84 watersheds that drain to coastal waters were mapped in the islands of Dominican Republic, Jamaica and Puerto Rico. Weather and hydrology were modeled. Calibration and validation of the model was completed in selected watersheds.
- Many rivers have been altered by construction of dams, channeling and sewage discharge, which has resulted in decreased water quality, and in increased algal biomass, nutrient export and sedimentation.
- In Puerto Rico, where about 80% of the people live in urban areas, about 50% of the wastewater is treated. Nitrate and phosphate from sewage effluents contaminate the rivers.
- In the Dominican Republic, deforestation, overgrazing and slash-and-burn agriculture is observed in the upper part of the Haina River watershed. High peak runoff causes flooding, destruction of infrastructure, properties and, occasionally, loss of life.

Principal investigator and lead agency

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Links to other IAI projects

This project collaborates with the Small Grants Project for the Human Dimension Designing a methodology to evaluate local knowledge on global change and its role in the construction of future land use scenarios by local actors (SGP-HD009).

Project web page: http://ccswp.fiu.edu/

List of publications: http://iaibr1.iai.int/bs?publications/CRN2061.pdf

Study region

Water-intensive rice cultivation is expanding in the Dominican Republic and Cuba. With growing populations and competing demands for water these islands face difficult choices in future water allocations

The project has delineated the main catchments of each island (84 in total) and constructed operational hydrological models simulate runoff from each

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