

Synopsis – Caño Martín Peña Workshop

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The US EPA's work in San Juan Puerto Rico incorporates a social-ecological systems (SES) perspective to conceptualize and model the impact of restoration projects on the state of the ecosystem as well as the community. We focus on the restoration of the Martín Peña and surrounding neighborhoods. An SES approach acknowledges the uncertainty in complex ecosystems, especially in their response to human interventions. We address the importance of underlying socio-economic drivers, and connect the new state of the system with changes in the delivery of ecosystem services. We are especially interested in quantifying the impacts on human health and well-being. By integrating SES into the adaptive management framework, stakeholders and managers will increase their ability to clarify the decision context, enumerate and anticipate beneficial impacts on human health and well-being, and gain insight into the long-term viability of restoration projects.

One important driver of social and ecological change in Puerto Rico is population loss. Shrinking cities face decreased income, reduced property values, and decreased tax revenue. Fewer people per unit area creates inefficiencies and higher costs for infrastructure maintenance and the provision of public amenities. However, population losses and economic distress are not equal in all neighborhoods, and in fact are quite heterogeneously distributed across the landscape. Broader statements about the trajectory of a shrinking city may mask underlying differences in economic, cultural, and environmental impacts as well as the ability of some neighborhoods to be resilient and adaptive to economic changes in addition to climate change and other environmental stressors. EPA and local scientists are collaborating on a study which examines the recent impact of population loss in neighborhoods in the Río Piedras watershed in San Juan, Puerto Rico, on the provision of ecosystem services, material and energy flows, and ecological impacts, using public data and data collected previously in two household surveys. Using scenarios, we will estimate future population changes and their potential positive and negative impacts on the environment and human well-being in these neighborhoods.