

Puerto Rico Sustainable Communities Research Project

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The goal of EPA's Sustainable and Healthy Communities Research Program (SHCRP) is to inform and empower decision-makers to equitably weigh and integrate human health, socio-economic, environmental, and ecological factors to foster community sustainability. Puerto Rico is an excellent location for EPA's Office of Research and Development to conduct their research: it is a spatially-limited geographic system, as an island it is highly dependent on coastal resources, and it has a long-term history of research, monitoring and assessment by territorial, federal and academic scientists. EPA's Office of Research and Development is conducting research at two scales: territory-wide, and in a targeted watershed.

The large-scale research is studying whether the cumulative decisions of communities are moving Puerto Rico toward or away from sustainability in environmental, economic and social terms. This issue is being addressed through four metrics that capture the basic properties of a system and represent human burden on the environment (Ecological Footprint Analysis), economic well-being (Green Net Domestic Product), flow of available energy through the system (Emergy Analysis) and overall system order (Fisher Index). A Sustainability Symposium and Workshop was held June 5-7 in San Juan. Participants (>60 registered) included academics, non-governmental organizations, Puerto Rico and US Federal Agencies. The two-day symposium was designed to discuss sustainability; present ongoing sustainability research/work; discuss what researchers think policy makers can do to move Puerto Rico toward sustainability, relative to their research; and discuss what is necessary to implement their research island-wide. Topics included habitat/land use, biodiversity, coral reefs, renewable energy, and environmental justice. Participants noted that the symposium created a missing forum for scientific discussion. The follow-on workshop captured outcomes from the symposium to be provided to decision makers. Based on recommendations from participants, future meetings will explore other stakeholders' perspectives.

Research at the watershed scale is focused on the Guánica Bay Watershed, where a multi-Agency program has been focusing on the impacts to coral reefs from land-based sources of pollution. The research is addressing social, economic and environmental sustainability for communities in the watershed. The task includes 1) a holistic characterization of land use and land use patterns on delivery of ecosystem services in the watershed and coastal zone, including effects on soil loss, drinking water availability, forest biodiversity, and services provided by coastal resources; 2) characterization of stakeholder values and preferences for ecosystem services and concepts of human well-being, including methods for elicitation of stakeholder values, objective hierarchies and means-ends networks, and characterization of decision contexts and various management and land use alternatives; 3) probability networks for different decision scenarios to characterize the probable social, economic and environmental costs and benefits of different proposed management strategies and 4) development of a spatially-explicit decision support tool which will combine and integrate information to evaluate sustainability and acceptability of land use alternatives.