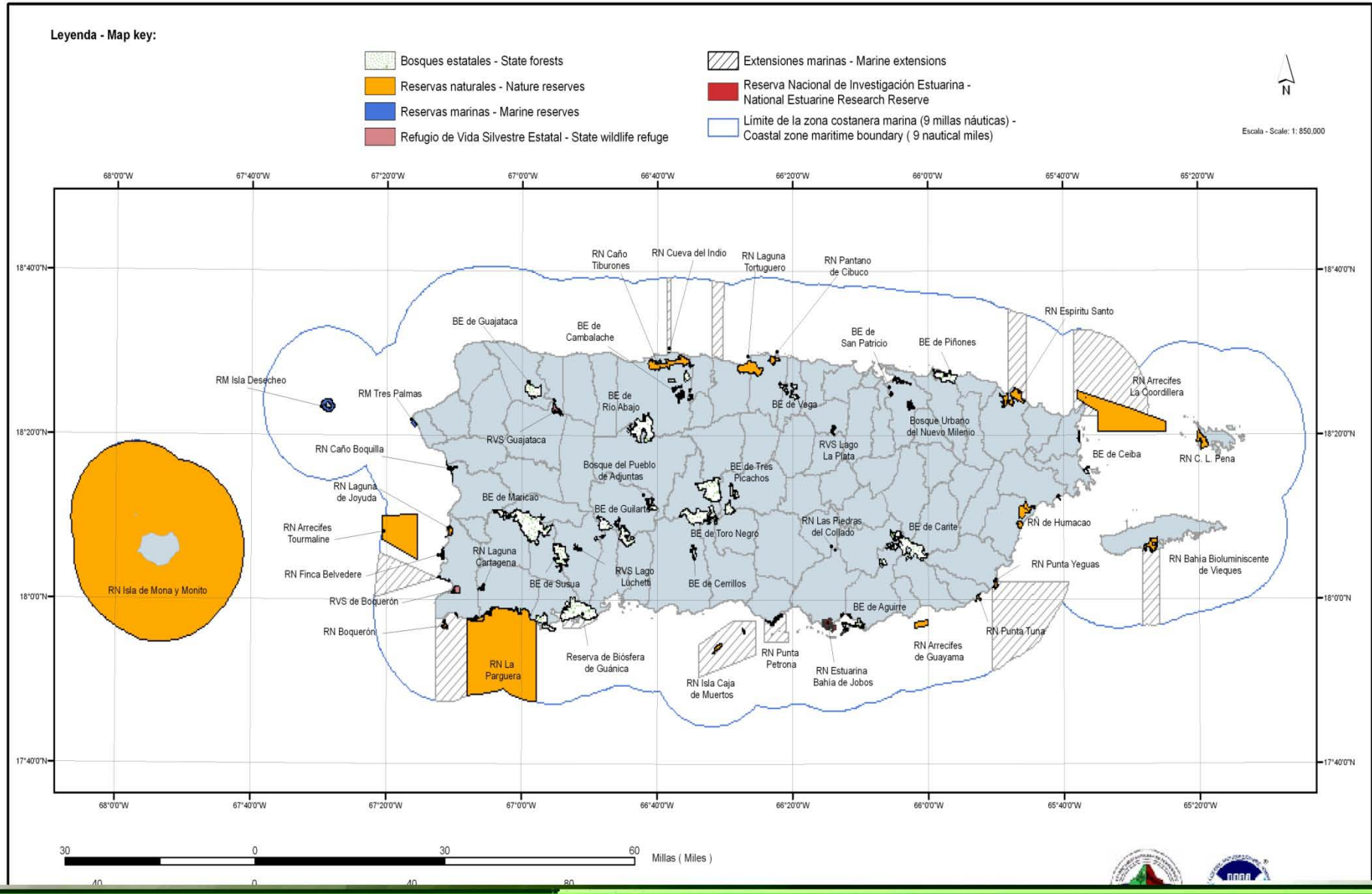
Puerto Rico's

Priority Coral Reef Mapping and Monitoring Needs

Presentation for Atlantic/Caribbean CREIOS Workshop, May 13, 2009



Áreas naturales protegidas administradas por el DRNA

Natural Protected Areas under the DRNA administration

Fuente de Información - Source
Departamento de Recursos Naturales y Ambientales
IITF

Departamento de Recursos Naturales y Ambientales
Programa de Manejo de la Zona Costanera

Agencies/Organizations Consulted

- University of Puerto Rico, Mayaguez—Marine Sciences
- University of Puerto Rico, Mayaguez—CARICOOS
- University of Puerto Rico, Mayaguez—Puerto Rico Sea Grant Program
- University of Puerto Rico, Rio Piedras
- Caribbean Coral Reef Institute
- U.S. Fish and Wildlife Service, Ecological Services
- U.S. Fish and Wildlife Service, Boquerón Field Office
- U.S. Fish and Wildlife Service, Caribbean National Wildlife Refuges
- Department of Natural and Environmental Resources (DNER)
- DNER—Coastal Zone Management
- DNER—Planning Division
- DNER—Marine Resources
- DNER—Forest Division
- DNER—Reserves and Refuges
- Army Corps of Engineers, Regulatory Section
- Puerto Rico Planning Board

Puerto Rico Context

- One main island with several offshore islands separated by ocean currents
- Commonwealth claims a 9 nm territorial sea
- Important marine areas protected through a natural reserve system (34), 4 no-take fishing areas, CFMC fishery management closures with shared jurisdiction (3), and a National Estuarine Research Reserve, and legislation
- ~90% of commercial catch in Puerto Rico is of reef-associated species
- Dramatic (50%) loss of remaining live coral cover from bleaching and disease in 2005-2006 and lingering effects through 2008
- Lionfish presence recently documented (2009), previous anecdotal sightings (possibly since 1996)
- Islands support populations of threatened Acroporid corals
- Seamounts and mesophotic reefs are present but poorly understood and documented
- Large human population in coastal areas
- Significant agricultural cultivation activities occur in most watersheds
- Challenges related to capacity, political will, community support, and governance structure and involvement limit conservation potential

Land-Based Sources of Pollution:

Issue: Watersheds are generally large and contain a variety of uses that generate sediments and other pollutants that impair water and habitat quality in near shore coral reef ecosystems.

Priority Needs:

Monitor, predict and model sediment and contaminant delivery and dispersal

- Fine scale circulation and near shore currents
- Regional oceanographic circulation
- Pinpoint sources of pollutants, including regional WWTP, to mitigate inputs
- Ground truth existing remotely sensed data e.g., CARICOOS

Monitor reef-associated habitats to understand role of mangroves/ salt marshes etc. in mitigating sediment and pollutant effects on reefs

Targeted before/after studies to evaluate effectiveness of BMPs and restoration activities

Land-Based Sources of Pollution:

Need improved maps for managing effects of LBSP

- Prioritize watersheds adjacent to and upstream of MPAs with coral reef resources
- Create seamless habitat maps from nearshore to shelf edge
- Identify locations of existing Acroporid coral colonies
- Build on/integrate habitat data into Environmental Sensitivity Index maps

Need to integrate existing physical, chemical and biological data to better understand causality between LBSP inputs, water quality and reef condition

Fishing Impacts:

Issue: Need to improve basic information on coral reef associated fisheries for Territorial and EEZ management.

Priority Needs:

More information on status of stocks and key species

- Distribution of important species, areas of high biological importance
- Species life history information for poorly understood species that may be disappearing
- Increase fishery independent studies for stock assessments

Confirm, including analysis of bathymetric and habitat data to identify potential SPAGs

Need to map deeper reef areas and seamounts

Fishing Impacts:

Prioritization for fisheries management in shallow and deep areas, including connections between mesophotic and shallow reefs through monitoring and mapping

Need to better characterize fishing effort and consider impacts of subsistence fishing, which is significant but not included in effort/catch estimates.

Climate Change:

Issue: Limited information is available to guide management on mitigating the impacts of climate change on coral reef ecosystems.

Priority Needs:

Conduct change analysis to quantify recent shoreline erosion and potential changes in habitat extent and distribution

Predict potential impacts of sea level rise to important coral reef ecosystem habitats (salt flats, mangroves, etc.)

Coordinate data collection efforts between remotely sensed and in situ data to help quantify the magnitude and distribution of climate-related effects

Remotely-operated system that can predict oceanographic processes to aid in detection of areas that could be affected by increased sea surface temperatures and acidification

Characterization of resilient areas in order to focus monitoring and management efforts there with particular interest in reef-builders such as Montastrea

Data Access and Integration:

Priority Needs:

Improve connections between those who generate data products and those who need to apply data products for management decisions

Data should be in formats available to non-technical users and be accessible via simple, widely available software

Central repository for data and standard format for reporting data, such as those that are routinely collected through monitoring studies, to ensure accessibility and stimulate cooperation between users and across jurisdictions

Establish communication links (points-of-contact) for submission of data and data exchange

Need to integrate various data layers to elucidate connections between impacts from multiple threats to reef ecosystems