Ocean observation in Puerto Rico: NEEDS AND APPLICATIONS

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Puerto Rico Department of Natural and Environmental Resources
## Puerto Rico

### Relevant Statistics

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerged land area:</td>
<td>9,497 km²</td>
</tr>
<tr>
<td>Territorial waters:</td>
<td>9 nm (10.35 stat. mi)</td>
</tr>
<tr>
<td>Population:</td>
<td>3.9 millones</td>
</tr>
<tr>
<td>GDP:</td>
<td>~$28.5 billion/yr</td>
</tr>
<tr>
<td>Construction value:</td>
<td></td>
</tr>
<tr>
<td>Housing:</td>
<td>~$7 billion/yr</td>
</tr>
<tr>
<td>Roads, schools:</td>
<td>~2.4 billion/yr</td>
</tr>
<tr>
<td>Industrial/commercial buildings:</td>
<td>~1.8 billion/yr</td>
</tr>
<tr>
<td></td>
<td>~3.2 billion/yr</td>
</tr>
</tbody>
</table>

Source: BGF 2005
PUERTO RICO: LAND USES

URBANISM
AGRICULTURE
INDUSTRY
TOURISM - RECREATION
INFRASTRUCTURE
Cuencas hidrográficas e hidrografía de Puerto Rico

Fuente de información: DRNA
Departamento de Recursos Naturales y Ambientales
Distribución de Arrecifes de Coral(1)

Leyenda:
- Artificial
- Colonized Bedrock
- Colonized Pavement
- Colonized Pavement with Sand Channels
- Land
- Linear Reef
- Macroalgae
- Mangrove
- Mud
- Patch Reef (Aggregated)
- Patch Reef (Individual)
- Reef Rubble
- Sand
- Scattered Coral/Rock in Unconsolidated Sediment
- Seagrass
- Spur and Groove Reef
- Uncolonized Bedrock
- Unknown

(1) Fuente: NOAA/NOS
Coral reef degradation is widespread in waters surrounding the island, but generally greatest offshore of watersheds where population is high and terrestrial discharge of water and sediment are high.
FLOOD CONTROL PROJECTS

*Eight (8) Proyectos Control Erosión (Funds USDA) en Coordinación Regional
Proyección de cambio en suelo urbano en Zona Costaner
Región Norte
Proyección de cambio en suelo urbano en Zona Costanera
Región Sureste
Proyección de cambio en suelo urbano en Zona Costanera
Región Sur
Proyección de cambio en suelo urbano en Zona Costanera
Región Noreste
<table>
<thead>
<tr>
<th>Tipo</th>
<th>Descripción</th>
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<tbody>
<tr>
<td>Aeropuertos</td>
<td>8</td>
</tr>
<tr>
<td>Puertos</td>
<td>8</td>
</tr>
<tr>
<td>Bombas de agua</td>
<td>36</td>
</tr>
<tr>
<td>Tanques de agua</td>
<td>33</td>
</tr>
<tr>
<td>Carreteras principales</td>
<td>178 km</td>
</tr>
<tr>
<td>Tubería de agua</td>
<td>1080 km</td>
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<tr>
<td>Lotes industriales (PRIDCO)</td>
<td>81</td>
</tr>
<tr>
<td>Cables eléctricos</td>
<td>266 km</td>
</tr>
<tr>
<td>Torres de transmisión</td>
<td>31</td>
</tr>
<tr>
<td>Plantas generatrices</td>
<td>5</td>
</tr>
</tbody>
</table>
POBLACIÓN

3.9 millones

- Aprox. 1,100 personas por millas²
- En una década ha incrementado 8%
- Desparramamiento urbano
Puerto Rico Land use trends

The Planning Board reviewed twice the amount of Use Permit requests in the coastal zone between 1991-2005 compared to the 1981-1990 period.

**TREND:** Human factors continue influencing vulnerability to hazards.

**CHALLENGE:** Develop disaster-resilient and sustainable communities.
OPPORTUNITIES AND APPLICATIONS

- Improve predictions of weather and climate change and their effects on coastal communities
- Improve the safety and efficiency of marine operations
- ID and develop alternatives to mitigate the effects of natural hazards;
- Reduce public health risks;
- Protect healthy coastal marine ecosystems (i.e. wetlands and coral reefs systems) and support habitat restoration projects where needed
- Enable the sustainable use of marine and coastal resources.
- Develop better tools and techniques for coastal areas management
OPPORTUNITIES AND APPLICATIONS

- Support decision making for coastal recreation and tourism
- Enhance knowledge of Waterways and Waterfronts for transportation and public access
- Increase Real-time Data streaming to support decision making
- Enhance Digital Mapping
- Support Fisheries and essential fish habitat Management
- Better assessments of Impacts of Contaminants on coastal waters
- ID Renewable Energy from Our Oceans
- Better understanding of CC-SLR and coastal hazards
- Better assessment of Vulnerability, Risks and Planning for Impacts
- Foster Coastal Community Resilience through Information dissemination and Collaboration
- Connecting Stakeholders to Management
STAKEHOLDERS

- Coastal citizens
- Government
- Ocean and coastal industries
- Ocean/coastal resource managers
- Fishermen
- Scientists
- Educators
- General public