

## Barbuda Ocean Club Eco-Engineering & Environmental Planning



Location: Antigua & Barbuda

Client: Private Sector Partnership, Investors & Real Estate Developers

Outcome: Provided solutions in natural risk reduction for a multi-million-dollar development project toward a resilient environment and small island community

The Peace Love and Happiness (PLH) Partnership was created in pursuit of the Barbuda Ocean Club development, which represents a multi-million-dollar investment in a sustainable island development. We were engaged as the environmental team for this project to provide solutions in protecting and restoring the environment, while meeting real community needs and creating a financial return on investment. Our work on the project leadership team has entailed designing, managing, and successfully implementing several complex projects involving diverse teams (<https://barbuda1team1dream.com>). The work was required to be completed in a timely, sequenced manner under challenging circumstances, as the island's resources, community services, and infrastructure were devastated in the wake of Hurricane Irma. We have achieved prompt and cost-effective solutions for our client that have resulted in positive community relationships and innovative environmental restoration.

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### Smart Solutions to Environmental Risks

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## Project Overview

Since our initial engagement in this project in 2017, we have been intimately involved in all aspects of environmental planning and eco-engineering for the design and development of the Barbuda Ocean Club. The following tasks highlight our work within the larger project to provide natural, cost-effective solutions to environmental risks.

**Environmental Impact Assessments and Environmental Permitting** – Deborah Brosnan & Associates successfully secured approval for the Barbuda Ocean Club development, in full compliance with Government of Antigua and Barbuda (GOAB) policy, through the completion of an initial Environmental Impact Assessment (EIA). This EIA was completed in three weeks, and approval for the development was secured two weeks later. This EIA set the standard for scientific quality and provided an environmental framework for our client and government agencies that has continued to define the standard for subsequent EIAs and permitting approvals submitted to GOAB. We facilitated a level of trust between our client and government agencies that has allowed for rapid turnaround in environmental approvals while reiterating a commitment to an ecosystem-based approach that minimizes risk and protects environmental integrity.

**Coastal Hydrodynamic Analysis and Risk Assessment** – A critical component of the Barbuda Ocean Club project is the ability to build close to the water to maximize views of pristine Caribbean waters. To determine the coastal risk and vulnerability of project sites, we assembled a team of coastal engineers to run hydrodynamic models and an independent panel of peer reviewers to review the results and data. The resulting models and subsequent review has provided recommendations on development setbacks and elevations, incorporating risk-levels and U.S.-based standards into the project design.

**Determination of Setback and Elevation Standards** – Deborah Brosnan & Associates has utilized the expertise of our coastal engineering team and the sustained relationships with GOAB to propose an innovative, state-of-the-art science approach to determining setbacks and elevations for island development. Through ongoing discussions with regulatory agencies, the adoption of this science-based approach will change the national standards and decision-making criteria. This solution is based on identifying and articulating the range of risks (including storm surge, flooding, and sea level rise), determining acceptable risks for our client, and implementing risk-managed development through nature-based solutions, including the restoration and design of protective coastal dunes.

**Development of GIS Mapping Tools** – The environmental field surveys and monitoring efforts undertaken for Barbuda Ocean Club have used the best-available science and developed innovative tools that are the first of their kind to be used on the island. We have undertaken comprehensive vegetation surveys to provide GIS maps of development sites, which allowed for the conservation of native vegetation and natural dune systems as well as identification of highly-disturbed areas due to storm surge and inundation. We have used GIS to institute a sea turtle monitoring program that's the first of its kind on Antigua and Barbuda, geo-referencing areas of turtle activity. Our field surveys and monitoring efforts have facilitated the employment of a local vegetation and sea turtle monitoring team on Barbuda, improving both environmental and community resiliency on Barbuda.

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