

LEE E. HARRIS, Ph.D., P.E.
Consulting Coastal and Oceanographic Engineer
Phone: 321-795-1126

310 Ormond Ave.
Indialantic, FL 32903
Email: Lharris@fit.edu

Project Name: **Reef Ball™ Submerged Artificial Reef Breakwater
Marriott Resort, Grand Cayman, Cayman Islands**

Project Dates: 2001 to present

Client Name: Grand Cayman Marriott Beach Resort

Address: 389 West Bay Road, Grand Cayman, BWI Cayman Islands

Telephone: 345/949-0088

Project Location: South end of Seven Mile Beach on the West Coast of Grand Cayman

Web Site: <http://marriott.com/hotels/travel/gcmgc-grand-cayman-marriott-beach-resort/>

Work performed: Feasibility study for beach stabilization, with development of alternatives. Engineering design, permitting, and construction supervision of submerged artificial reef breakwater.

Status: Project completed, current feasibility study for expanding the project north and south.



Aerial photograph (above left), 5-row Reef Ball™ breakwater viewed above water (above center) and underwater (above right), beach in 2002 before the project (below left), and in February 2003 after the project (below center), and in February 2007 (below right).



In 2001 Dr. Harris was contacted by Columbia-Sussex Corporation, then owners of the Grand Cayman Marriott Resort, to perform a site visit and a feasibility study for methods to stabilize the eroding beaches. This study was completed and several alternatives were presented, with the owners electing to construct a submerged artificial reef breakwater using Reef Ball™ units. Dr. Harris then proceeded to develop the design for the submerged breakwater, with permit applications submitted to the Cayman Islands (CI) Department of the Environment (DOE). Dr. Harris made presentations to the DOE staff, and accompanied the Minister of the Environment and DOE staff to a site visit of similar successful projects by Dr. Harris in the Dominican Republic. The breakwater was constructed in 2002, with an extension to the south completed in 2004. All of the reef units have remained stable during waves from major hurricanes, including the direct hit by Category 5 Hurricane Ivan that devastated Grand Cayman in 2005 and large waves from Category 5 Hurricane Wilma (photo on the right after Hurricane Ivan shows the breakwater and beach with no damages, but damages to an upland building which forced its demolition). The beach continues to have seasonal variations in width, but unlike the complete lack of beach 50% of the time prior to this project, the beach has been stabilized.

