

Design of Coastal Structures in Response to Sea Level Rise

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The impact of both long term and short-term sea level rise on the design of coastal structures will be discussed. Most coastal engineering projects now include an allowance for projected long-term sea level rise due to global warming. The projected increase in water level varies depending on the method used to calculate the value, location, selected return period and other factors.

The impact of the projected long-term water level change on design wave heights, wave loads, cost, and even aesthetics will be presented. In the Caribbean region in particular, with its emphasis on tourism, aesthetics plays a key role in defining the size of most coastal projects.

“Views to the sea” from roadways, hotels and other vantage point, as well as the often natural low lying topography at the coast, increase the impact and difficulty of designing structures to withstand future sea level rise scenarios.

Significant short-term changes in sea level (weeks to months) related to sea level anomalies have also been identified through satellite imagery and verified with actual water level measurements and related tidal analyses. These changes in water level, although relatively brief, can greatly impact both design and performance of coastal facilities.

The presentation will focus on the Caribbean region and will also include a well-documented and verified example of the impact of sea level rise from a recently constructed project in Barbados.

BIO



Mr. MacIntosh is the Chief Executive Officer of Baird & Associates (“Baird”), and a member of the Board of Directors. He also participates in, and is responsible for, the overall management of coastal engineering projects for Baird.

Mr. MacIntosh has extensive experience in the development and management of coastal engineering projects in various parts of the world, particularly in the Caribbean. He has managed numerous field programs, undertaken numerical and physical model studies, undertaken design work from conceptual through to final design, and provided expert advice during construction.

For the past almost 30 years, Mr. MacIntosh has focused on projects from the north to the south of the Caribbean basin including the Bahamas, Turks and Caicos, Virgin Islands, St. Lucia, and Bonaire. For the past 8 years, he has focused on the island of Barbados.

In particular, he was Baird’s project manager for the Barbados Coastal Infrastructure Project. All of these projects have involved on site participation with civil engineers, marine biologists, and other professionals concerned with sustainable development. This team approach has resulted in creative field programs and innovative solutions to coastal challenges.

He has been an invited speaker at Queen’s University, The Waterfront Center, SOBA (U.S. Small Boaters Association) and the Danish Hydraulic Institute.