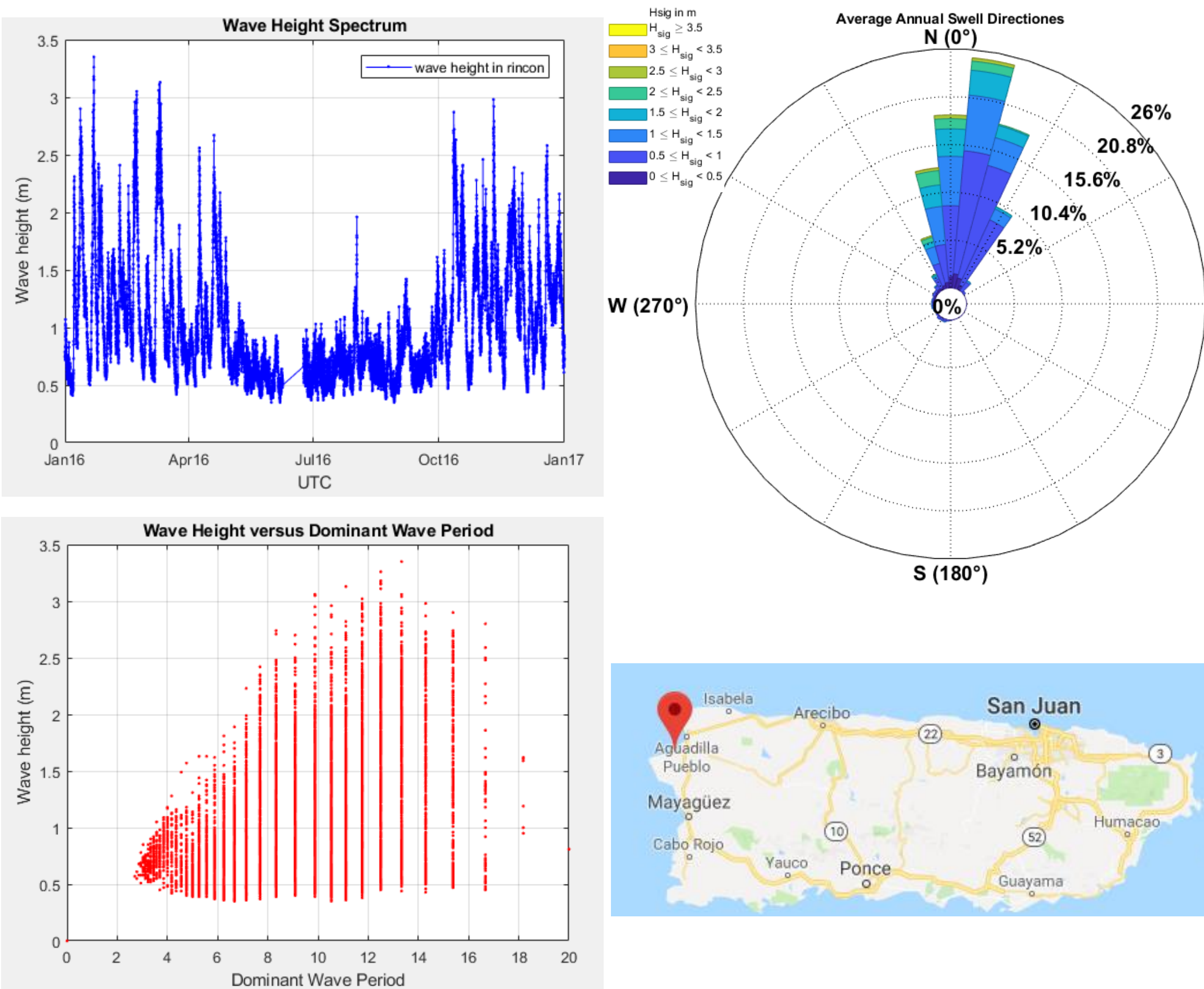


Proposal for the Design and Construction of an Artificial Surfing Reef for the Town of Aguada Puerto Rico

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Wave Spectrum Analysis

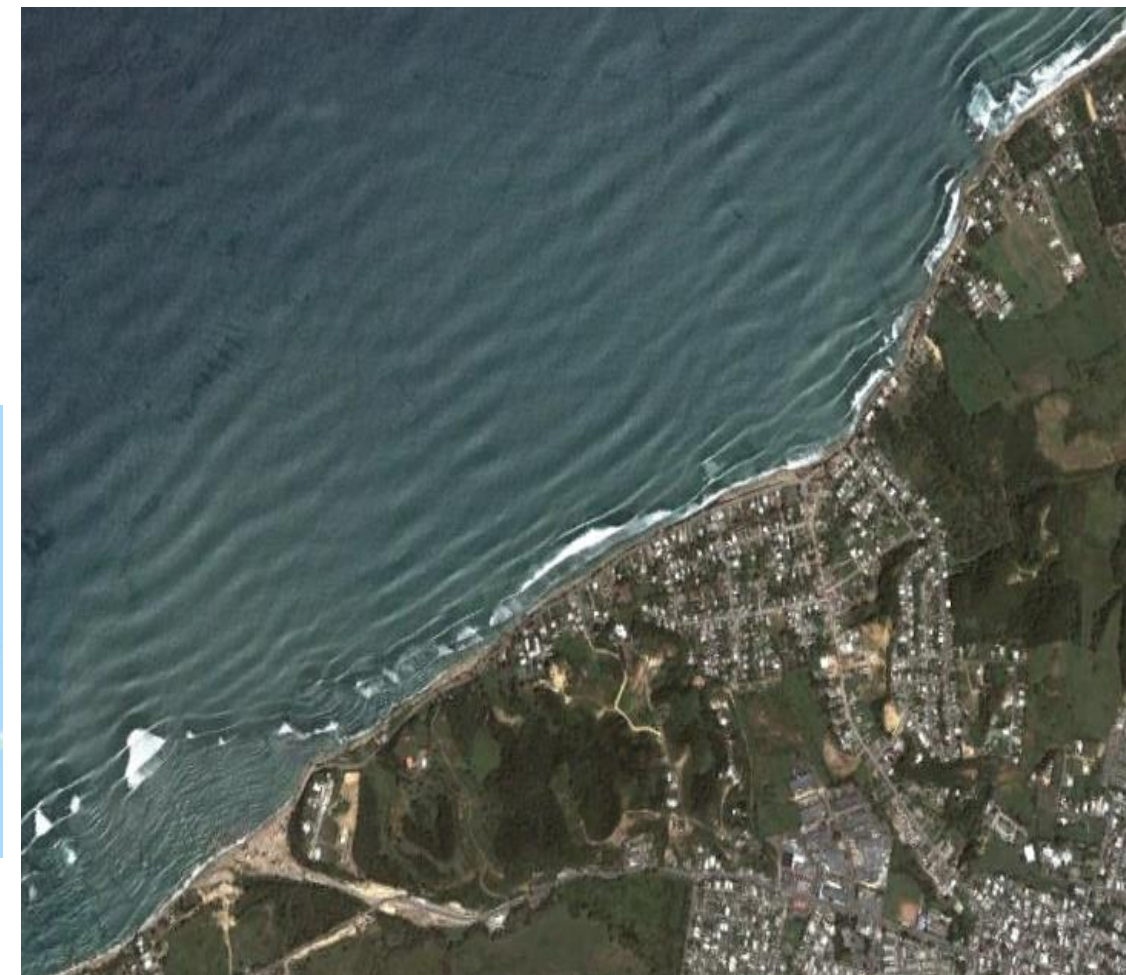


Introduction

The city of Aguada is located on the west coast of Puerto Rico between its two major surf capitals: Rincon and Aguadilla. While Aguada receives substantial swell throughout the year, it lacks the natural reefs and headwaters that its neighbors enjoy. Thus the majority of Aguada's beach front is not conducive to water sports. Therefore an artificial surf reef would provide a solution to this problem as well as a social and economic benefit for the city of Aguada.

Objectives

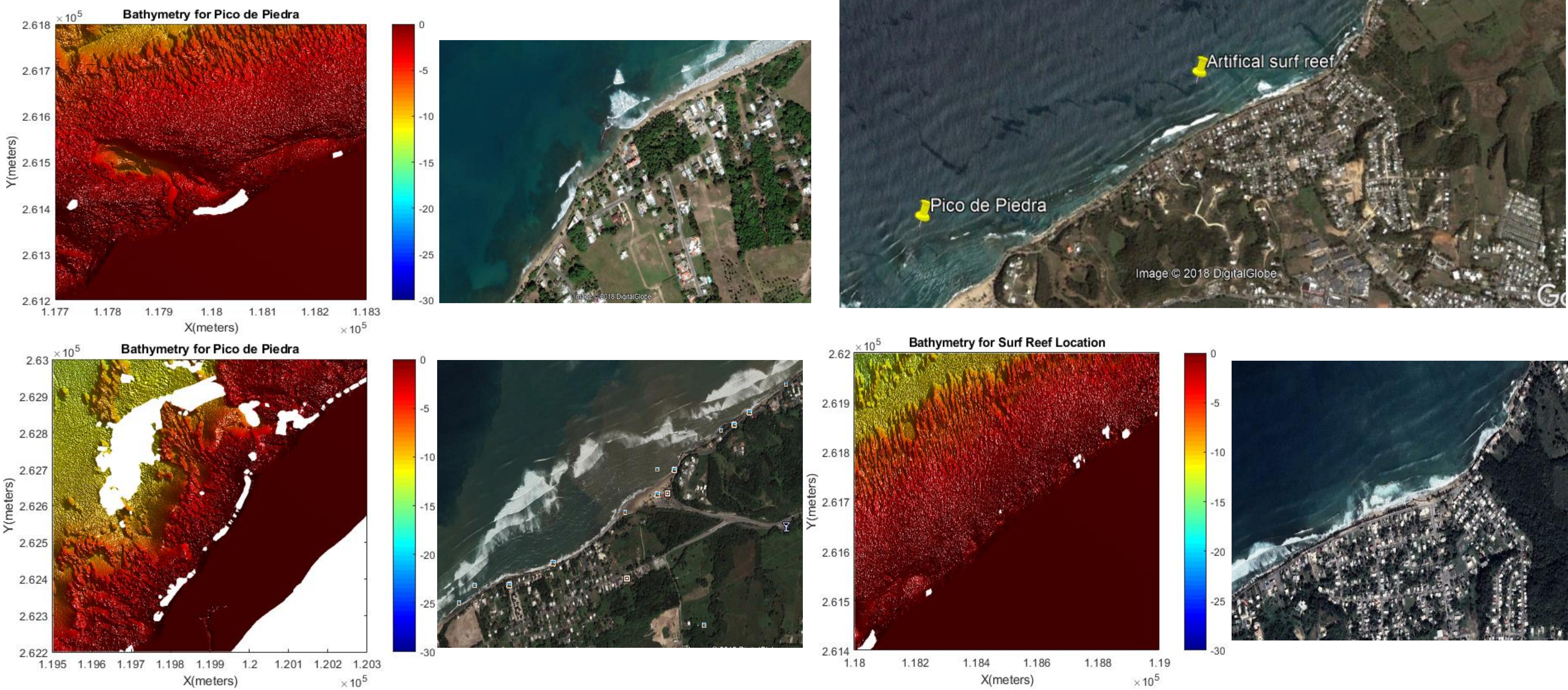
- Create a quality surf break for the Town of Aguada
- Provide social and economic benefit to the town of Aguada by increasing its local and foreign tourism
- Promote marine life activity by adding to the topographical complexity of the seabed in Aguada
- Provide coastal protection from storm surges and sediment transport without impairing the visual beach aesthetic



Lidar Bathymetry Studies

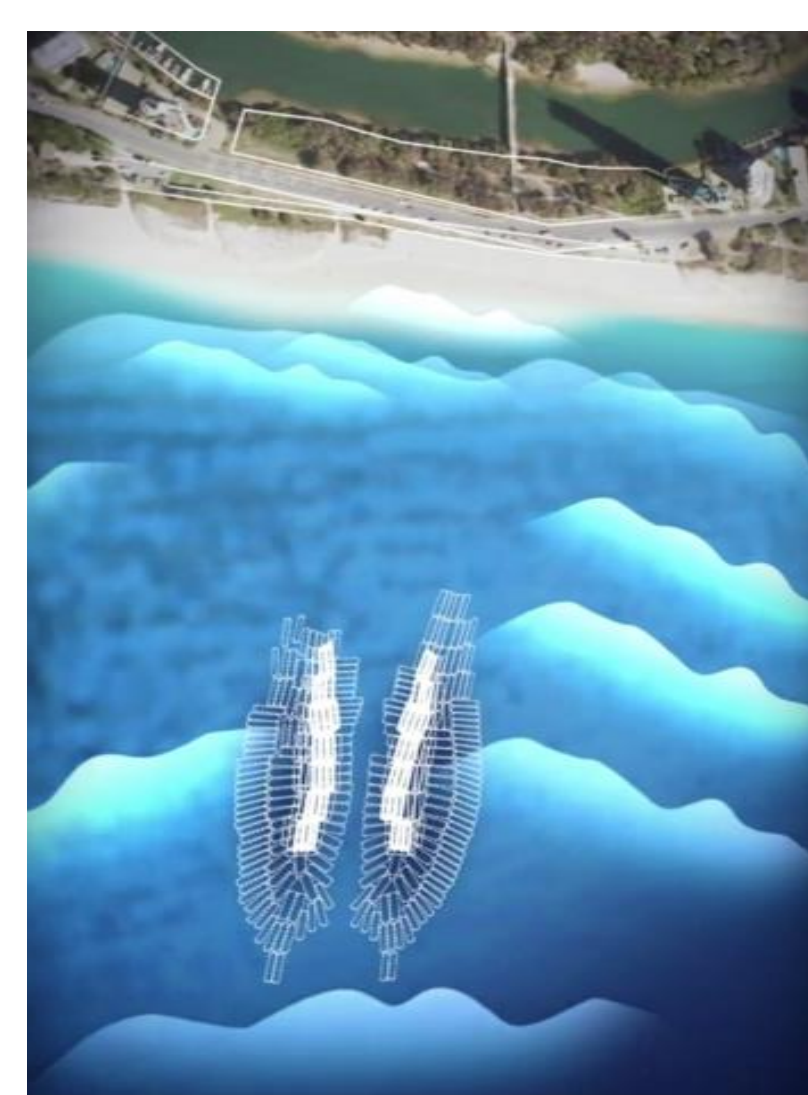
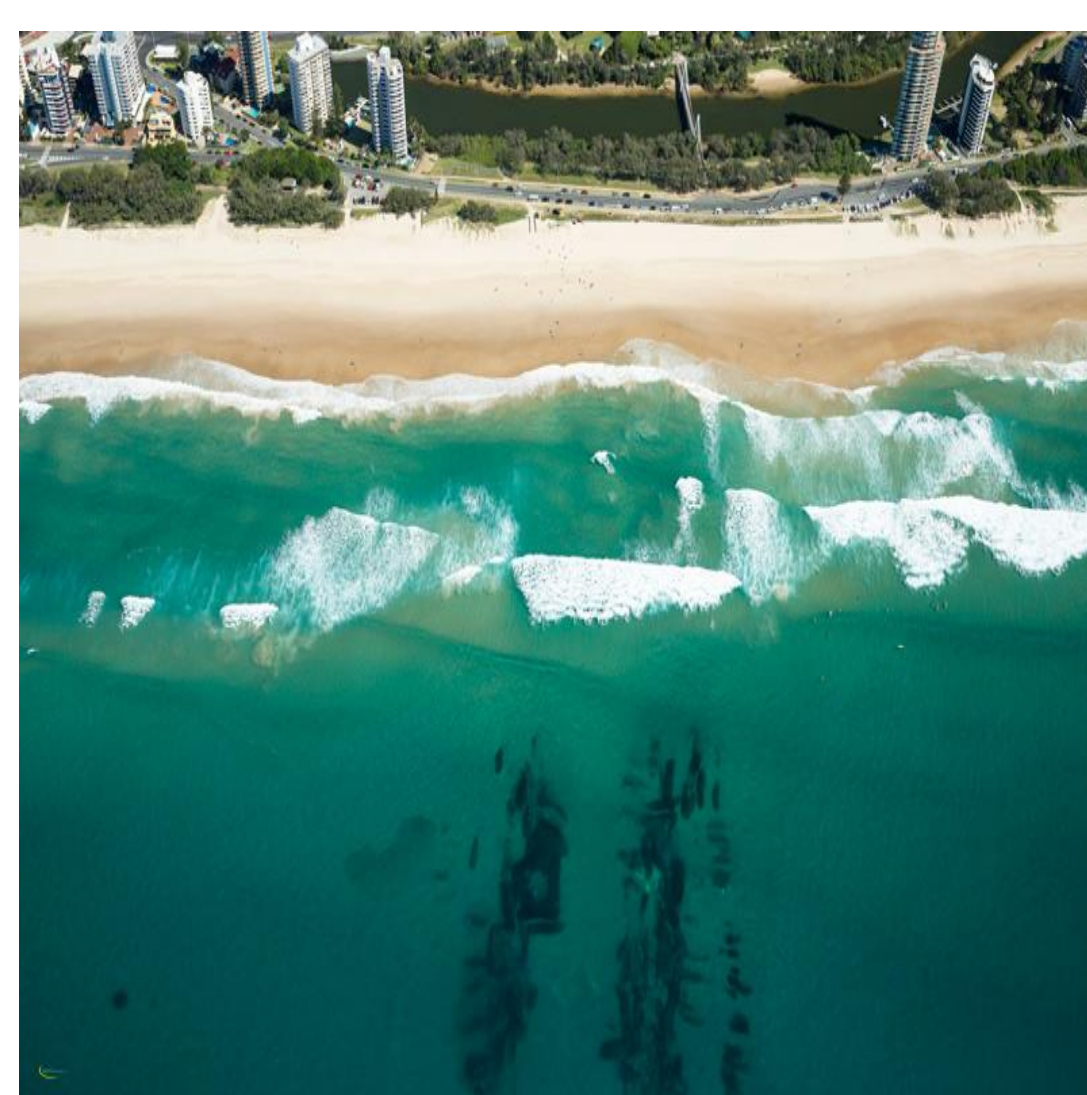
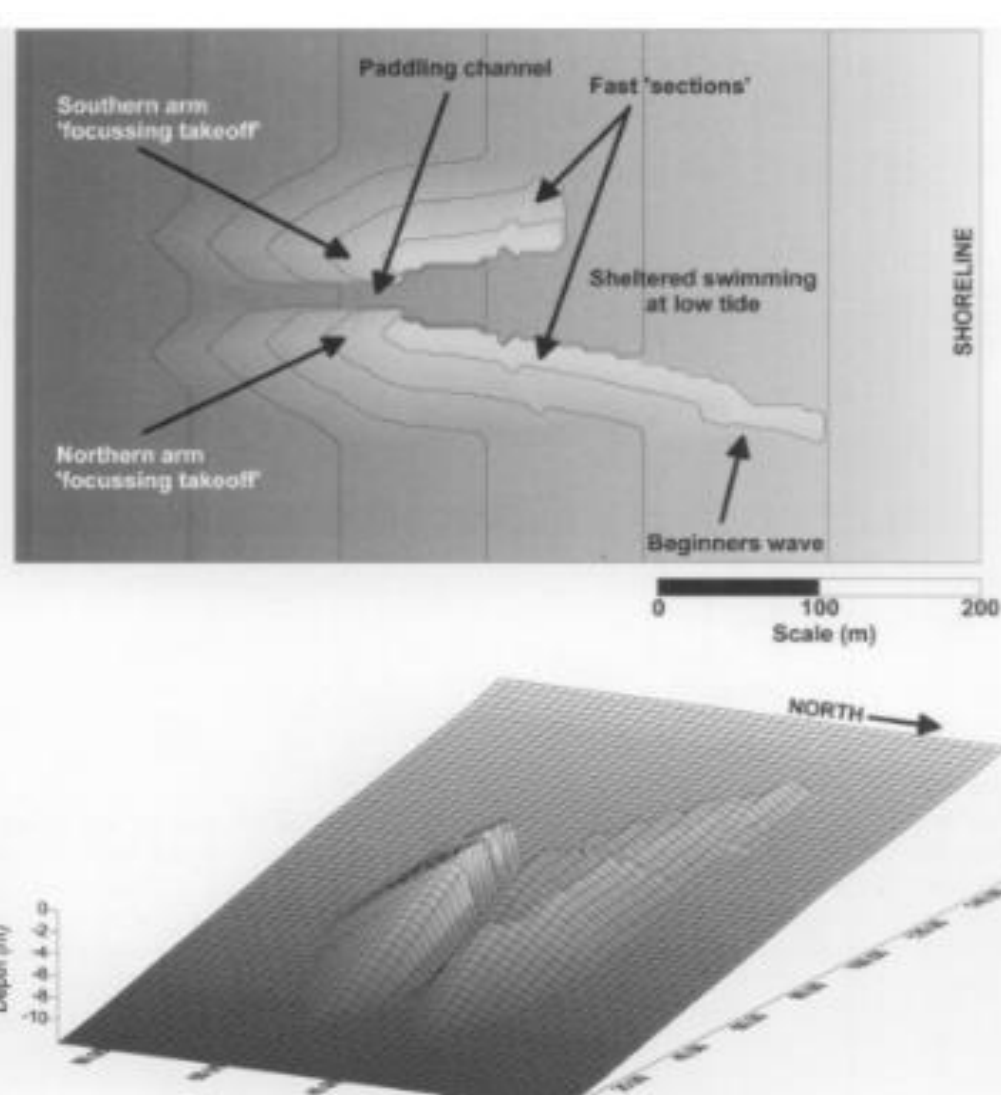
Analysis Process

The only two reefs that provide ideal conditions for surfing are Table Rock and Pico de Piedra, and both have submerged reefs with ideal wave refraction characteristics. The angles, depths, and distances from the shoreline of these two breaks will be analyzed to design the artificial surfing reef.



Existing Surfing Reefs

Comparative Analysis



Further analysis through numerical modeling is needed to determine the desired dimensions of the reef. This will also be used in designing the shape that suits the specific wave climate and bathymetry.

Existing artificial surfing reefs will be referenced during this process. A notable surf reef that will be used in the design process is in Narrow Head, Australia, as shown to the right. This reef was constructed in 2000 primarily as a coastal protection structure that also doubles as a surfing amenity.