

Accepted Manuscript

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Guilherme Vieira Da Silva, Thomas Murray, Darrell Strauss



PII: S0272-7714(18)30146-X

DOI: [10.1016/j.ecss.2018.07.022](https://doi.org/10.1016/j.ecss.2018.07.022)

Reference: YECSS 5924

To appear in: *Estuarine, Coastal and Shelf Science*

Received Date: 22 February 2018

Revised Date: 15 July 2018

Accepted Date: 18 July 2018

Please cite this article as: Da Silva, G.V., Murray, T., Strauss, D., Longshore wave variability along non-straight coastlines, *Estuarine, Coastal and Shelf Science* (2018), doi: 10.1016/j.ecss.2018.07.022.

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Longshore wave variability along non-straight coastlines

Guilherme VIEIRA DA SILVA^a; Thomas MURRAY^b; Darrell STRAUSS^c

^{a,b,c} Griffith Centre for Coastal Management (GCCM), Building G51, Griffith University, Gold Coast Campus, QLD 4222, Australia

^ag.vieiradasilva@griffith.edu.au (corresponding author); ^bt.murray@griffith.edu.au;

^cd.strauss@griffith.edu.au

Declarations of interest: none.

Abstract

The present paper demonstrates the role of wave direction and shoreline alignment on wave attenuation along a non-straight coastline. A numerical model was calibrated against measured data at six locations along a non-straight coastline and a hybrid method composed by wave case selection/simulation and nearshore time series reconstruction was applied to transfer 20 years of wave time series from offshore to nearshore. The results highlight the importance of the orientation of the coastline to different degrees of wave exposure to the wave attenuation process. The varying orientation of the coastline, at each of the six sites, resulted in non-uniform wave attenuation alongshore under different wave directions. The extreme wave conditions at each of the sites were also shown to vary significantly along the coast, e.g. ~18% alongshore (at -17 m Australian Height Datum - AHD) and as much as 34% from offshore (-70 m AHD) to nearshore (-17 m AHD). The results presented here reinforce the importance of assessing variations in wave attenuation along the coast as opposed to simply using the closest offshore wave dataset available. Improved understanding of nearshore wave attenuation along non-straight coastlines aids in better informing future coastal protection and management strategies.

Key Words: *wave attenuation; wave direction; average recurrence interval; Delft3D.*

1. Introduction

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