

# **WAVE AND STORM-INDUCED CHANGES IN SEDIMENT TRANSPORT OF BEACHES IN BORACAY ISLAND, PHILIPPINES**

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## **ABSTRACT**

Global assessment of sandy beaches reveals that almost 24% are eroding while 28% are accreting and the remaining 48% are stable (Luijendijk et al., 2018). While erosion is considered a naturally occurring process, it becomes a hazard when society cannot adapt to its effect on people. This happens when the net loss of sediments becomes greater than the net gain. Despite the risk of coastal erosion, almost 2.4 billion people worldwide live within 100km of coastline (United Nations, 2017). The Philippines coastline is considered the fourth-longest in the world with a total length of 36,289 km. and of these, 34,300 km of this coastline is exposed to coastal erosion, affecting about 60% of the country's population (Licuanan et al., 2019). However, studies on coastal erosion have focused on the magnitude and distribution of erosion with little concern about the coastal processes happening along the shore. This study aims to examine the influence of waves and storm surge on the sediment transport dynamics of the Boracay shoreline using the Delft3D hydro-morphodynamic model. Specifically, it aims to determine the erosion and depositional areas, through the model, during fair weather and stormy conditions. Results of the model will be validated against the study of Ignacio (2015) on the morphological impact of Typhoon Haiyan during pre-storm (Oct 2012-Jan 2013), post-storm (Jan-Nov 2013), and recovery (Nov 2013-April 2014) periods of the island. With almost 95% of the Philippine coastline remaining to be unexplored and the country being situated in the typhoon belt, this study will provide a systematic understanding of the different coastal processes happening along the shoreline. Furthermore, the information gathered in this study is important to accurately determine the hydro-morphodynamic processes of the coast hence, ensuring the effectiveness of future beach management especially on the Philippine's small island beaches like Boracay.

Keywords: coastal erosion, Delft3D, 3D hydro-morphodynamics, longshore currents, beach dynamics, Boracay Island, Haiyan