

**TRACKING SHORELINE MORPHOLOGY USING DRONE BASED  
PHOTOGRAMMETRY ON ROCKPILES BEACH IN HAWAII**

A THESIS SUBMITTED TO  
THE GLOBAL ENVIRONMENTAL SCIENCE  
UNDERGRADUATE DIVISION IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF SCIENCE

IN

GLOBAL ENVIRONMENTAL SCIENCE

AUGUST 2019

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## **ABSTRACT**

Beaches around the world have huge economic, social, and recreational value to cities, which are based primarily on the aesthetic quality of the beach. There are multiple factors that contribute to coastal erosion such as wind, sediment, wave, and tidal forces. In addition, each coastal area has its own unique geomorphological, geological, and biological systems that makes coastal topography surveys challenging. Beach profiling estimates the total volume changes of sediment in any given coastal area and shows the health of the beach. These surveys inform and dictate possible management schemes needed to heal beaches, such as, beach recharge, barrage construction, beach nourishment, and manage retreat methods all to reduce the rate of coastal erosion. Generally, traditional ground-based surveys use 2-dimensional horizontal shoreline and vertical beach profiles, but tend to have limitation in expenses and are time consuming for larger surface areas. Unmanned Aerial Vehicle (UAV) photogrammetry (the science in using photography in surveying and mapping to measure distances between objects) is a simpler and cheaper way in approaching large-scale data collection, especially in capturing the rapid coastal changes caused by natural processes. This project intends to accurately quantify the impact of high swell activity on beach faces over the course of a season using UAV drones with cameras and photogrammetry with the software Agisoft. The project will focus on one beach, Rockpiles, over the 2017 – 18 academic year.