

**UNIVERSITI TEKNOLOGI MARA**

**DETERMINATION OF SUBMARINE VOLCANIC  
GROWTH AT MARIANA VOLCANIC ARC AREA  
USING MULTIBEAM COMMON DATASET  
BETWEEN YEAR 2010 AND 2014**

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Thesis submitted in fulfillment  
of the requirements for the degree of  
**Bachelor of Surveying Science and Geomatics (Hons.)**

**Faculty of Architecture, Planning and Surveying**

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## AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

Eruption of the underwater volcanic is a natural disaster that is capable of bringing huge impact to depth of the seafloor and underwater life. Today, multibeam echo sounder system (MBES) can produce a most detailed of navigation map. Moreover, it can even map of marine environment for the scientific purposes. The purpose of this study is to determine the active growth of submarine volcano at Mariana Volcanic Arc. The objectives of the study are to identify the area of submarine volcano, determine the characteristic of submarine volcano based on soil types and to analyze the change of structure of submarine volcanic based on different time period. The growth of submarine volcano is analyzed based on the surface of submarine volcano from digital elevation model (DEM) and growth calculation. This study applies MBES data that process using Qimera, Flerdermaus ERDAS and ArcGIS software. The type of seafloor is determined by Angular Range Analysis (ARA) technique from backscatter data analysis while the analysis of submarine volcano growth is to determine using qualitative raster and statistical technique in GIS software. This study promotes the capability of multibeam common dataset to interpret and determine submarine volcano growth over 4 years whether submarine volcano at Mariana Volcanic Arc is still active or inactive. Broth of submarine volcano based on the minus map shows that the area has grown and experienced a landslide. The calculation of area and volume show the volcanic growth has increased 0.4% in four years. It concludes that, submarine volcano at the study area shown is at the active stage of volcano eruption.

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