

**IDENTIFYING POTENTIAL AREAS
OF LOW AND HIGH WATER LEVEL
IN KELANTAN USING GIS
APPROACH**

**NUR RAIHANAH BINTI MD. ZAHRIN
NURUL AIN AFIQAH BINTI ZAMRI**

**DIPLOMA IN GEOSPATIAL TECHNOLOGY
COLLEGE OF BUILT ENVIRONMENT
UNIVERSITI TEKNOLOGI MARA**

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ABSTRACT

Identifying Potential Areas of Low and High Water Level in Kelantan Using Gis Approach

Flood disasters that occur frequently in Kelantan are events that can have an impact on various aspects of society, the economy, the environment and infrastructure. This study researches the potential areas of low and high water levels in Kelantan from year 2018-2020 using two geostatistical methods, which is Inverse Distance Weighting (IDW) and Kriging. The main goal is to compare the spatial patterns produced by using these two methods to understand their effectiveness in water level monitoring. Using water level data from river stations which are the main focus in Kelantan for the creation of surface maps using both IDW and Kriging.

IDW, as a deterministic method, produces a smoother gradient and a wider generalization of water level variations. Kriging, reveals more localized and detailed water level variations, showing its potential sensitivity to local anomalies. A comparative analysis of IDW and Kriging methods highlights the strengths and limitations of each in the context of water level monitoring in Kelantan. IDW smooth gradient maps provide an overview of water level trends, useful for general assessment. On the other hand, Kriging's ability to capture detailed local variations makes it more suitable for accurate water level analysis and identifying specific areas at risk of flooding. In addition, this study also conducted research through selected data from SQL selected according to the attributes. The overall insight of this study is important to improve flood management and mitigation strategies in Kelantan, because understanding the spatial distribution of water levels can lead to more informed decision making and more effective resource allocation.

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CHAPTER 1

1.1 Background of Study

Flood risk analysis and assessment is a critical component of disaster management and urban planning. Kelantan is a state located in the northeastern region of Malaysia, with a charming landscape characterized by thick forests, meandering rivers and a vibrant ecosystem. However, behind the beauty there is a dynamic hydrological system that is full of challenges especially regarding the issue of flooding. This issue can be said to happen every month from November to March.

Kelantan has a network of many river systems, the Kelantan River being one of the most concentrated rivers. In addition, there are also other rivers such as Sungai Lebir, Sungai Golok and others. During heavy rains, these rivers can overflow quickly, causing widespread flooding in the area around the river. It can be said that the flood that occurred in December 2014 in Kelantan was recorded as a devastating flood, causing severe damage, economic losses, and thousands of people lost their homes (Salleh & Ahamad, 2019). Geographic Information Systems (GIS), remote sensing, and spatial data integration techniques to produce detailed flood hazard and risk maps. These studies have mapped flood-prone areas, identified risk factors, and analyzed the spatial distribution of flood impacts. (Udin & Ab Malek).

In this study, areas that have the potential to experience floods in Kelantan that have a negative impact on the environment, infrastructure and local residents in 2018-2020 can be detected by using water level data at certain stations. Through ArcGIS approach, interesting story maps can be created that are useful for various stakeholders, including policy makers, environmentalists and local communities.