

GIS PROJECT REPORT: THE DIORAMA OF LAKE MICHIGAN

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Project Title: 3D Diorama of Lake Michigan

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Executive Summary:

This project covers the processes involved in creating a 3D diorama of a specific location from a 2D digital elevation model with the aid of a GIS. This processes range from data selection to 3D local scene conversion, customization and labelling of features. The 3d view help us to analyze terrain and elevation in a more visualizing manner.

Introduction

Project Background

Dioramas are three dimensional representation of a scene, either full sized or miniature. They are replicas of real life. This 3d map focuses on the straits of Mackinac which is a vital waterway for commerce on the Great lakes region.

Project objective:

- To create a 3D topographical map diorama of the straits of Mackinac

Scope of work

The project covers the process of converting a 2D map to a 3D map that represents depicts the Lake Michigan in a realistic manner.

Data and Methodology

A. Data collection

The data utilized in carrying out the project was sourced from Existing maps and

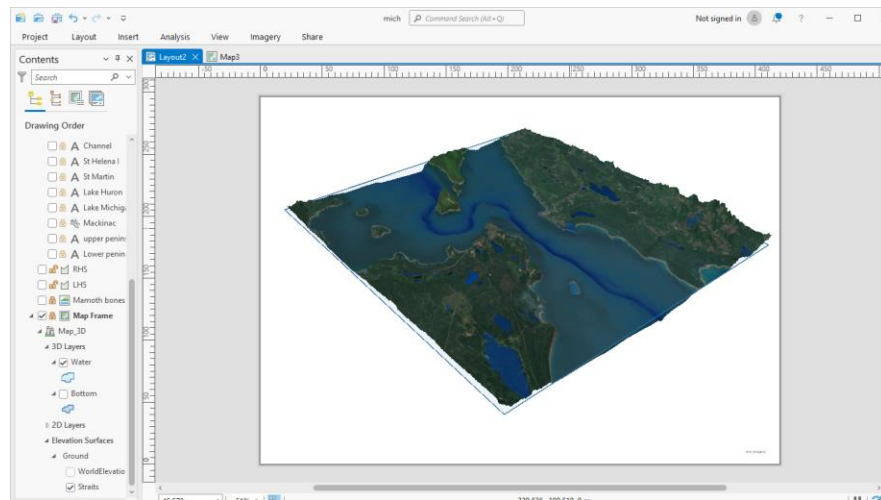
B. Data Processing:

- **Data selection:**

To create a 3d diorama, the digital elevation Model of the area is needed. Extract the area of interest on the DEM. The extraction process was done firstly by creating a polygon note and selecting the area of interest and then applying the geoprocessing tool, Extract by mask.

- **Local 3D scene:**

The clipped out area is then converted to a local scene. Here the 2d map is converted to a local 3d scene, the ground layer activated, vertical exaggeration is added, World elevation is then turned off, the world imagery Basemap is activated, and then the raster function, hillshade is added. The result is then blended with the world imagery used.



- **Water Layer**

Next, polygon note was activated and then in the Elevation section, features are set to “at absolute height”. By so doing, the polygon cuts through the terrain. The polygon note is then duplicated and then renamed as water and bottom respectively. The world elevation layer is then turned on. This water layers were joined by creating a polygon that connects them. As shown in the figure below, this process is repeated for the both sides (Left and right)

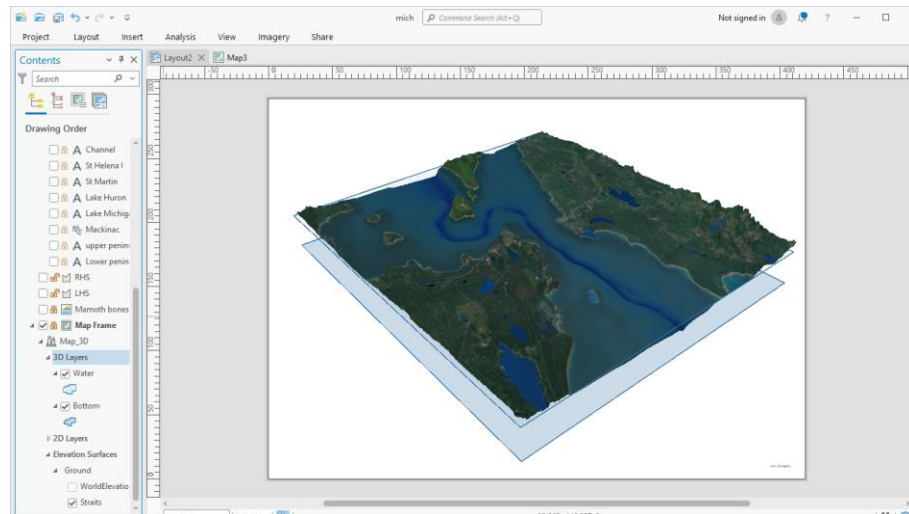


Figure showing the two water and bottom layer respectively

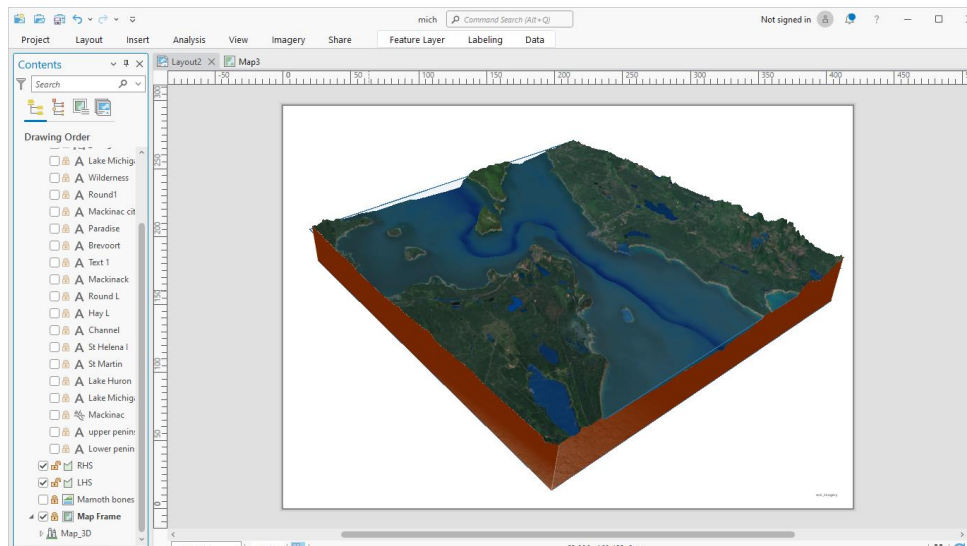
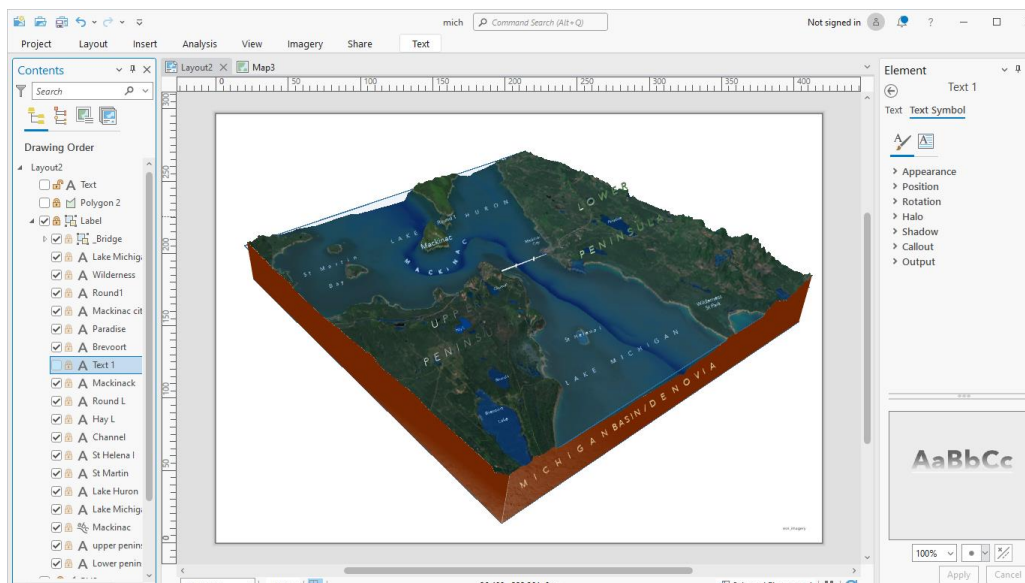


Figure showing the outcome of connecting the two layers using the polygon tool and adding colours and effects.

- **Customization and Labelling:**

The necessary properties are edited such as gradient, transparency which shows the sense of depth, the right symbology added to depict. Other effects can also be added. A new layout is created and the map frame is inserted into the layout and the placed at a fixed position and all other symbology properties can then added.



Results

Data Interpretation: The topographic map shows the variation in depth which is depicted by the changes in colour on the map represents variations in elevation. The darker the colour, the deeper the area. Trenches, ridges and slopes can be identified.



Conclusion

This GIS project has attained its purpose with the creation of the diorama map.

Appendices

A1: Detailed map of the map

Reference:

John Nelson map YouTube Video: How to make this 3D diorama of Lake Michigan