

## Introduction

In 2021, the island of Oahu experienced a major leak from several military bases' underground fuel tanks located in Red Hill. This would lead into an investigation that would find that the tanks in question had been slowly leaking for decades<sup>[1]</sup>. A Task Force from the University of Hawaii was formed to record tap water samples for traces of fuel contamination. The results can be viewed on an online dashboard<sup>[2]</sup>. This project used tap water data, as well as island wide water quality data, and the development of a 3D Aquifer contamination monitoring interface using GIS tools and python. The analysis this of this project was to map the points approximate area of the southern aquifer. This project found that the positive contaminated fuel readings overlapped where the aquifer was located.

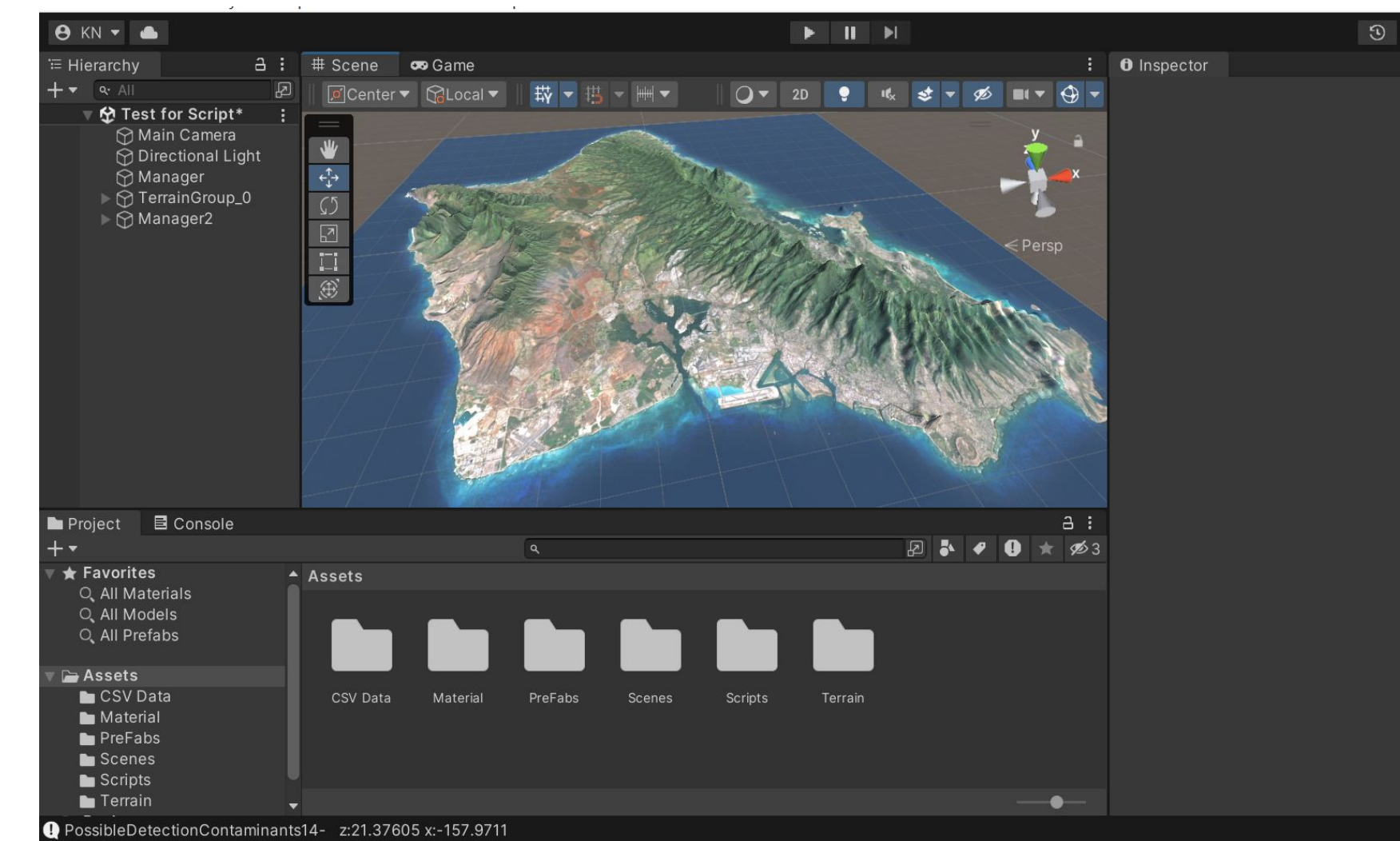
## Research Question

What was the location of the positive contaminated fuel readings?

## Acknowledgments

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## References



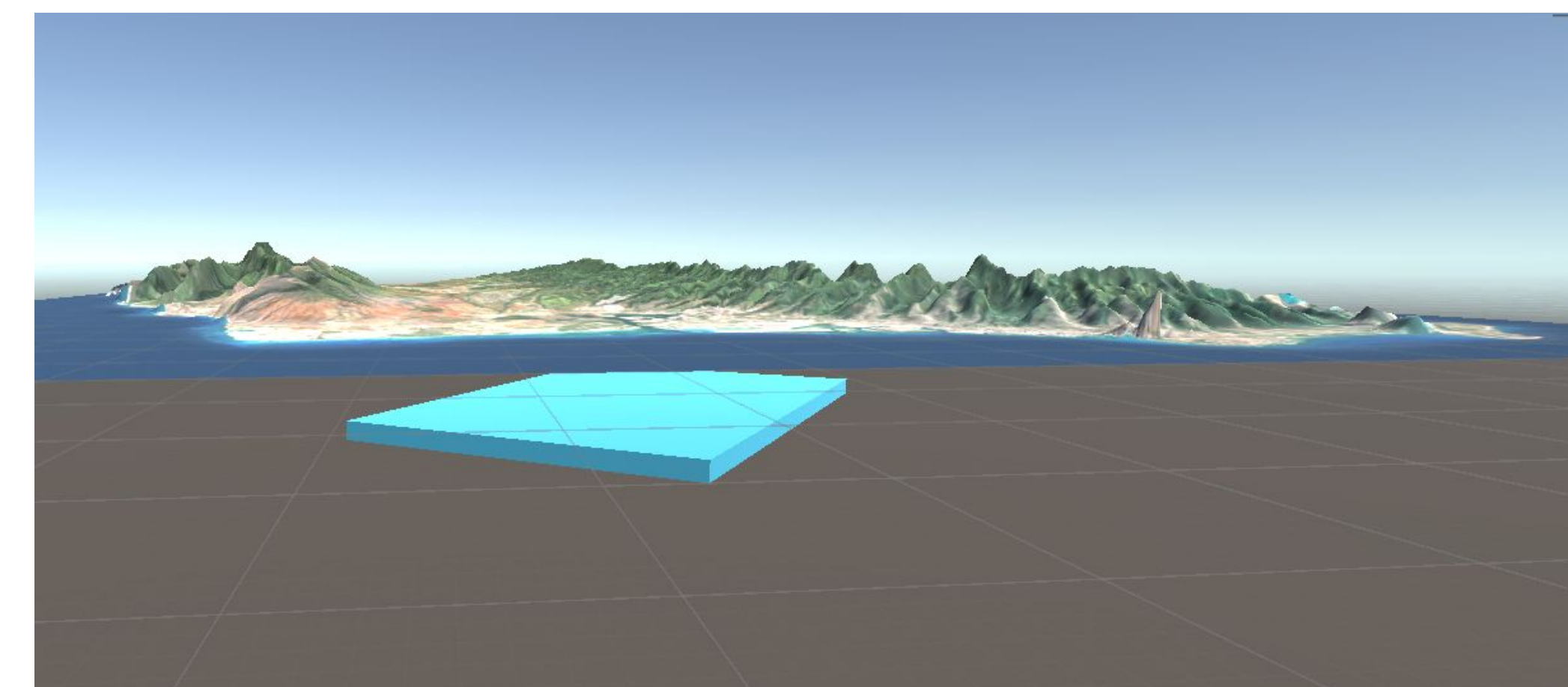
**Fig 1: Created a Unity scene with Oahu's terrain using Tangrams to get a grayscale height map of Oahu. Material used for Oahu ' terrain was a LandSat image.**



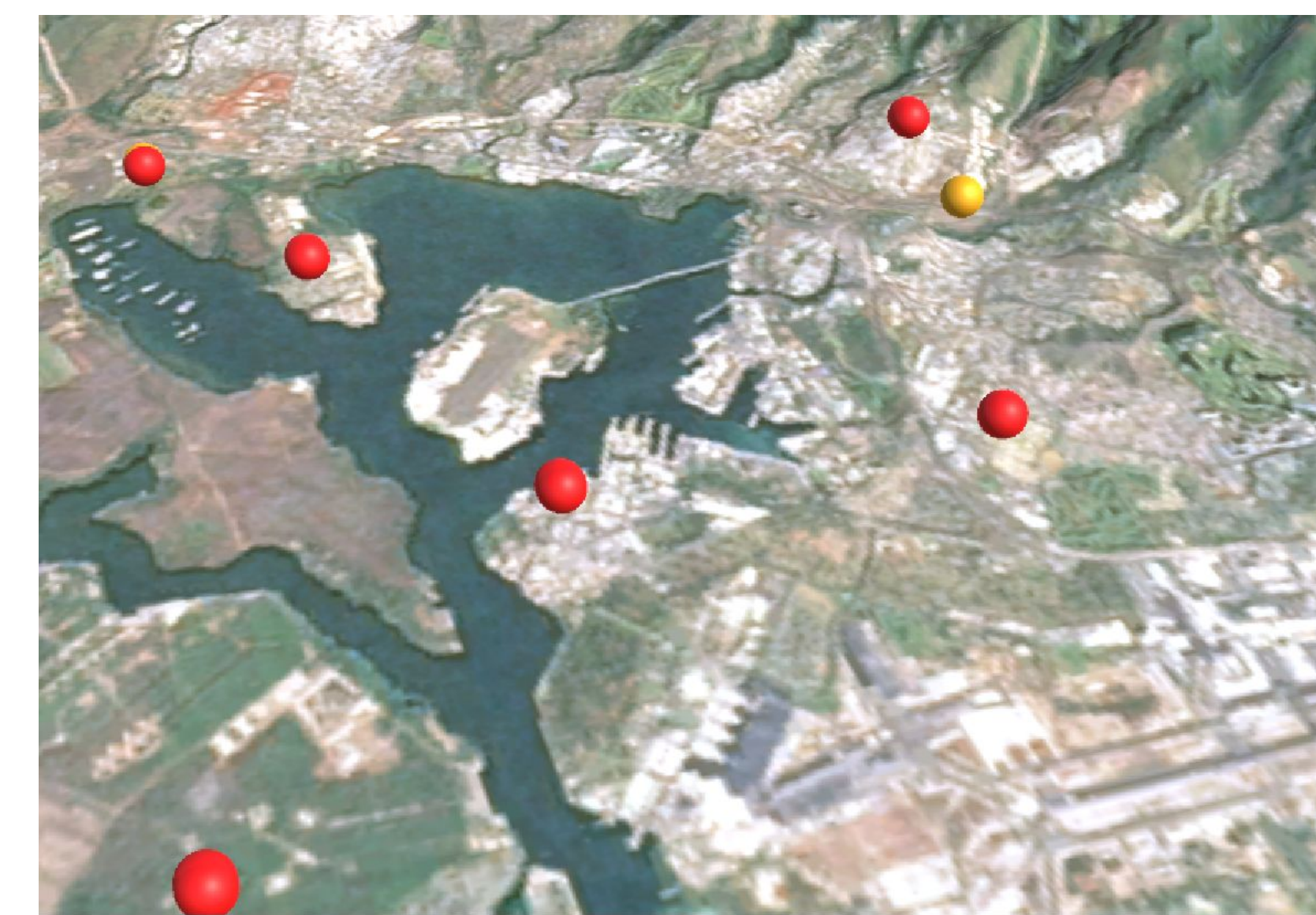
**Fig 3: As Unity does not support a Latitude and Longitude coordinate system, use C# to create a lat/lon system.**



**Fig 5: The representation of the aquifer is made transparent to see where in relations the affected tap water is in relation of the aquifer.**



**Fig 2: Created a rough representation of the aquifer.**

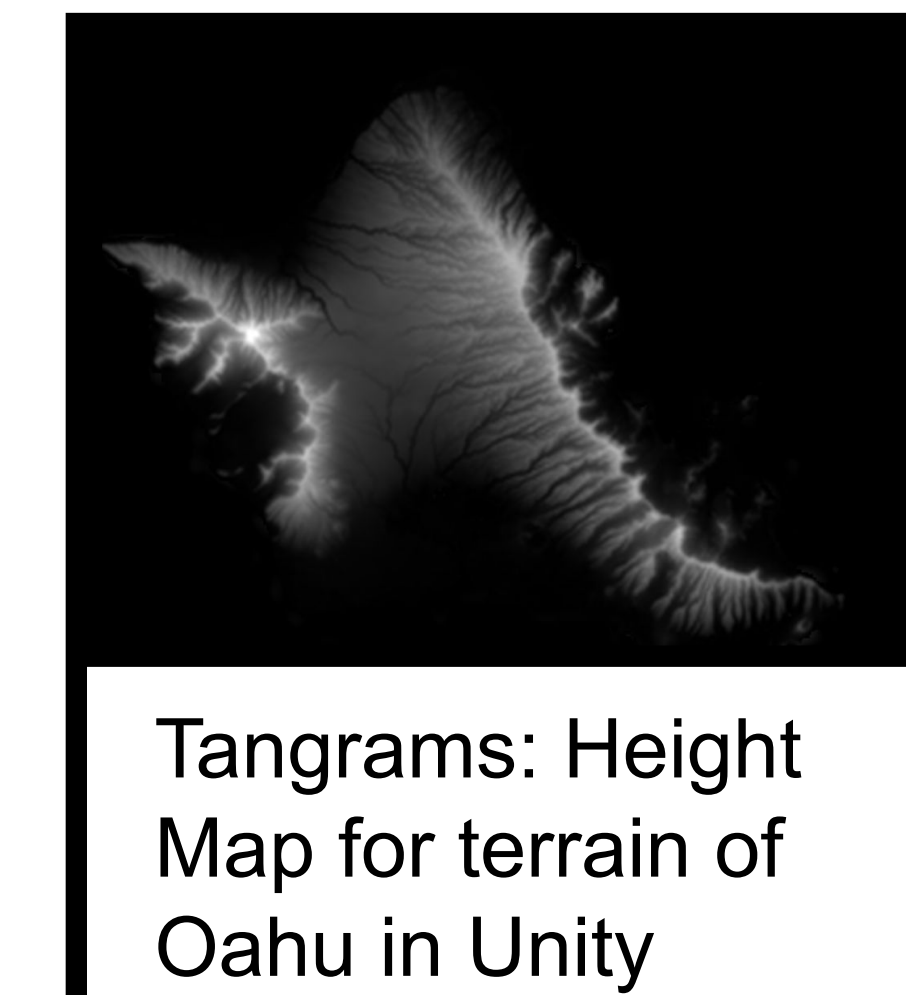


**Fig 4: With the coordination system in, the data can be read from a CSV file and create points on the Oahu terrain.**

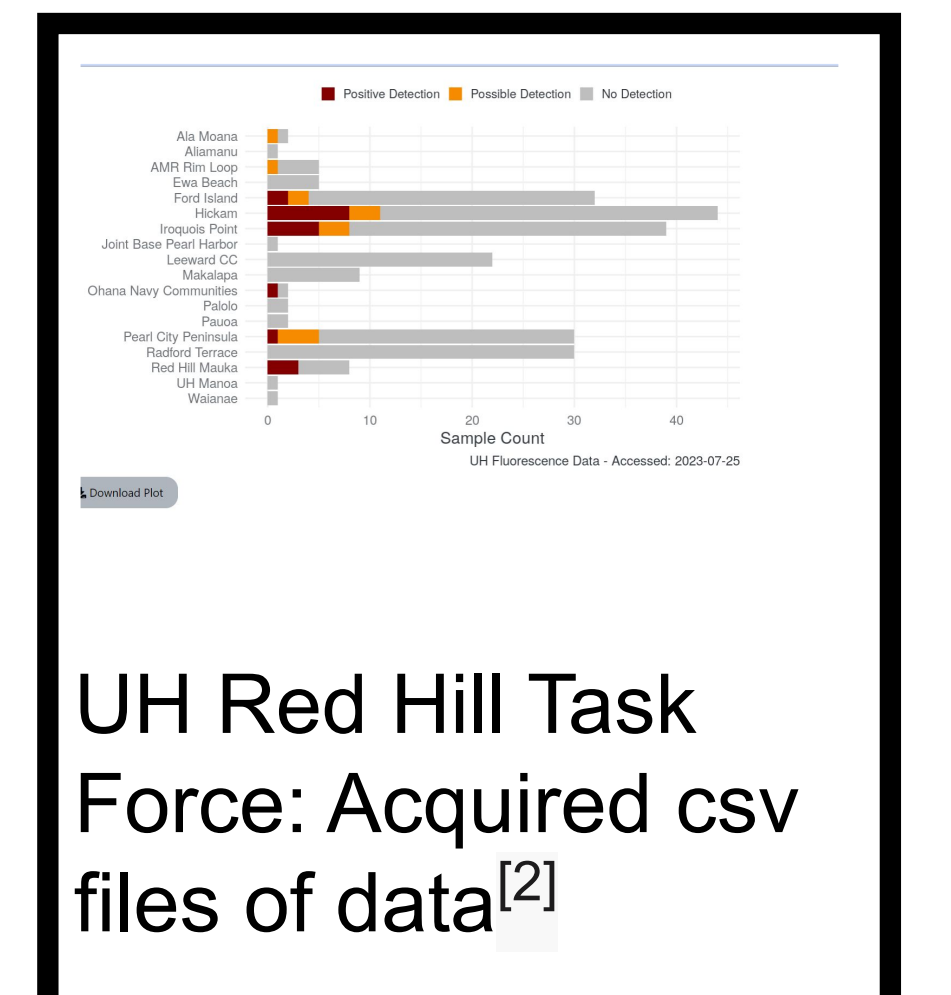


**Fig 6:All Possible (orange) and Positive (red)**

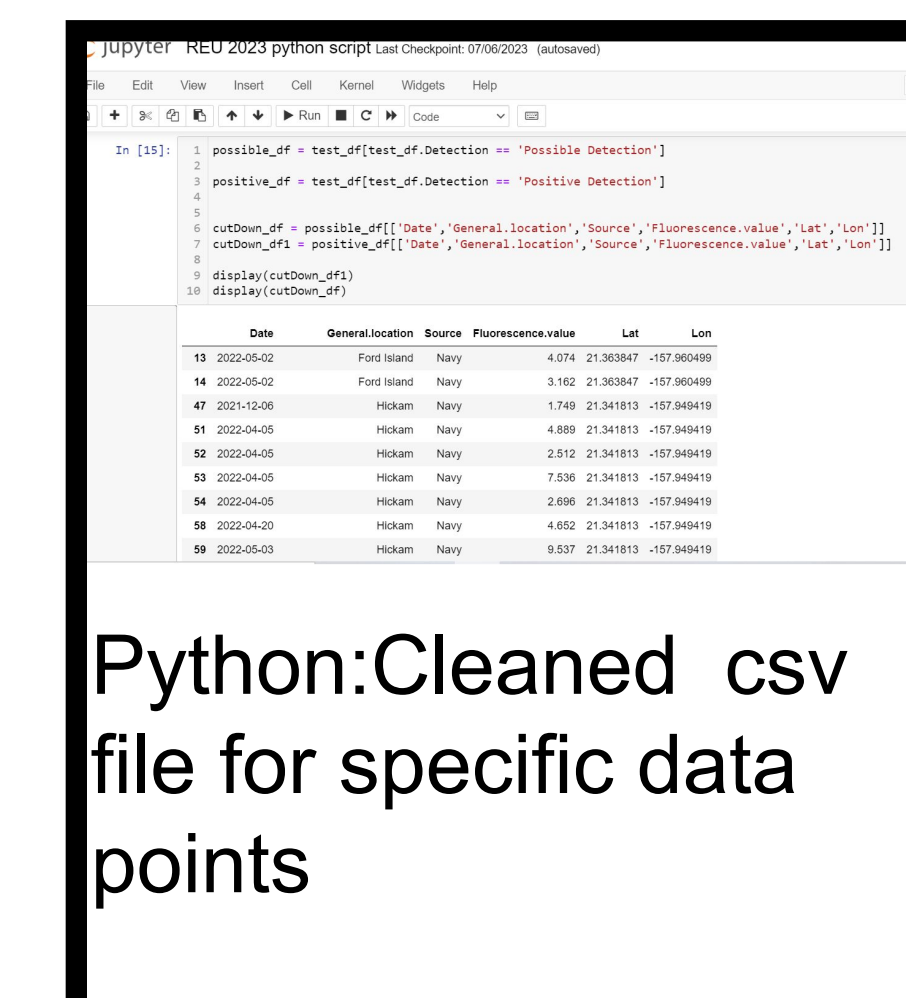
## Methods



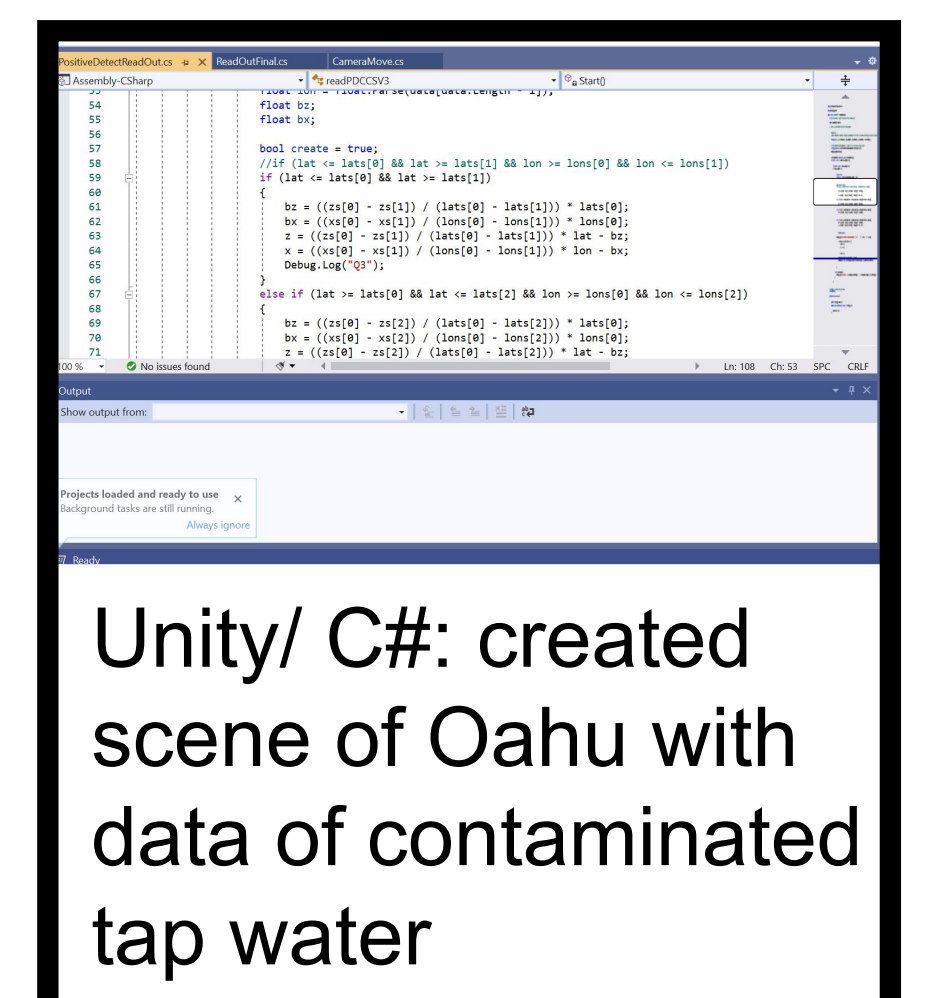
**Tangrams: Height Map for terrain of Oahu in Unity**



**UH Red Hill Task Force: Acquired csv files of data<sup>[2]</sup>**



**Python:Cleaned csv file for specific data points**



**Unity/ C#: created scene of Oahu with data of contaminated tap water**

## Limitations

L1: First limitation is the representation of the aquifer. Hawaii's aquifers only has drawn maps. Creating an accurate model of the aquifer is something out of my skill set.  
L2: The dataset that was used is relatively narrow in sources, an expanded database like USGS water quality data could be worked in to provide higher coverage of the watershed to inform of other aquifer related correlations

## Future Work

Attempt to find more precise reading of dept, both of aquifer and fuel contaminant readings could allow for more in-depth findings. Use of another 3D software to create better aquifer assets to better represent aquifer.