

# Yellowstone Caldera Hazard and Geothermal Risk Assessment

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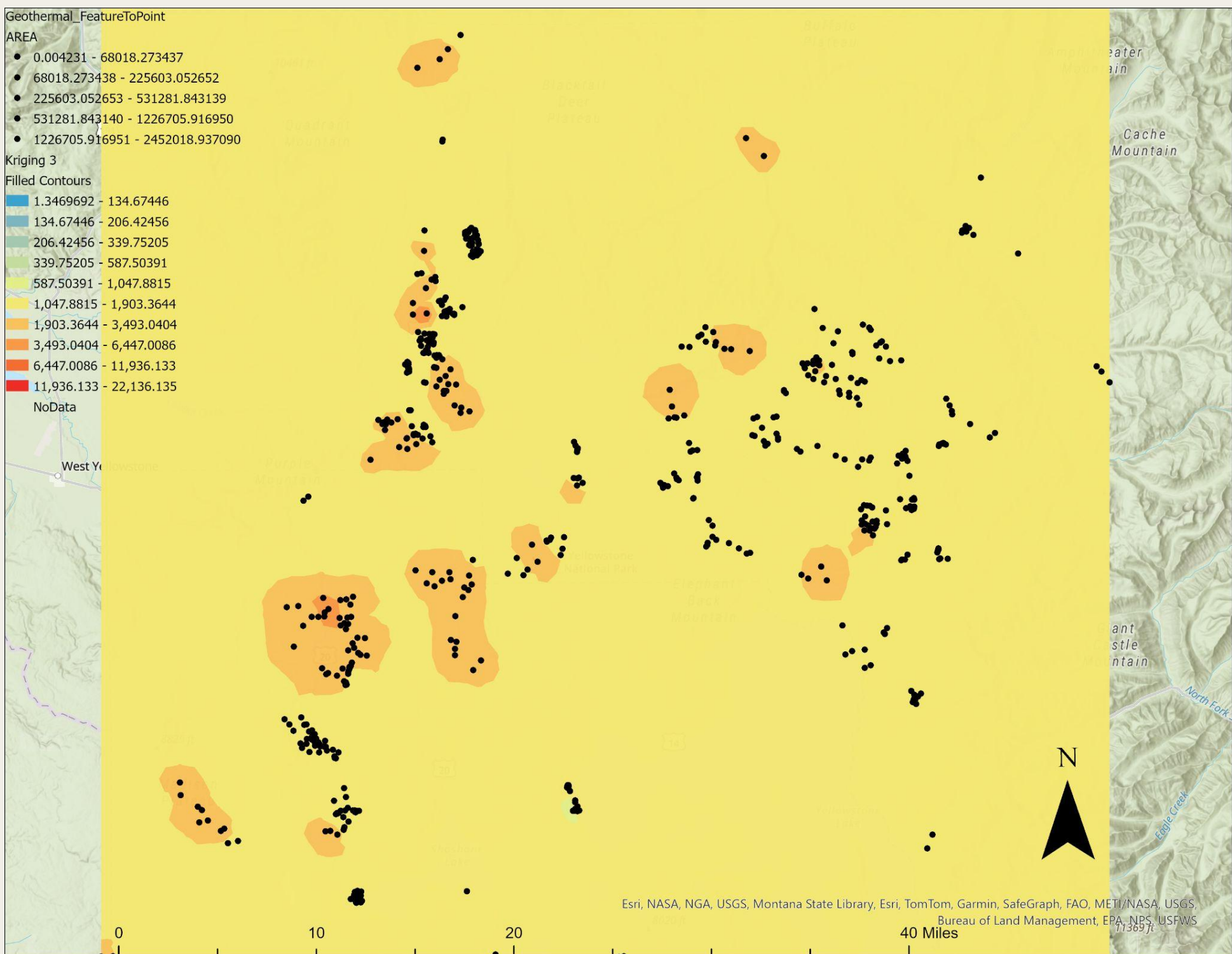
## Introduction:

The Yellowstone Caldera, also known as the Yellowstone Super volcano, is one of the largest volcanoes on earth. While the likelihood of an eruption is miniscule, we have created an analysis of predicting the hazards given the outcome of an eruption. Furthermore, we have derived hazard maps of everyday hazards caused by the Caldera such as geothermal outburst and earthquakes.

## Purpose:

The objectives of this project are to visualize the overall risk of a potential eruption, demonstrate ash projection, along with highlighting volatile geothermal terrain surrounding the caldera and creating a risk mitigation plan. Furthermore, we used buffer zones to highlight potential danger areas within the park.

## Geothermal Surface Area

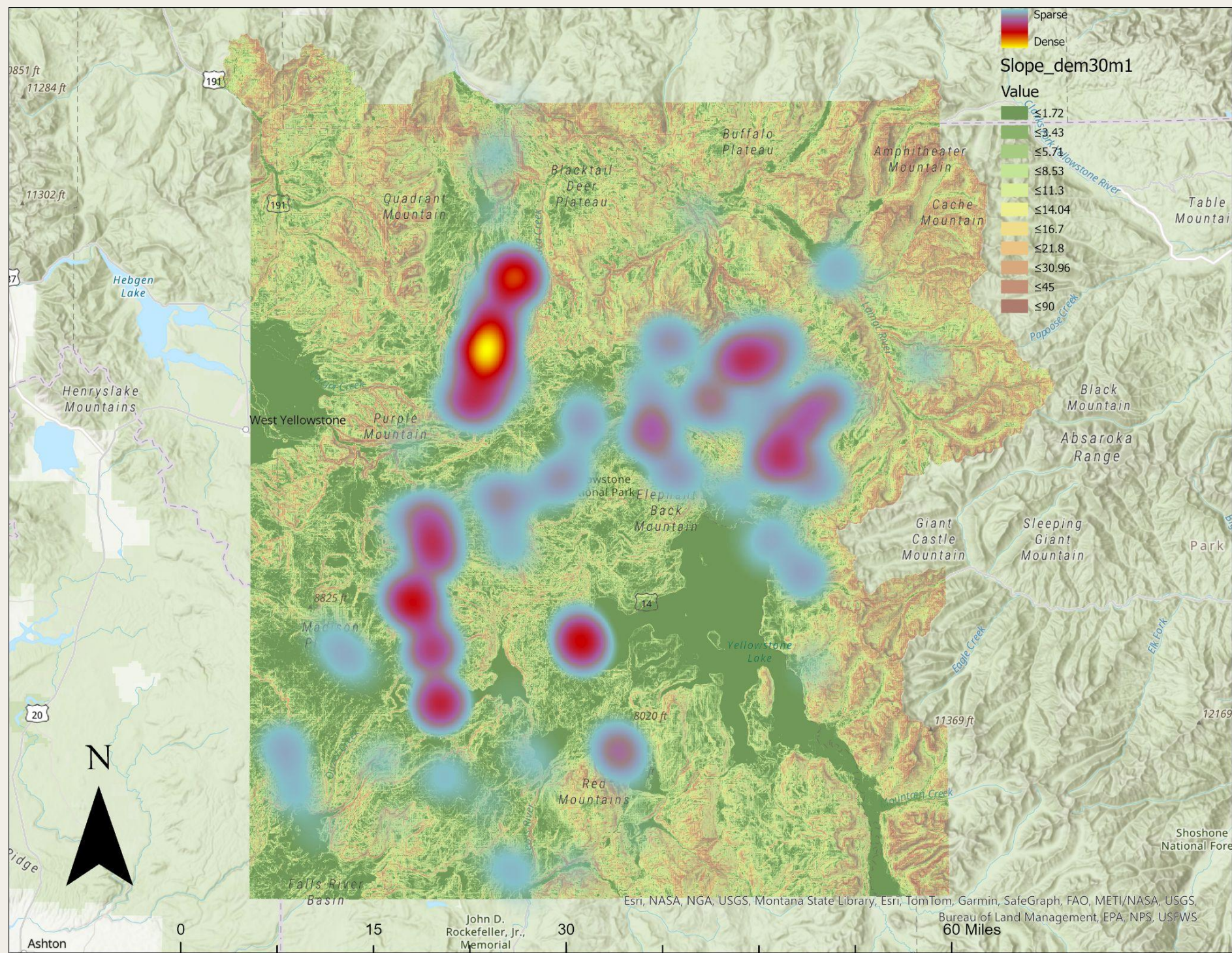


## Methodology:

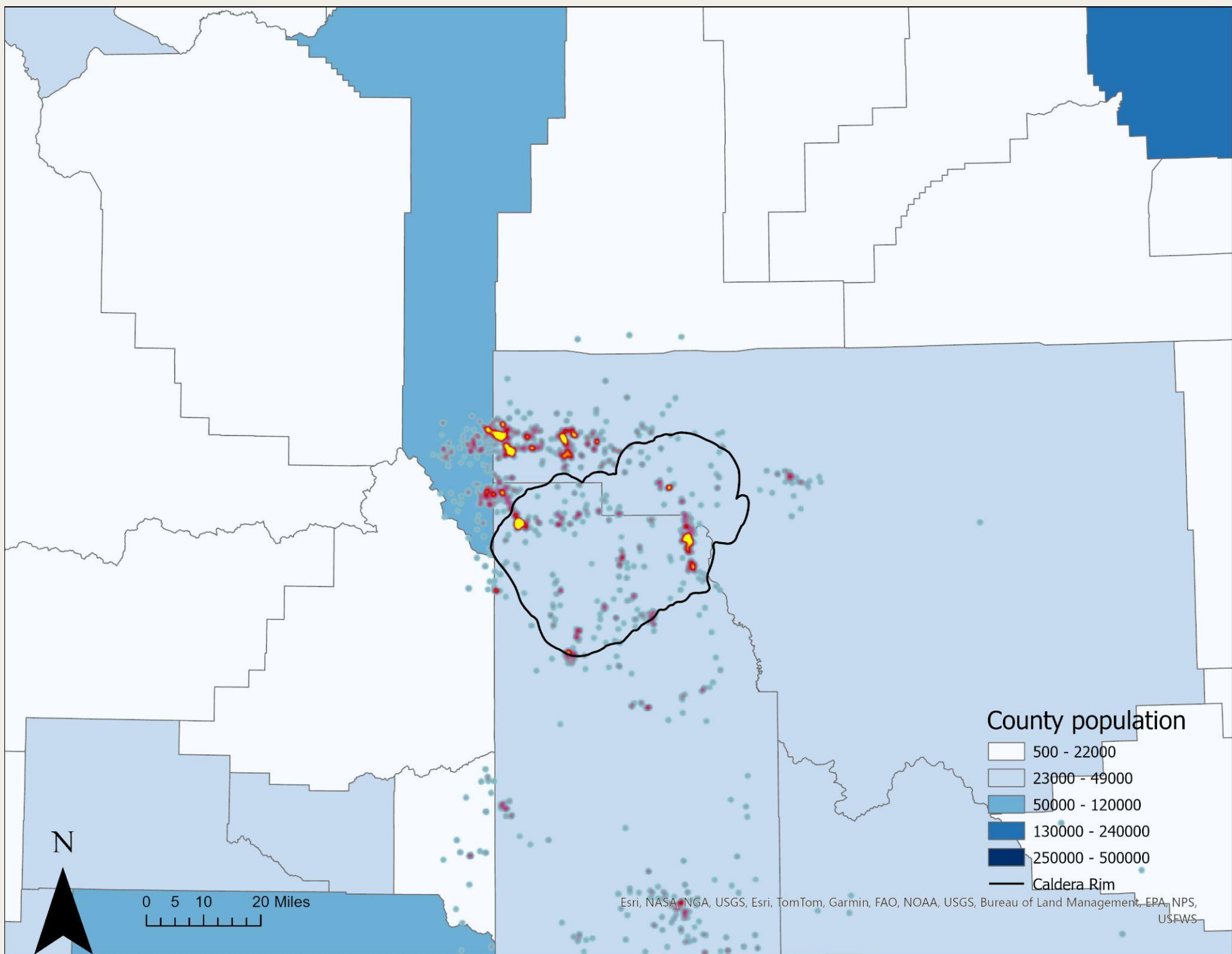
- I. Gathered and analyzed USGS and WSGS data to identify terrain hazards imposed by the caldera such as earthquakes, geothermal outcropping, and historic earthquakes.

- II. Identified areas that face the highest risk of danger following a natural disaster
- III. Created hazard maps displaying the geothermal risk within Yellowstone, earthquake risk, and minimum ash projection following an eruption.

## Geothermal Feature Heatmap



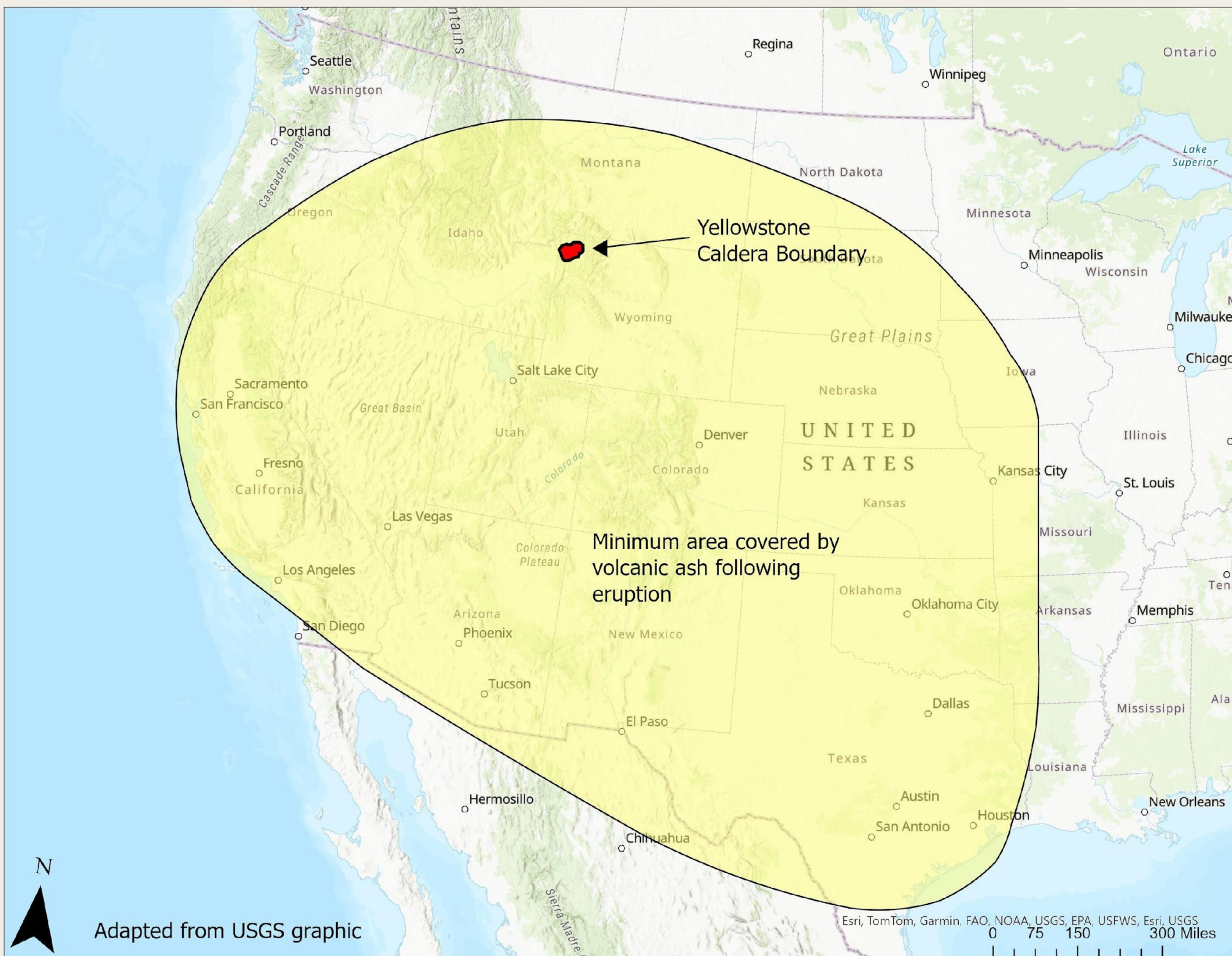
## Heat map of Earthquakes surrounding Caldera between 1974 and 2024



## Results:

The area in the Northwest area of the park on the border between Wyoming and Montana showed a high concentration of both geothermal activity and a history of earthquakes.

## Volcanic ash spread following eruption



## Conclusions/Discussion:

The area with the highest concentration of residential population is coincidentally the most dangerous area following a natural disaster. The Northwest corner of the park was found to have the highest concentration of both geothermal activity and historical earthquakes. While this area would be affected directly, a much larger group of the United States population would feel the effects of the ash fallout, as it is projected to cover much of the Western contiguous United States, spanning as far East as Northwest Louisiana. The spreading of ash would cause far-reaching effects such as damaged infrastructure, contaminated water supplies, eye and upper airway irritation, and damaged vegetation.