

Mapping Migrant Deaths in Pima County, Arizona

Brenda Camacho – Veronica Leon – Ambar Rivera

Masters of Science in Geographic Information Science (MSGISci) Cohort 6
Department of Geography, California State University, Long Beach

Introduction

Despite immigration laws, border security and physical barriers, migrants continue to find ways to cross into the United States. As a result of dangerous areas and extreme temperatures, some journeys result in death. The objective of this applied research project is to provide a visual analysis of migrant deaths that occurred in Pima County from 2016 to 2019 (443 deaths). The results of this spatial analysis can raise public awareness of tragedies that occur near the border.

Methodology

Data of migrant deaths were obtained from Humane Borders and the Pima County Medical Examiner. Points were geo-located and visualized along with additional datasets including locations of water stations, average temperature (MODIS) terrain, rivers, vegetation and Tiger line road data.

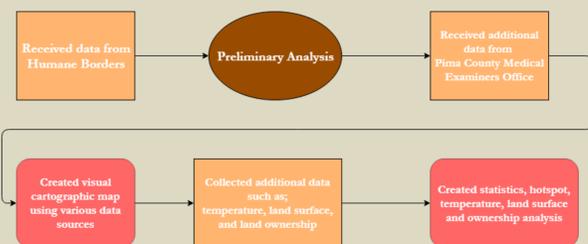


Figure 1. Our methods flow chart for our project.

Data and Data Sources

Primary data were provided by Humane Borders and the Pima County Office of the Medical Examiner. Data sources are shown below.



Results

Results illustrate that the tragedies occur throughout a large area, not just at the border (Figure 2), with the majority of migrant deaths occurring on or near the Tohono O'odham Reservation. A kernel density analysis reveals the pattern of migrant deaths (Figure 3). It is evident that many migrants do not make it past a few miles of crossing the border. Since the data received showed a significant amount of deaths due to exposure, a temperature analysis of the most extreme temperatures (high and low) within Pima County (2016-2018) was included (Figure 4).

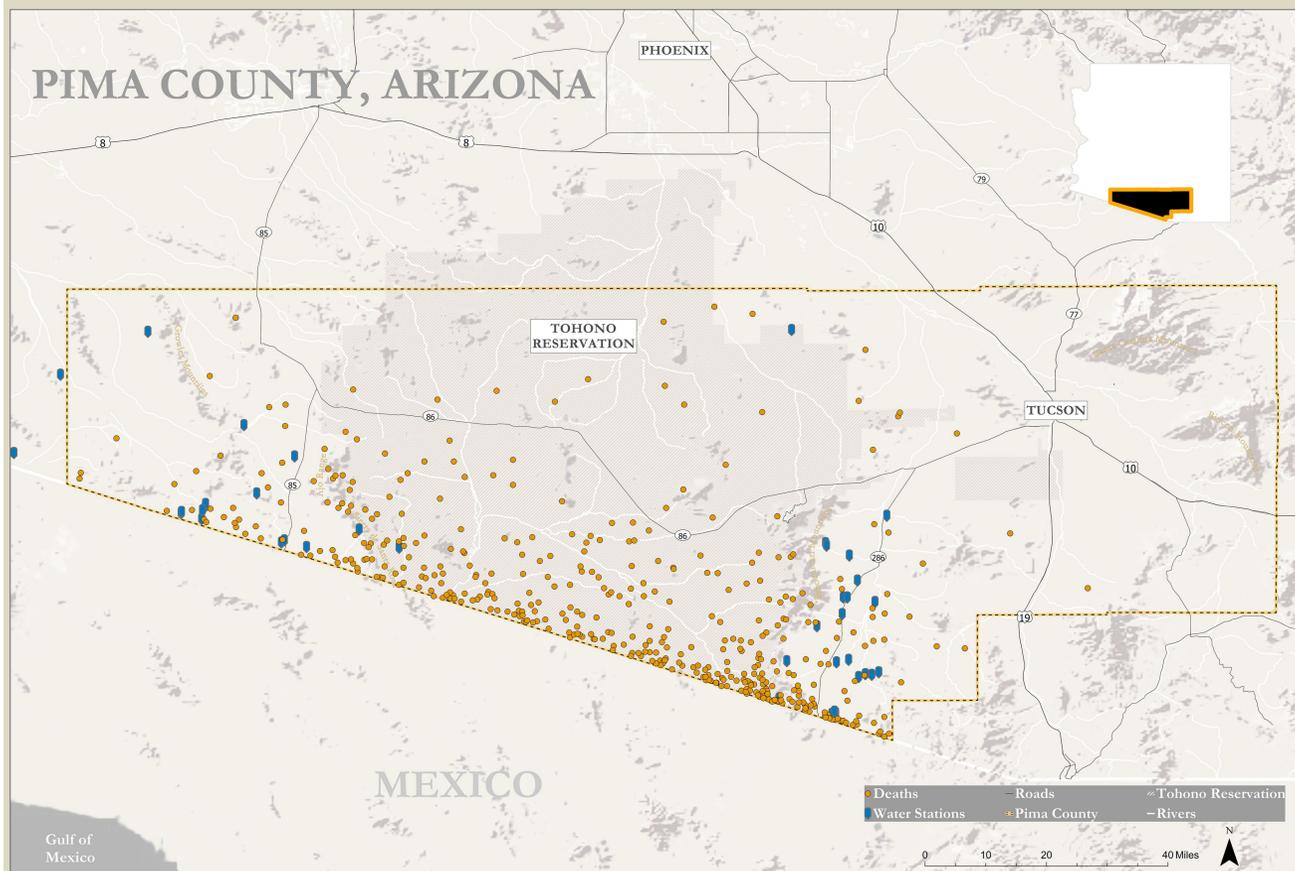


Figure 2. Our final map of migrant deaths in Pima County, AZ from January 2016 to May 2019. Water station data is from 2018.

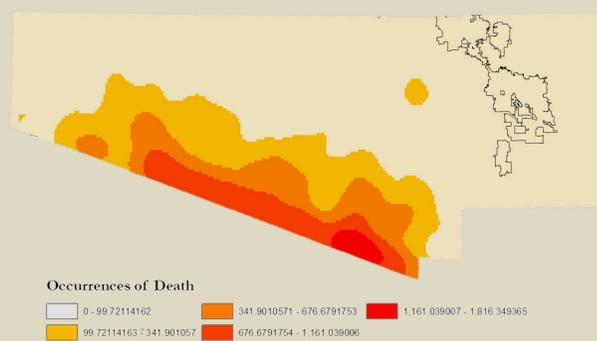


Figure 3. Kernel Density map of migrant deaths from 2016 to 2019

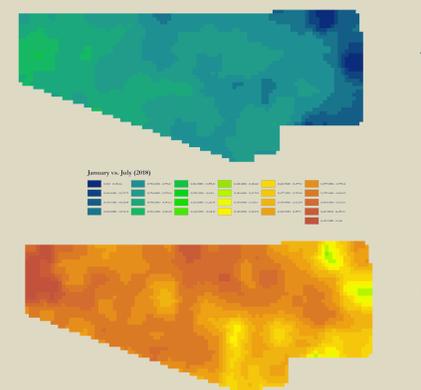
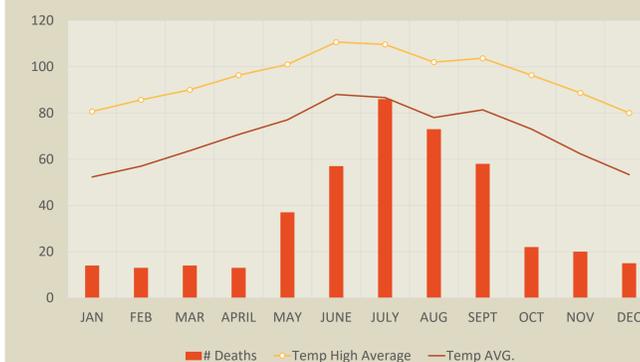


Figure 4A and B. Temperature maps from January 2018 (A) vs July 2018 (B)

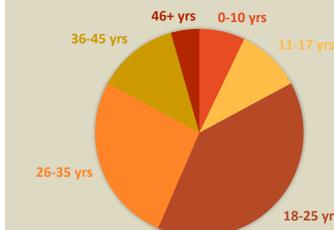
Discussion

While some data was redacted, the medical examiner included stats such as temperature, age, cause of death, and nationality. We created and illustrated the statistics from all three years below.

2016-2018 TOTAL DEATHS & TEMPERATURE (HIGH & AVERAGE) BY MONTH



2016-2018 AGES OF VICTIMS



CAUSE OF DEATH

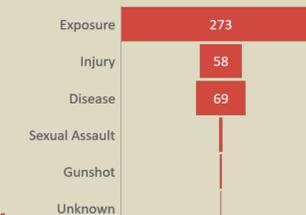


Figure 5. Top figure shows the average temperatures in Pima County by month. Bottom figures show the age and cause of death of the victims.

Conclusion

We hope that our project contributes to future analyses regarding immigration policy and border security. We would like to thank Sequoya Perez, Humane Borders and the Pima County Medical Examiner for providing the data and resources needed for this applied research project.



Submitted in partial fulfillment of the requirements of the Masters of Science in Geographic Information Science (MSGISci), August 9, 2019.

For additional information please contact: Brenda Camacho @ brenda.camacho@student.csulb.edu, Veronica Leon @ veronica.leon01@student.csulb.edu, & Ambar Rivera @ ambar.rivera@student.csulb.edu