Assessing and Mapping the Demographics and Environmental Concerns of Households in El Tololar, Nicaragua

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Background

- Nicaragua is the third poorest country in Latin America with 25.2% of the population surviving on less than $3.10 per day.[1]

- Approximately 41% of the population of Nicaragua live in rural areas reliant on farming.[2]

- El Tololar is an agrarian territory which has been largely deforested to make way for 1-crop farming, mainly peanuts and sugar cane.

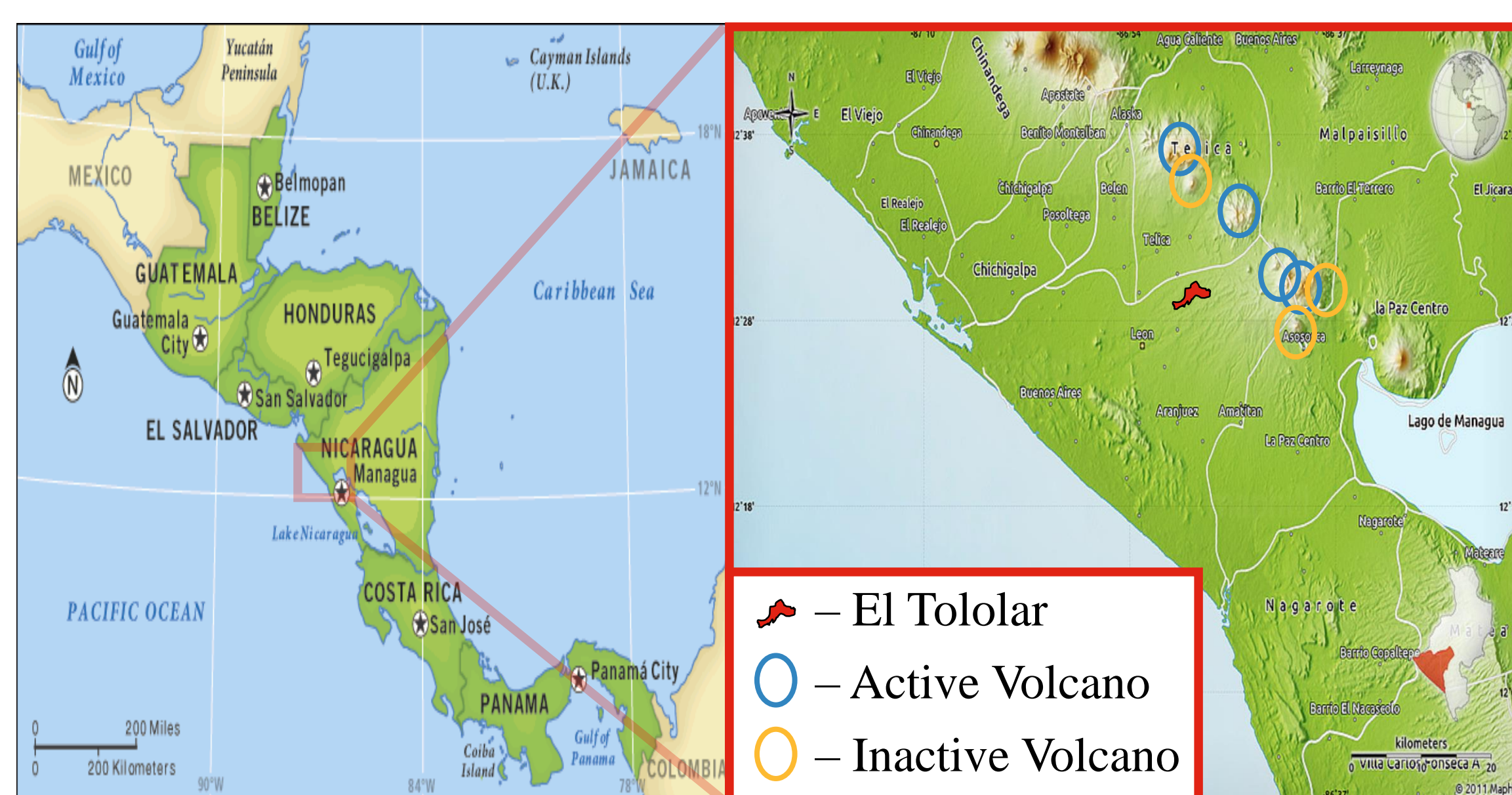- The territory of El Tololar is located approximately 10 km NE of Leon, Nicaragua as shown in Figure 1.

Figure 1. Location of El Tololar in Nicaragua.[3]

Objectives

1. Identify the environmental concerns of inhabitants of El Tololar, Nicaragua.

2. Characterize concerns by poverty status, educational level, employment, and geographic location.

3. Visualize the distribution of demographic characteristics and environmental concerns of residents by mapping.

Methods

- 449 Households out of 1,224 in El Tololar (36.7%) were surveyed from the region indicated in Figure 2.

- One member of each household was asked if the household was concerned or not about various environmental conditions.

- Results were tallied and regressed against measures of poverty, education, and employment.
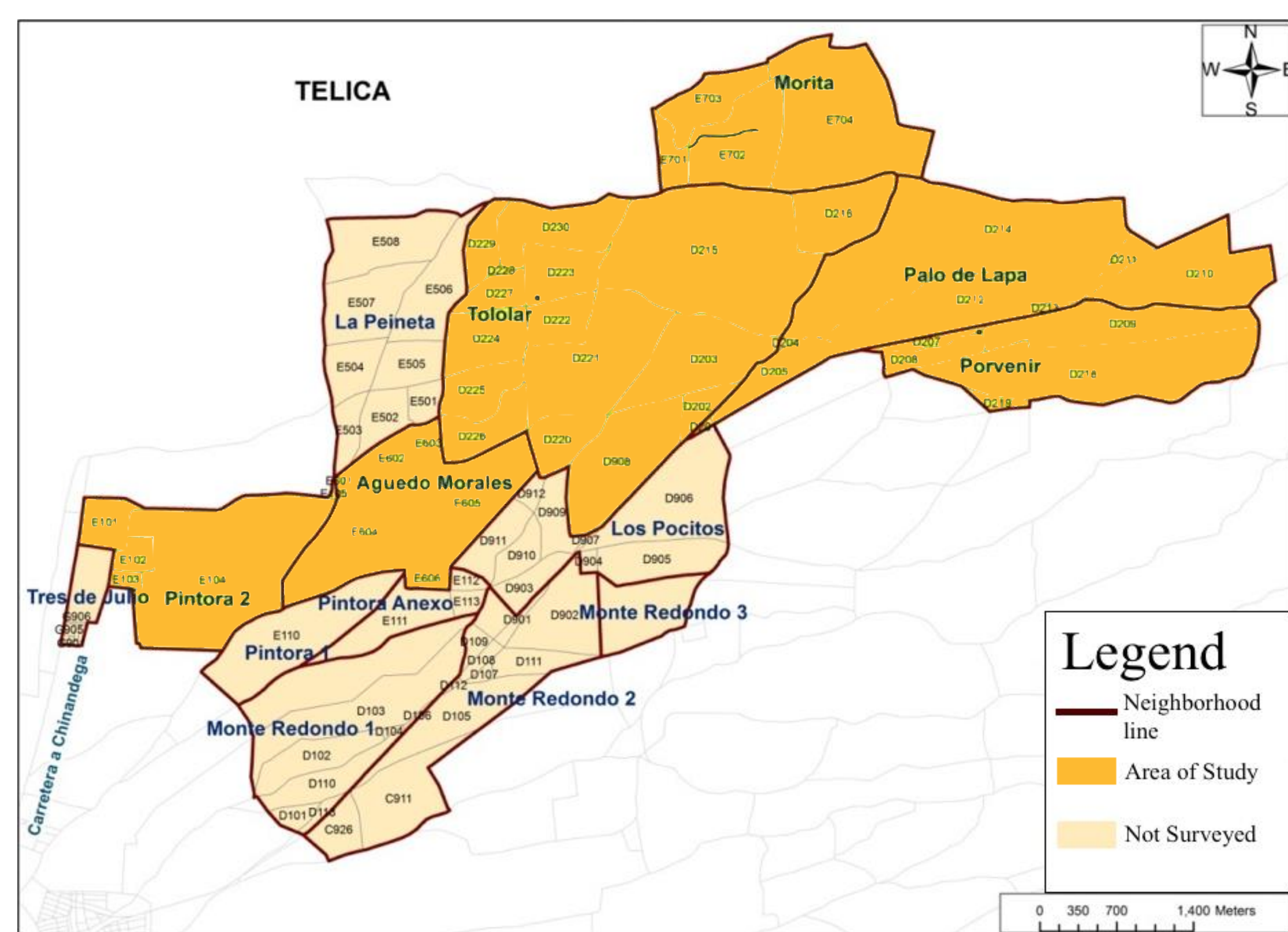

Figure 2. Surveyed area of El Tololar Territory.[4] Note that map areas of Tololar, Palo de Lapa, and Porvenir were combined to form 1 neighborhood known as Palo de Lapa.

Demographic Results

El Tololar Demographics
- 79.1% of households meet at least one criteria of poverty
- 38.9% of households have potable water
- 64.0% of habitants age 22+ had never attended high school
- 14.2% of habitants age 22+ are illiterate
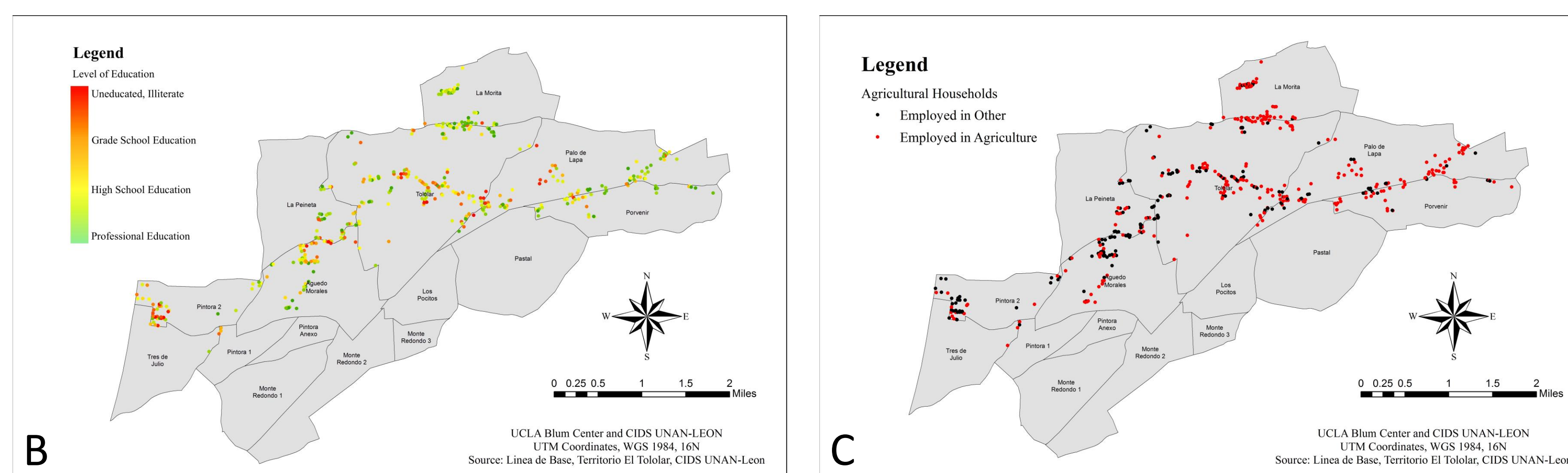- 58.8% of households contain at least one agricultural employee

Figure 3. Demographic maps of El Tololar. A. Household poverty score. B. Average household education. C. Households with at least one agricultural employee.
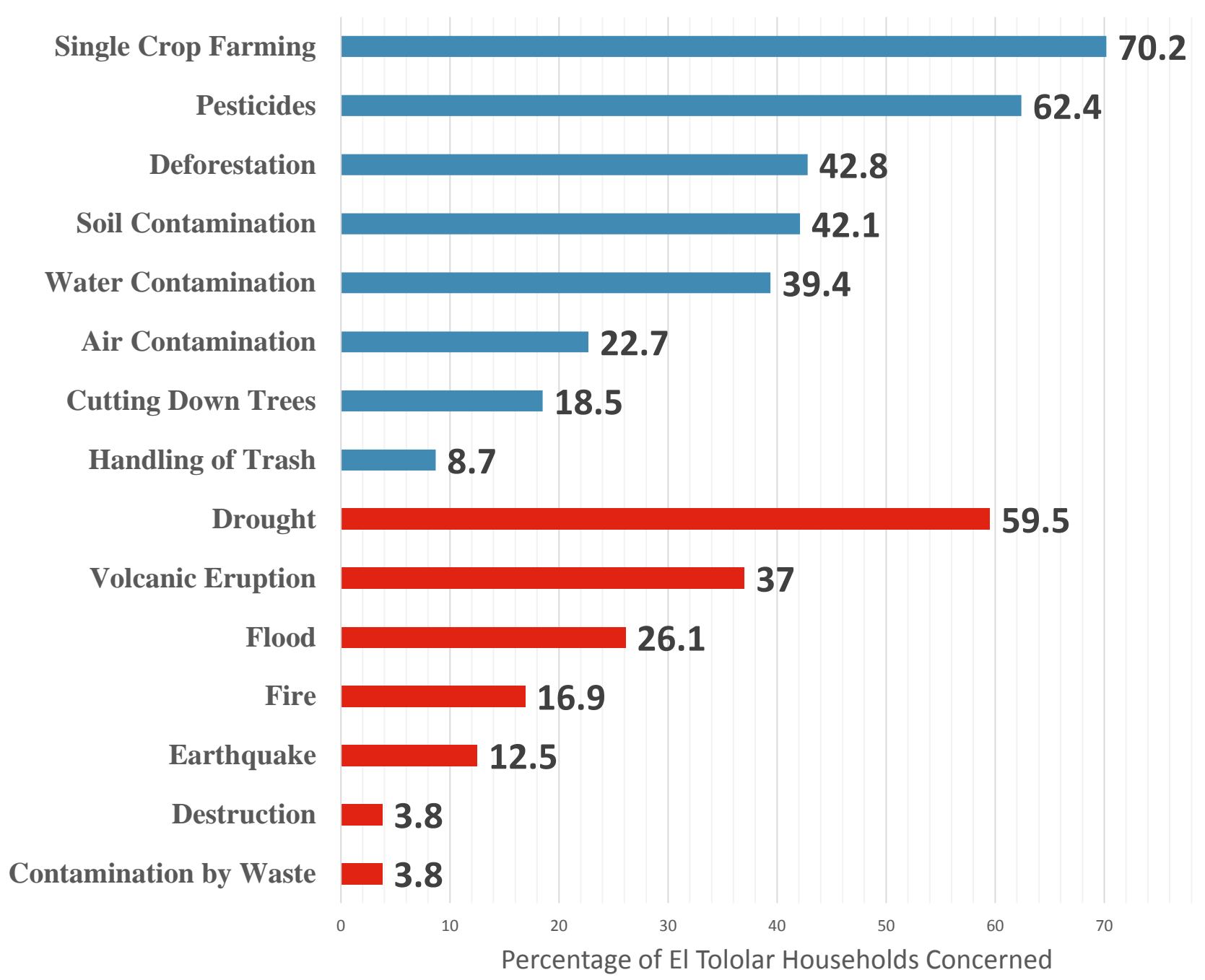
Environmental Concerns

Figure 4. Portion of households concerned about various man-made (blue) and natural (red) environmental conditions. Values are in percentages.
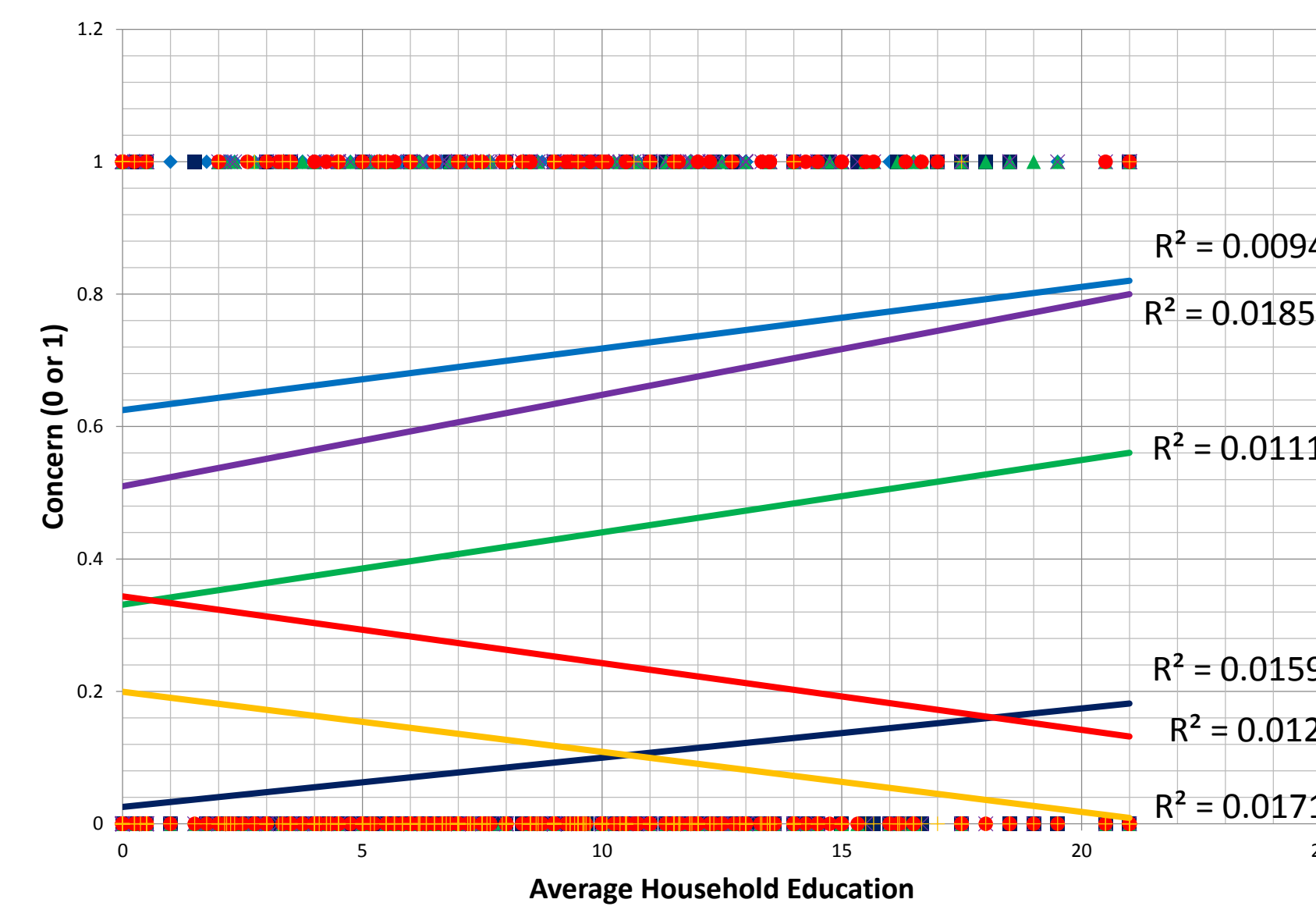

Figure 5. Concern for man-made environmental conditions tends to increase with education level while the opposite is true of natural conditions. $P<.05$
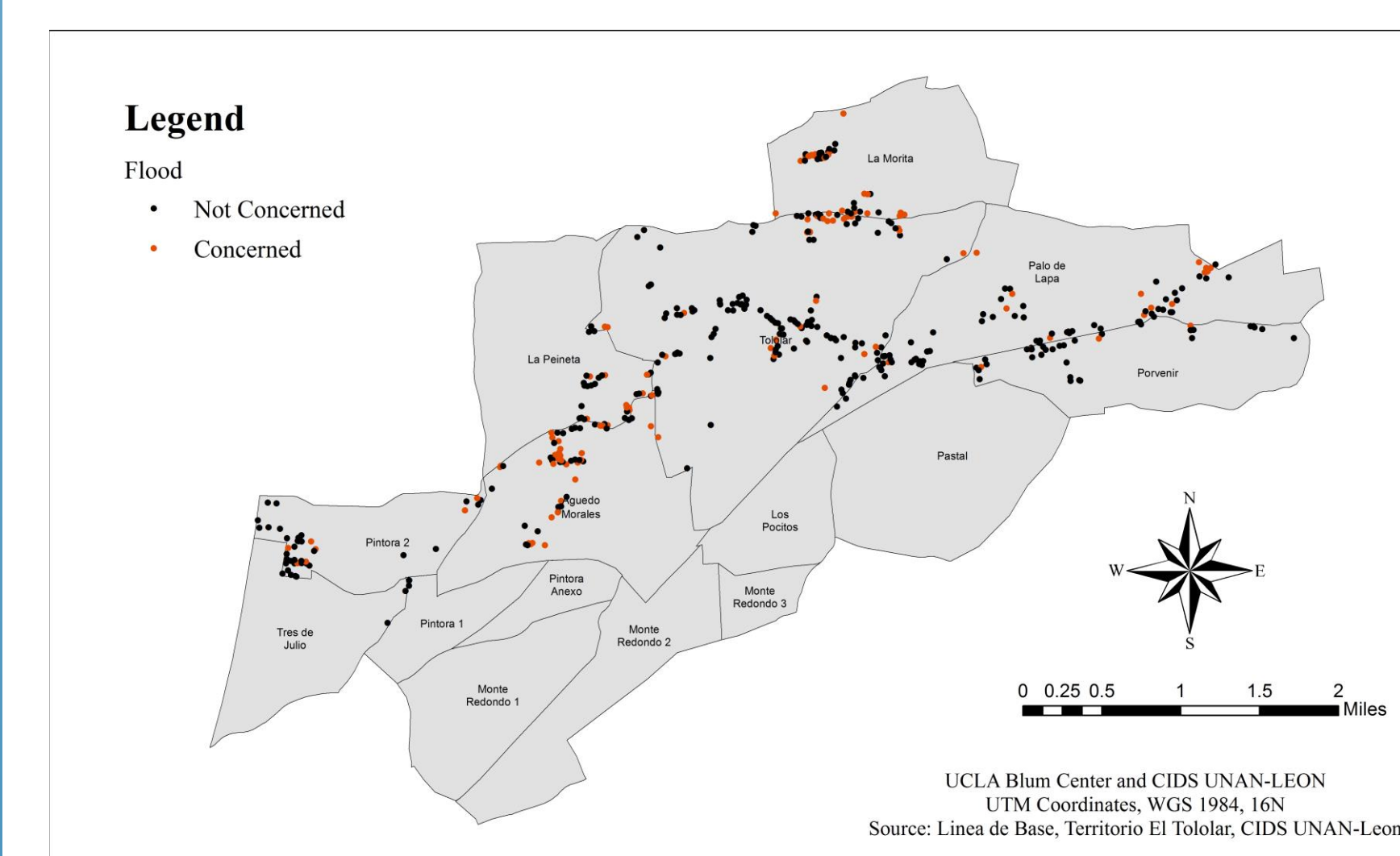
Geographic Distribution

Figure 6. Concern for flood in El Tololar is concentrated in Morita and Agueda Morales.
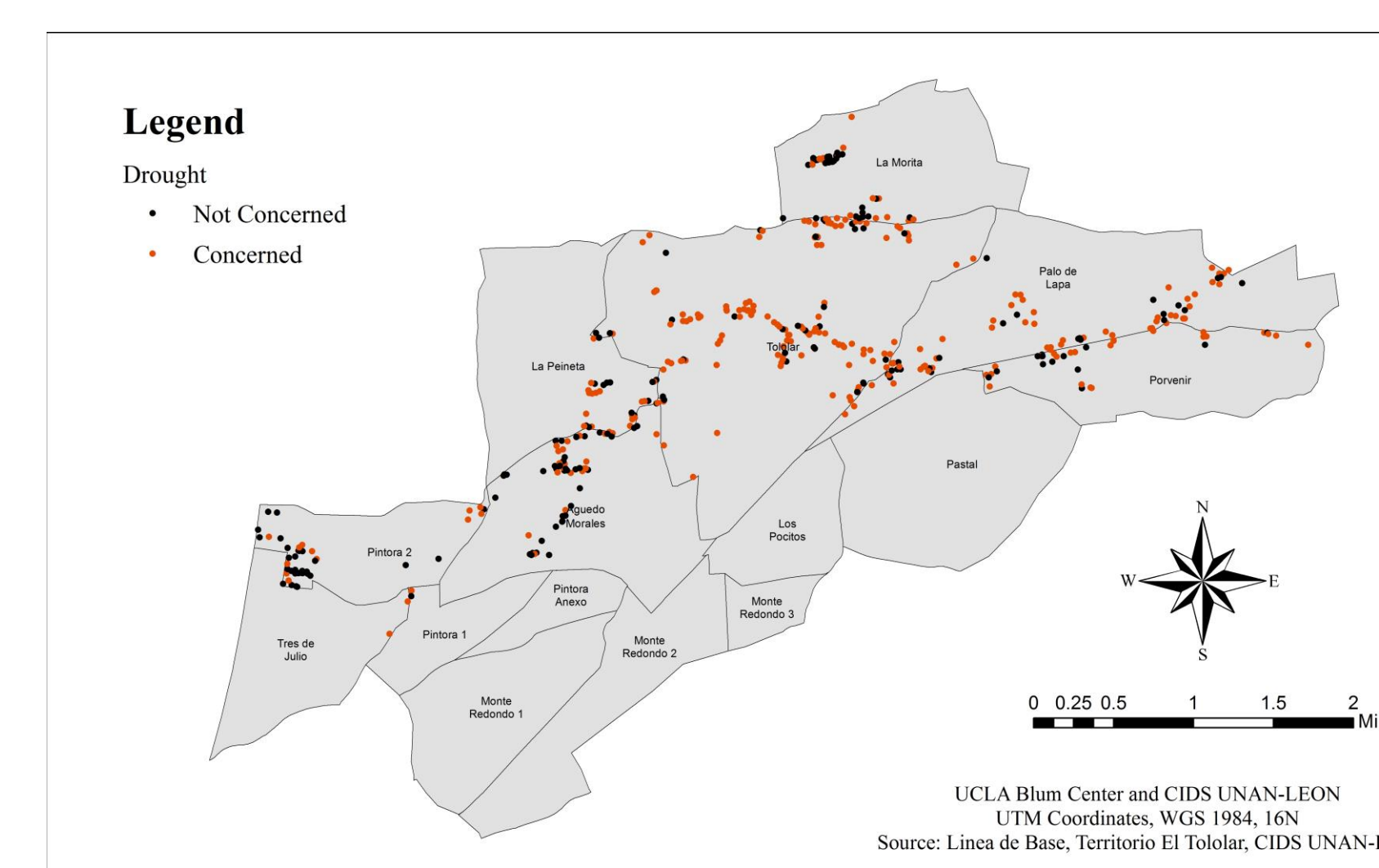

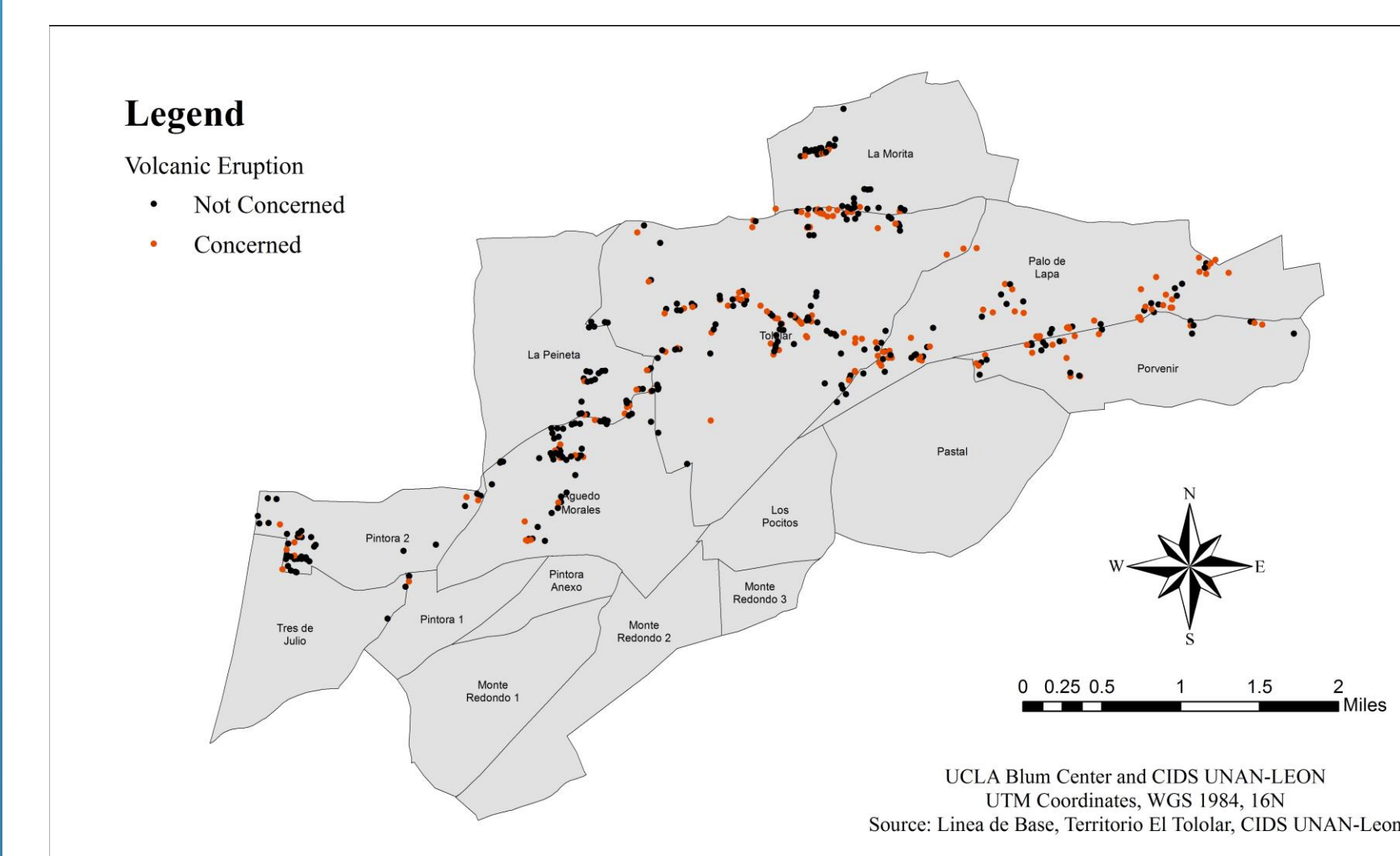Figure 7. Concern for drought in El Tololar is concentrated in Palo de Lapa.

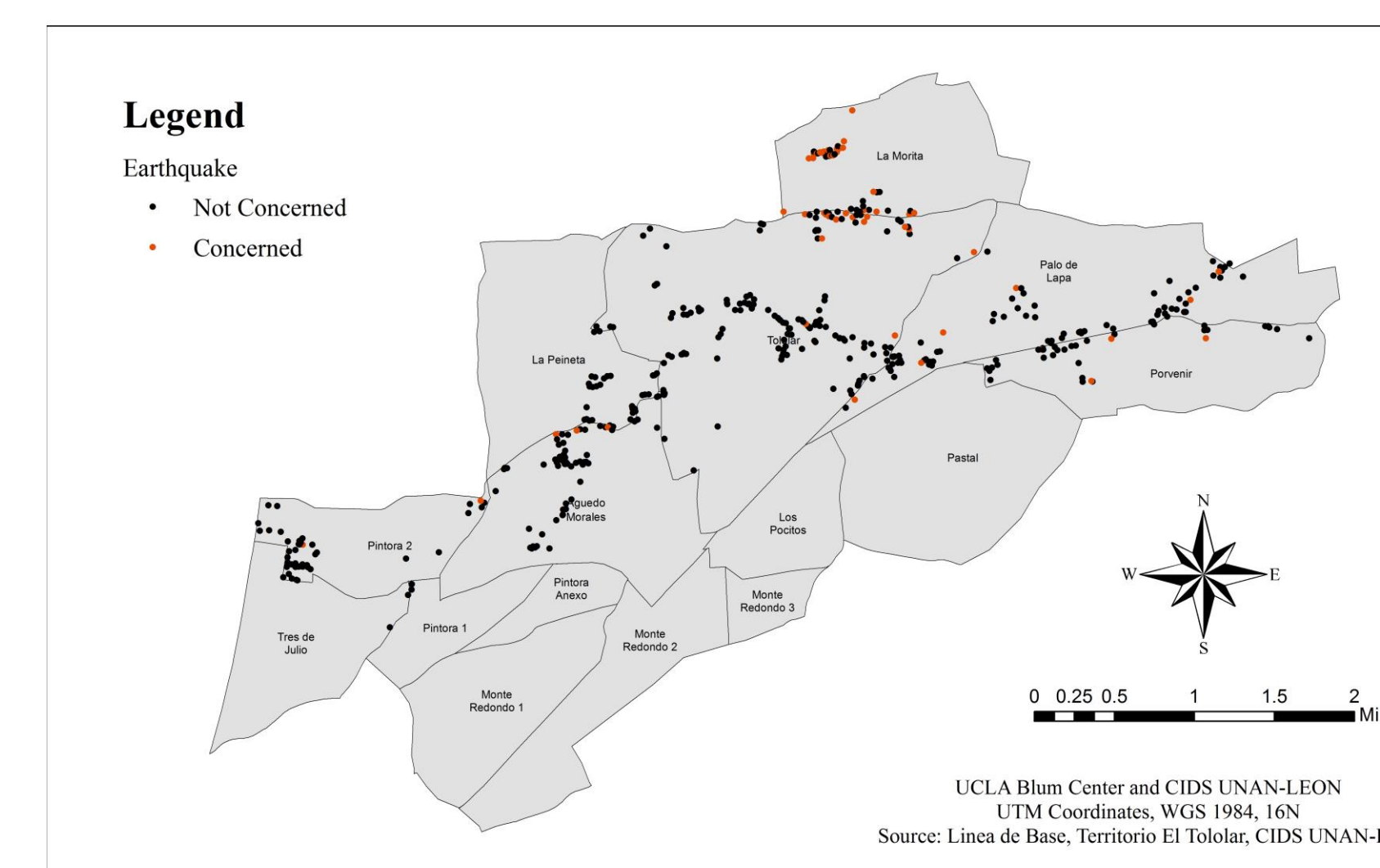Figure 8. Concern for volcanic eruption in El Tololar is concentrated in the Northeast.

Figure 9. Concern for earthquake in El Tololar is concentrated in the northern neighborhood, Morita.

Conclusions

Environmental Pollution and Health

- High levels of concern for single crop farming may refer to the usage of pesticides in peanut growing, intense heat experienced by field workers, and the possibility of crop failure.

- Though only 8.6% of homes were concerned about the handling of trash and only 3.8% about contamination from waste, 77% of households manage their waste products by burning their trash.

Education and Location

- Homes with higher educational scores were more concerned about man-made conditions such as pesticide usage and trash burning, while households with lower educational scores were more concerned about natural disasters such as flood and earthquake.

- Concern for several natural disasters depended highly on the location of the surveyed household.

Outcomes
- Findings suggest that community health concerns arising from the cash-crop farming which dominates the region have been inadequately addressed by the Ministry of Health.

- Digital mapping of demographic characteristics and environmental conditions can help researchers and public officials assess and respond to the unique needs of rural communities.

Works Cited

1. World Bank. (n.d.). Poverty and Equity: Latin America and the Caribbean. Retrieved from http://povertydata.worldbank.org/poverty/region/LAC

2. Orozco, Manuel S., Thomas W. Walker, Bernard Nietschmann, Rosendo Arguello, and Franklin D. Parker. "Nicaragua." Encyclopedia Britannica. N.p., 10 May 2017. Web. 11 July 2017.

3. "Physical Map of Leon." MapHill. N.p., n.d. Web. 11 July 2017.

4. Herrera Rodriguez, Andres, et al. "Linea de Base Territorio El Tololar – Leon / Nicaragua," Manuscript, 2014.

Acknowledgements

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