

#HAIYAN #ASSISTANCE

ICT Access & Humanitarian Response Following Typhoon Haiyan in the Philippines, 2013

Background



As natural disasters become more frequent and more powerful, humanitarian agencies such as the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) are working to better target their aid to the most vulnerable affected populations. Social media is playing an increasingly relevant role in disaster response.

This project focuses on the use of social media data for humanitarian response following Typhoon Haiyan. One of the strongest storms ever recorded, Typhoon Haiyan devastated the Philippines in November 2013, resulting in over 6,000 deaths and affecting over 11 million people. During this time, the Digital Humanitarian Network launched MicroMappers, a web-based application which allowed volunteers to remotely review and categorize tweets related to Typhoon Haiyan. Digital volunteers mapped the needs resulting from the typhoon, to enable UN OCHA and its partners to respond more effectively during their relief efforts.

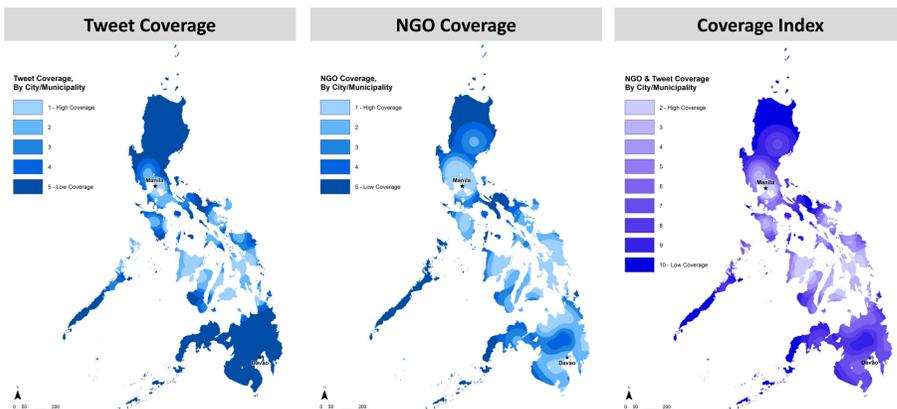
The primary goal of this project is to analyze the effectiveness of crisis-mapping as a tool for targeting during disaster response. I seek to examine the demographic characteristics of those populations which sent Typhoon Haiyan-related Tweets, and establish whether the location of humanitarian assistance was related to the presence of those Tweets. UN OCHA partnered with Bond, a network of UK-based international non-governmental organizations (NGOs), to deliver assistance. I will not focus on which aid organizations had the greatest presence during the crisis response. Instead, I hope to identify correlation between crisis-related Twitter data and humanitarian assistance.



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Key Spatial Questions

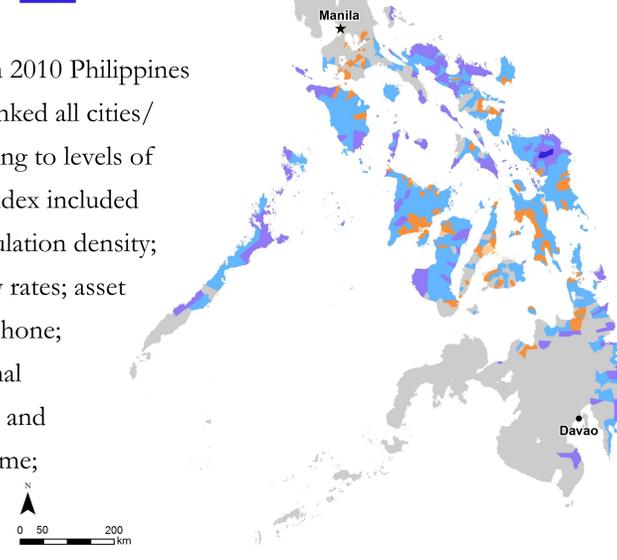
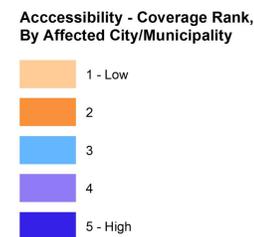
- 1) Which areas did humanitarian agencies target for assistance?
- 2) Is the presence of humanitarian agencies in a city/municipality correlated with the amount of crisis-related tweets recorded by humanitarian agencies?
- 3) Are there populations which were underserved and lack access to information and communication technology (ICT)?



Methodology

In order to determine whether humanitarian agencies targeted the most vulnerable populations within the areas affected by Typhoon Haiyan, I conducted six major stages of analysis. First, I created an index based on 2010 Philippines census data, which ranked all cities/municipalities according to levels of access to ICT. This index included 10 key variables: population density; literacy rates; illiteracy rates; asset ownership (landline phone; mobile phone; personal computer; and none); and Internet access (at home; outside of home; no access). Secondly, I

ICT Accessibility-Coverage Index for Affected Areas



created zones of coverage for those areas which sent crisis-related Tweets regarding the storm. Thirdly, I created zones of coverage for those areas in which NGO activities were recorded in response to Typhoon Haiyan. Fourth, I combined these factors into one map, which shows the coverage index for crisis-related Tweets and NGO activities. Fifth, I combined the coverage index with the interim ICT accessibility index, in order to determine areas with low ICT accessibility which also lacked coverage. Finally, I extracted the comprehensive index to map those cities/municipalities which were affected by Typhoon Haiyan.

City/Municipality Population By Final Accessibility Rank		
ICT Accessibility Rank	No. of Cities/Municipalities	Total Population
Very High	109	27,677,272
High	426	26,088,947
Medium	526	19,461,097
Low	469	13,979,660
Very Low	85	2,400,575

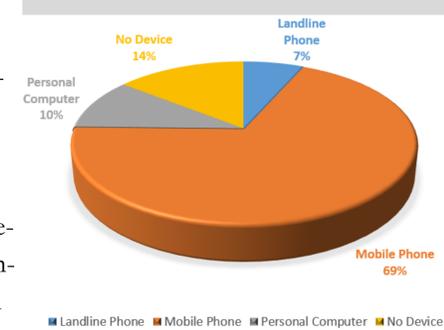
Limitations

I experienced several limitations during the data gathering and data analysis phases of the project. I was unable to access income data at the city/municipality level of analysis. I was also unable to disaggregate age census data at the city/municipality level. Therefore, the ICT Accessibility Index does not include age or income data, which would be key to such analysis.

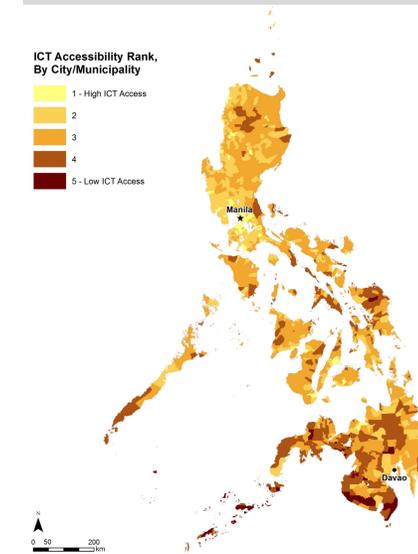
Results & Recommendations

While this analysis is not sufficient to isolate causal relationships, it identifies clear patterns in ICT access and NGO assistance. As predicted, the ICT Accessibility-Coverage Analysis shows that areas with more access to ICTs sent more Tweets. These areas were also more likely to have NGO coverage. However, based on the results of the ICT Accessibility-Coverage Index for Affected Areas, there were several affected areas which lacked ICT access, sent few or no crisis-related Tweets, and were also not targeted by NGOs for humanitarian assistance. Therefore, while aid organizations were able to target their aid activities to many affected areas in need, it is clear that there were many affected areas lacking ICT access and which were underserved by aid organizations.

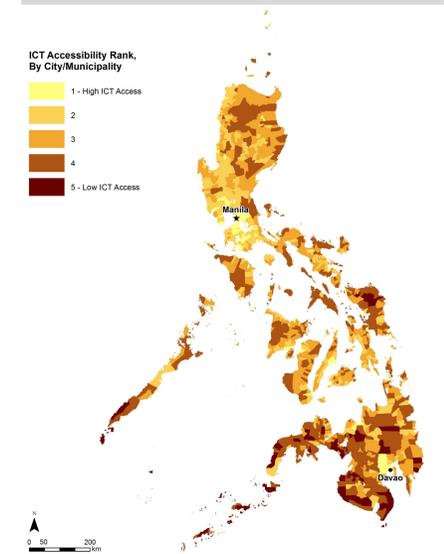
% Household Access to ICT Devices



Interim ICT Accessibility Index



Comprehensive ICT Accessibility Index



As crowdsourcing and crisis-mapping gain greater global attention, it is important to recognize the inherent limitations of both strategies. As this project demonstrates, there is selection bias based on criteria such as access to ICT devices, Internet access and literacy rates. Age, gender and income are also key determinants of vulnerability. Therefore, the humanitarian community must realize that crisis-mapping—and technology at large—are not a panacea; crowdsourced data must be supplemented by other forms of data in order to improve targeting and better deliver assistance to those who need it the most.

Projection: WGS UTM Zone 51N, Transverse Mercator (Linear Unit: Meter)

Data Sources: Philippines Statistics Authority; Humanitarian Data Exchange (HDX); National Disaster Risk Reduction and Management Council (NDRRMC); Database of Global Administrative Areas (GADM); Direct Relief Services; Global Disaster Alert and Coordination System (GDACS); The Telegraph/Getty Images

Cartographer: Danielle S. Robinson

Course: P207: GIS for International Applications

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