

Landsat Data Predictive of Cholera

Retrospective Case Study Correlating WHO and Landsat Data Haiti 2010

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According to the Pan American Health Organization (PAHO) and the World Health Organization (WHO) there have 711,442 cases of Cholera in Haiti since the 2010 earthquake of which 400,103 were hospitalized and of which 8,646 people died. The source of the epidemic was linked to Haiti's largest river, the Artibonite. Every 8 days the whole globe gets scanned by the various sensors of the United States USGS Landsat Program, including the areas affected before and after 2010 earthquake. This study looked at detecting spectral differences that occurred in the Artibonite river before and after the earthquake to highlight leakage of raw sewage into the river from damaged infrastructure.

This was then correlated with spatiotemporal WHO data of the epidemic. As the river is used for drinking, washing and bathing, and as Cholera is contracted through the oral-fecal route, it would be beneficial to healthcare workers and civil engineers to target sources of Cholera in rivers. This study was intended as a "proof of concept" to create a low-cost tool to help manage future Cholera outbreaks.

No correlation was found using band 8 (panchromatic) of the Landsat 7 mission and the WHO data of the epidemic at 3 locations along the river. Integrating more of the sensors of the Landsat or other missions along with refining the algorithm for separating water from land in a river setting are the biggest confounding factors that would require more research to detect a correlation.