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Exploring Patterns of Uncertainty in Crowdsourced Crisis Information

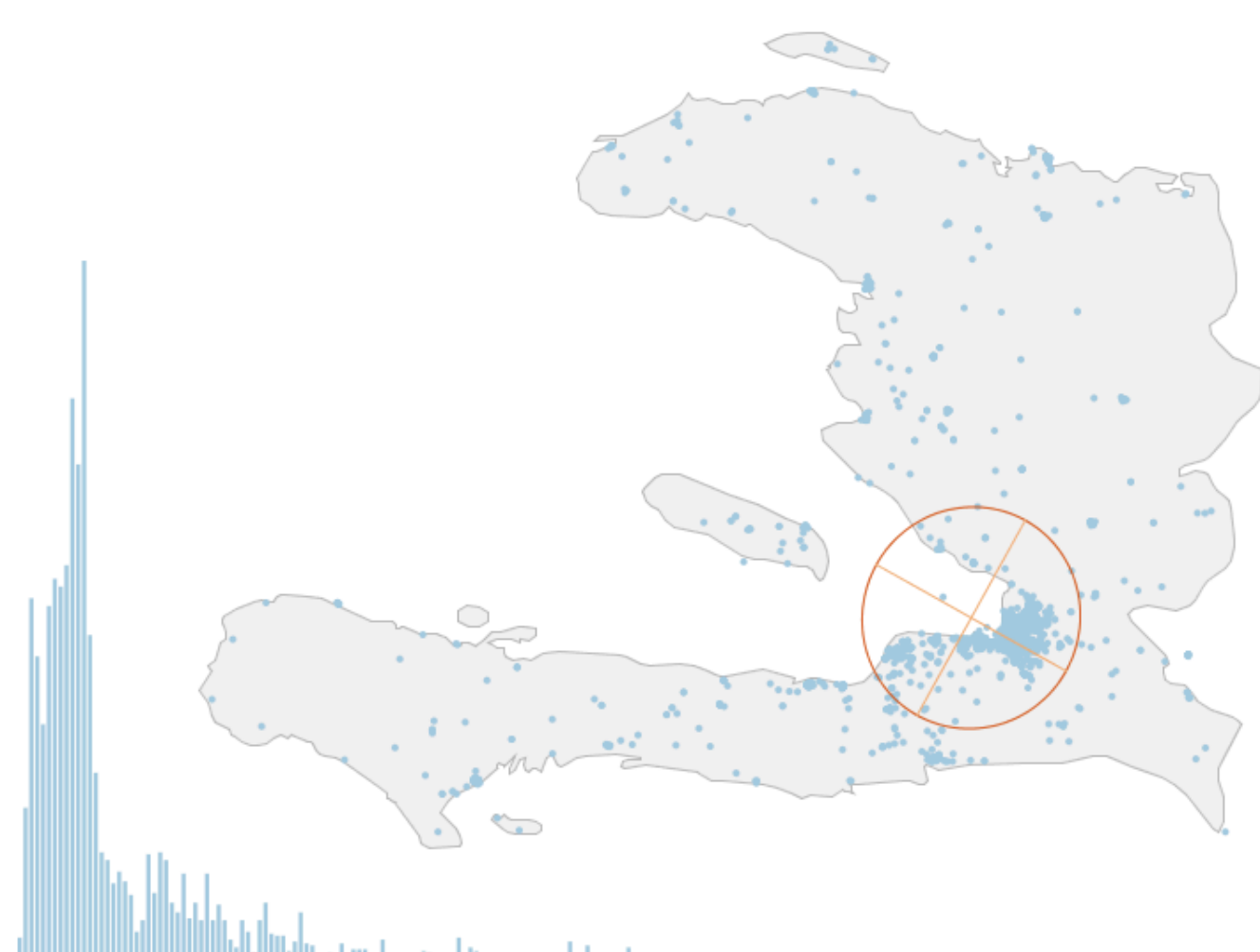
Iain Dillingham, Jason Dykes and Jo Wood—giCentre, City University London

The humanitarian community is reluctant to use reports from social media when responding to a crisis event, as it fears the costs of untrustworthy and inaccurate information.

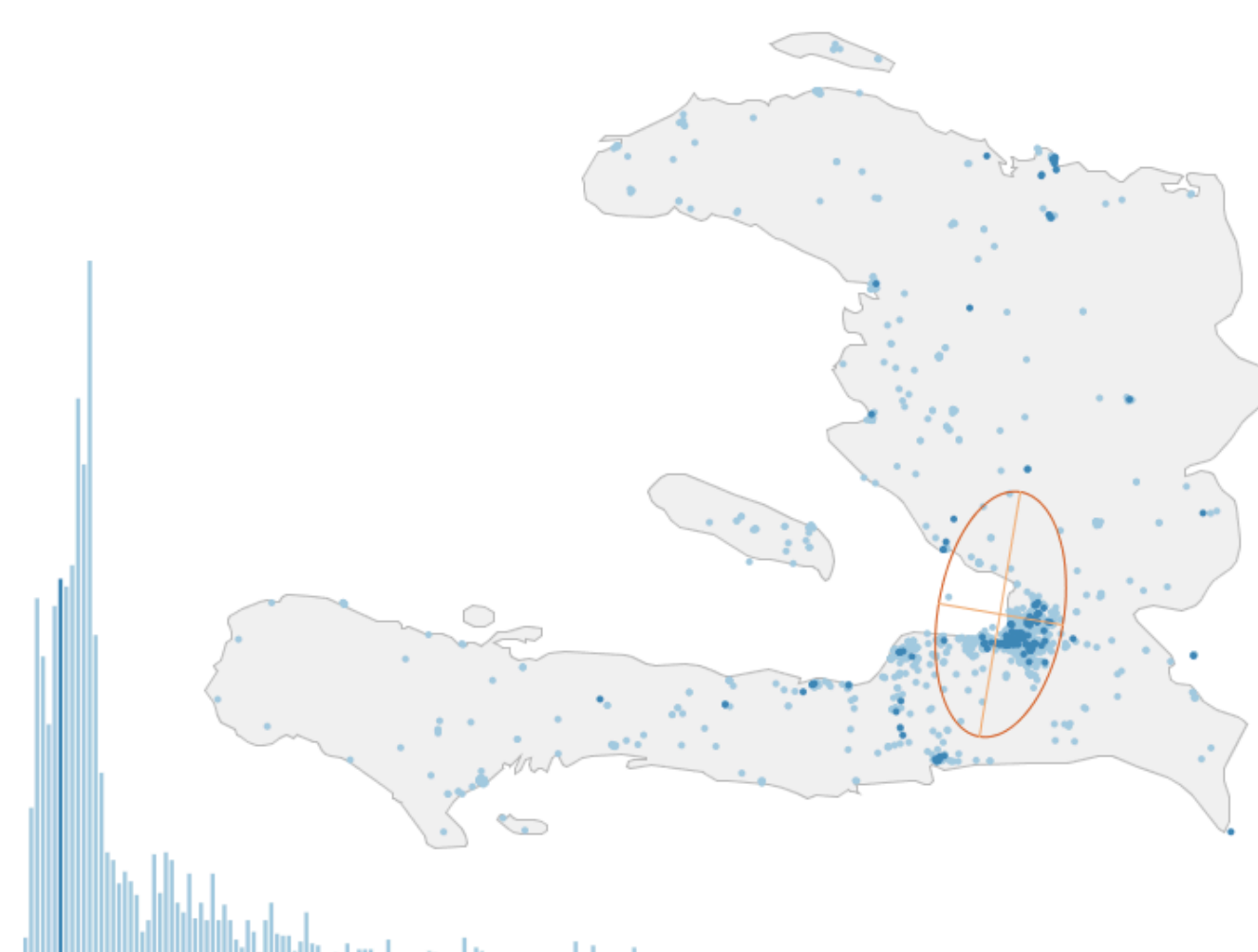
Organisations such as Ushahidi use crowdsourcing to identify reliable reports, but this introduces further uncertainty.

Our prototype software allows us to explore the spatial and temporal distribution of crisis event reports gathered in the wake of the 2010 Haiti earthquake.

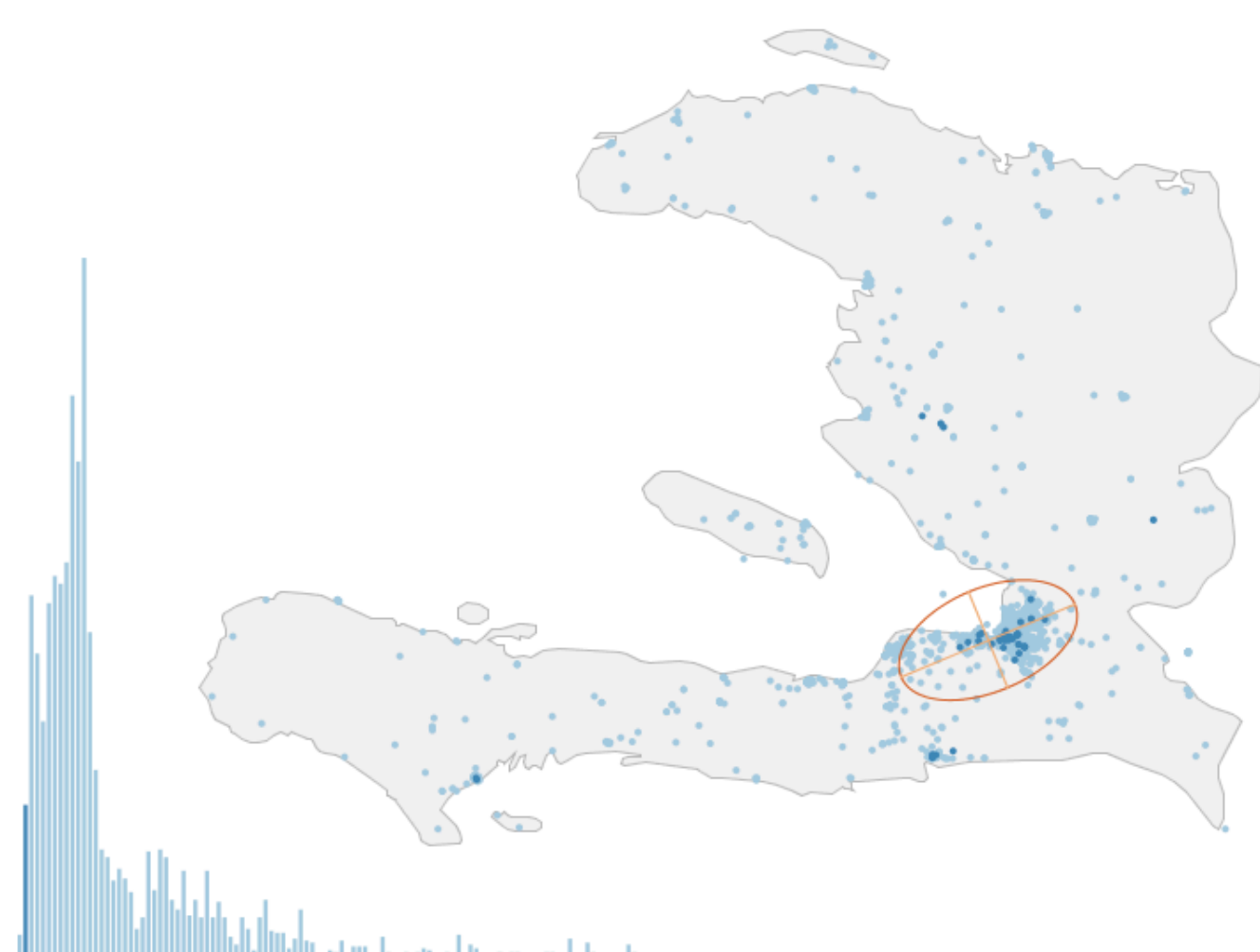
A standard ellipse provides a convenient summary of the spatial distribution of reports from a given time period.



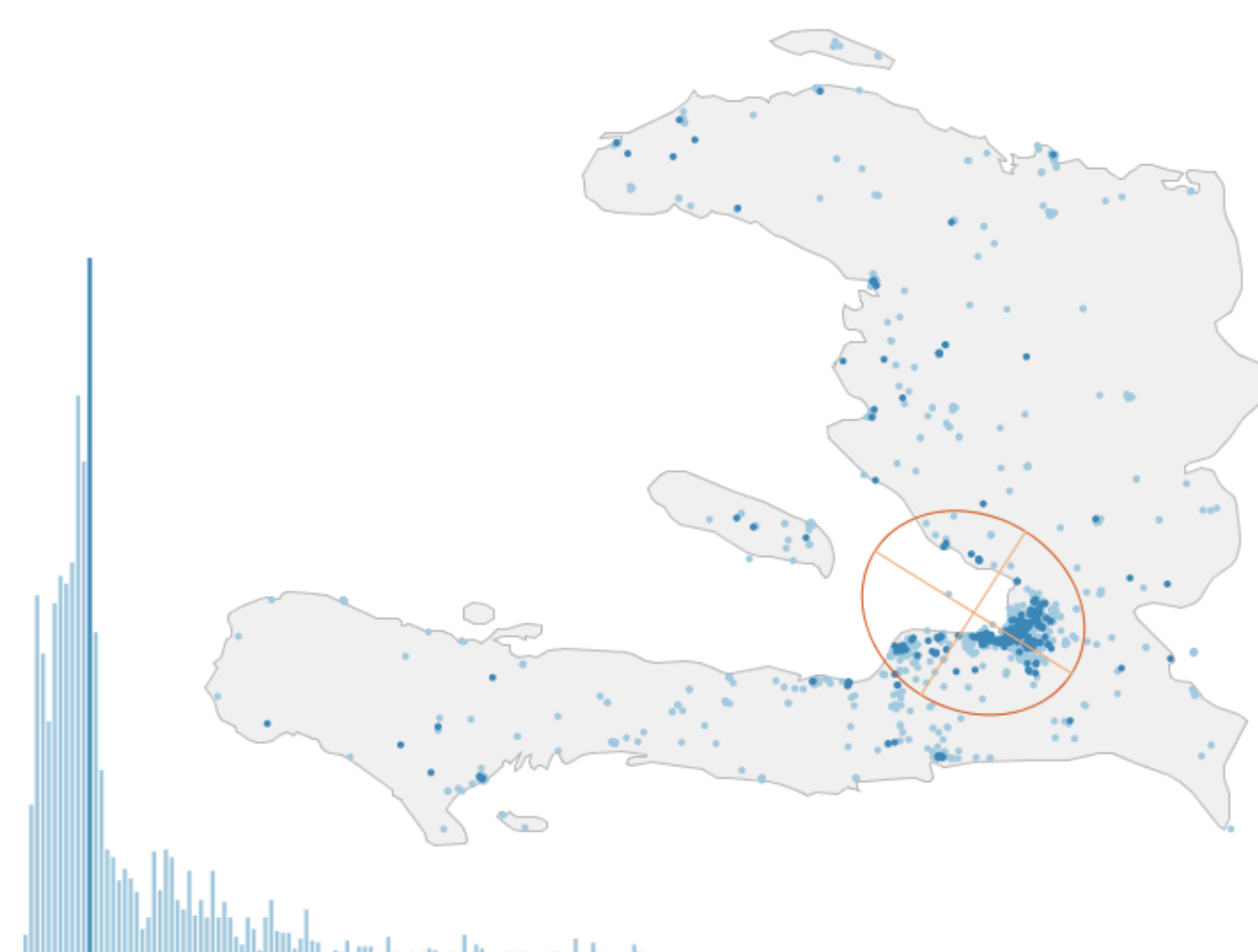
Spatio-temporal distribution, dataset duration



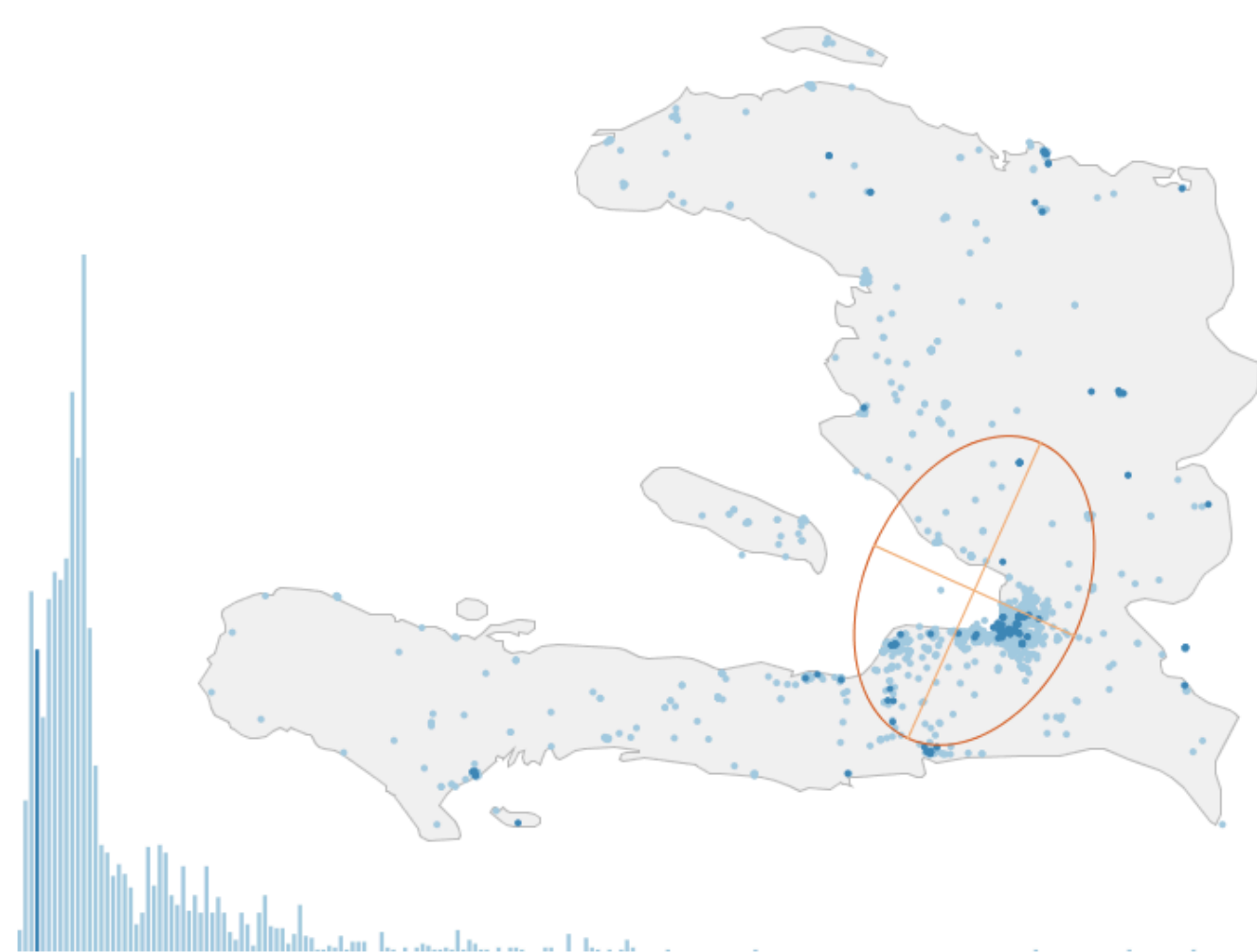
Spatio-temporal distribution, day 7



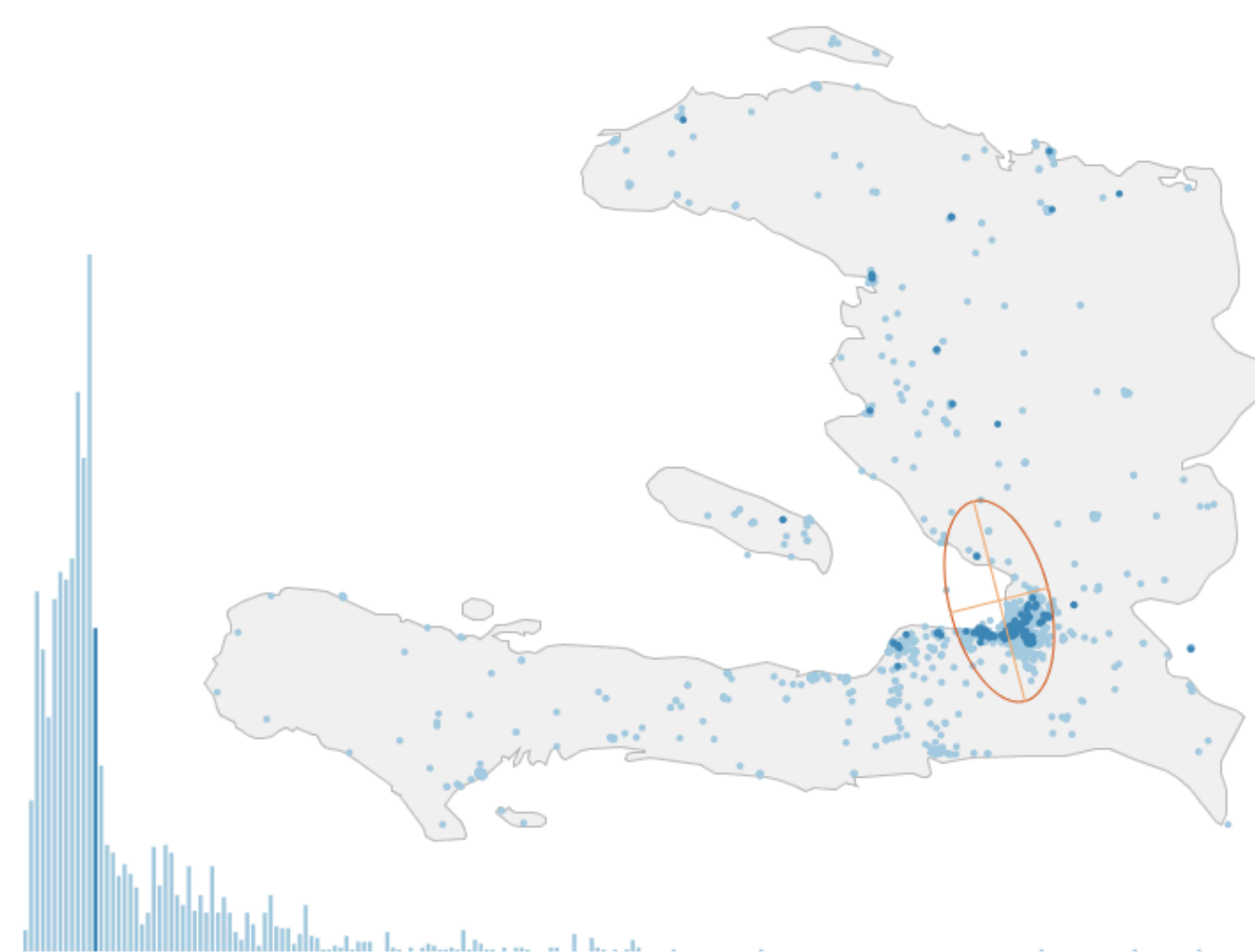
Spatio-temporal distribution, day 2



Spatio-temporal distribution, day 12



Spatio-temporal distribution, day 4



Spatio-temporal distribution, day 13

By identifying interesting spatio-temporal patterns, we can begin to hypothesise about the completeness of the information.

Standard ellipse

A standard ellipse is constructed about the mean centre of a set of points. Its orthogonal axes, each of one standard deviation in length, extend in the direction of maximum and minimum dispersion.

By incorporating text mining techniques we hope to investigate the relationship between locality descriptions and geographic coordinates.

Example report

id	15
title	Karibe Hotel Collapsed
date	2010-01-13 10:57:00
location	Karibe Hotel, Juvenat 7...
description	The Karibe Hotel and adjoining apartments...
category	5a. Structure effondres...
latitude	18.51933
longitude	-72.301626
approved	YES
verified	NO

Most locality descriptions (values of the location attribute) refer to features, such as named places, rather than to distances and directions from features.

References

[1] A. M. MacEachren, A. Robinson, S. Hopper, S. Gardner, R. Murray, M. Gahegan, and E. Hetzler, "Visualizing Geospatial Information Uncertainty: What We Know and What We Need to Know," *Cartography and Geographic Information Science*, vol. 32, no. 3, pp. 139–160, 2005.

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