

# CF Challenge Fund

## FloodTags

Using Twitter data to map flood risk

Credit: Mary Joy Evalarosa/ IFRC

### CONTEXT

Thousands of messages per hour are shared on Twitter during flood events. These include early, on-the-ground observations accessible in real-time. The arguably lifesaving nature of this information has not gone unrecognized by humanitarian agencies. After witnessing an Indonesian NGO manually transcribe tweeted data onto a map to inform disaster response actions, a team at FloodTags decided to create a better solution to efficiently and effectively capture risk information generated on social media to help improve preparedness and response actions.

The Philippines, both disaster-prone and especially active on social media, was selected as a highly relevant context to develop the initiative. Working with local actors like the Philippine Red Cross (PRC), the team combined natural language processing and flood modeling to improve risk information via social media activity, presenting the information in standardized maps, tables, and graphs to effectively support response and preparedness procedures.

The project benefited from contributions by the Philippine Red Cross, the ICT research community COMMIT and Topconsortia Kennis en Innovatie (TKI), as well as the Red Cross Climate Centre, Deltares, Radboud University Nijmegen, and VU University Amsterdam. [CLICK TO SEE THE DASHBOARD](#)

### HIGHLIGHTS



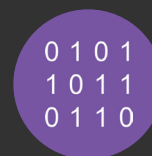
Created a tool to quickly analyze social media in combination with hydrologic models to improve flood response and preparedness.



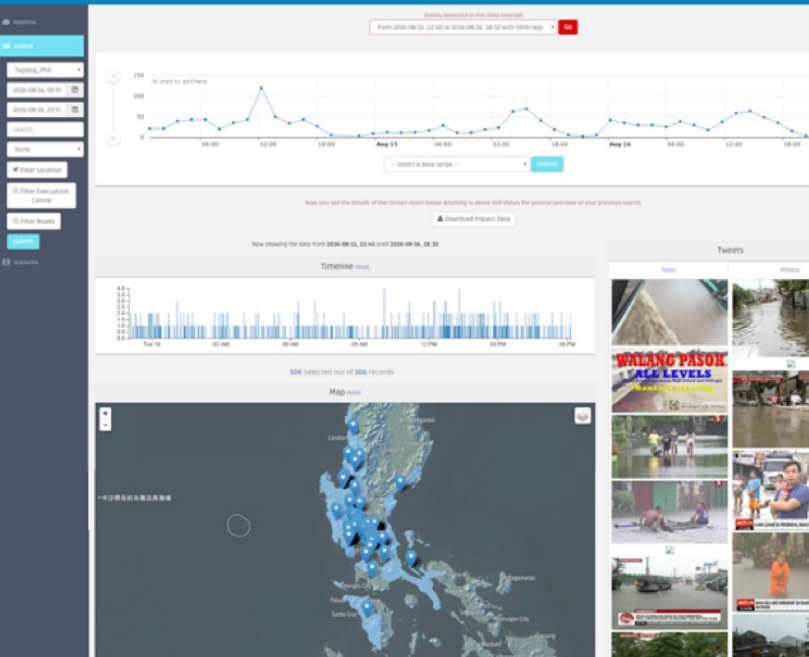
Explored sex-disaggregated data to better understand gender issues and build an evidence base to guide inclusive approaches.



Capturing real-time locally-specific data, the tool keeps pace with a changing disaster risk landscape due to climate change.



Using supervised machine learning, the tool uses end-user feedback to improve the filters and increase response effectiveness.



Credit: Cheryl Gagalac/ IFRC

## APPROACH

Extensive scoping research helped determine how the tool's design could best support PRC's existing preparedness and response measures. The team worked with lead PRC staff, including personnel and officers in charge from the department of Safety Services, Disaster Management Services, Operations Centre, Communication, and the focal point for gender issues. All aspects of the software, including functional, technical, societal, collaborative, and sustainability issues, were wholly stakeholder driven.

To incorporate the expertise of the PRC, the project developed a tool called "The Relevancer." Using a supervised machine-learning approach, the PRC was able to exclude irrelevant material and add specific labels to Twitter content. The tool then generates and applies new filters to the incoming Twitter feed, ensuring PRC receives information customized to their needs.

FloodTags, The Red Cross Climate Centre, and the academic partners developed the required software using their expertise on disaster response and preparedness, flood and impact modeling, natural language processing, and programming with an eye on specific user needs. A prototype demonstration with Operations Centre of the PRC was a major success, with more improvements being incorporated and additional ideas flagged for the second phase of the project.

"The tool's role to improve reporting during disasters should, in turn, support more timely and better informed response and preparedness actions. Ultimately this will help to improve outcomes for those vulnerable to disasters."

– Restylou Talamayan, Manager, Disaster Management Services, PRC

## NEXT STEPS

With the achievement of this project, the next step is to integrate the results into the existing software and procedures of the PRC. This includes linking the social media analysis to national forecasting tools. Also, the design process generated locally-driven ideas to maximize the software's potential, including gender dis-aggregation of the Twitter data and further research into how best to support inclusive disaster risk management. The team is also exploring the development of mobile apps to provide PRC staff with on-the-ground situational awareness, and engaging with social media users to better spread awareness.

The newly designed software is being prepared for scaling under the Dutch Partners For Water Programme. This includes integration of the tested components into one flexible software platform and distribution of the data, adhering to international data exchange standards, to help other disaster risk agencies better collaborate and benefit from these efforts.