
Google
Flood Forecasting Initiative

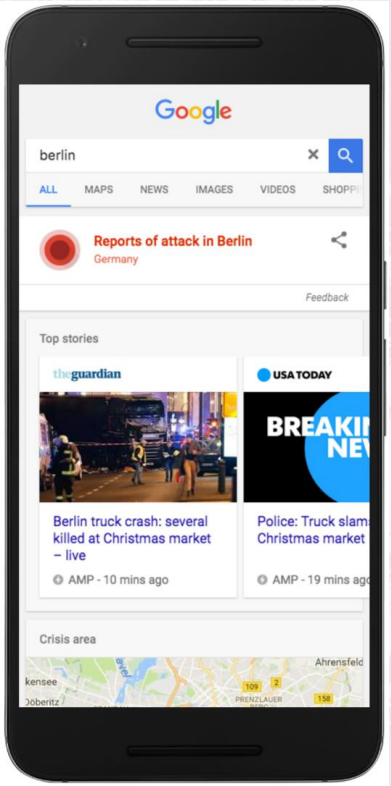
Google Crisis Response

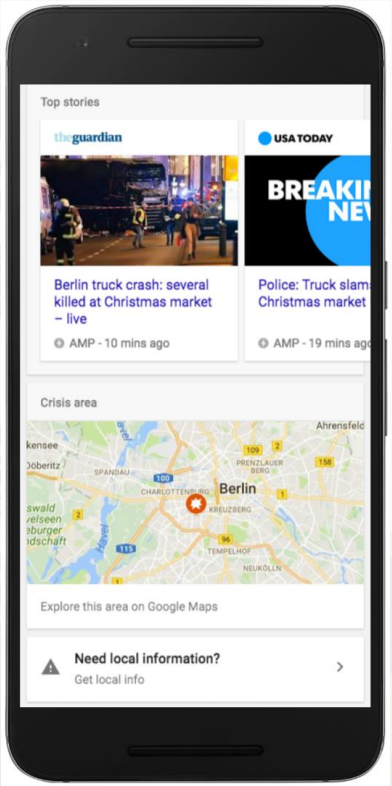
Our Mission

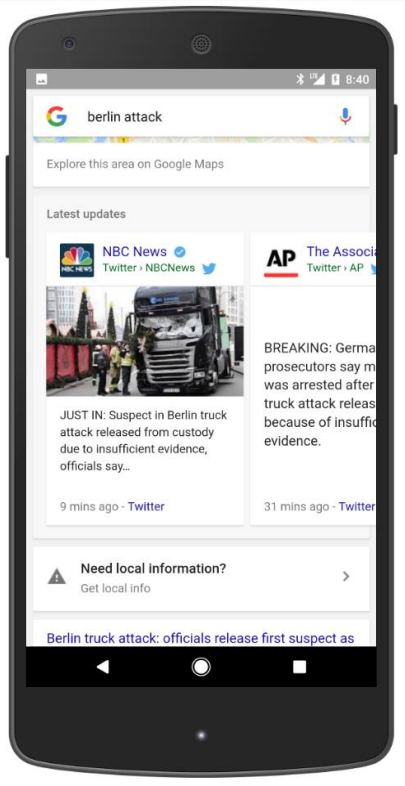
Save lives and prevent suffering with timely information.
Help everyone make better decisions in emergencies by quickly getting them credible, actionable information; enabling them to contribute and exchange information.

SOS Alerts - The Beginning

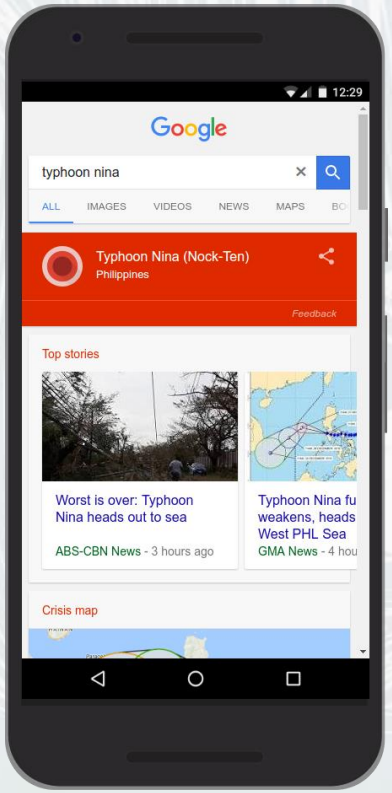
SOS Alerts - Terror Attacks

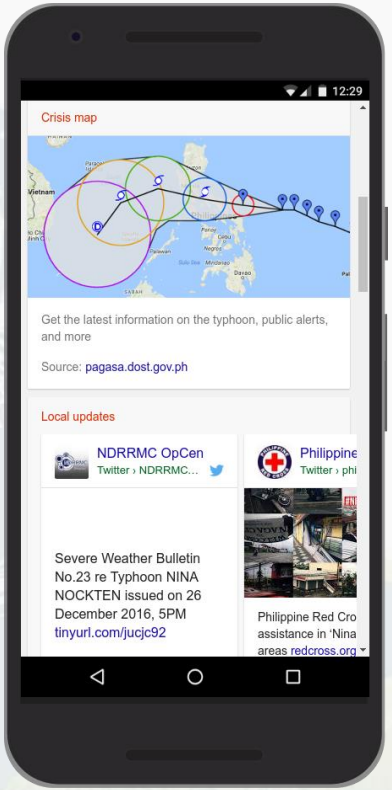


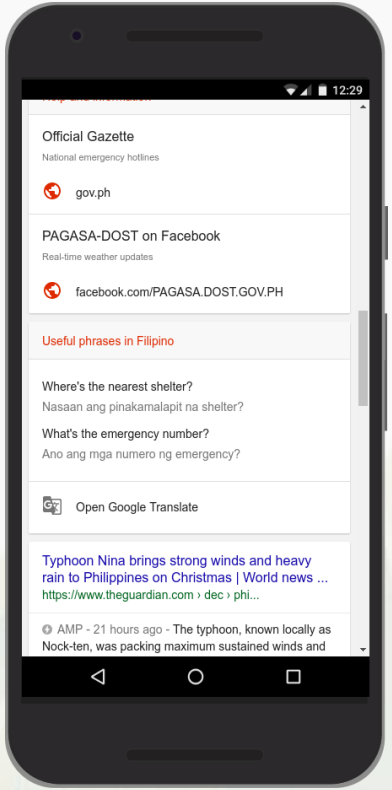


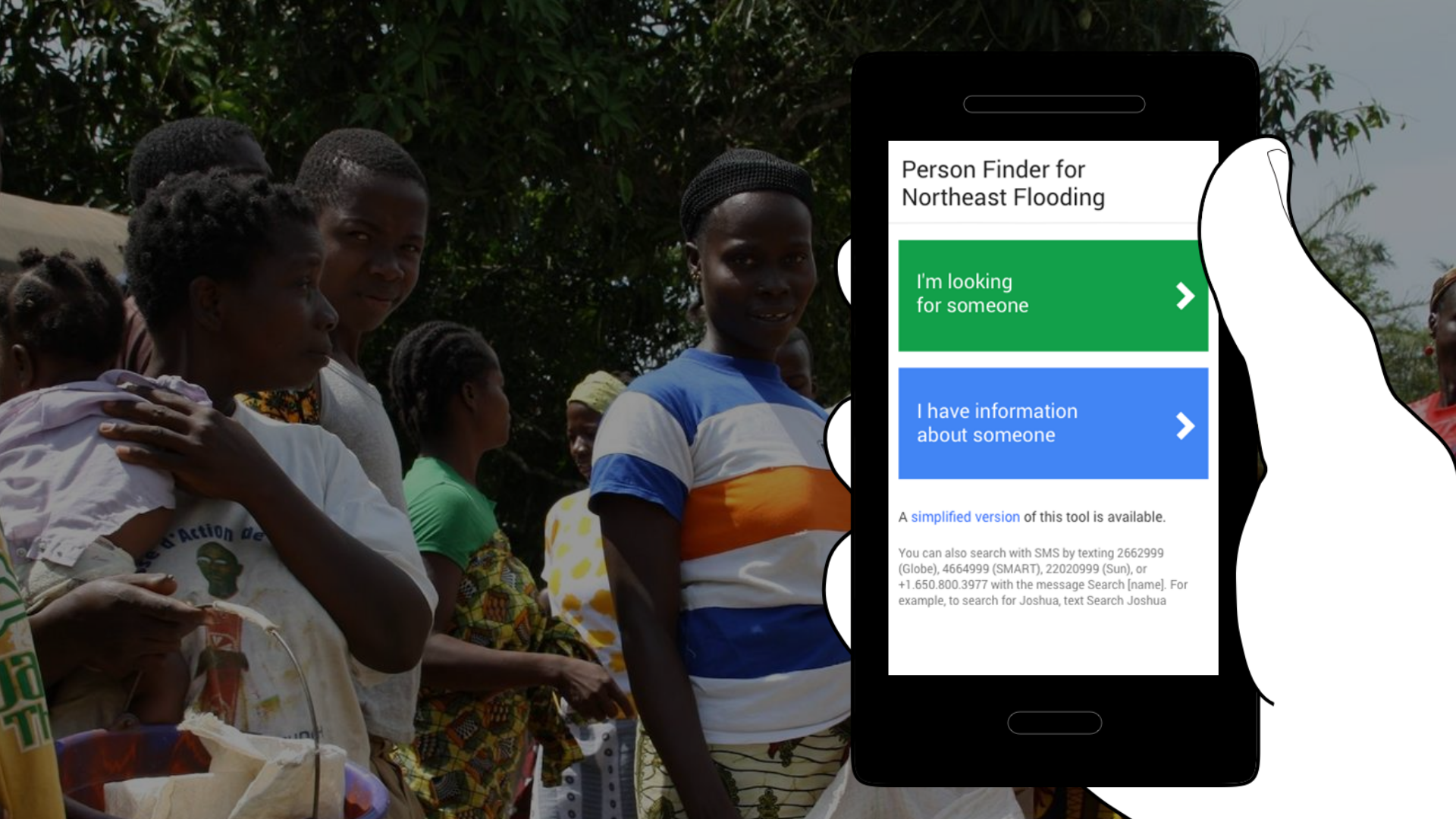


Crisis Response - Typhoons





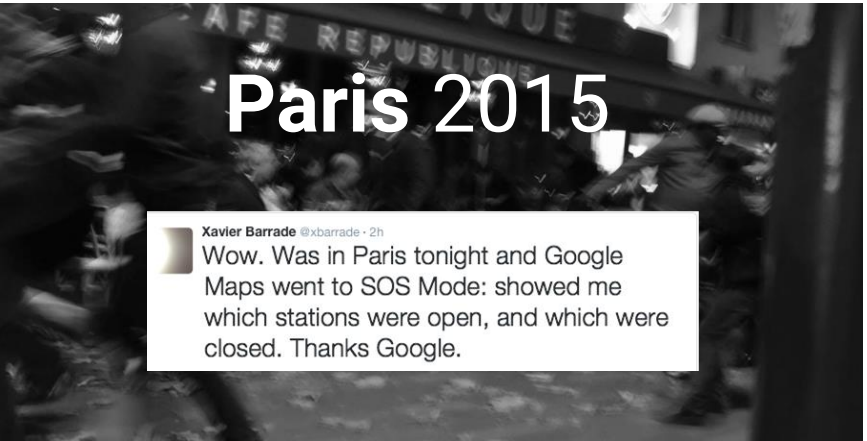



Person Finder for
Northeast Flooding
I'm looking
for someone
I have information
about someone
A simplified version of this tool is available.
You can also search with SMS by texting 2662999
(Globe), 4664999 (SMART), 22020999 (Sun), or
+1.650.800.3977 with the message Search [name]. For
example, to search for Joshua, text Search Joshua

Haiti 2010

Japan 2011

Boston 2013



Paris 2015

Fort Lauderdale 2017

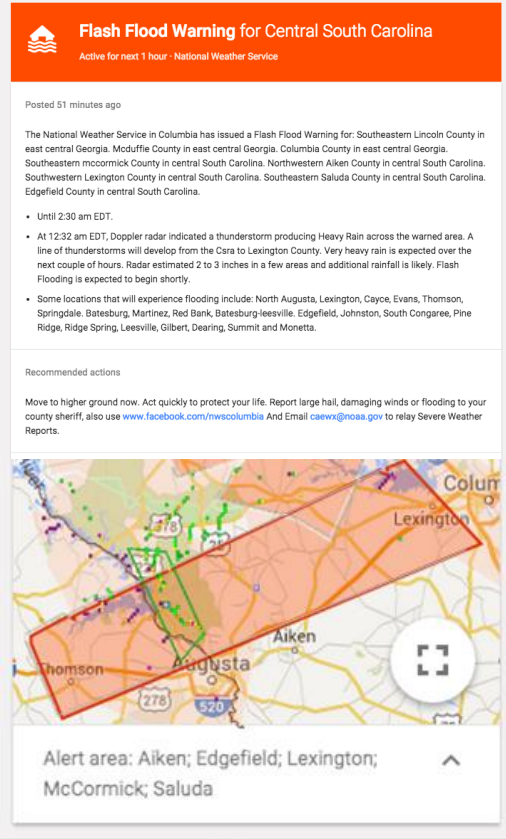
"I was at the airport sitting right outside that terminal when it was all happening. I had no clue something this serious was happening until I used Google and found out. You saved my life."
Fort Lauderdale SOS Alert recipient,
Airport Shooting - 6th Jan, 2017

Flooding impact

- Floods are the most common and the most deadly natural disaster on the planet. They affect 250M people, and cause 7,000 fatalities and $9.8B in economic damages **annually**
- Simple safety guidelines prior to and during a flood can prevent a substantial portion of flood fatalities
- Improving alerts for floods has the **most life-saving potential** of all interventions assessed by Google's Crisis Response team

Flooding Alerts - Current Status

- In flooding events, we provide real time warnings, updates and safety recommendations
- Currently, the warnings are based exclusively on governmental alerts. Which is a problem.



The Google Flood Forecasting Initiative

Goal: High-resolution high-accuracy flood forecasts and warnings where it matters most

The Google Flood Forecasting Initiative

- Why Google?
  - Computational resources
  - Access to global data (Elevation, user-generated data, etc.)
  - Scalability
  - Machine learning expertise

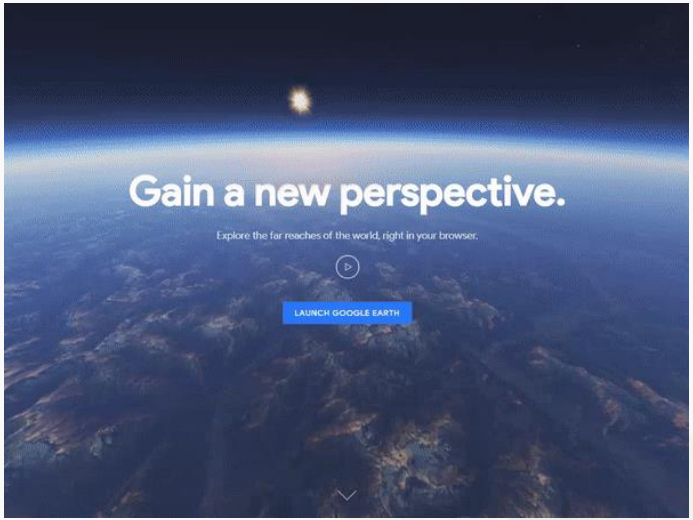
Why not (just) Google?

Hydrologic expertise

Operational expertise

Relationship with organizational consumers

We're looking for collaborators!

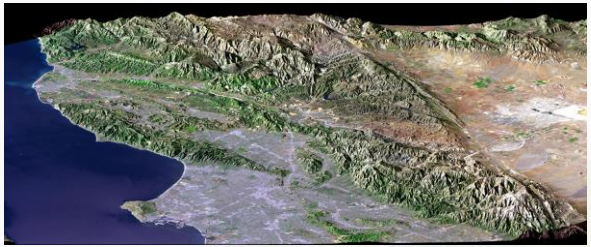


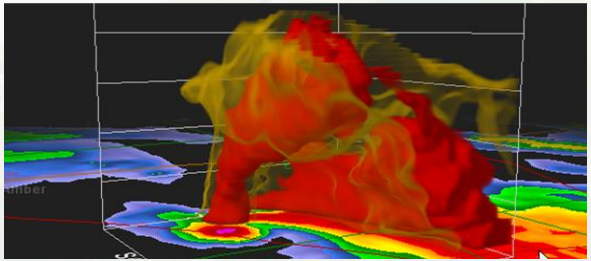
Discharge data - via Remote Estimation

- Use machine learning models to integrate information from various signals: Optical, MW, SAR and others
- Currently use Gradient Boosting Machines, but experimenting with other frameworks
- This data can (hopefully) be useful for all hydrologic models in data scarce regions, not just ours

Hydrologic Modeling - Research Directions

- Incorporating machine learning into classic physical models
- Estimating physical model parameters in ungauged basins
- Downscaling model-generated input data





Inundation Modeling

- Google has already spent many millions collecting global high-resolution elevation data
- We are currently working on implementing standard raster-based flood inundation models based on this data
- Pilot based on CWC stream gauge data

Questions?

Feel free to contact me at **sellanevo@google.com**