



A HOT mapping party

OPEN HELP

HUMANITARIAN OPENSTREETMAP TEAM APPLIES THE PRINCIPLES OF OPEN SOURCE AND OPEN DATA TO ECONOMIC DEVELOPMENT, DISASTER PREPAREDNESS AND EMERGENCY RELIEF. PAUL STEWART EXPLAINS HOW IT WORKS – AND HOW YOU CAN HELP

Humanitarian crises necessitate the fast and effective use and sharing of geographic data. The 'where dimension' is of crucial importance because aid in the wrong place is no aid at all. Save the Children International's director, Charlie Mason, echoes the thoughts of thousands of first responders when she says: "In an emergency, we want maps, maps of the affected population, displacements, major routes, other actors, clinics, water points and so on, all the things [we] need [...] to plan and coordinate the response."

Very much aware of this, Humanitarian OpenStreetMap Team (HOT) is a global community of volunteers that applies the principles of open source and open data to rapidly and collaboratively create and provide free, detailed and up-to-date OpenStreetMap (OSM) maps to NGOs and local communities. The aim is to foster economic development, enhance disaster preparedness and help first responders to reach those most in need during humanitarian crises.

When disaster strikes or a crisis develops, the HOT activation leadership ascertains the scale and impact of the event, what OSM data already exists, what satellite imagery is available, and if there is a local OSM mapping community that can help to plan and prioritise relief efforts. This information informs an appropriate response, including what needs to be mapped, if it can be mapped and to what geographical extent it should be mapped.

Once the mapping project is created in the OSM Tasking Manager (see 'How HOT works') and the call put out through HOT's mailing list, the community mobilises, mapping the entire area, then validating the new maps before putting them into the hands of first responders. These efforts are typically augmented by ground teams that put names to streets and buildings, and locate essential amenities, such as schools, health facilities and ATMs.

As an example, in response to last year's earthquake in Nepal, HOT worked in partnership with Kathmandu Living Labs (KLL) to boost OSM coverage of Kathmandu and its surroundings. KLL gathered a wealth of locally submitted crisis data using the Ushahidi map-based crowd-sourcing platform, with HOT mapping roads, buildings, waterways, residential areas and camps for internally displaced people (see Figure 1).

But it is those mapping projects that have a long-term focus, are designed to foster economic development and enhance disaster preparedness, and help a host of NGOs perform their day-to-day work that constitute the daily work of HOT. Most of this work stems from the Missing Maps project – a collaborative humanitarian mapping project founded in 2014 by HOT, Médecins Sans Frontières (MSF), Doctors Without Borders (MSF-UK), the British Red Cross and the American Red Cross. The aim is to put 'the world's vulnerable on the map' – to create base maps of the world's most vulnerable locales with which NGOs can

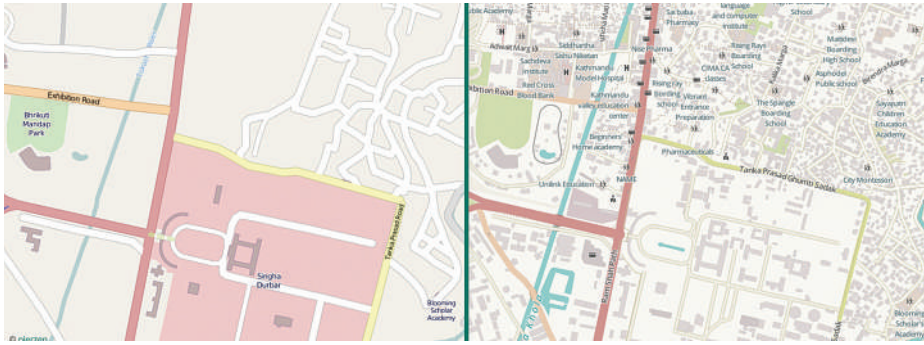


Figure 1. Central Kathmandu on OpenStreetMap before and after HOT's crisis mapping

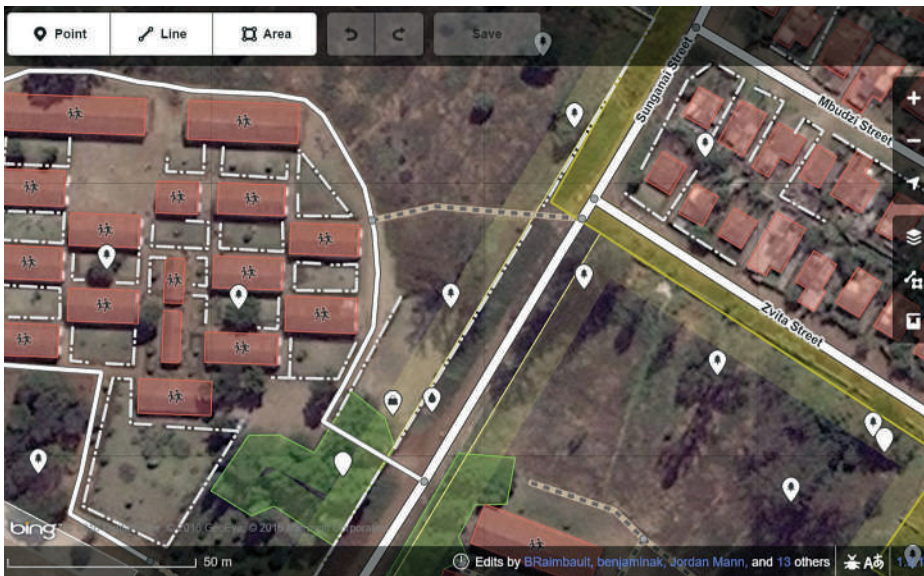


Figure 2. Mapping West Harare to support an MSF programme addressing typhoid and cholera

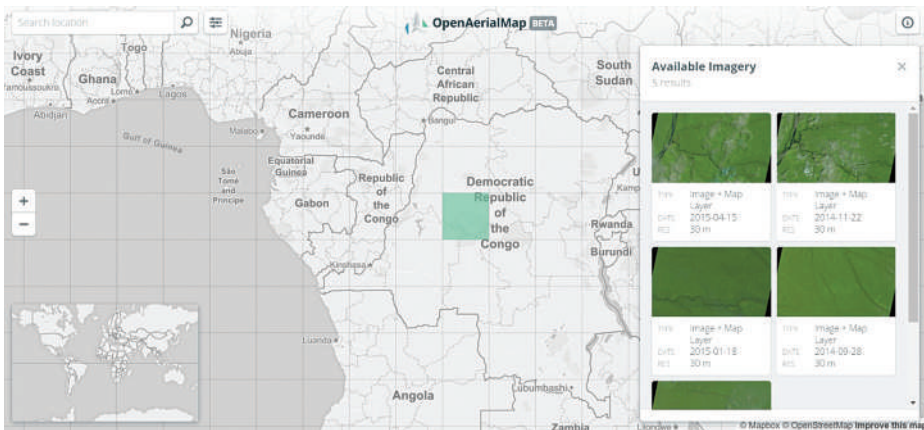


Figure 3. HOT has developed OpenAerialMap, the first free and open platform for processing and providing Earth imagery for disaster preparedness and emergency relief

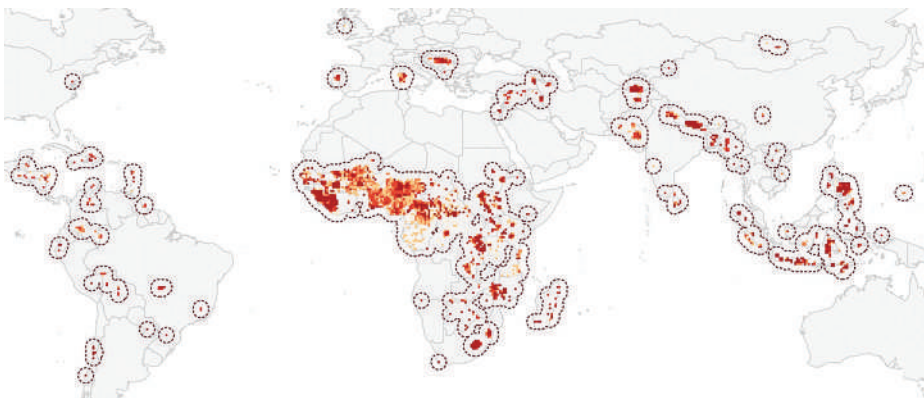


Figure 4. HOT's global footprint

plan and coordinate programmes that aim to address these locales' most pressing problems. The world's most vulnerable locales have been mapped previously but what was – or, in some cases, is – missing is quality local spatial data.

Right now, Missing Maps partners are mapping areas of Guyana, Belize, Zimbabwe, Swaziland and many more countries, thanks largely to volunteers who contribute remotely to OSM, but also local volunteers who can add details such as street names, place names and the most essential local amenities (see Figure 2). Partner NGOs are using the data to perform spatial epidemiology (analysis of disease and its geographic variations) and improve their responses to outbreaks of diseases such as cholera, Ebola and malaria. They and several others are also using it to plan and coordinate disaster risk reduction programmes.

Developing open source software

HOT also develops open source software to assist with collaborative mapping. The most recent development is OpenAerialMap (OAM), the first free and open platform for processing and providing Earth imagery for disaster preparedness and emergency relief.

OAM was first conceived in 2007 when Earth imagery providers began making their data freely available for crisis mapping. From the outset, it was clear the crisis mapping community was struggling to digest and organise the surge of information. It took several years of brainstorming and prototyping to finalise the design, which includes a set of open source tools for providing the necessary functions to upload, host, share, search, filter, display, download and use Earth imagery.

Developed in collaboration with Development Seed, the application has an interactive, easy-to-use world map browser with a dynamically shaded grid that symbolises density and availability of images (see Figure 3). Users can navigate the map and click on any cell to display footprints, overviews and details of each image.

OAM is already being put to use: the UAV Humanitarian Network uses it to share imagery collected by UAVs flying over areas affected by natural disaster, and the World Bank-sponsored Ramani Huria project uses it to support its disaster risk reduction work.

Get involved

From September 2011 to January this year, HOT's 165,000 volunteer hours have resulted in 120 million map edits and 1,000 mapping projects across the globe (see Figure 4). But HOT's work relies almost exclusively on its skilled and dedicated volunteer mappers, validators and fundraisers, so it is always seeking new volunteers – volunteers just like you!

There are many ways in which you can get involved. You can join the HOT mailing list, after which you can start mapping, either remotely or at a mapping party. In no

time at all, even if you have no cartographic experience, you could be supporting Peace Corps' Botswana public health programme, Missing Maps' West Swaziland malaria elimination programme or MSF's provision of aid in Tete province, Mozambique.

You can join also one of HOT's eight working groups: activation, communications, community, fundraising, governance, security, technical and training. Each calls for skills other than mapping; all are driving HOT into the future.

Finally, if you do not have the time but would like to help, you can donate at <https://hotsm.org/donate>

Yes, HOT has mapped an astonishing amount of the Earth's surface – but it is far from finished.

HOT'S 165,000 VOLUNTEER HOURS HAVE RESULTED IN 120 MILLION MAP EDITS AND 1,000 MAPPING PROJECTS ACROSS THE GLOBE

Paul Stewart is studying a master's in GIS through Lund University, and writes and maintains 'Humanitarian Mapping' (pjestewart1984.tumblr.com)



HOT is collaborating with Dar Ramani Huria in Mozambique to support public health work

HOW HOT WORKS

As its name suggests, HOT creates and provides maps through OpenStreetMap (OSM), the free street-level map of the world. OSM can be edited using specific editing software (the desktop editor JOSM, the default in-browser iD editor and many others for mobile devices and just about any operating system) and a base layer of satellite imagery over which the editor traces.

However, HOT has also developed an additional piece of software called the OSM Tasking Manager that helps to coordinate mapping projects. Early attempts to map an area affected by disaster often resulted in edit-conflicts or duplication of data, once more than a few people were simultaneously editing the OSM database. It was quickly identified that a simple platform that shows where other mappers were working would reduce the likelihood of such problems.

The first version of the OSM Tasking Manager used a simple square grid placed over the area of interest and a function that allowed mappers to 'check out' a grid tile to let others know they were working that area. Today's version of the software functions fundamentally the same, but, being open software, many people have been able to contribute enhancements and additional features. These range from including more complex task shapes to better map features such as roads or rivers that do not often fit well into a square, to a second step in the workflow of a mapping project called validation, where a second mapper double-checks to ensure the contribution sufficiently meets the project's objectives. The program also provides a way to give basic instructions so even those mappers making their first edits can start contributing right away.

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