

GIScience Computer Practical

Citizen science: mapping for humanitarian response

[GEES Applicant Visit Day]

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About this practical

This session will walk you through the process of editing a targeted area of OpenStreetMap, the largest collective effort to create a map of the World (think of it as the Wikipedia of maps). Use the red arrows to navigate through the slides.

- ▶ An online version is available at http://darribas.org/bham_avd_osm
- ▶ A **pdf** version of this document is available here.

Background

In this practical, you are going to learn how to contribute to the OpenStreetMap (OSM) project, helping map parts of the world at risk of humanitarian disaster. To do that, you will be using satellite images that will help you identify objects on the ground, such as buildings or roads, so you can draw them, effectively adding them to the map. The selection of areas in need will be taken care of by the Humanitarian OpenStreetMap Team (HOT).

OSM is the largest collective effort to create a digital free map of the entire World contributed by volunteers. Think of it as the Wikipedia of maps. Started in 2004 at UCL, it has grown substantially over the years and, currently, parts of the map provide better quality data than commercial alternatives such as Google Maps.

The HOT is the arm of OSM that is concerned with maximizing the impact of the Map for humanitarian purposes. As such, it connects traditional efforts in humanitarian relief with the OSM. Having reliable and accurate spatial data is crucial for humanitarian missions because it allows to manage scarce resources in more efficient ways. One of its missions is to keep updated the Tasking Manager, a list of urgent parts of the world to be mapped. In this practical, we will be using the Tasking Manager to select the area that we will be editing.

Like this??? Here's more!

If you are interested in these issues, follow up on these links:

- ▶ OpenStreetMap info page
<http://www.openstreetmap.org/about>
- ▶ HOT project page: <http://hotosm.org/>
- ▶ Link to the Task Manager: <http://tasks.hotosm.org/>

What to do

1 - Make sure you have your password at hand.

2 - Go to the Tasking Manager list to pick an area of the world in need of mapping. To do that, open up a (modern, e.g. Firefox, Chrome) browser and follow this url:

`http://tasks.hotosm.org/`

You should see something like this:

The screenshot shows the OSM Tasking Manager interface. At the top is a navigation bar with the OSM logo and 'Tasking Manager' text. Below this is a 'Projects' section with a search bar and a 'Sort by: High priority first' dropdown. Three project cards are visible:

- #591 South Sudan Crisis, Cholera outbreak in Juba, mapping with WorldView-2 imagery**: Juba, the capital city of South Sudan, has experienced rapid growth in the last few years, and following the violence since December 2013, is now facing a cholera outbreak, as shown on this overview map from UNDOCA or this more detailed map from the UN WASH cluster. This urges the need for updated foundation geographic data. Thanks to the MapGive project, we have access to a WorldView-2 imagery dated 20 February 2014, whose offsets have been corrected in this TM job. Created by sev_helium - Updated 3 minutes ago - Priority: urgent
- #847 Malawi Flood 2015 - Lower Shire**:
 - Author: HOT, MapGive
 - Mapping for: Department of Disaster Management Affairs in Malawi - DuDIMA, G'DRIR
 - Purpose: Crisis Response
 - Priority: High

The Southern parts of Malawi along the Lower Shire river (that connects Lake Malawi and Zambesi River) are frequently flooded and affects the villages of farmers around. Since mid January 2015, they are critically hit (read eg this article).

This job aims at adding the missing buildings, that will serve to estimate the number of affected people for each settlement.

WARNING: sometimes the buildings have been created as a node. Please do not delete them as they generally encompass a lot of attributes from the field survey done in August-September 2014.

Created by sev_helium - Updated 3 minutes ago - Priority: high
- #843 Central African Republic, Basse-Kotto, M'ingala - mapping the remaining sub-prefectures**:
 - Author: HOT
 - Mapping for: All the humanitarian stakeholders
 - Purpose: Crisis Response
 - Priority: High

On the right side, there is an 'About the Tasking Manager' section explaining its purpose for humanitarian OSM team collaborative mapping, and a 'Questions About Tasks, Mapping or HOT?' section with contact information for mailing list, IRC chat, and general inquiries.

This is essentially a list of top priorities to be mapped around the World. Pick the one you prefer by clicking on its title.

3 - In this example, we will be editing task #591 which relates to the South Sudan Crisis. You should then see something that looks more or less like this:

The screenshot shows the OSM Tasking Manager web application. The browser address bar shows the URL `tasks.hotosm.org/projects/591`. The page title is "OSM Tasking Manager" and the specific task title is "#591 - South Sudan Crisis, Cholera outbreak in Juba, mapping with WorldView-2 imagery".

On the left side, there is a sidebar with tabs: "Description", "Instructions", "Contribute", "Activity", and "Stats". The "Description" tab is active.

The "Description" section contains the following text:

Context

Juba, the capital city of South Sudan, has experienced rapid growth in the last few years, and following the violence since December 2013, is now facing a cholera outbreak, as shown on this overview map from UNOCHA or this more detailed map from the UN WASH cluster. This urges the need for updated foundation geographic data. Thanks to the MapGive project, we have access to a WorldView-2 imagery dated 20 February 2014, whose offsets have been corrected in this TM job.

EDIT: after this job has been published, the Bing Imagery has been renewed and is now dated 20 June 2013. The mapping process mixes the two.

Imagery Details

The imagery downloaded with the job is from Digital Globe's WorldView-2 satellite taken on February 20, 2014. The image is almost 1000 in size and has been pan-sharpened (combined panchromatic and multispectral images) for visual clarity and orthorectified for terrain corrected geographic precision (CGRS-4.4; RMSE=3.6). A second rectification process was performed to reduce offset between the image and the Bing imagery / existing OSM data. Additionally, the image has been contrast stretched using a custom stretch and processed into a Tiled Map Service (TMS) for performance.

With the renewal of Bing Imagery (now dated dated 20 June 2013), the offsets with the Bing imagery informed with the JOSM offset_db plug-in are now obsolete and it is not worth to use them. See the instructions below.

Instructions

- Check if the vector data is correctly aligned on Bing imagery, that is the reference for the georeferencing. Move/adjust the data if necessary. Map anything missing with it.
- Align manually the WorldView-2 imagery on the vector data (and not the contrary). Modify/add anything that changed during the 8 months between the two imagery. Mostly there are a few new buildings here and there within the residential area, and more new buildings on the edge of the city.

If you want to have an idea about what Juba looks like in the ground, you can watch this video for example.

Below the text is a green button labeled "Instructions".

The main part of the screen shows a map of Juba, South Sudan. The map displays a satellite image with a grid overlay. A legend in the bottom right corner indicates the status of the mapping: "Cut, worked on 20" (orange square), "Unprocessed" (yellow square), "Done" (green square), and "Validated" (light green square). A scale bar shows 5 km and 2 mi. The map also includes a small inset map of the world in the top right corner.

4 - Click on “Instructions”, this shows what you are expected to map (roads, streets, buildings. . .) as well as the source of the satellite imagery.

The screenshot shows a web browser window displaying the OSM Tasking Manager interface. The browser's address bar shows the URL `tasks.hotosm.org/tasks/591`. The page has a red header with the "OSM Tasking Manager" logo and navigation links for "About", "on", and "dashboard". The main title is "#591 - South Sudan Crisis, Cholera outbreak in Juba, mapping with WorldView-2 imagery". Below the title are tabs for "Description", "Instructions", "Contribute", "Activity", and "Stats", with "Instructions" currently selected.

The left sidebar contains the following information:

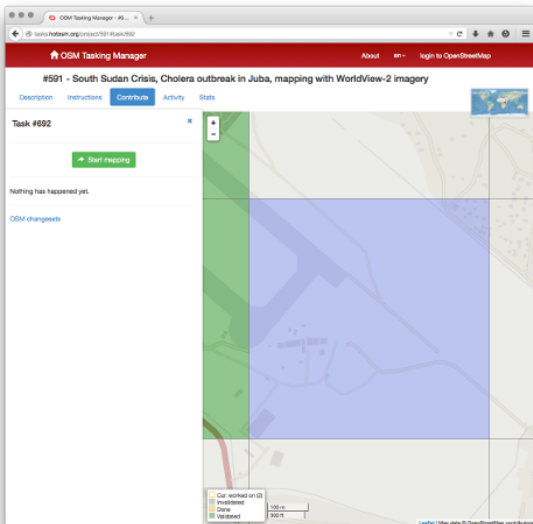
- Drillies to Map:** roads, streets, buildings, walls, water streams and canals
- Chargest Comment:** South Sudan, Juba, #cholera-task-591
- Imagery:** `img22(http://hiu-maps.net/ht/1.0.0/juba-20160314-16pped(zoom){x}{y}.png)`
Access to this imagery is limited by the [GeoView license agreement](#).
✓ You have already acknowledged the terms of this license.
- MapGive:** Through the MapGive project, the Humanitarian Information Unit (HIU) of the U.S. Department of State is providing the OpenStreetMap community access to updated satellite imagery services to help assist with humanitarian mapping.
A green button labeled "Start contributing" is located below this section.

The main map area displays a satellite view of Juba, South Sudan, with a grid overlay. A legend in the bottom-left corner of the map indicates the status of the grid cells:

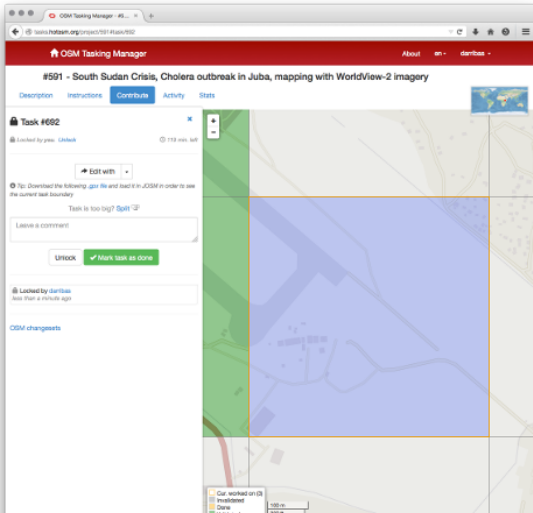
- Cur. worked on (2)
- Prohibited
- Done
- Validated

A scale bar at the bottom of the legend shows 0 km and 2 mi. The bottom of the map area includes a "Location" link and a copyright notice: "Map data © OpenStreetMap contributors".

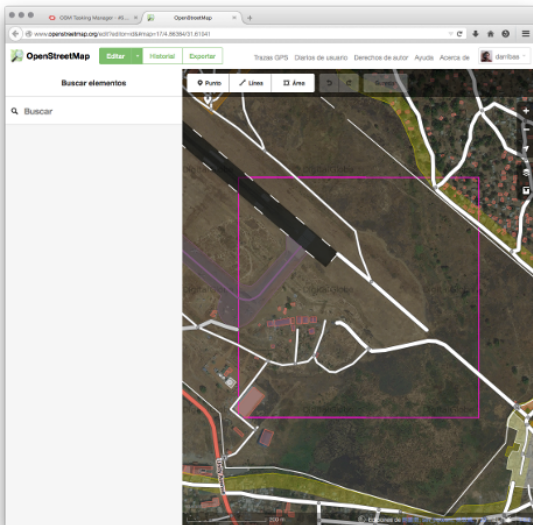
5 - Click on “Start contributing” and either click a polygon on the map in the right, or click on “Take a task at random” to let the computer select it for you. You’ll be zoomed into a specific area of the map, this is where you will be editing.



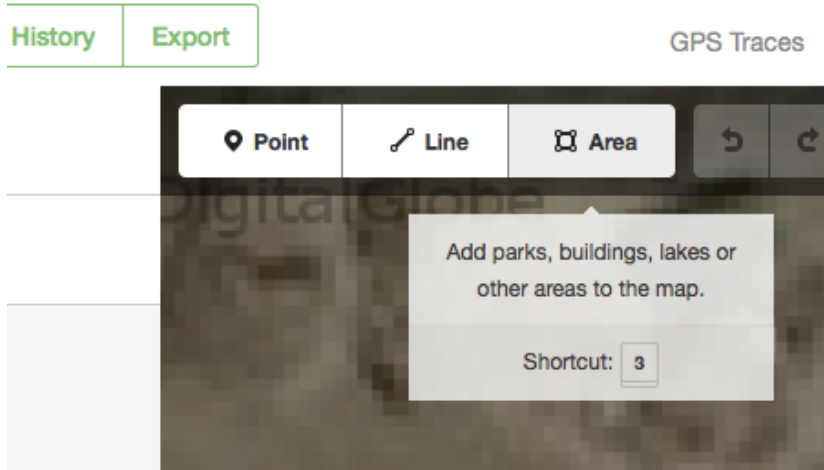
6 - Now click on “Start Mapping”. If you haven’t logged in, you will need to: enter the account name and password provided and, on the next page, click on “Save changes”. When you’re redirected to the area to map, click “Start Mapping” again. You should see something like this:



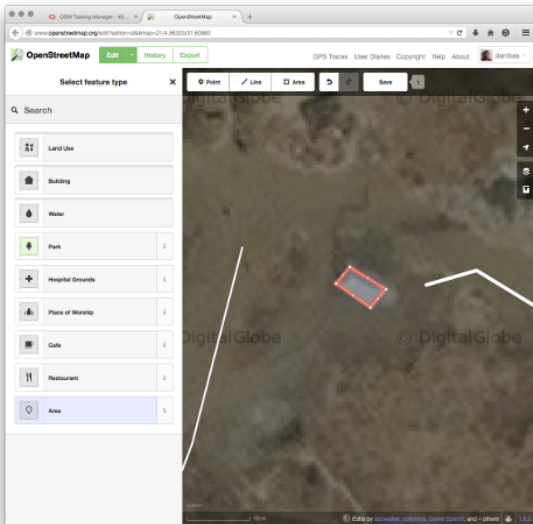
7 - Select “Edit with iD editor” and a new tab/window will open with the editor where you can make changes. Ready to map!!!



8 - Now spot an object such as a building in the image that has not been added to the map (that is, that does not have a map object, such as a building footprint, drawn onto it). Click on “Area” on the top-left of the map:



9 - Use the mouse to click through the shape of the object you would like to map:



10 - Select the kind of object it is. In this example: “Building → House”. Save the changes by clicking “Save” in the upper right part of the map.

11 - Click “Save” on the left hand side bar. You are done! You have just contributed making the world a more mapped place!

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Materials available at

https://github.com/darribas/bham_avd_osm



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