

The Use of Geoinformation in (Anticipatory) Humanitarian Action

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FOR GEOINFORMATION
TECHNOLOGY

Recap of self-study time, results

- Share your experiences:
 - What did you find easy / complicated over the course of last week?
 - What are potential use cases for you?
 - Any open questions?

Day 4 - Agenda

Time	Content
09:00	Welcome Recap of self-study time Overview of today's course
09:30	OpenStreetMap Intro and Hands-On
10:00	<i>Coffee break</i>
10:15	Humanitarian OpenStreetMap Team and HOT Tasking Manager
10:30	OSM / HOT Tools for OSM data collection, analyses and access
11:00	<i>Coffee break</i>
11:15	Data creation QGIS ORSTools Intro
12:00	<i>Coffee break</i>
12:15	Quick Raster Data Intro



OpenStreetMap

OpenStreetMap

- OpenStreetMap (OSM) core facts:
 - Wikipedia of maps, launched 2004 in London
 - Under Open Data Commons Open Database Lizenz (ODbL)
 - Approx. 8 Mio. contributors around the world



OpenStreetMap

The screenshot shows the German version of the OpenStreetMap Wiki page for "Map features". The page title is "Map features". It includes a sidebar with links to "Hauptseite", "Die Karte", "Map Features", "Beitragende", "Hilfe", "OSM-Blogs", "Fanartikel", "Spenden", and "Wikiforum (auf englisch)". The main content area has tabs for "Seite", "Diskussion", "Lesen", "Quelltext anzeigen", "Versionsgeschichte", and "OpenStreetMap Wiki durchsuchen". Below these tabs is a search bar. The main text discusses "Map Features – Weitere Sprachen" and "Andere Sprachen · Übersetzen". It explains that OpenStreetMap represents physical features on the ground using tags attached to basic data structures (nodes, ways, and relations). The free tagging system allows users to add unlimited attributes. A note at the bottom states that certain key and value combinations act as informal standards.

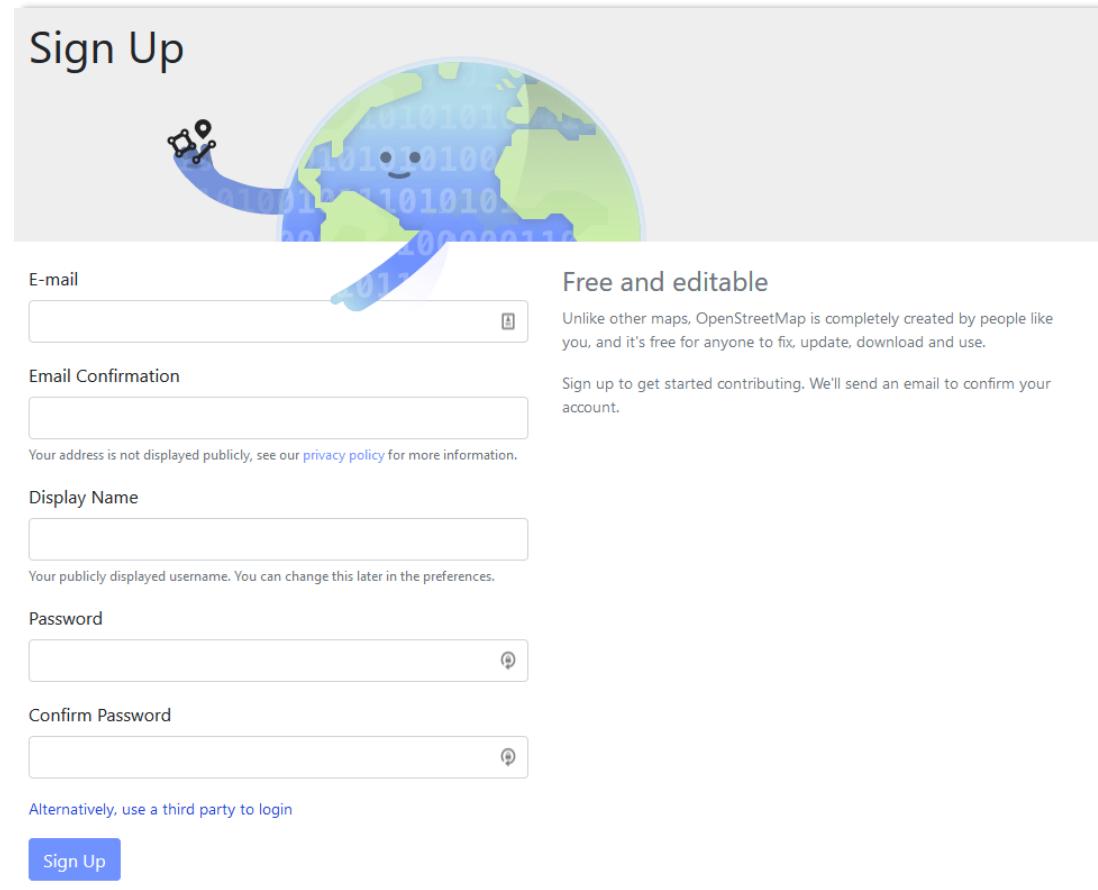
wiki.openstreetmap.org/wiki/Map_features



Goets & Zipf (2022)

Your turn 😊

- Create an OpenStreetMap Account:
<https://www.openstreetmap.org/login>
- Click „Sign Up“



The image shows the "Sign Up" page for OpenStreetMap. The page features a large globe icon with a smiling face and binary code patterns. The title "Sign Up" is at the top left. To the right, there's a section titled "Free and editable" with a subtext explaining that the map is created by people like the user and is free for anyone to fix, update, download and use. Below this, there are fields for "E-mail" and "Email Confirmation". A note below these fields states: "Your address is not displayed publicly, see our [privacy policy](#) for more information." There are also fields for "Display Name" and "Password", along with a "Confirm Password" field. A note below the display name field says: "Your publicly displayed username. You can change this later in the preferences." At the bottom, there's a link "Alternatively, use a third party to login" and a prominent blue "Sign Up" button.



QuickOSM-

Access OSM Data in QGIS

Your turn 😊

- Try the QuickOSM Plugin (You can use the Wiki “QuickOSM”)
- Search for an area of interest (your home, workplace etc.) and check what is available in the OpenStreetMap
- Download data which is of interest for you in your AOI

Selection of additional tools to download OSM data

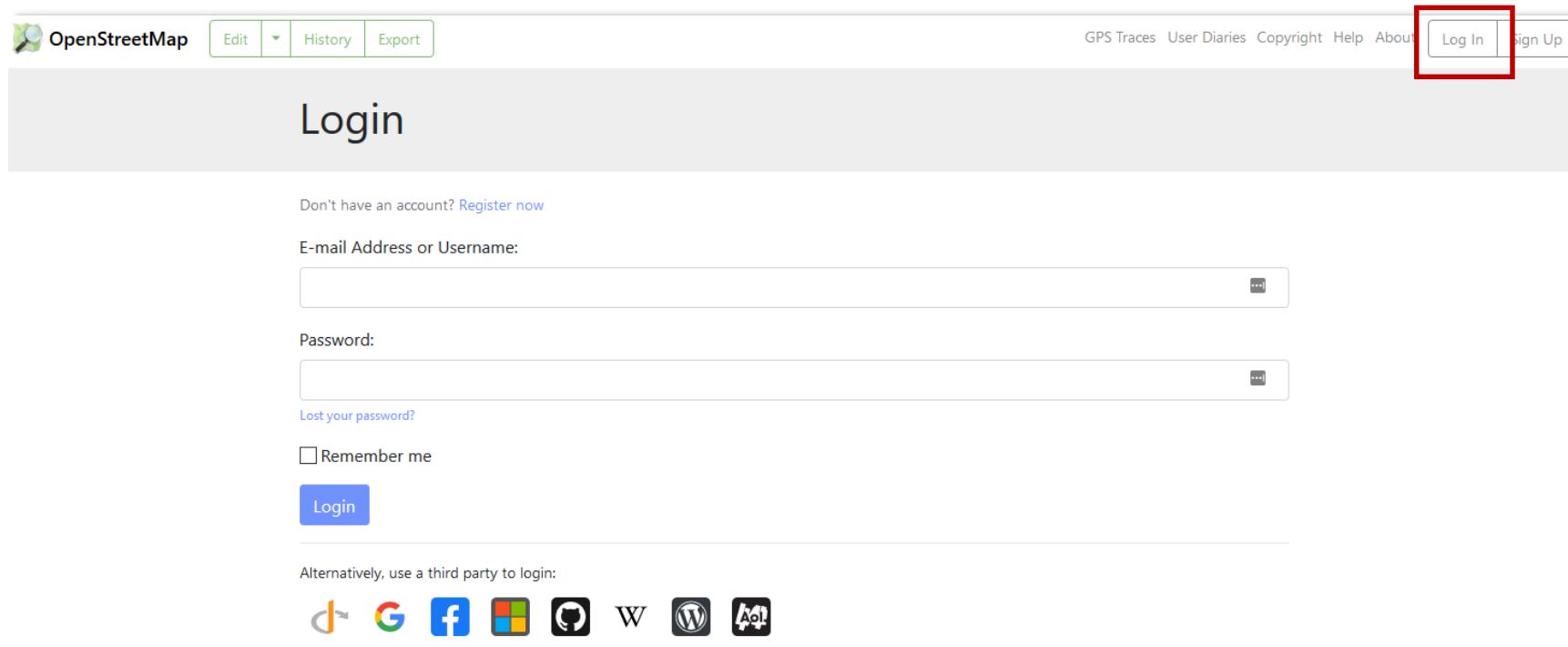
- Geofabrik: <http://download.geofabrik.de/>
 - Pre-processed data for different admin regions
 - Not all original tags available per geo object
- Bbbike: <http://download.bbbike.org/osm/>
 - Choose your AOI and download the OSM data in various formats
- Overpass Turbo: <http://overpass-turbo.eu/>
 - Download of specific features in smaller areas of interest
 - SQL queries
 - For advanced users: Overpass API



OSM Data Editing

Your turn 😊

Go to openstreetmap.org and log in using your account details



Your turn 😊

Create a feature in your area of interest

- Point, line or polygon

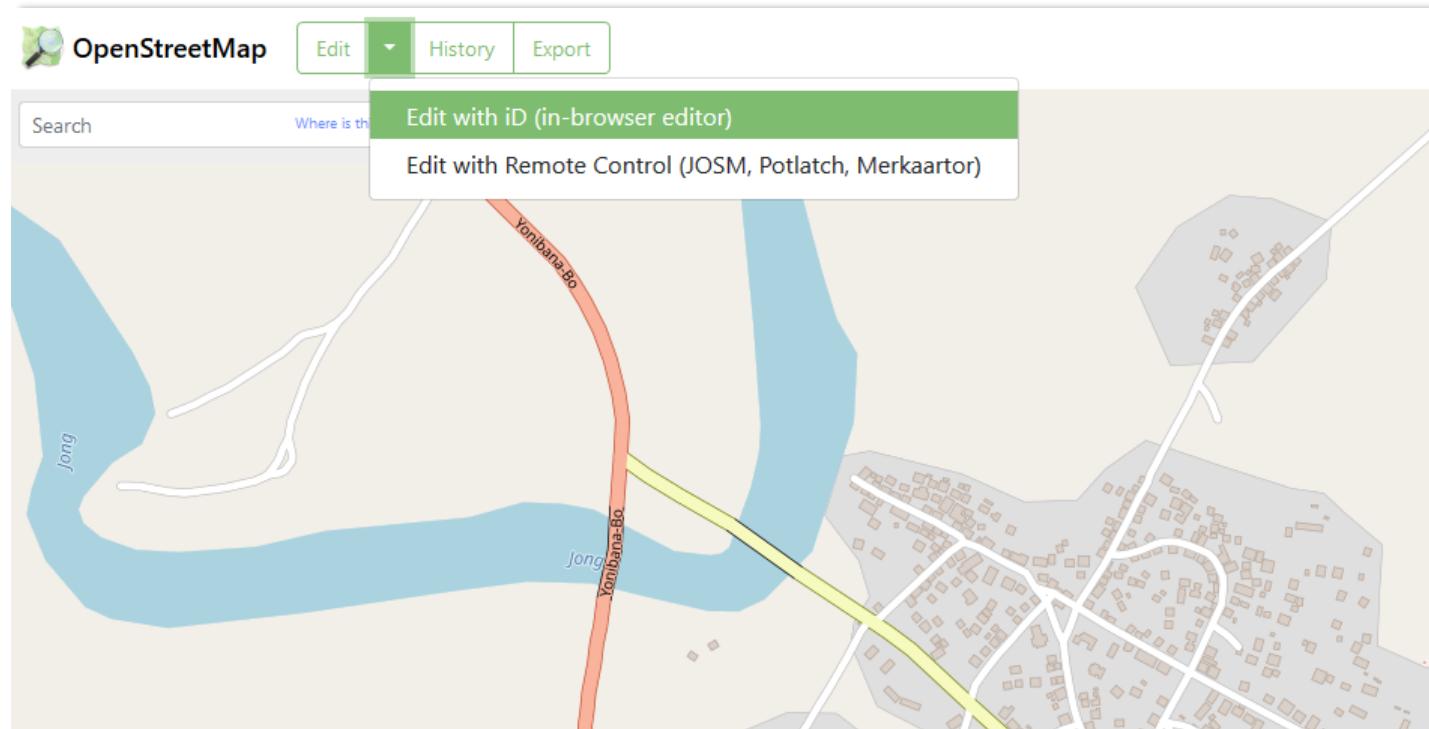


- Use the MapFeatures page to find the right tag

The screenshot shows the 'Map features' page on the German Wikipedia. The page title is 'Map features'. Below the title, there is a section titled 'Map Features – Weitere Sprachen' (Map Features – Other Languages) with a list of links to other language versions. The main content area explains what map features are and how the tagging system works. At the bottom, there is a link to the English version of the page: wiki.openstreetmap.org/wiki/Map_features.

Your turn 😊

Select the iD editor in the Edit menu



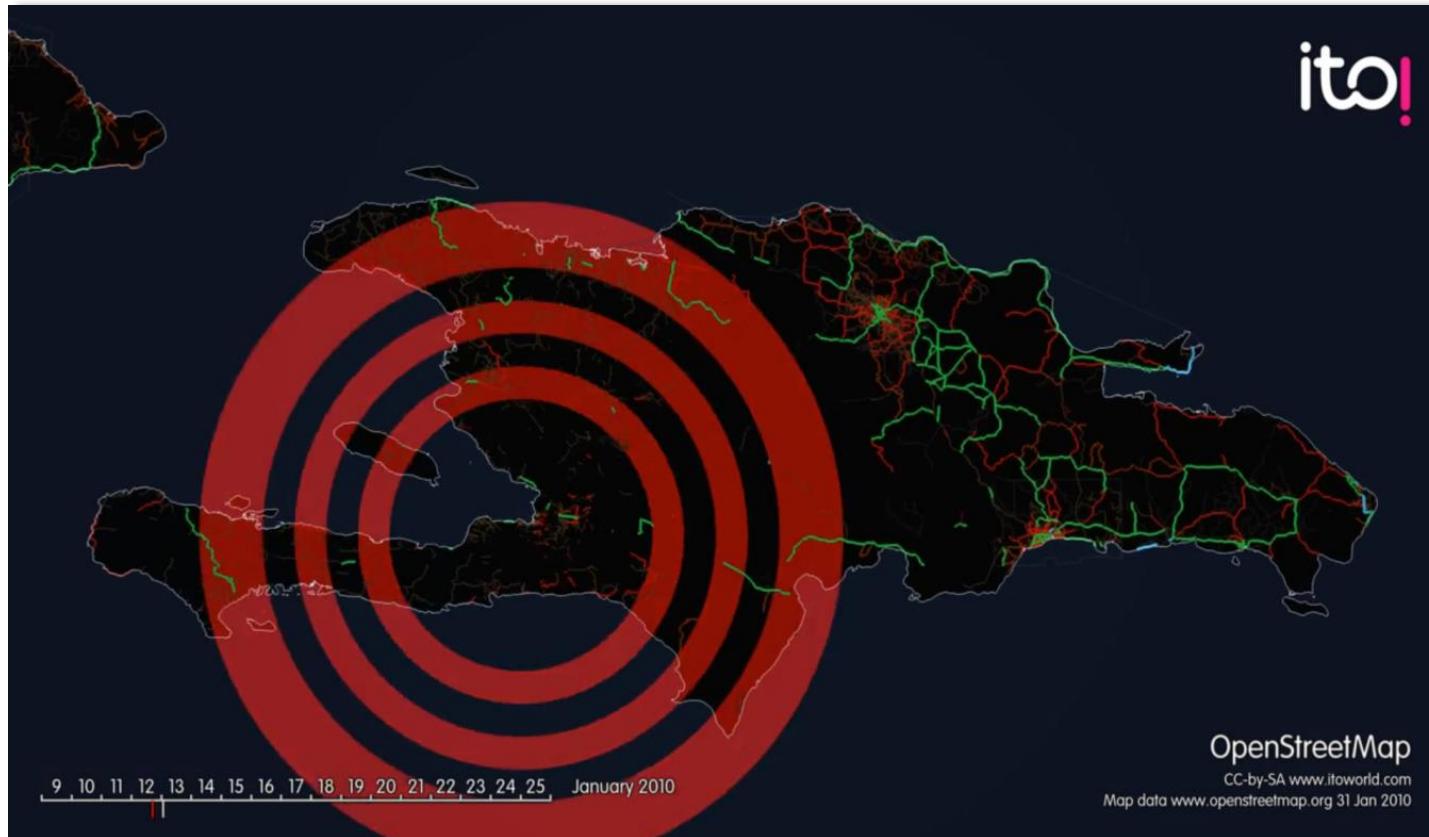
Your turn 😊

- Share your observations with the group



Humanitarian Mapping with OpenStreetMap

Haiti 2010



<http://www.vimeo.com/9182869>

Humanitarian OpenStreetMap Team



coordinates humanitarian mapping



partnerships



develop open-source applications to leverage
and coordinate collaborative mapping



support community mapping projects





MISSING MAPS

Founders



American
Red Cross



British Red Cross



Humanitarian
OpenStreetMap
Team



MÉDECINS SANS FRONTIÈRES
DOCTORS WITHOUT BORDERS

Members



caritong



The Netherlands
Red Cross



GIScience



THE GEORGE
WASHINGTON
UNIVERSITY
WASHINGTON, DC



CADASTA



PADF
Pan American Development Foundation



youthmappers



MAP ACTION



Canadian
Red Cross



Croc-Rouge
canadienne



IFRC



German
Red
Cross



CROWD2MAP
TANZANIA
Putting rural
Tanzania on the map
tanzaniaproj.org



Cruz Roja Española



MAP KIBERA

missingmaps.org



Putting the World's Vulnerable
Communities on the Map



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How we work

Step 1.

Remote volunteers trace satellite imagery into OpenStreetMap



Step 2.

Community volunteers add local detail such as neighborhoods, street names, and evacuation centers



Step 3.

Humanitarian organizations use mapped information to plan risk reduction and disaster response activities that save lives



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missingmaps.org



Remote (Humanitarian) Data Collection

Tasking Manager

The image shows the HOT Tasking Manager interface. At the top, there is a navigation bar with links for "Tasking Manager", "EXPLORE PROJECTS" (which is underlined), "LEARN", and "ABOUT". Below the navigation bar, there are filters for "Difficulty level" (set to "Any project"), "More filters", "Sort by" (set to "Search Projects"), and a search bar. A message "Showing 14 of 2,244" is displayed.

The main area displays a grid of 14 project cards:

- #11055 Kwara State-Ilorin West LGA Citizen Science Mapathon for Flood (Urgent, HIGH priority). Ilorin West LGA has been listed as one of the highly probable flood risk areas. 1734 total contributors. Beginner Mapper.
- #6865 Cucuta Colombia #MigrationCrisis (HIGH priority). Colombia has seen an influx of refugees moving through the country. 3975 total contributors. Beginner Mapper.
- #6979 German Red Cross Missing Maps: Forecast-based Action in Central Asia (HIGH priority). Central Asia is a region which is especially prone to natural disasters. 2555 total contributors. Beginner Mapper.
- #8171 Kinshasa - Ndjili watershed (HIGH priority). During the rainy season, Kinshasa regularly faces heavy rains. A map is shown with various mapping activities. 628 total contributors. Intermediate Mapper.
- #8942 Mapping the Unmapped in Province 2 of Nepal (HIGH priority). Out of the total 8,600+ COVID-19 cases in Nepal, one third is from Province 2. 655 total contributors. Intermediate Mapper.
- #9181 Port-Salut Arrondissement Update, Sud, Haiti (HIGH priority). The 2020 Atlantic Hurricane Season began June 1st. HOT has been mapping this area. 65 total contributors. Intermediate Mapper.
- #9353 HOTChiquitania_SanIgnacik (HIGH priority). This is HOT's Chiquitania first mapping project, which aims to map the Kpandal Prefecture. 58 total contributors. Beginner Mapper.
- #9459 German Red Cross Missing Maps: Disaster preparedness - Floods, Togo - Kpandal Prefecture (HIGH priority). The German Red Cross is mapping Kpandal Prefecture as part of a disaster preparedness project. 1238 total contributors. Beginner Mapper.

A large callout box highlights the "Kinshasa - Ndjili watershed" project, showing a detailed map of the area with various mapping activities. The map includes a legend for activity status: Ready (light blue), Mapped (yellow), Bad imagery (dark grey), Validated (green), Invalidated (red), Locked (blue), and Locked by you (dark blue). A scale bar indicates 5 km.

On the right side of the interface, there is a large map view showing a green shaded area, likely representing a specific region or project area. A legend for this map is also present, listing the same activity statuses as the project cards.

At the bottom right, the URL hotosm.org/tools-and-data is displayed.



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Mapping our world together



Tasking Manager

EXPLORE PROJECTS

LEARN

ABOUT

Difficulty level ▾

Any project ▾

More filters

Sort by ▾



Search Projects

Clear filters

TYPES OF MAPPING



CAMPAIGN

ForecastBasedFinancing

X | ▾

ORGANIZATION

Organization

| ▾

LOCATION

Location

| ▾

Clear

Apply



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 HeiGIT

The logo for HeiGIT, featuring a stylized red and black geometric icon followed by the text 'HeiGIT'.

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Remote Mapping in OpenStreetMap



hotosm.org, learnosm.org



FEB
01

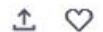
Missing Maps February Mapathon

by The Missing Maps London

494 followers [Follow](#)

Free

[Register](#)



The aim of the Missing Maps project is to map the most crisis-prone parts of the world.

About this event

This Mapathon will take place online! If you wish to attend please register and details for joining the event will be emailed to you thirty minutes before the start time.

This event is London based in name only! Since we have moved to virtual events we have been getting attendees from all over the world - we heartily welcome this!

Schedule:

18:30: You will receive a setup email with a link to attend the event online

19:00: Introduction to Missing Maps and practical information

Date and time

Tue, 1 February 2022
20:00 – 22:15 CET

[Add to calendar](#)

Location

Online event

Cooperation Anticipatory Action

IFRC German Red Cross

HOME ABOUT PROJECTS FUND DIALOGUE PLATFORM NEWS ANTICIPATION HUB LIBRARY 

Anticipating and addressing epidemics – the potential of open data initiatives

In order for Forecast-based Financing to work, we need to be able to decide quickly, when and where to act: Our decisions are based on the anticipated impact. In order to predict impact, we need good exposure data and in order to plan our interventions we need maps: For both we rely on our colleagues from OSM, HOT, HeiGIT. Find out more about them, their work on FbF and now the Covid Response in this article.

#8926 | HOT

 HIGH

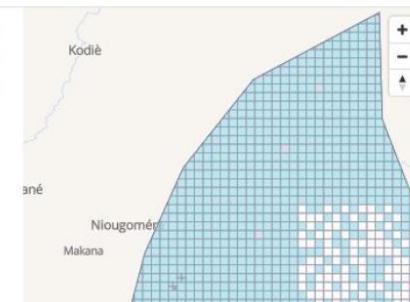
COVID-19 - YELIMANE CERCLE 4 - KAYES REGION, MALI

COVID-19 - Mali

HOT has been requested to map areas in Mali susceptible to, or identified as impacted, by the COVID-19 outbreak. Please join our global effort to help control this disease by mapping on this project.

The goal of this project is to digitize the buildings using MAXAR Premium Imagery.

[READ MORE](#)



Recent

Anticipating the flood:
Taking early actions at
the Lower Limpopo in
Mozambique
February 4th, 2021



Mozambique Red Cross
taking early action as
Tropical Cyclone Eloise
brings strong winds and
rains
January 22nd, 2021



Early Action Protocol
activated as Tropical
Storm Chalane
approaches Mozambique
December 28th, 2020



<https://www.forecast-based-financing.org/2020/09/24/anticipating-and-addressing-epidemics-the-potential-of-open-data-initiatives/>



Page Discussion

Kathmandu Living Labs/exposuresurvey

< Kathmandu Living Labs

Main Page
The map
Map Features
Contributors
Help
Blogs
Shop
Donations
Wiki discussion
Recent changes

Tools
What links here
Related changes
Special pages
Printable version
Permanent link
Page information
Cite this page

Contents [hide]

- 1 General Tags For Educational and Health Facilities
 - 1.1 Educational Facility
 - 1.1.1 Amenity
 - 1.1.2 Level of Education
 - 1.1.3 Management-type of educational facility
 - 1.1.4 Additional Attributes of Educational Building
 - 1.2 Health Facility
 - 1.2.1 Amenity
 - 1.2.2 Management-type of Health Facility
 - 1.2.3 Services rendered
 - 1.2.4 Additional Attributes
 - 2 Building
 - 2.1 Building Structure
 - 2.2 Floor Material
 - 2.3 Roof
 - 2.4 Roof Material
 - 2.5 Vulnerability Factors
 - 2.5.1 Building Neighbourhood
 - 2.5.2 Shape in Plan
 - 2.5.3 Shape in Elevation
 - 2.5.4 Physical Condition
 - 2.5.5 Presence of Earthquake Resistant materials
 - 2.5.6 Additional Attributes

General Tags For Educational and Health Facilities

This page lists the tags used by Open Cities Kathmandu team to map and populate exposure survey data for educational and health facilities in OpenStreetMap.

Educational Facility

Used to map and populate exposure data for educational facilities : kindergarten, school, college.

Amenity

For tagging amenity type of educational facilities

wiki.openstreetmap.org/wiki/Kathmandu_Living_Labs/exposuresurvey



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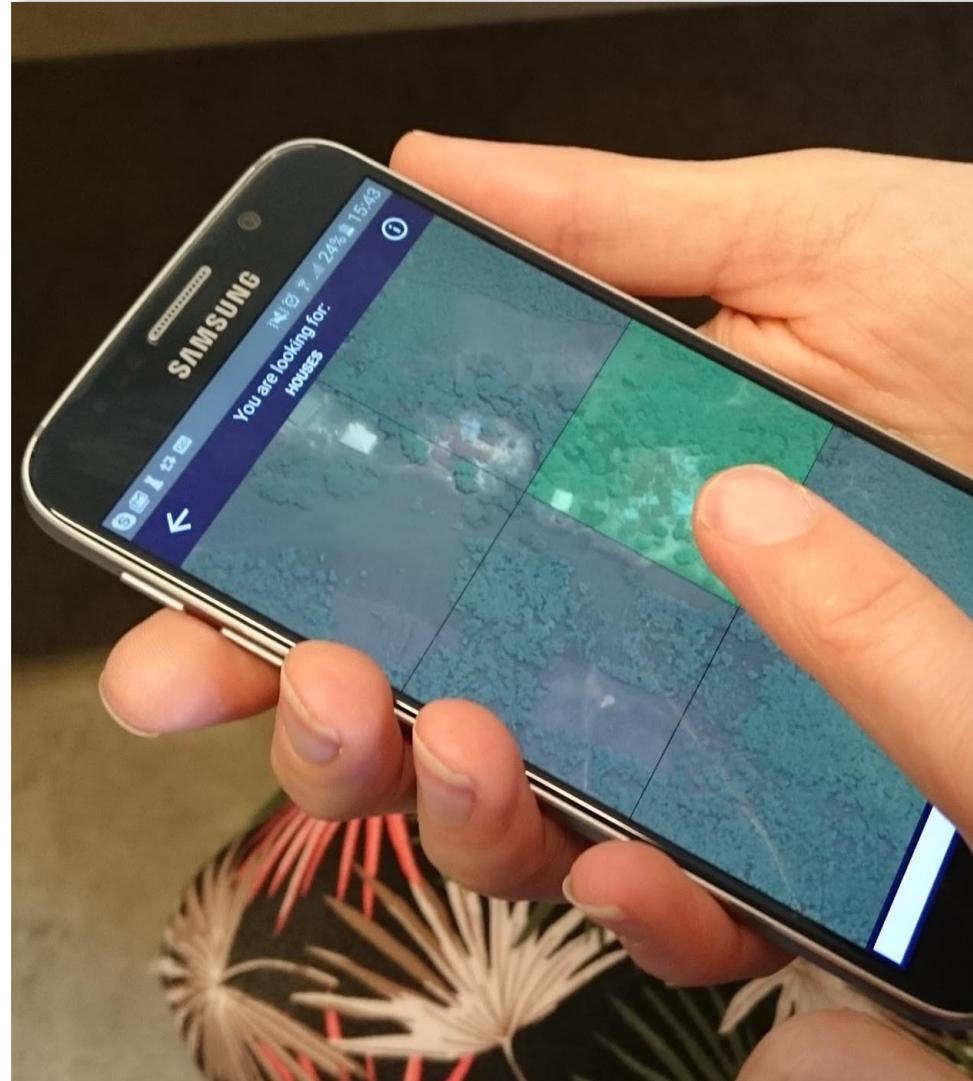
HeiGIT

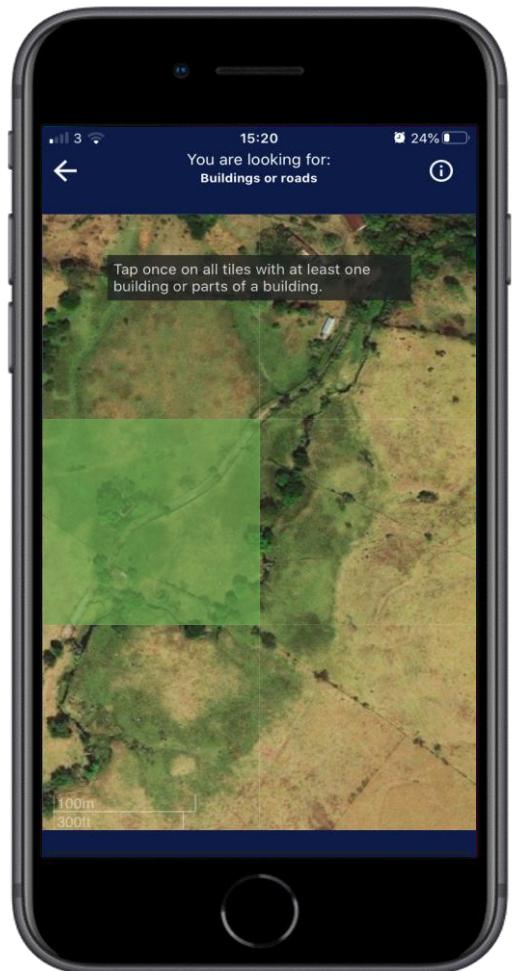
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MapSwipe is an easy to use mobile app

Created for rapid mapping, MapSwipe helps humanitarian organisations to find population centres, and take action where people need it most.

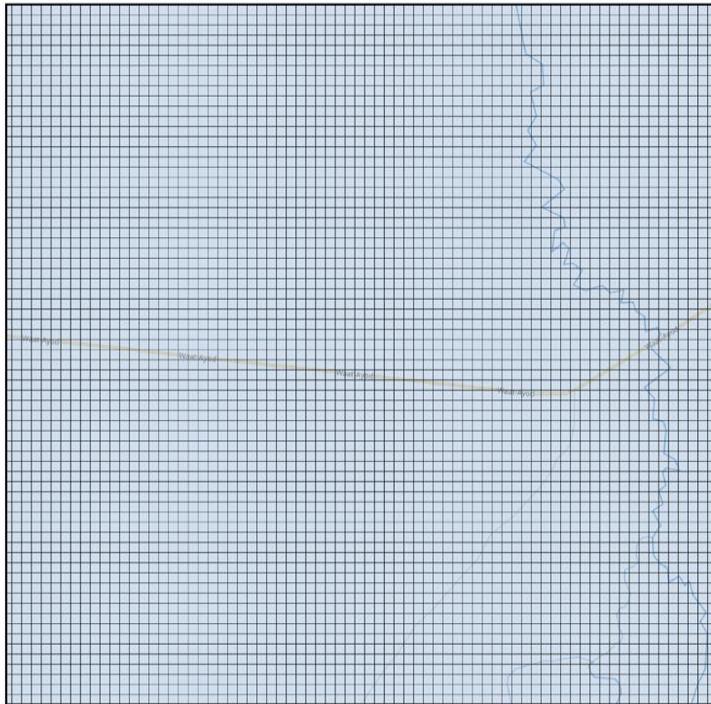




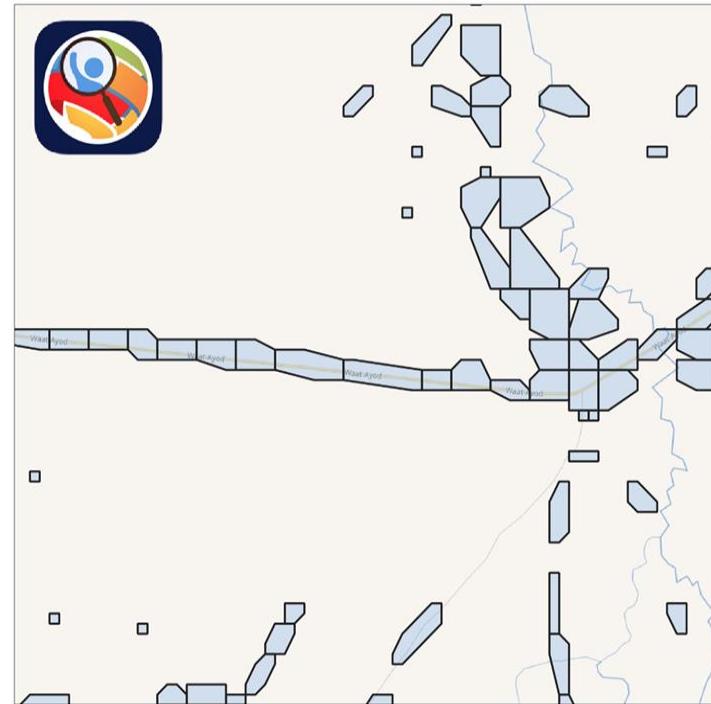
Project Type 1: Standard

Tap on areas where you find signs of civilisation. Most projects are in this format.

How MapSwipe saves time

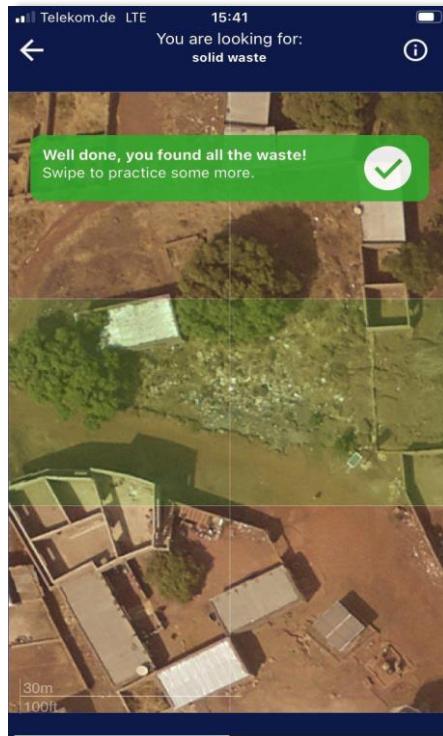


This would be a huge area for people to map.



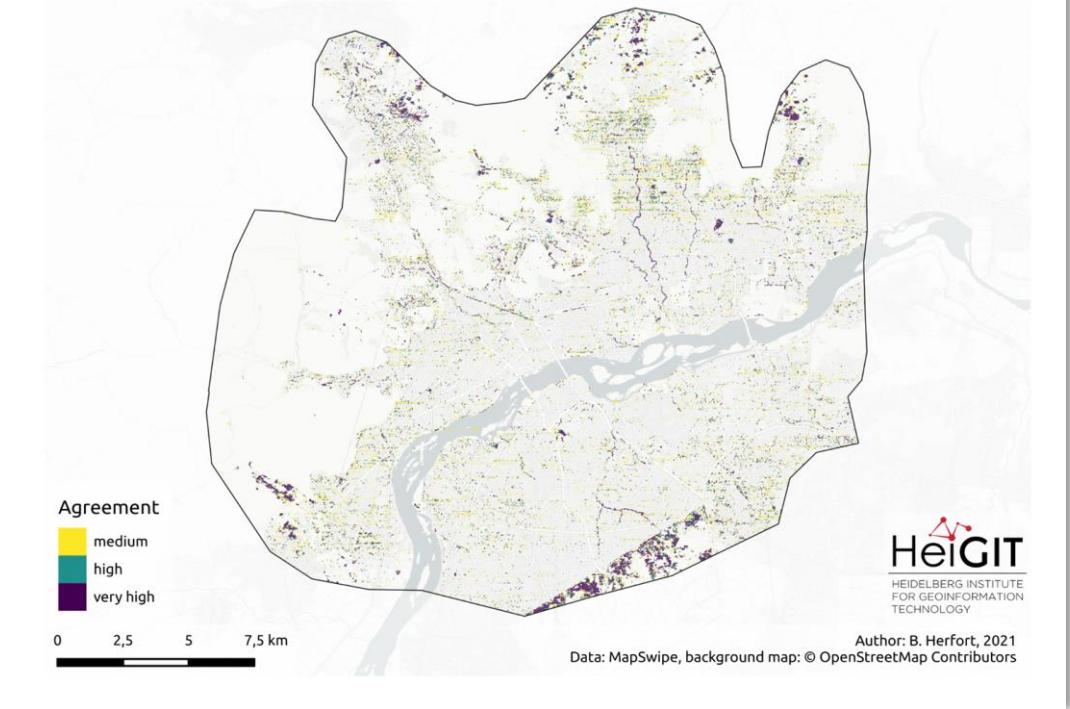
This is the result of MapSwipe. Much better.

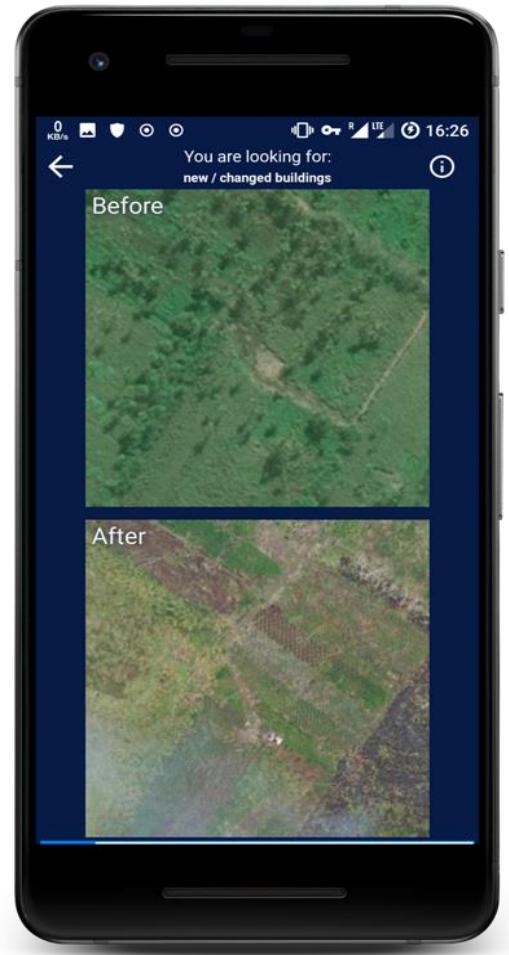
Solid Waste Mapping Bamako (Mali)



Bamako's First High Resolution Solid Waste Map

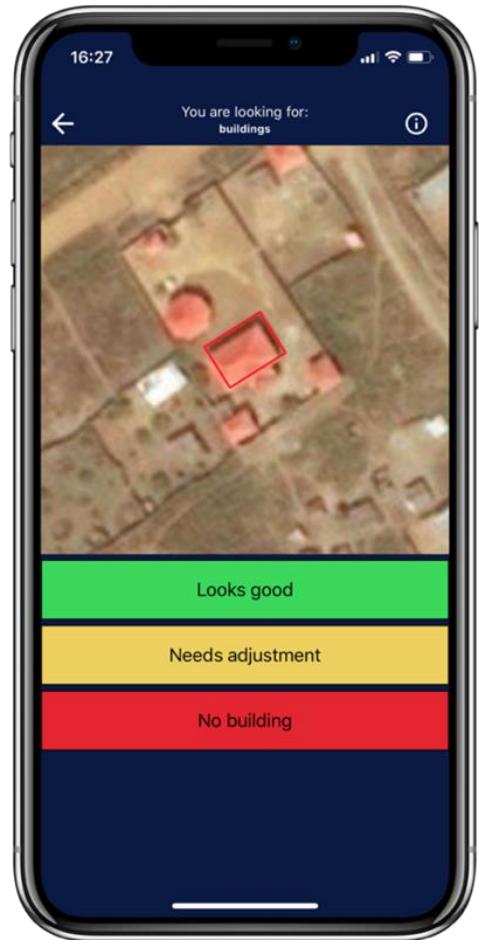
The project covered an area of 455.9 square kilometers. MapSwipe users identified that in 32.6 square kilometers (7.1% of the entire area) solid waste has been deposited.





Project Type 2: Change Detection

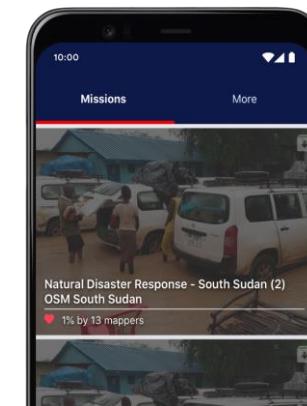
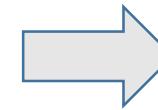
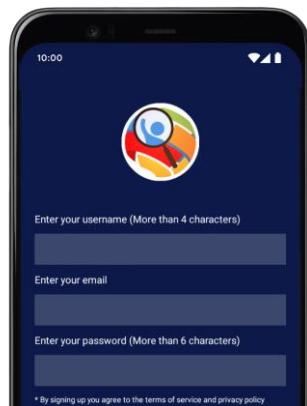
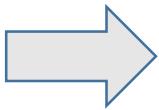
Indicate signs of change in a settlement. You're looking for new, re-sized or the removed buildings



Project Type 3: Building Footprint

Check whether buildings have been
drawn correctly

Get the App



Visit the Google Play
Store or iOS App Store
or and search for
MapSwipe

Add a username
and
create a MapSwipe
account

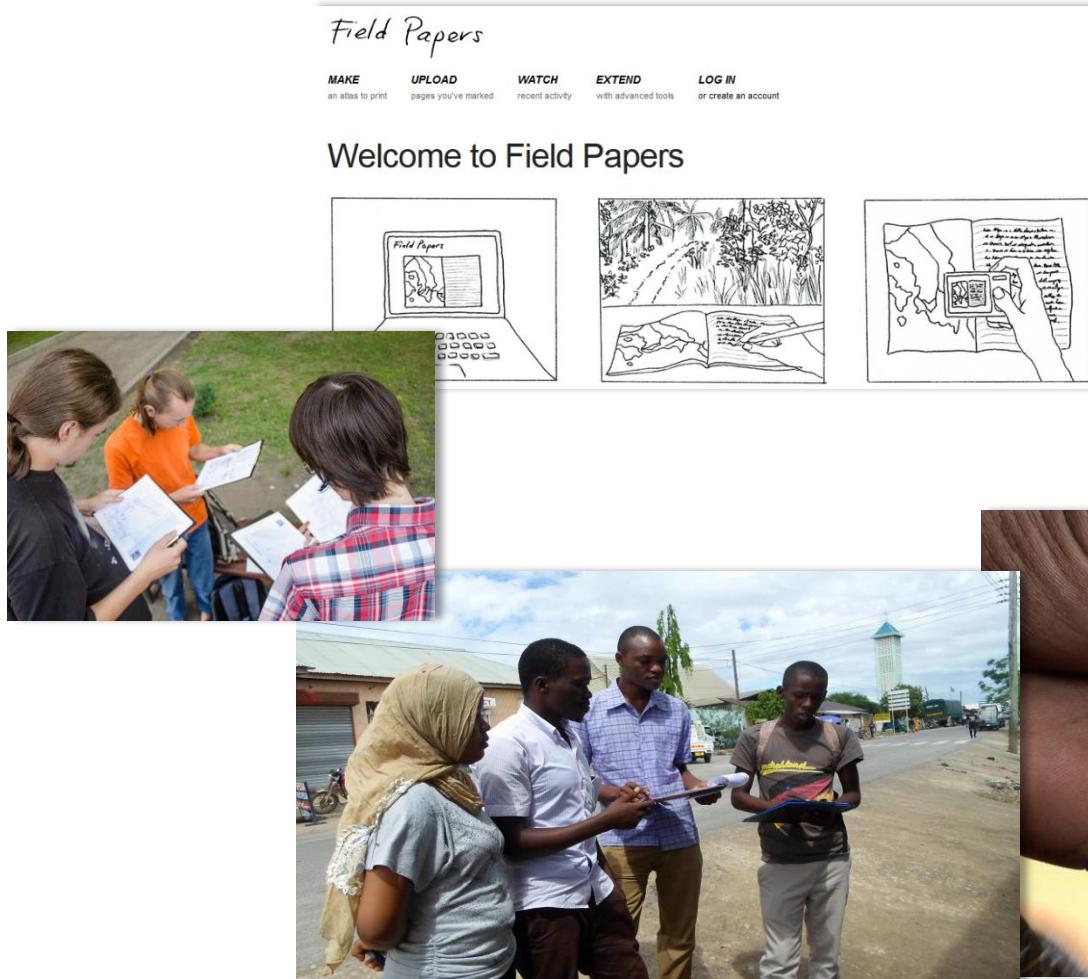
Pick a project



Local OSM Data Use and Collection

- Selection

Local Data Collection



The screenshots show the KoboCollect 1.4.3 (1039) interface, which is part of the KoboToolbox. The top screenshot shows a survey form titled "Escuintla Buildings" with instructions in Spanish. The bottom screenshot shows the main menu with options: Fill Blank Form, Edit Saved Form, Send Finalized Form, Get Blank Form, and Delete Saved Form.

Escuintla Cen...

* Escuintla Buildings

Esta es la encuesta de edificios CHAI-Guatemala utilizada para recopilar información de vivienda y edificio. Por favor, seleccione un edificio y etiquetar adecuadamente.

Launch OpenMapKit

KoBoCollect > Main Menu

KoBoCollect 1.4.3 (1039)

Part of KoBoToolbox

Fill Blank Form

Edit Saved Form

Send Finalized Form

Get Blank Form

Delete Saved Form



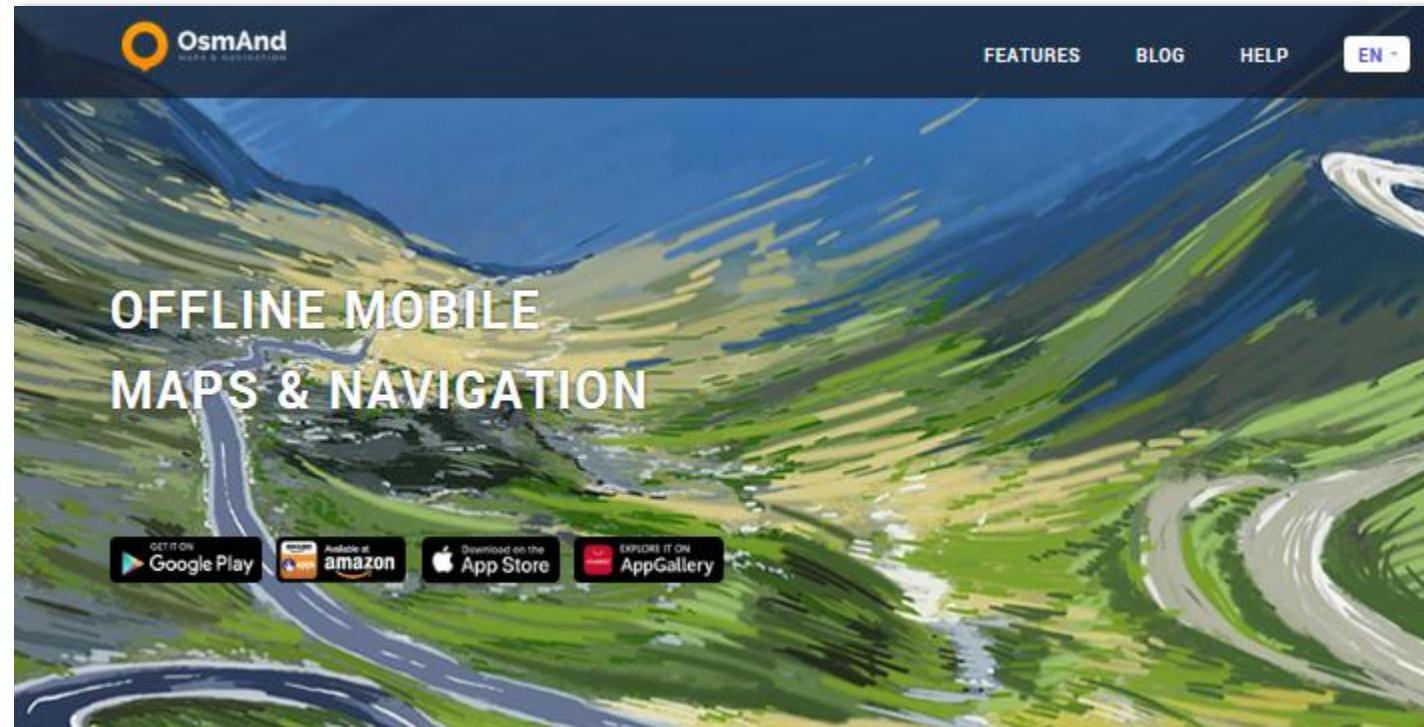
Deutsches
Rotes
Kreuz

HeiGIT

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OSMAnd

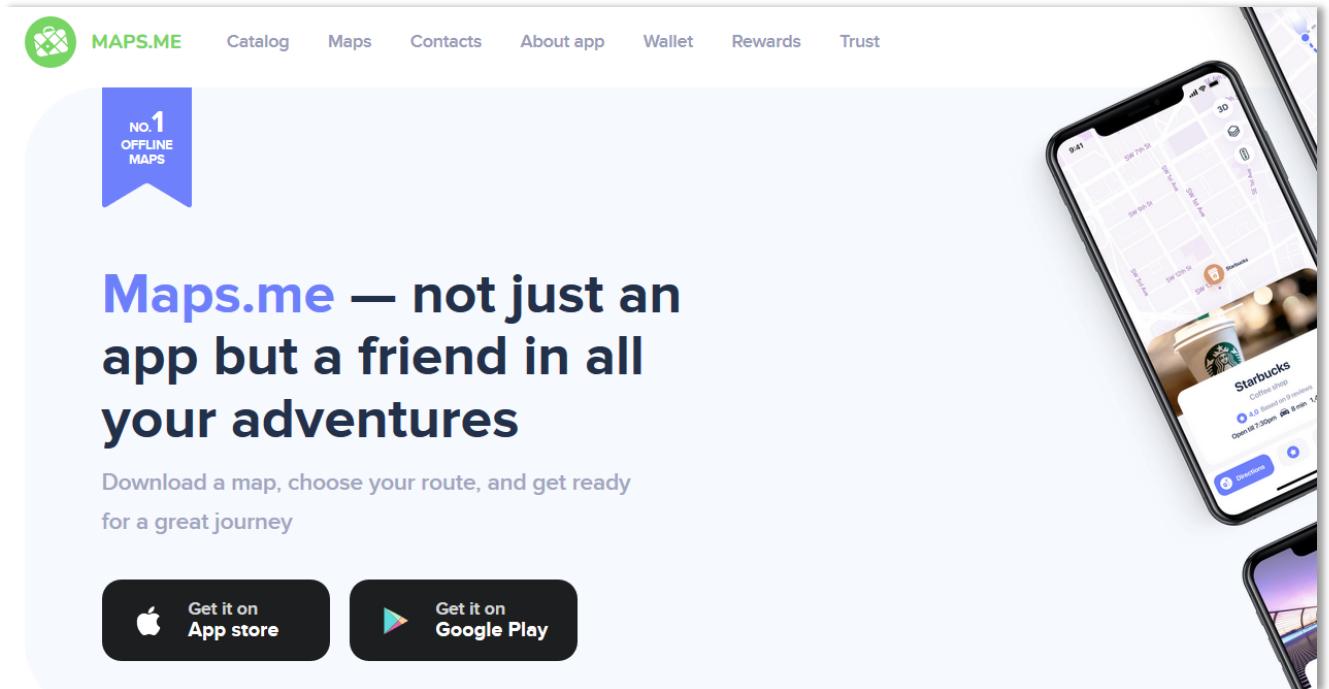
- Enables OSM based offline navigation
- Map Viewing



osmand.net

Maps.Me

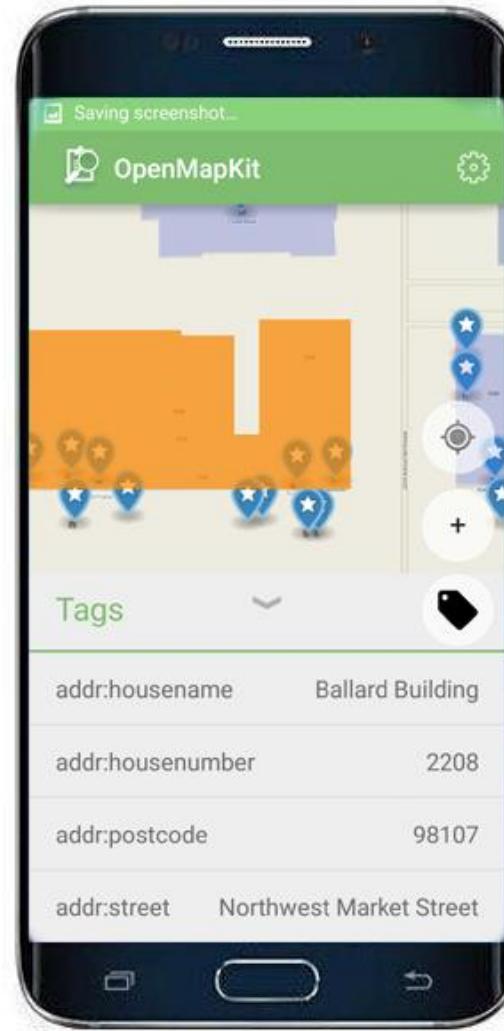
- Enables OSM based offline navigation
- Map Viewing
- OSM Contribution/ Editing



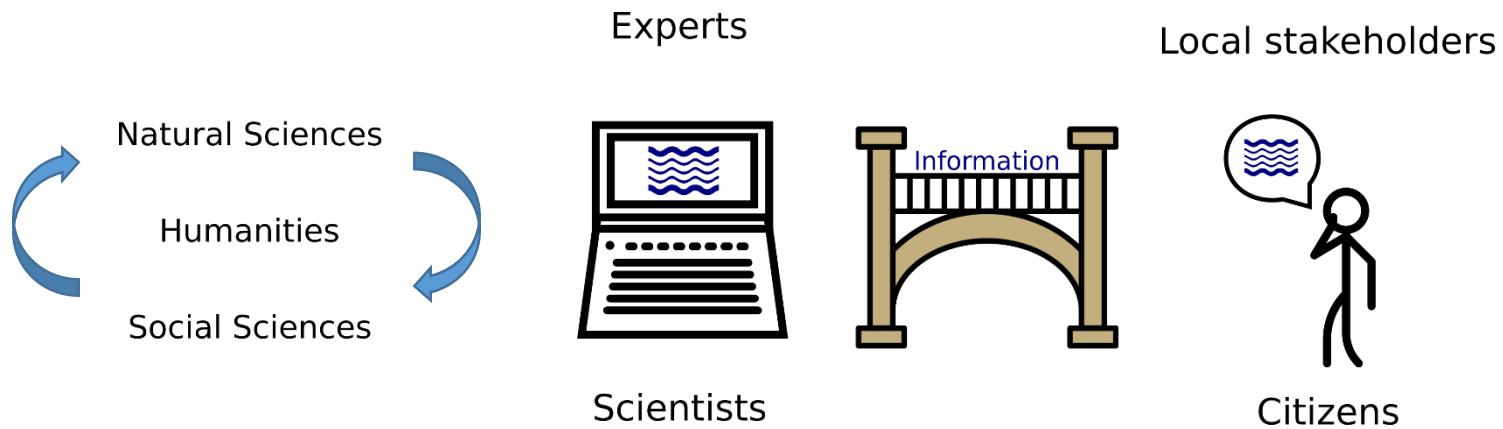
maps.me

OpenMapKit

- Developed by American Red Cross in scope of MissingMaps
- An extension of OpenDataKit to create mobile data collection surveys for field data collection



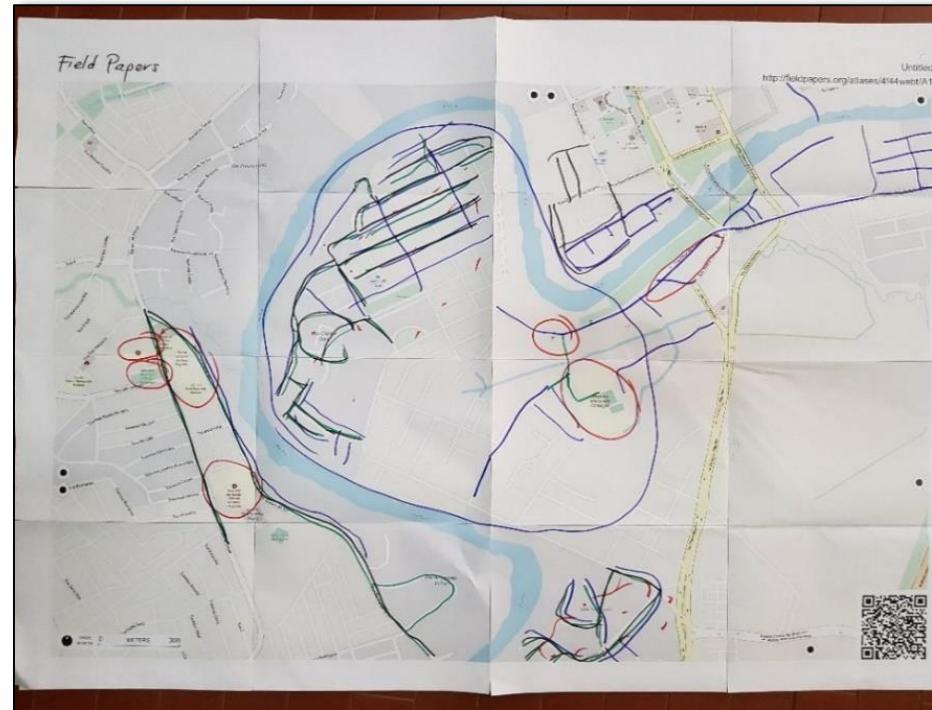
Local Data Collection- SketchMapTool



Developed in scope of the Waterproofing Data Project (Brazil, Germany, UK):
geog.uni-heidelberg.de/gis/waterproofing.html

Community/ Participatory Mapping

Result of a group discussion: Sketch Map on DIN A0



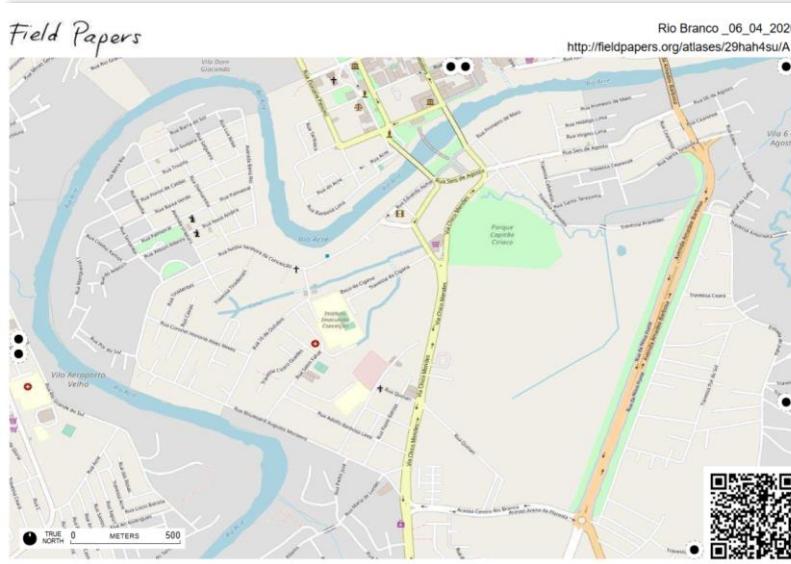
Community/ Participatory Mapping

Study in Rio Branco, Acre and M'Boi Mirim, São Paulo
June 2019

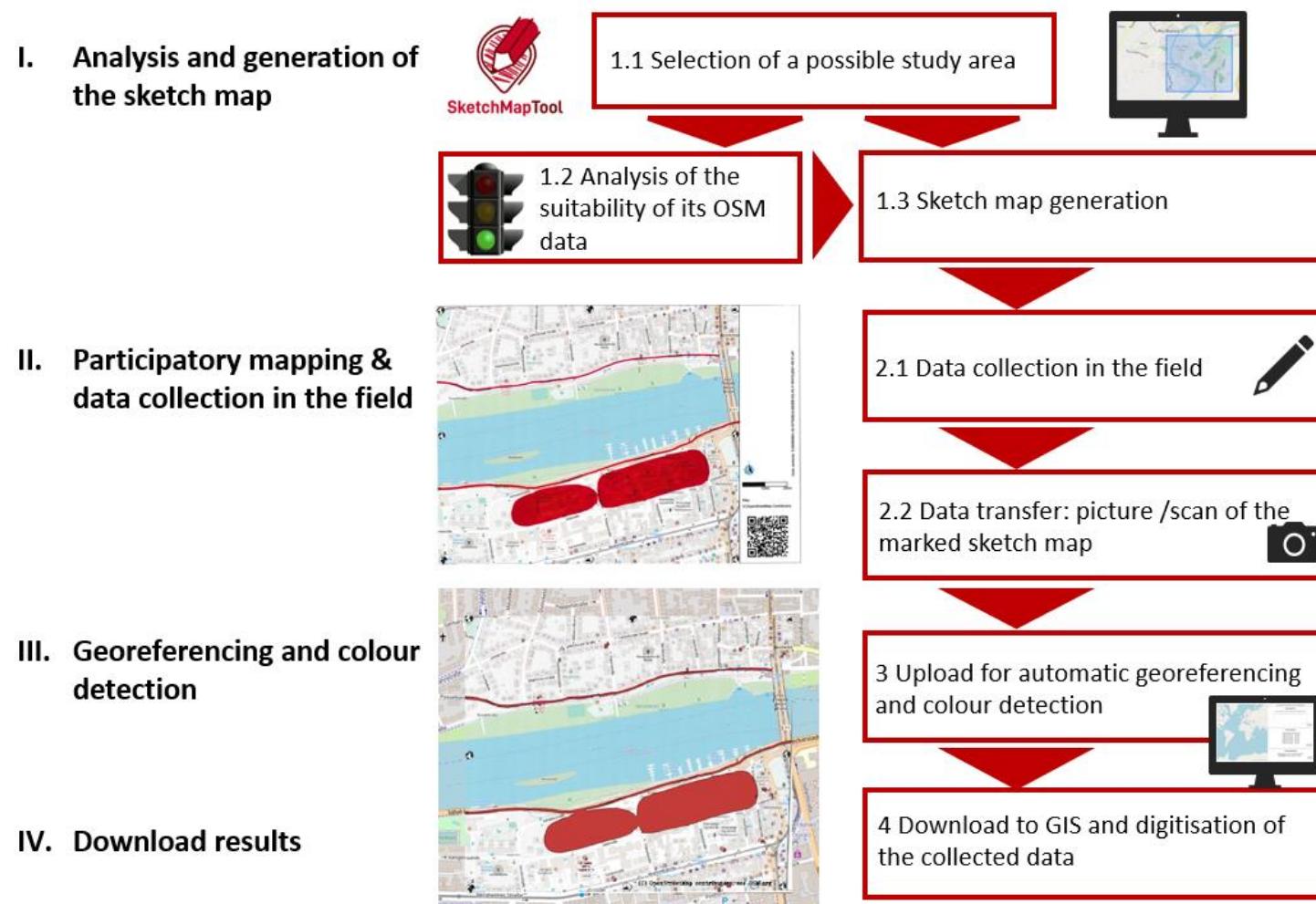


Community/ Participatory Mapping

Base map was improved through participatory remote mapping project

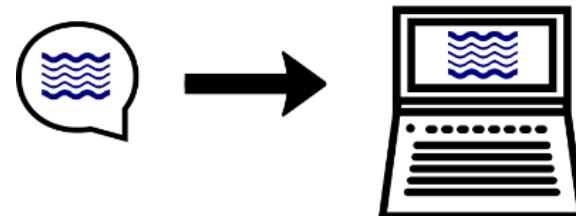
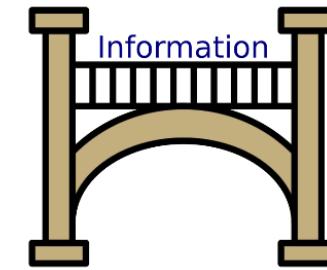


Community/ Participatory Mapping



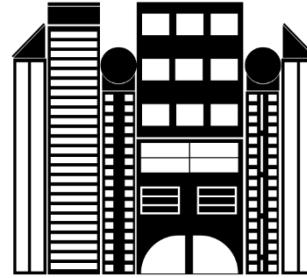
Community/ Participatory Mapping

- Connect experts, remote communities and local populations/ communities
- Knowledge and data exchange
- Coproduction of data and knowledge



Sketch Maps Tool Extension

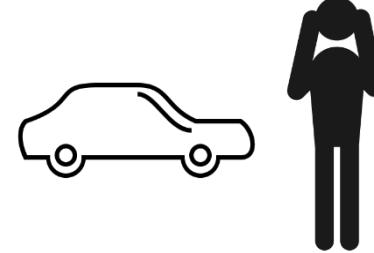
Urban heat
islands



Areas of fear

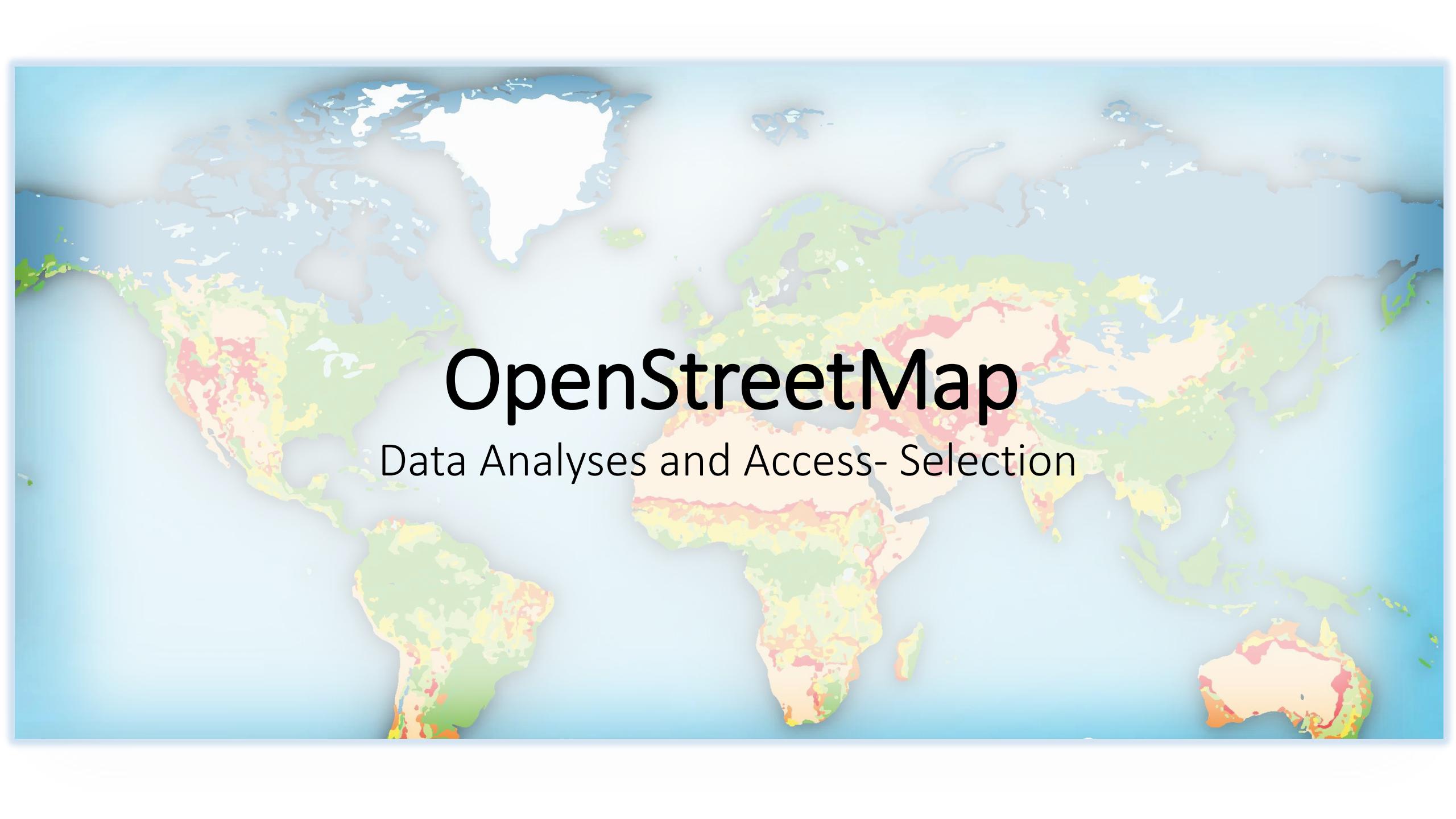


Noise pollution



Identification of water points, which
serve as breeding grounds for
mosquitoes



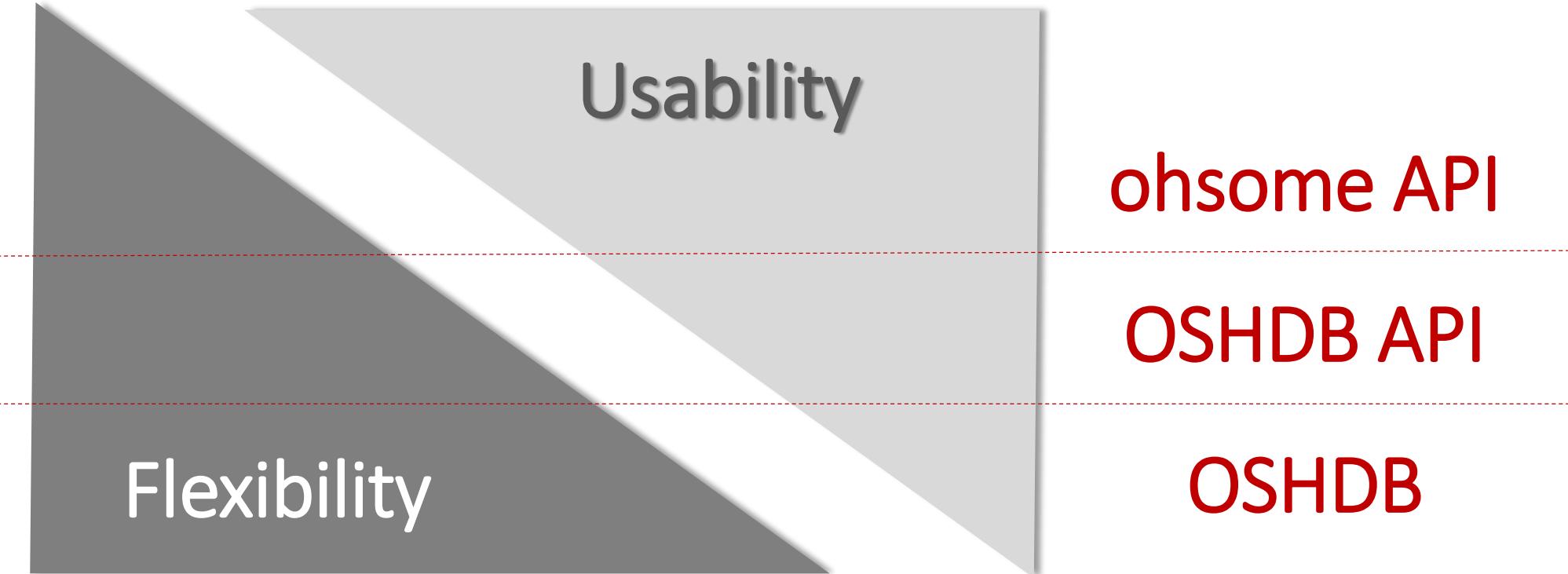


OpenStreetMap

Data Analyses and Access- Selection

ohsome framework

ohsome framework



ohsome quality analyst - OQT

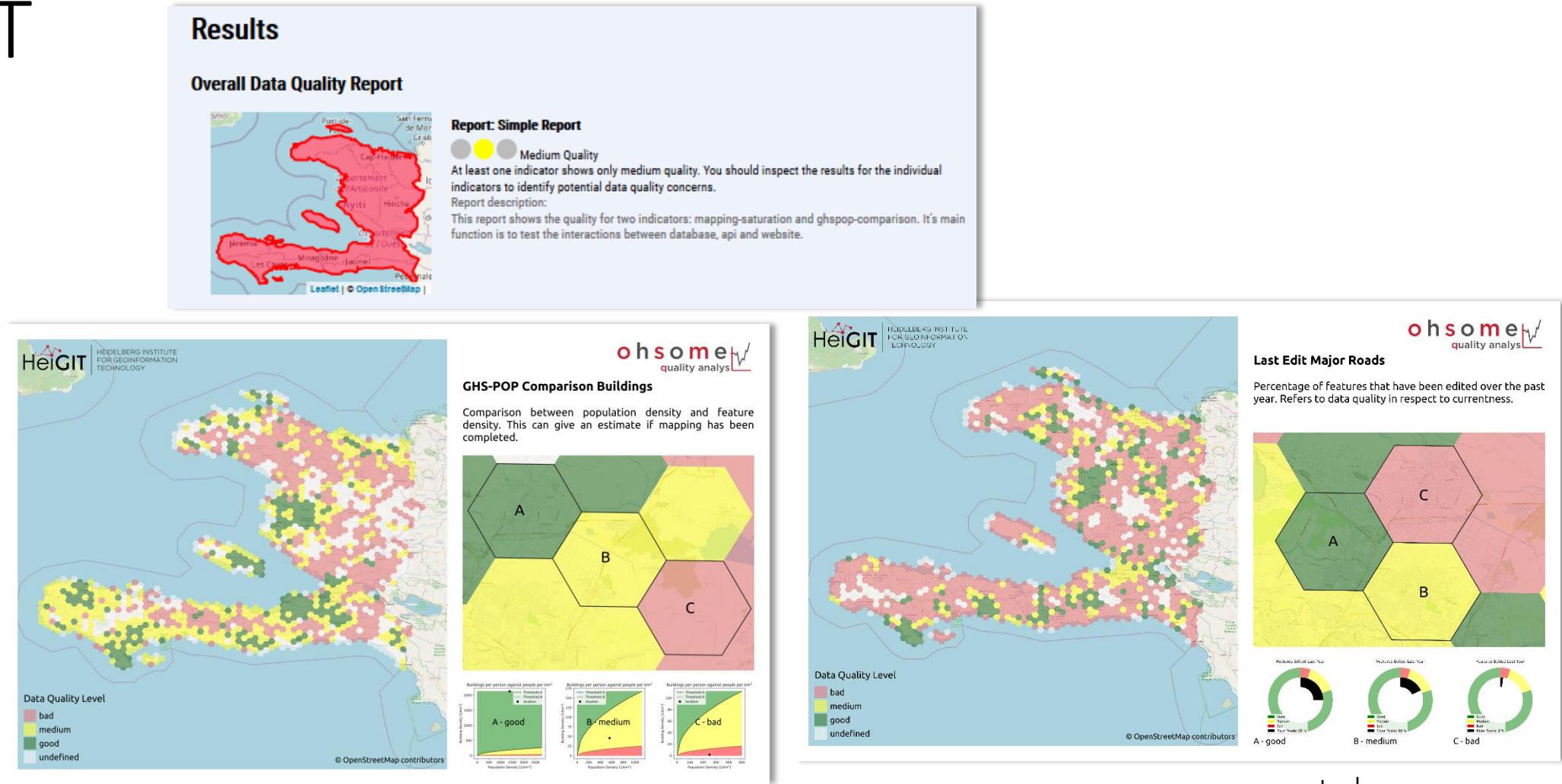
OpenStreetMap Data Quality
Assessment for Specific Regions
and Topics

The screenshot shows the homepage of the ohsome quality analyst - OQT website. At the top right are links for "Home" and "About". The main title "ohsome quality analyst - OQT" is displayed prominently over a grayscale map of Heidelberg, Germany. Below the title is the subtitle "Get OpenStreetMap Data Quality for Specific Regions and Topics". A note at the bottom left states: "Please note, this is a proof of concept implementation of the OQT, we are constantly working on enhancements (e.g. further indicators, being able to customize the weighting of the different indicators, processing bigger or customized areas of interest)." The central part of the page features a map of the Caribbean region, specifically showing Cuba, Hispaniola (Dominican Republic and Haiti), and parts of Central America. Two locations are highlighted with blue markers: one near Cap-Haïtien in the Dominican Republic and another near Santo Domingo. Below the map, three numbered steps are listed: 1. Pick an area on the map, 2. Choose data quality report, and 3. Run analysis. Step 1 includes a sub-instruction: "Click on a marker, when it turns red, it is selected." Step 2 has a dropdown menu set to "Simple Report". Step 3 has a "GET QUALITY REPORT" button.

oqt.ohsome.org

ohsome quality analyst

- OQT



oqt.ohsome.org

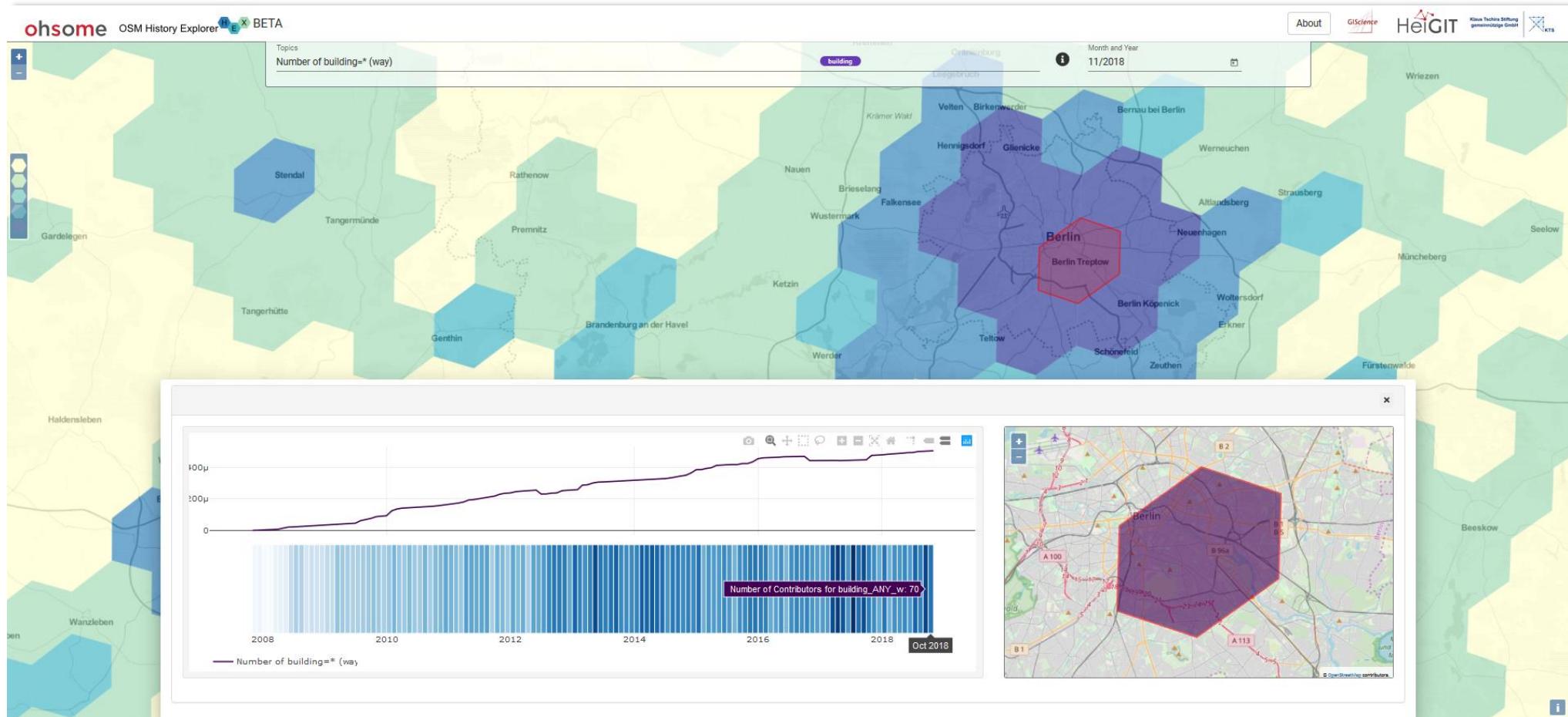


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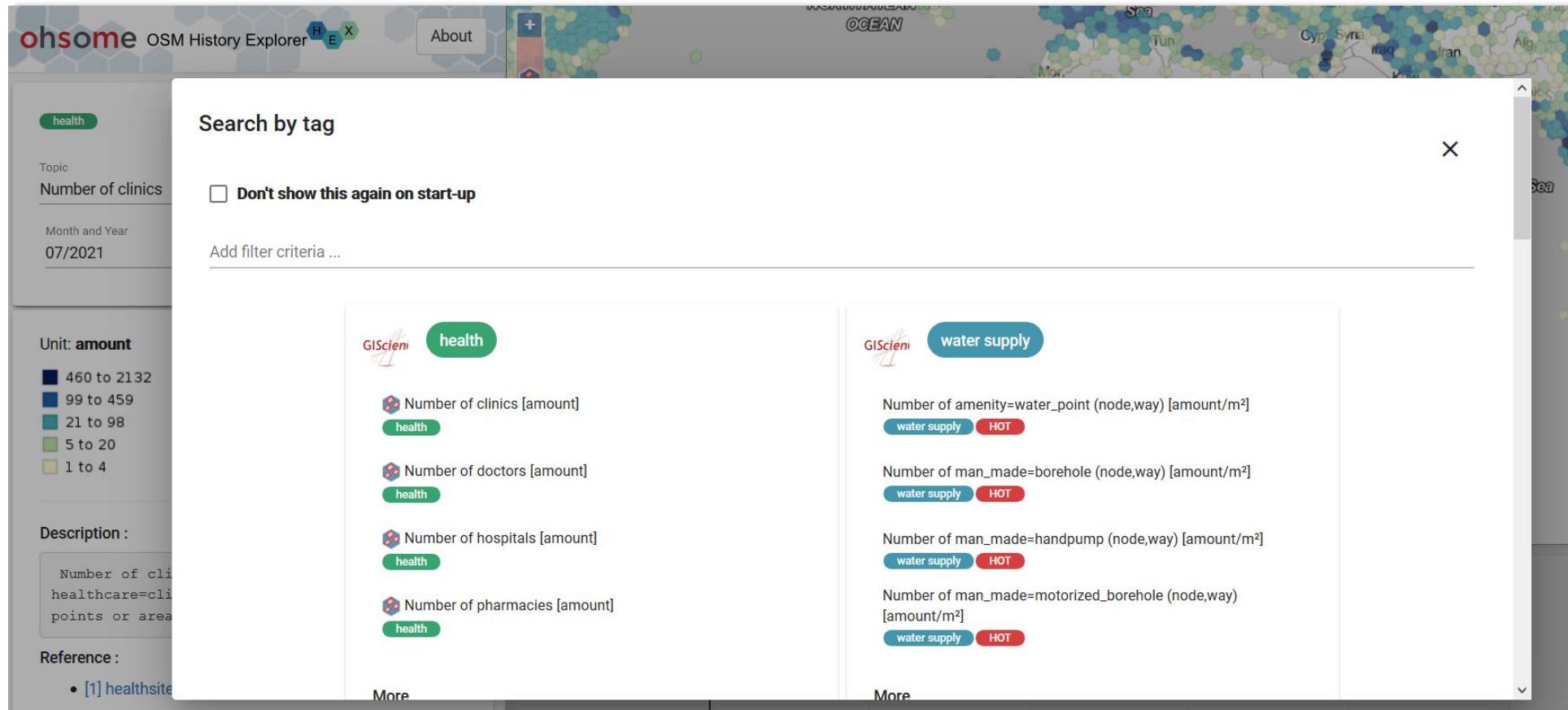
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Exploratative Analyses- ohsome History Explorer



ohsome.org/apps/osm-history-explorer/

Exploratative Analyses- ohsome History Explorer



Exploratory Analyses- ohsome History Explorer

The screenshot shows the ohsome OSM History Explorer interface with a red box highlighting a specific analysis for a volcanic eruption in La Palma, Spain.

Search by tag:

- Don't show this again on start-up
- Add filter criteria ...

Topic: Number of clinics
Month and Year: 07/2021

Unit: amount

- 460 to 2132
- 99 to 459
- 21 to 98
- 5 to 20
- 1 to 4

Description :

Number of clinics [amount] (health)

Number of doctors [amount] (health)

Number of hospitals [amount] (health)

Number of pharmacies [amount] (health)

Reference :

- [1] healthsite

Analysis (highlighted by red box):

GIScien! **disaster**

Volcanic eruption (lava field) La Palma, Spain 2021 [km²]

GIScien! **water supply**

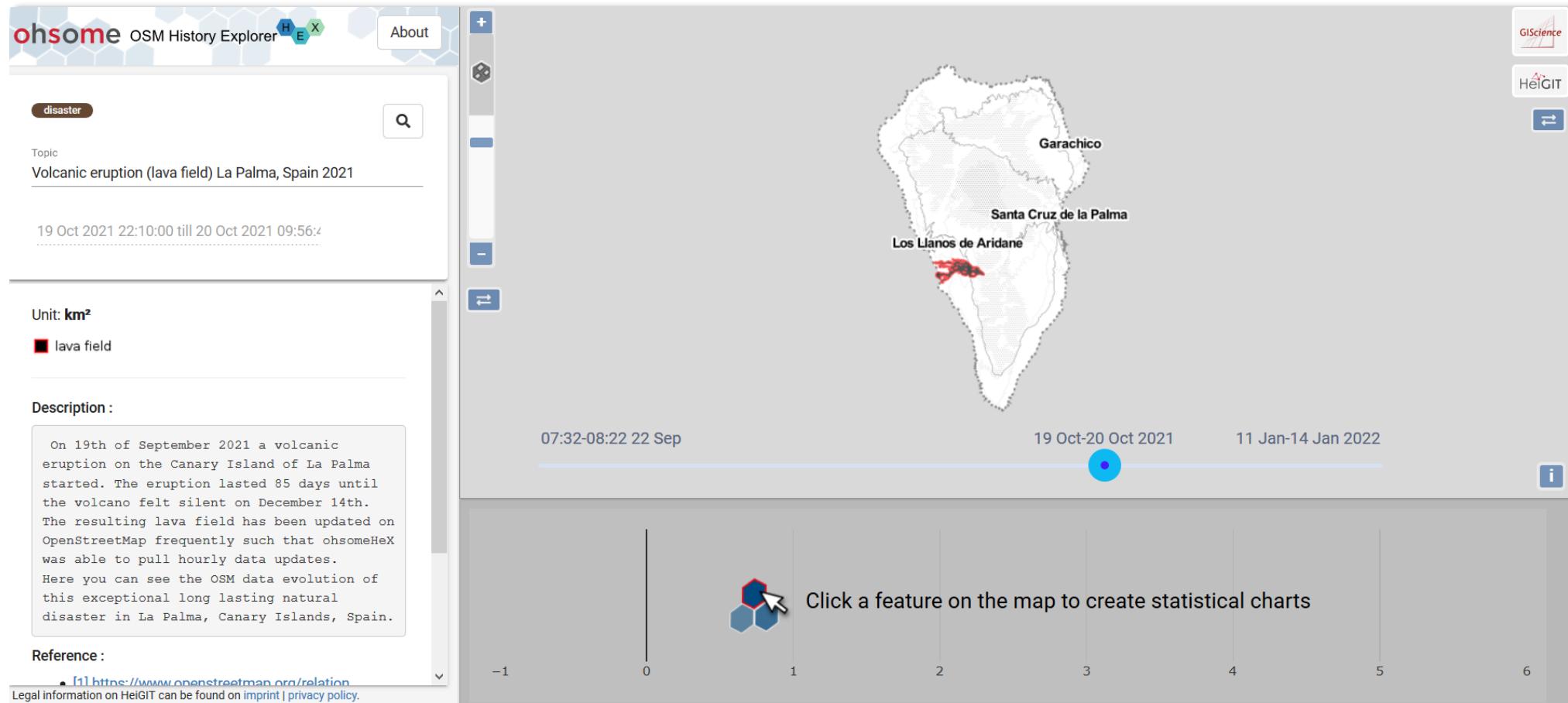
Number of amenity=water_point (node,way) [amount/m²] (water supply HOT)

Number of man_made=borehole (node,way) [amount/m²] (water supply HOT)

Number of man_made=handpump (node,way) [amount/m²] (water supply HOT)

Number of man_made=motorized_borehole (node,way) [amount/m²] (water supply HOT)

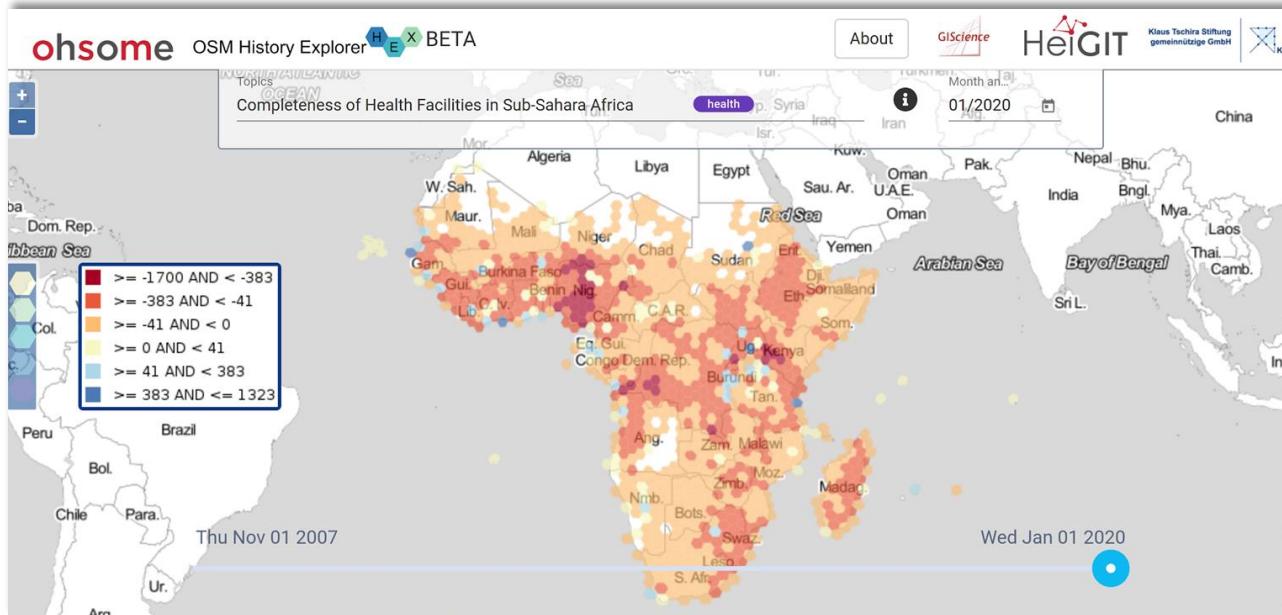
Exploratative Analyses- ohsome History Explorer



Identify areas where health facilities are missing in OpenStreetMap (OSM)

Question: How complete is the mapping of Sub-Saharan Africa (SSA) health facilities in OSM?

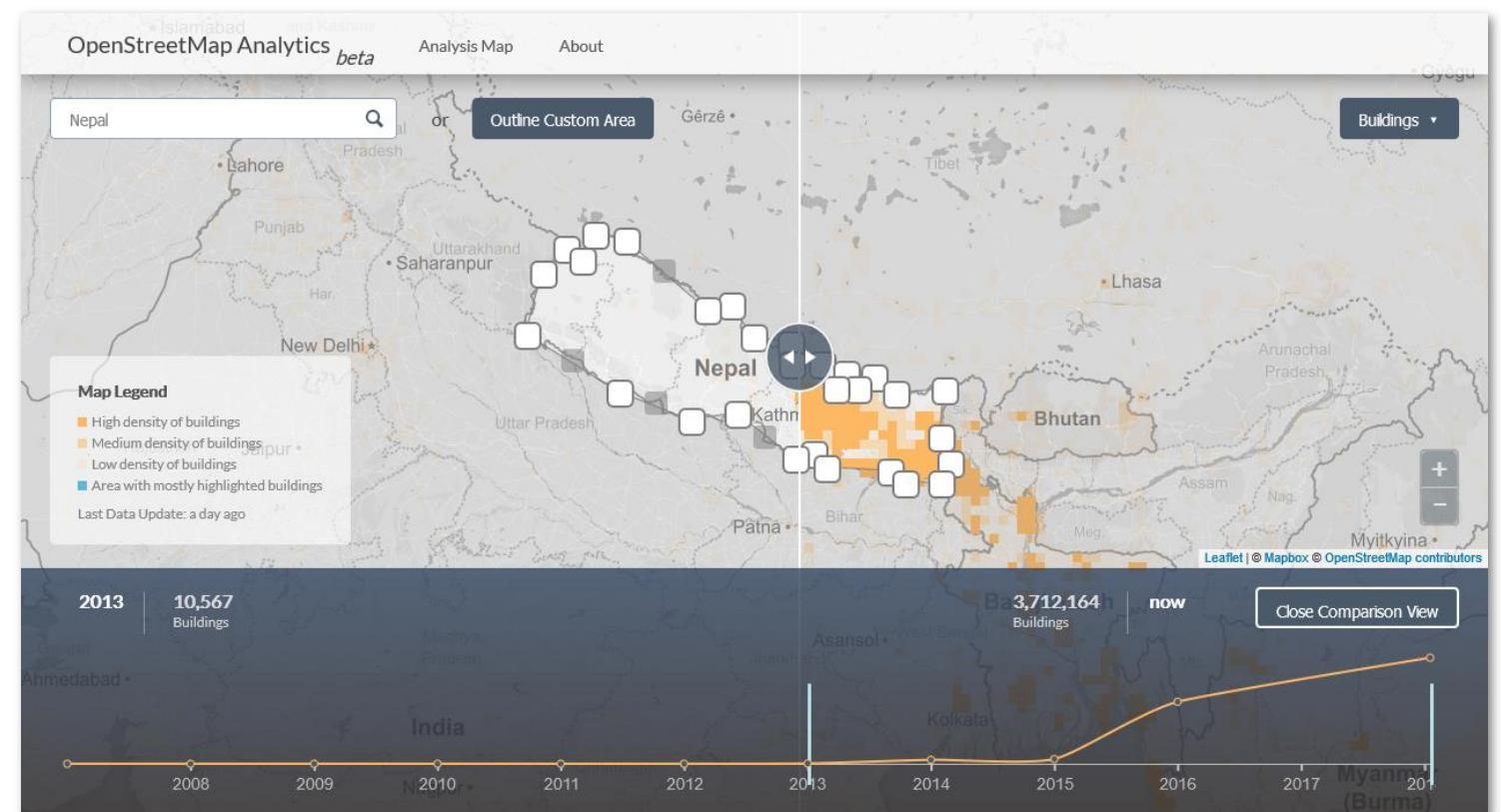
- The completeness of OSM is measured by comparison to the WHO/KEMRI dataset on public health facilities in SSA.
- The results can be interactively explored in [ohsomeHeX](#).



<http://k1z.blog.uni-heidelberg.de/2020/04/17/osm-completeness-of-health-facilities-in-sub-sahara-africa/>

HOT Tools- OSM Analytics

- Explore OSM Data development over time
- Gap detection



HOT Tools- HOT Export Tool

Download data using presets and already existing configurations

The screenshot shows the main interface of the HOT Export Tool. At the top, there's a navigation bar with links for Create, Exports, Configs, About, Learn, Support, a language dropdown set to English, and a Log Out button. The main content area features a large grayscale map of a city street network. Overlaid on the map is a dark blue rectangular box containing the text "Download OpenStreetMap Data". Below this, a smaller text block explains the service: "The Export Tool is an open service that creates customized extracts of up-to-date OSM data in various file formats. Download and use the data simply by crediting the OpenStreetMap contributors." A blue "Start Exporting" button is located at the bottom of this box. At the very bottom of the page, there's a "Get Started" section with a link to sign up for an OSM account.

export.hotosm.org



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EXPORT TOOL

1 Describe

2 Formats

3 Data

4 Summary

Create

Exports

Configs

About

Learn

Support

English ▾

Log Out

Tag Tree

Configs

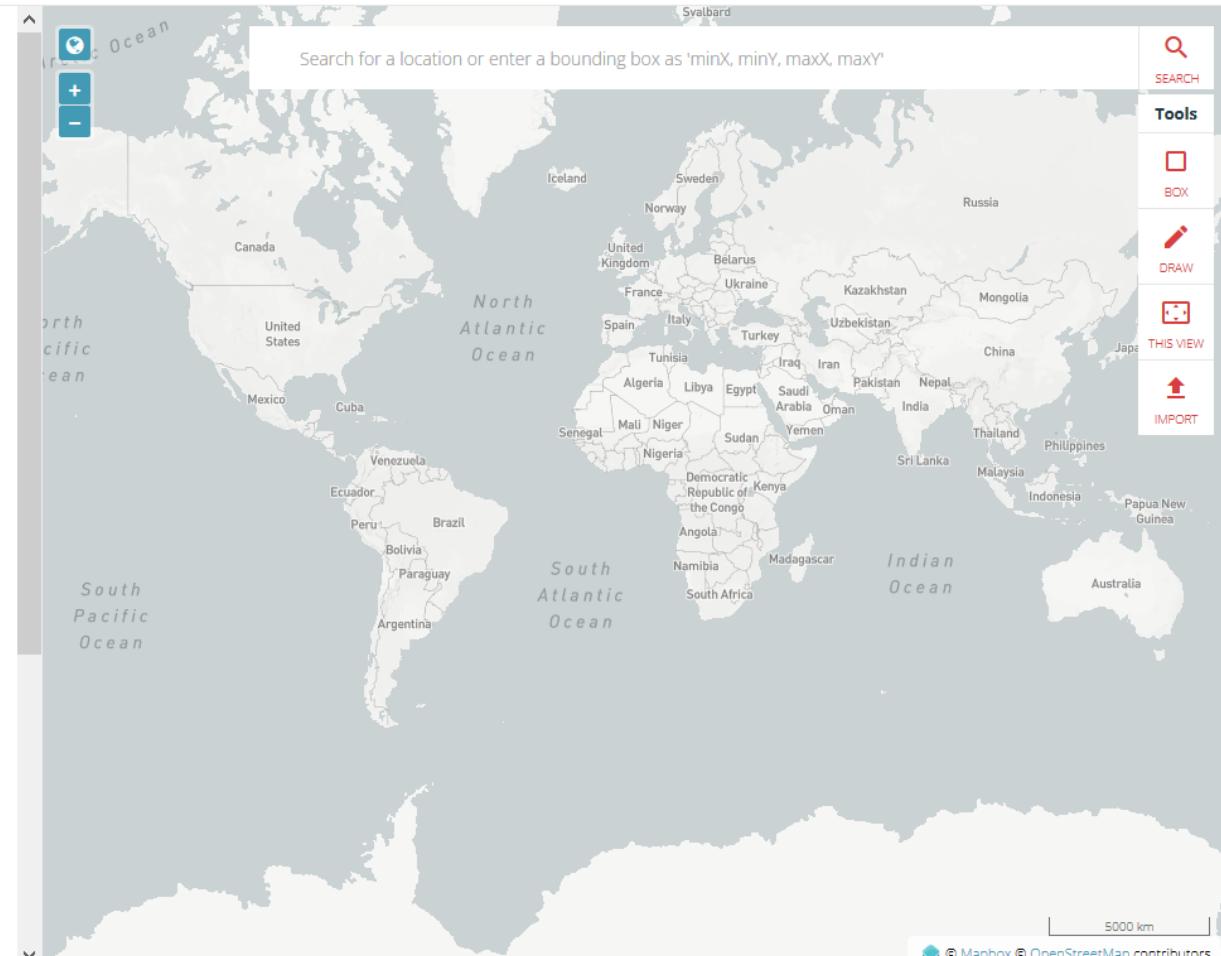
YAML

Search for a feature type...

Clear

> Buildings> Commercial> Communication> Education> Emergency> Financial> Government> Healthcare Doctor Dentist Clinic Hospital Pharmacy Alternative> Humanitarian> Land Use> Localities> Natural**Alternative****Geometry types:** point, polygon**Keys:**

- name
- healthcare
- shop

Where: healthcare='alternative' OR shop IN ('herbalist','nutrition_supplements')

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TYPHOON Kammuri (Bicol Region)

HOT Philippines ACTIVATION Response

[View](#)

MINDANAO Earthquake (Northern Region)

HOT Philippines ACTIVATION Response

[View](#)

Featured Exports

METEOR Project (Kathmandu)

UK Space Agency METEOR Project

[View](#)

MINDANAO Earthquake (Southern Region)

HOT Philippines ACTIVATION Response

[View](#)

METEOR Project (Dar es Salaam)

UK Space Agency METEOR Project

[View](#)

Global Exposure Database 4 All

Healthsites.io

Featured Configurations

Humanitarian Data Exchange

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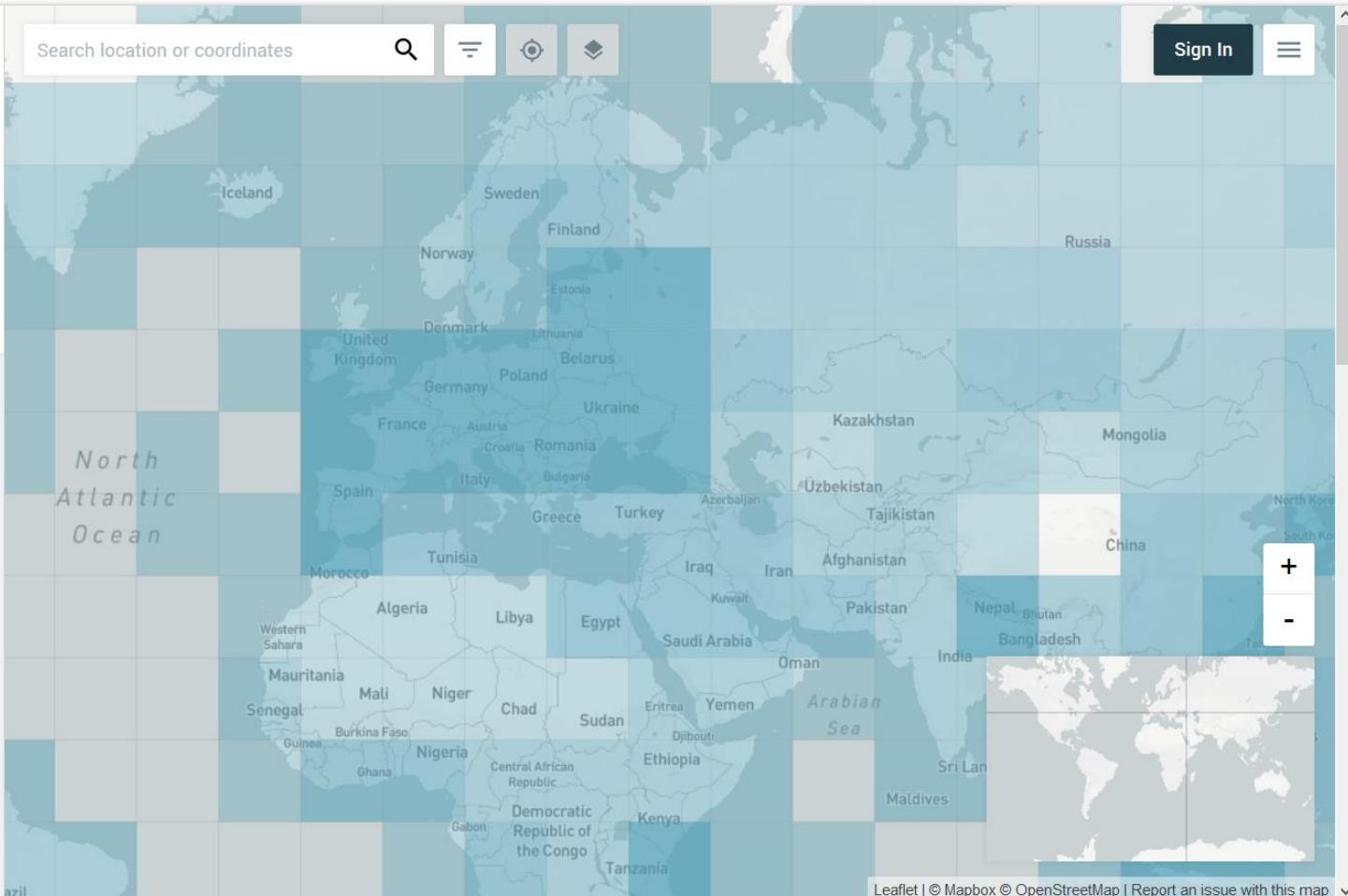
openaerialmap



OpenAerialMap (OAM) is a set of tools for searching, sharing, and using openly licensed satellite and unmanned aerial vehicle (UAV) imagery.

Latest uploads

km5 2019-11-07 / 6 cm La Trinidad MDRRMC	Walk Of Excellence 2019 Update 2019-11-05 / 3 cm Andrew Thompson
Oficinas Centrales de PROBOSQUE 2019-11-05 / 5 cm Jonathan Vera Hernandez	El Pintado 2019-11-05 / 5 cm Jonathan Vera Hernandez



Deutsches
Rotes
Kreuz

HeiGIT

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