

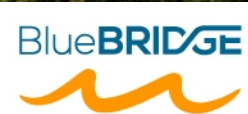


POLITECNICO  
MILANO 1863

# RDA Geospatial Interest Group

Marco Minghini  
Politecnico di Milano – GEOLab

Heraklion, Crete | June 15, 2017



Join the RDA-Europe / BlueBRIDGE

**Datathon** on  
**Fisheries** and **Aquaculture**

June 15-16, 2017 – Heraklion, Crete, Greece



# RDA Geospatial Interest Group



RESEARCH DATA ALLIANCE



# RDA Geospatial Interest Group

- ✓ A domain-oriented IG to coordinate & build synergies on topics related to geospatial data

➔ <https://www.rd-alliance.org/groups/geospatial-ig.html>



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## Geospatial IG

[Home](#) » [Working And Interest Groups](#) » [Interest Group](#) » [Geospatial IG](#)

IG

### Group details

**Status:** Recognised & Endorsed

**Chair(s):** Suchith Anand, Peter Baumann, Luciene Delazari, Andrea Perego, Chris Pettit

**Case Statement:** [Download](#)

The Geospatial Interest Group is a domain oriented interest group to coordinate and build synergies on topics related to geospatial data. Though there has been lot of developments and advances in geo data collection through mobile communications, sensor platforms, spatial search, and pervasive computing but still, the inter-disciplinary research needed to transform raw data into useful intelligence, to improve the planet's environmental, economic and societal well being, remains constrained by a range of barriers - disciplinary, organisational, historical, and a non-existent or non-rigorous approach to quantifying uncertainty in collected datasets.

### Geospatial IG

**Status:** Recognised & Endorsed

**Chair(s):** Suchith Anand, Peter Baumann, Luciene Delazari, Andrea Perego, Chris Pettit

\*\*\*\*

**Group Email:**

**Secretariat Liaison:**

**TAB Liaison:**

Public - accessible to all site users

[Join Group](#)



# RDA Geospatial Interest Group

- ✓ The Geospatial IG coordinates activities, promotes good practices and involves stakeholders in areas related to **geospatial data**, including:
  - geospatial data sharing policies
  - policies for documenting and sharing geospatial analytical models
  - geospatial data management plans
  - quantify uncertainty in datasets
  - geospatial data re-use across domains & cross-domain interoperability of location and place information
  - global research agenda for Geospatial Data Science
- ✓ IG charter available at <https://www.rd-alliance.org/group/geospatial-ig/case-statement/charter-geospatial-interest-group.html>



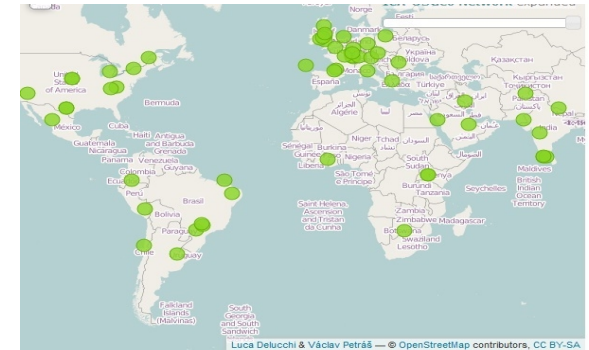
# RDA Geospatial Interest Group

- ✓ Linked to many other [RDA WGs & IGs](#), for example:
  - ➔ Metadata IG, Metadata Standards Directory WG
  - ➔ Data in Context IG, Big Data Analytics IG
  - ➔ Agriculture IG, Fisheries Data Interoperability WG
  - ➔ Urban Quality of Life Indicators WG
  - ➔ Defining Urban Data Exchange for Science IG
  - ➔ Publishing Data IG, Data Citation WG
- ✓ Involving [major international institutions](#) in the geospatial domain:
  - ➔ OGC, ICA, OSGeo, ISPRS, GEO, ESSI/AGU, EarthCube, AGILE, and relevant W3C community groups



# Open Geospatial Science

- ✓ It builds upon the idea of Open Science:
  - ➔ scientific knowledge of all kinds can be developed more rapidly and in a more productive manner if **openly shared** (as early as it is practical in the discovery process)
  - ➔ key ingredients to make Open Geospatial Science possible are **Open Principles** (GeoForAll – <http://www.geoforall.org>):
    - x open source geospatial software
    - x open geospatial data
    - x open geospatial standards
    - x open access to research publications



**OGC**®  
Making location count.





# Datasets & tools for the RDA-Europe / BlueBRIDGE datathon

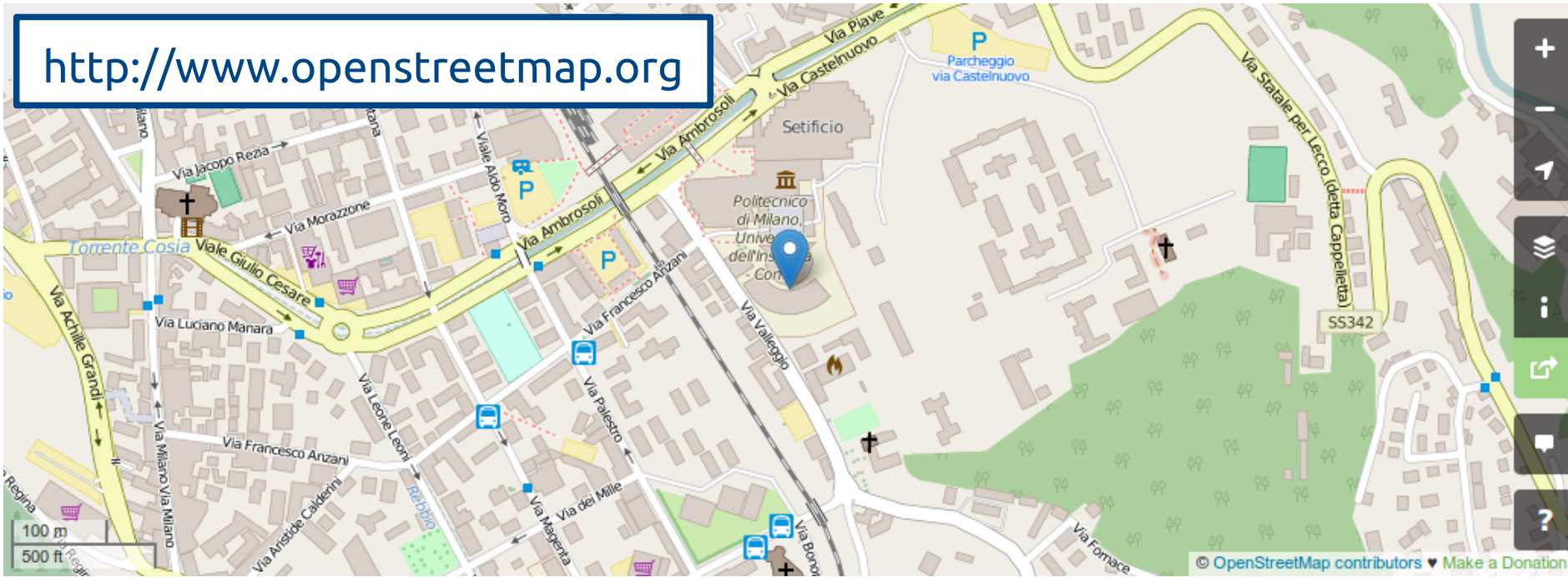


# OpenStreetMap (OSM)



- ✓ The most popular project of Volunteered Geographic Information (VGI)
  - ➔ founded by Steve Coast in UK in 2004  
([http://wiki.openstreetmap.org/wiki/History\\_of\\_OpenStreetMap](http://wiki.openstreetmap.org/wiki/History_of_OpenStreetMap))
  - ➔ a free, editable vector map of the whole world built by volunteers  
([http://wiki.openstreetmap.org/wiki/About\\_OpenStreetMap](http://wiki.openstreetmap.org/wiki/About_OpenStreetMap))

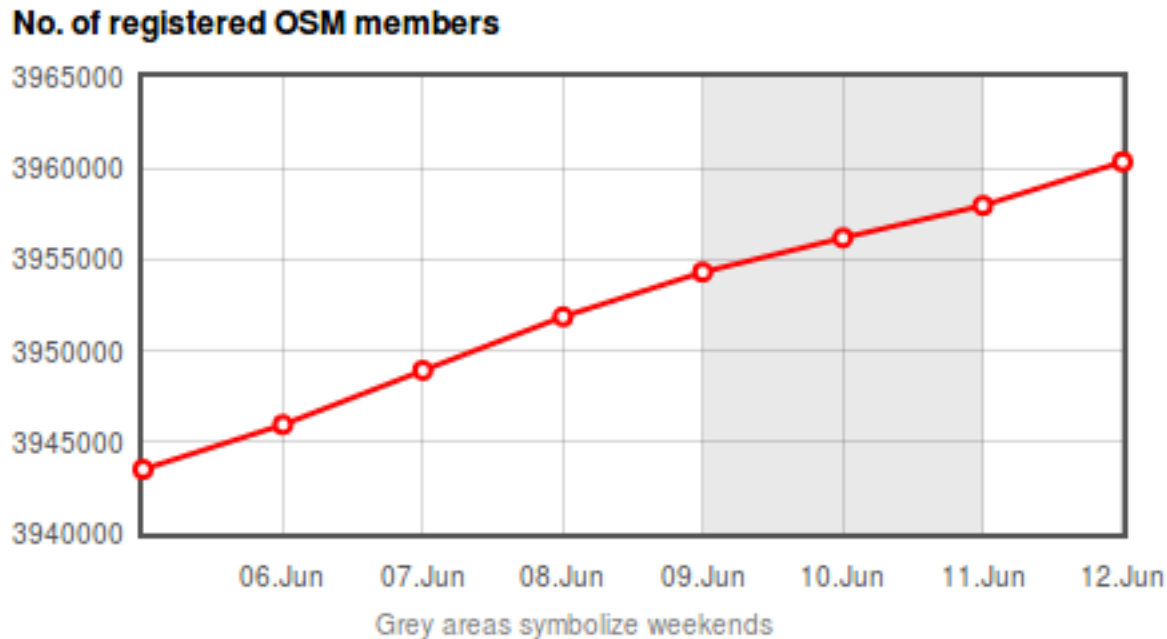
<http://www.openstreetmap.org>





# OpenStreetMap (OSM) – how many users?

- ✓ Currently (June 2017) there are almost 4 million registered users
  - ➔ <http://wiki.openstreetmap.org/wiki/Stats>
  - ➔ <http://osmstats.neis-one.org>



# OpenStreetMap (OSM) – license

- ✓ OpenStreetMap is an **openly-licensed** database!
  - ➔ OSM was born from the evidence that many geodata are proprietary or copyrighted, i.e. you cannot freely use them (e.g. Google Maps) ([http://wiki.openstreetmap.org/wiki/Why\\_OpenStreetMap%3F](http://wiki.openstreetmap.org/wiki/Why_OpenStreetMap%3F))
  - ➔ OSM is licensed under the **Open Database License (ODbL)** by the OpenStreetMap Foundation (OSMF):

## You are free:



*To Share:* To copy, distribute and use the database.



*To Create:* To produce works from the database.



*To Adapt:* To modify, transform and build upon the database.

## As long as you:



*Attribute:* You must attribute any public use of the database, or works produced from the database, in the manner specified in the ODbL. For any use or redistribution of the database, or works produced from it, you must make clear to others the license of the database and keep intact any notices on the original database.



*Share-Alike:* If you publicly use any adapted version of this database, or works produced from an adapted database, you must also offer that adapted database under the ODbL.



*Keep open:* If you redistribute the database, or an adapted version of it, then you may use technological measures that restrict the work (such as DRM) as long as you also redistribute a version without such measures.



# OpenStreetMap (OSM) – how to contribute

- ✓ Everything you need to contribute to OSM is to create an account from <http://www.openstreetmap.org>

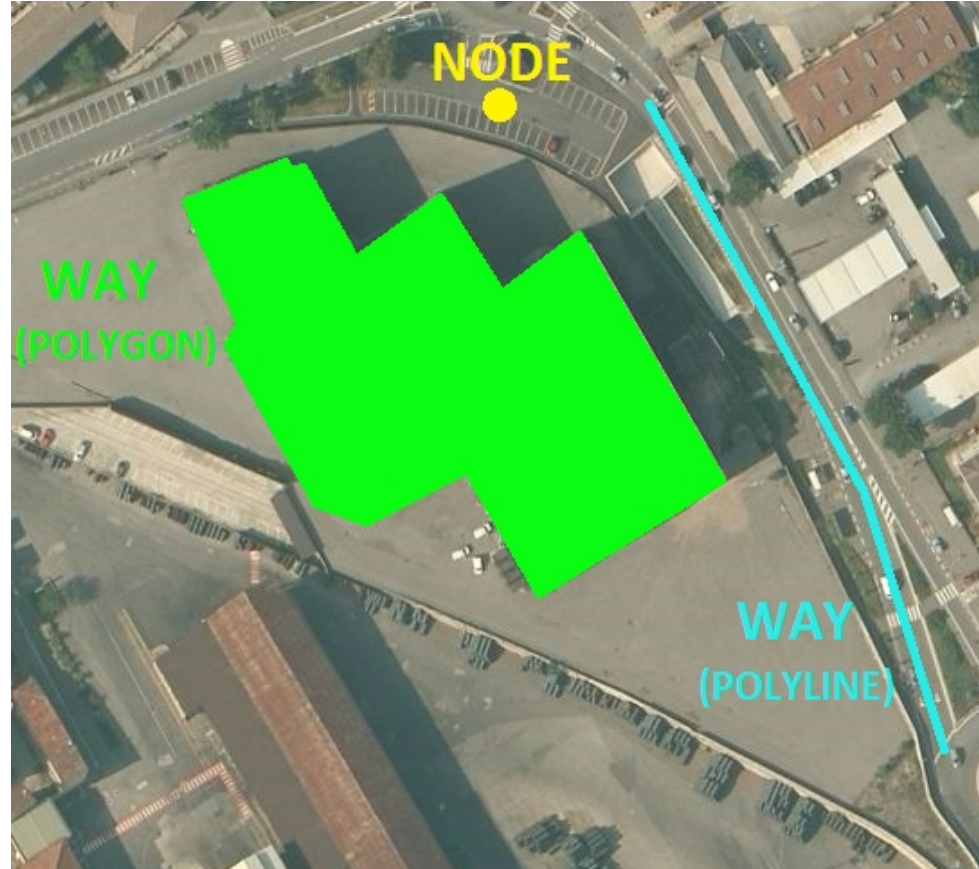


- ✓ Then you need to get started working with an OSM editor:
  - ➔ **iD**: a simple, easy-to-use online editor – suitable for beginners (<http://wiki.openstreetmap.org/wiki/iD>)
  - ➔ **JOSM**: a more powerful, offline editor – suitable for experienced users (<https://josm.openstreetmap.de>)
  - ➔ **Vespucci**: an Android editor – suitable for fast and efficient field survey (<http://vespucci.io>)
  - ➔ many others (full list at <http://wiki.openstreetmap.org/wiki/Editors>)



# OpenStreetMap (OSM) – the data model

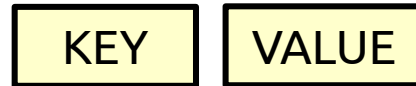
- ✓ OSM objects are the combination of geometries and tags.
- ✓ There are 3 geometries (<http://wiki.openstreetmap.org/wiki/Elements>):
  - ➔ **NODE**: a single point
  - ➔ **WAY**: an ordered list of nodes
    - ✗ **polyline**: initial and final nodes do not coincide
    - ✗ **polygon**: initial and final nodes coincide
  - ➔ **RELATION**: a logic group of nodes, polylines & polygons



# OpenStreetMap (OSM) – the data model

- ✓ OSM objects are the combination of **geometries** and **tags**.
- ✓ **Tags** are the object attributes, and are composed of a **key** and a **value**:
  - **example**: a building (polygon) which is used as a hotel has the tag

building = hotel



- an object must have at least one tag, but can have any number of tags
- the reference set of OSM tags (a “must” for any OSM user) is available at [http://wiki.openstreetmap.org/wiki/Map\\_Features](http://wiki.openstreetmap.org/wiki/Map_Features)
  - x open the page and Ctrl+F to what you are looking for :)





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**RELATION**  
**type = route**  
**route = bus**  
**name = B30**



# OpenStreetMap (OSM) – how to add data

- ✓ Regardless of the OSM editor you are using, data can be derived from 3 different mapping actions:
  - ➔ **normal mapping**: implies to have knowledge of the area to be mapped. Data are captured using specific software such as GPS devices and field papers (<http://fieldpapers.org>) → this mapping method is adopted for mapping parties ([http://wiki.openstreetmap.org/wiki/Mapping\\_parties](http://wiki.openstreetmap.org/wiki/Mapping_parties))

*Field Papers*

**MAKE** an atlas to print    **UPLOAD** pages you've marked    **WATCH** recent activity    **EXTEND** with advanced tools    **LOG IN** or create an account

## Welcome to Field Papers



**Make yourself an atlas**  
Print out anywhere in the world.



**Take it into the field**  
Make your notes and observations.



**Capture your notes**  
[Upload](#) pages you've photographed.



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  - ➔ **armchair mapping**: consists in digitizing elements (roads, buildings, etc.) in areas for which users have no previous knowledge. Data are usually obtained from aerial/satellite imagery → it is crucial to check the **copyright** of the data source used!



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  - ➔ **bulk import**: consists of the direct upload of data which is available with an open (and compatible) license → this mapping method is not for beginners and can introduce problems if not correctly performed!





# OpenStreetMap (OSM) – some cool videos

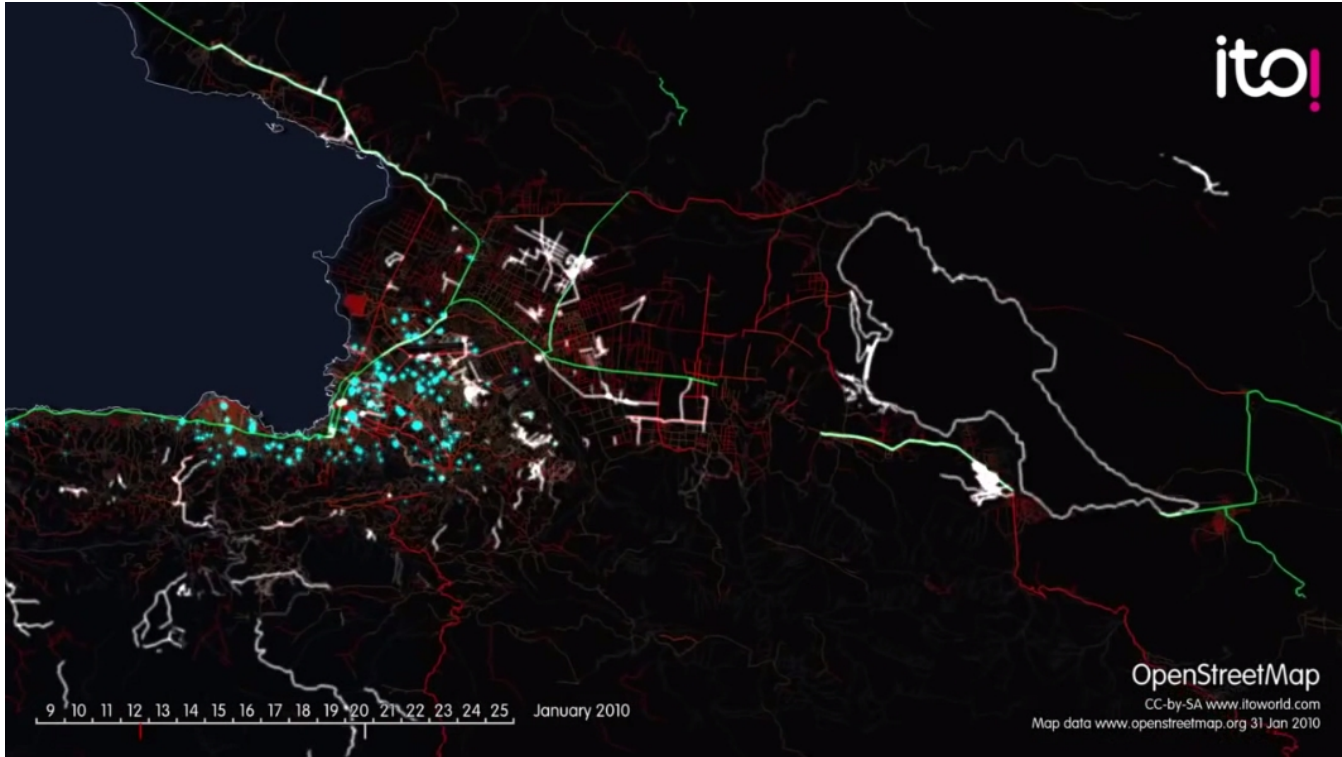
- ✓ OpenstreetMap celebrating 10 years (2004-2014):  
<https://www.youtube.com/watch?v=7sC83j6vzjo>
- ✓ OpenStreetMap nodes history 2006-2016:  
<https://www.youtube.com/watch?v=FdRO-QZaWX8>
- ✓ Near real-time edits in OpenStreetMap:  
<http://osmlab.github.io/show-me-the-way>



# Humanitarian OSM Team



- ✓ The Humanitarian OpenStreetMap Team (HOT) creates and provides free and up-to-date maps in case of natural disasters or political crises.



- ➔ OSM edits after Haiti earthquake (2010):  
[https://www.youtube.com/watch?v=oNZ\\_ZBCTRqC](https://www.youtube.com/watch?v=oNZ_ZBCTRqC)



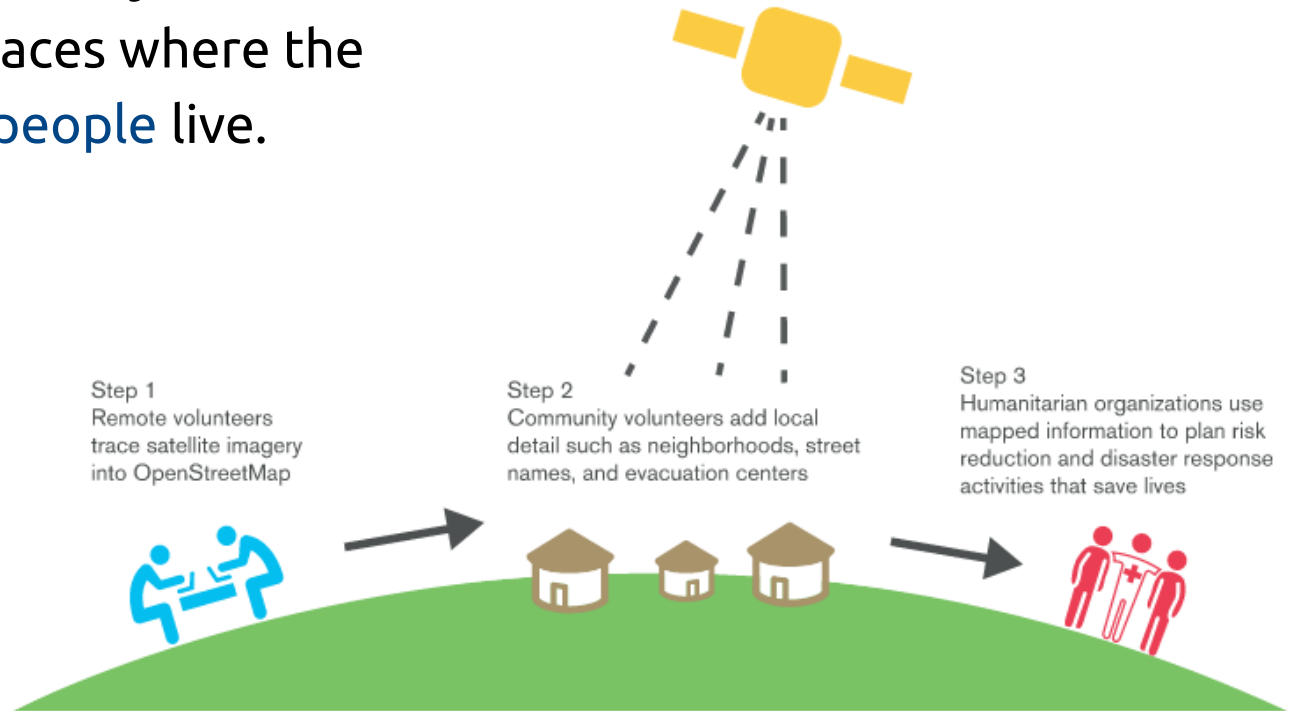
# Missing Maps project



- ✓ Whereas HOT maps in response to disasters and conflicts, the Missing Maps project maps in anticipation of crises by identifying the places where the most vulnerable people live.

**FOUNDED BY:**  American Red Cross  British Red Cross  Humanitarian OpenStreetMap Team  MEDECINS SANS FRONTIERES DOCTORS WITHOUT BORDERS

**MEMBERS:**  cartong  The Netherlands Red Cross



➔ website: <http://www.missingmaps.org>, Twitter: @TheMissingMaps



# OpenStreetMap – how to download data

- ✓ There are many different ways to download OSM data:
  - ➔ extracts by data providers: GeoFabrik (<http://download.geofabrik.de>), Mapzen (<https://mapzen.com/data/metro-extracts>), etc.
  - ➔ a full copy of the OSM database (including the full history of changes) – Planet.osm file (<http://planet.openstreetmap.org>)
  - ➔ using the OSM API (<http://wiki.openstreetmap.org/wiki/API>):
    - ✗ Overpass API ([http://wiki.openstreetmap.org/wiki/Overpass\\_API](http://wiki.openstreetmap.org/wiki/Overpass_API))
    - ✗ Overpass Turbo (<https://overpass-turbo.eu>)
  - ➔ using the export feature on a selected bounding box on the OSM home page (<http://wiki.openstreetmap.org/wiki/Export>)
  - ➔ using plugins for desktop GIS software, e.g. the QuickOSM plugin for QGIS (<https://plugins.qgis.org/plugins/QuickOSM>)



# Free Spatial Data from DIVA-GIS

- ✓ Global data (<http://www.diva-gis.org/Data>):
  - ➔ global country boundaries
  - ➔ global climate data (also from WorldClim: <http://www.worldclim.org>)
  - ➔ biodiversity data (from portals such as GBIF: <http://www.gbif.org>)
  - ➔ crop collection data (from Genesys: <https://www.genesys-pgr.org>)
- ✓ Country-level data (<http://www.diva-gis.org/gdata>):
  - ➔ administrative data, inland water, roads and railways
  - ➔ land cover (from GLC2000:  
<http://forobs.jrc.ec.europa.eu/products/glc2000/glc2000.php>)
  - ➔ population (from CIESIN: <http://www.ciesin.org>)
  - ➔ gazetteer (from the U.S. National Imagery and Mapping Agency's (NIMA) database of foreign geographic feature names)





# Other geospatial data of general interest

- ✓ Land Use / Land Cover (LULC) datasets:
  - Urban Atlas (European Environment Agency):  
<http://www.eea.europa.eu/data-and-maps/data/urban-atlas>
  - CORINE Land Cover (Copernicus Land Monitoring Service):  
<http://land.copernicus.eu/pan-european/corine-land-cover>
  - LUCAS (Eurostat): <http://ec.europa.eu/eurostat/web/lucas/overview>
  - Global Land Cover 2000 (EC-JRC):  
<http://forobs.jrc.ec.europa.eu/products/glc2000/glc2000.php>
  - Global Human Settlement Layer (EC-JRC): <http://ghsl.jrc.ec.europa.eu>
  - Global Urban Footprint (DLR):  
[http://www.dlr.de/eoc/en/desktopdefault.aspx/tabid-9628/16557\\_read-40454](http://www.dlr.de/eoc/en/desktopdefault.aspx/tabid-9628/16557_read-40454)



# Other geospatial data of general interest

- ✓ Terrain datasets:

- SRTM (CGIAR-CSI): <http://srtm.csi.cgiar.org>

- ASTER (NASA): <https://asterweb.jpl.nasa.gov/gdem.asp>

- ✓ Fisheries datasets:

- Global Fishing Watch: <http://globalfishingwatch.org>

- x estimation of global fishing activity through vessel tracking

- x data visualization on an interactive map



# Geospatial open source software tools

- ✓ OSGeo Live (<https://live.osgeo.org>):
  - ➔ a Linux-based bootable DVD, USB thumb drive or Virtual Machine image offering a wide variety of open source geospatial software and open geospatial data without installing anything.

## Welcome to OSGeo-Live 10.5

[OSGeo-Live](#) is a self-contained bootable DVD, USB thumb drive or Virtual Machine based on [Lubuntu](#), that allows you to try a wide variety of open source geospatial software without installing anything. It is composed entirely of free software, allowing it to be freely distributed, duplicated and passed around.

It provides pre-configured applications for a range of geospatial use cases, including storage, publishing, viewing, analysis and manipulation of data. It also contains sample datasets and documentation.

To try out the applications, simply:

1. Insert DVD or USB thumb drive in computer or virtual machine.
2. Reboot computer. (verify boot device order if necessary)
3. Press "Enter" to startup & login.
4. Select and run applications from the "Geospatial" menu.

OSGeo-Live is an [OSGeo Foundation](#) project. The OSGeo Foundation is a not-for-profit supporting Geospatial Open Source Software development, promotion and [education](#).

## Quick Starts

- [Getting started with the OSGeo-Live DVD](#)
- [Change language or keyboard type](#)
- [Install OSGeo-Live on your hard disk](#)
- [Run OSGeo-Live in a Virtual Machine](#)
- [Create an OSGeo-Live bootable USB thumb drive](#)



# Contacts

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 [@MarcoMinghini](https://twitter.com/MarcoMinghini)

# Thank you!

Chair of RDA Geospatial IG:

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