

Open Data for Resilience in Latin America and the Caribbean

Vivien Deparday
GFDRR Labs / World Bank
Open Data for Resilience
Technical Lead

10th United Nations Regional
Cartographic Conference for the
Americas



GFDRR
Global Facility for Disaster Reduction and Recovery



OpenDRI
OPEN DATA FOR RESILIENCE INITIATIVE



**THE
WORLD
BANK**

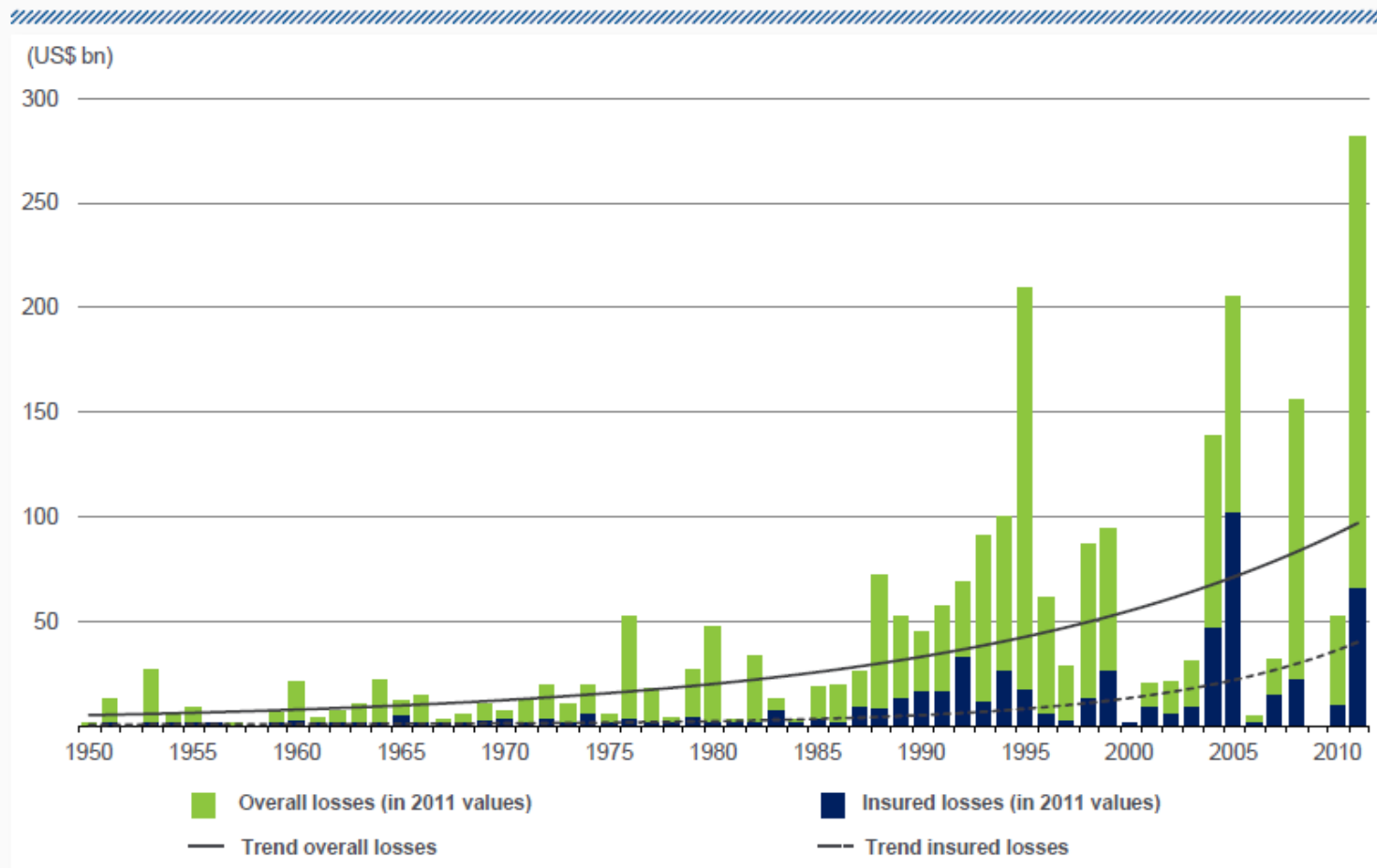
Why it matters?

NatCatSERVICE

Great natural catastrophes worldwide 1950 – 2011

Overall and insured losses with trend

Munich RE 



Building resilience and better decision-making

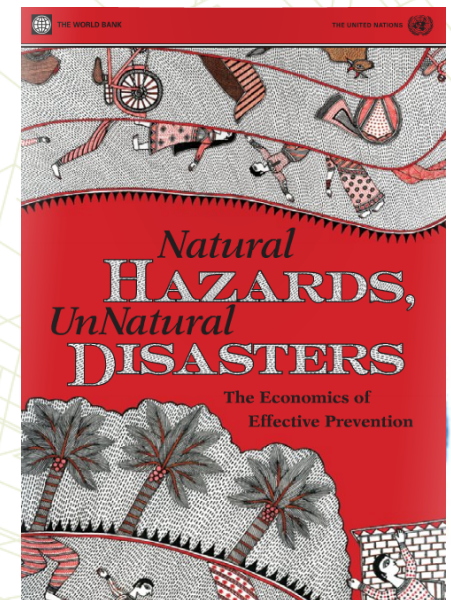
- Latin America and the Caribbean (LAC) region is one of the most vulnerable region with respect to natural disasters
- 20 countries in LAC region have half of the GDP exposed to natural disasters
- Damages due to natural hazards happen because of how and where we build
- The key is using (geospatial) data in decision making process

Across the Disaster Risk Management Cycle

Data about **hazard** and **exposure** are key for:

- Investments for disaster risk reduction, mitigation and prevention (i.e. school retrofitting, dredging)
- Emergency preparedness
- Real time impact assessment to guide response
- Disaster Risk Financing
- Post Disaster Needs Assessment (PDNA)
- Recovery

The *Natural Hazards, Unnatural Disasters* report highlights the importance of information sharing in effective Disaster Risk Management.



OpenDRI in the Carribean (video)



Open Data for Resilience Initiative (OpenDRI)

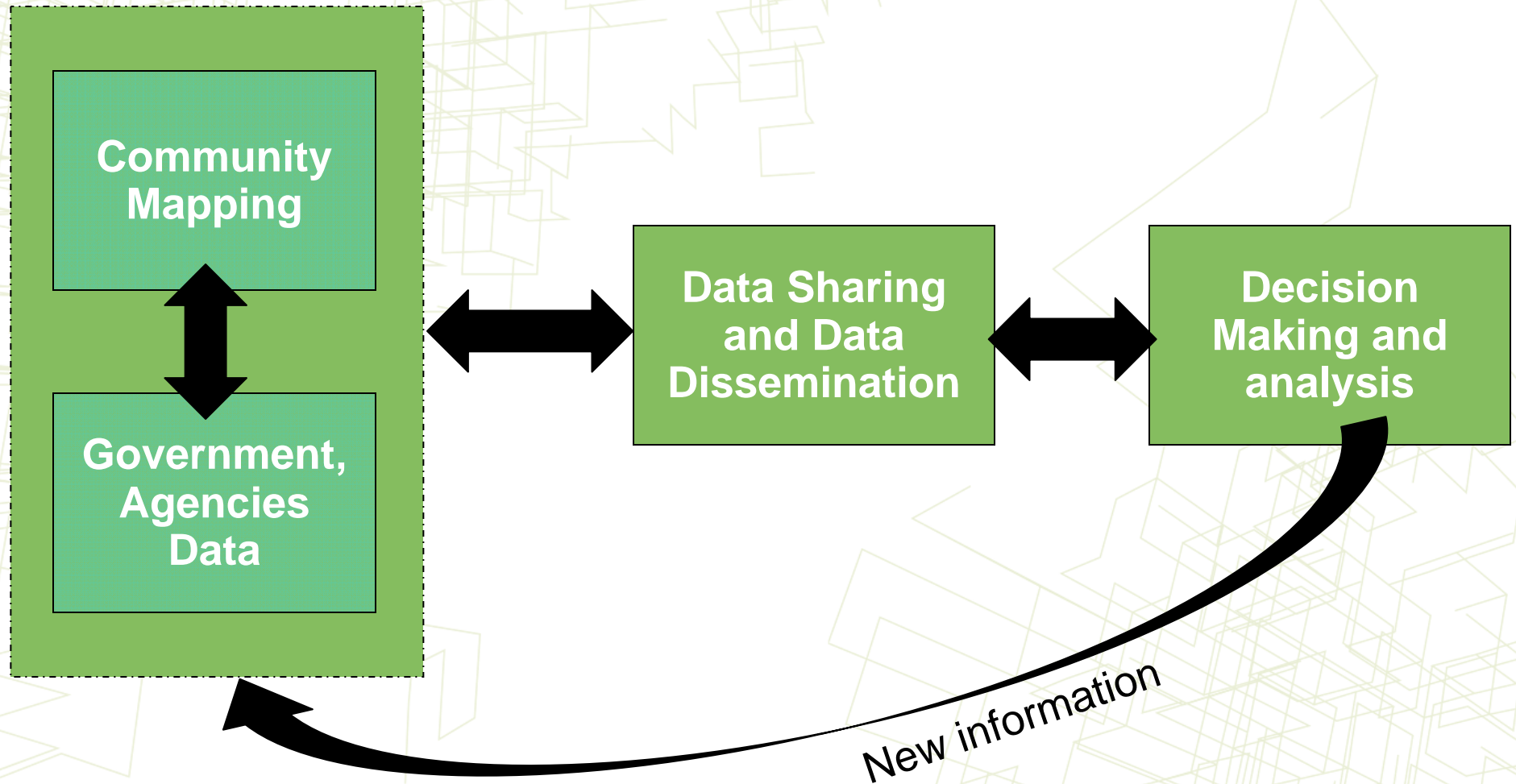
The **Open Data for Resilience Initiative (OpenDRI)** encourages and facilitates the sharing of climate and disaster data to enable more effective decision-making by providing the rationale, technical assistance, and tools for data sharing.

OpenDRI has programs in more than 20 countries around the world.

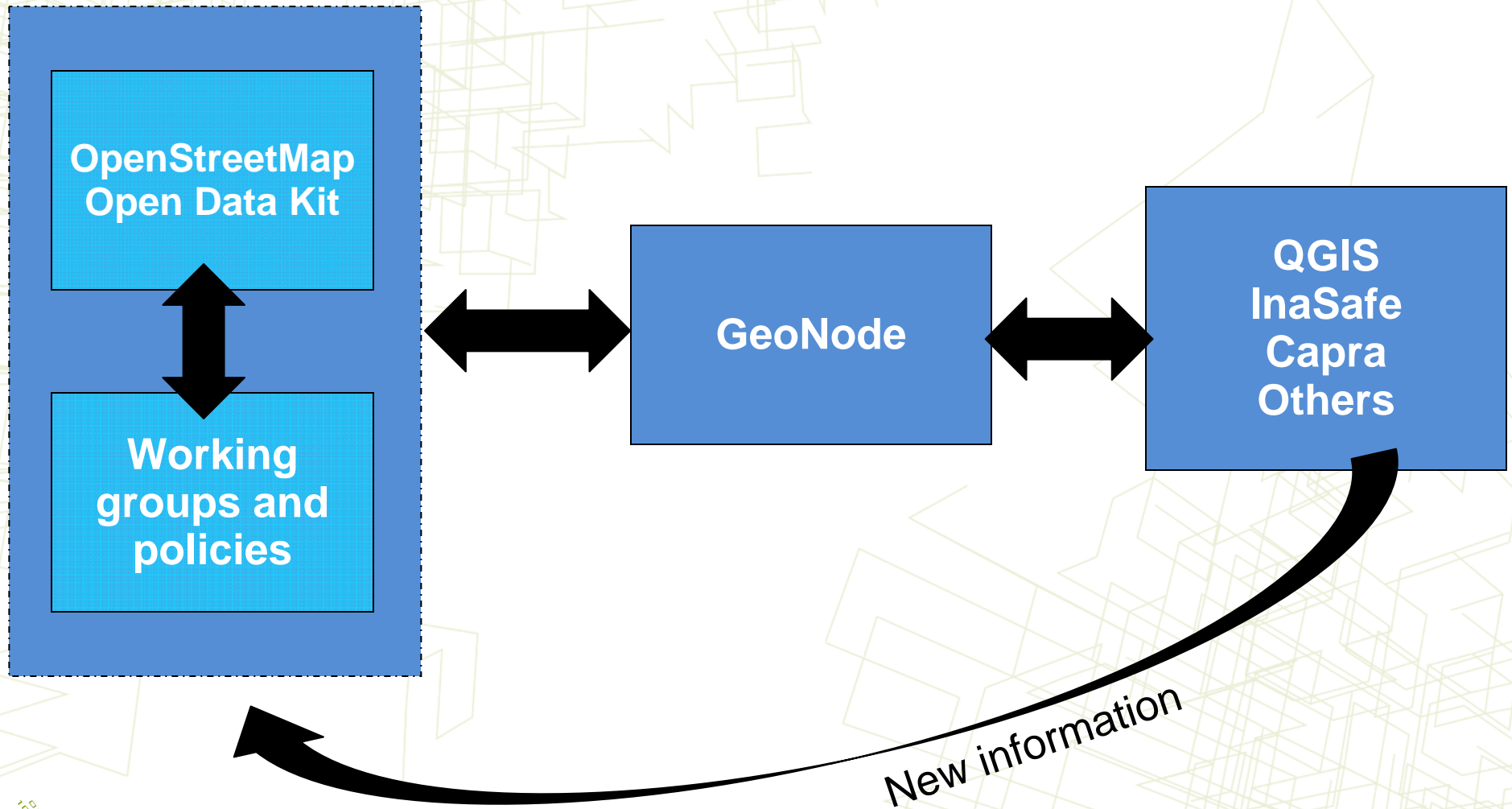
1. Institutional support
2. Technical support
3. Innovation through open source software and collaboration with international communities
4. Capacity building
5. Knowledge management and exchange
6. Local and international partnerships



OpenDRI Overview



OpenDRI Technologies



Community Mapping



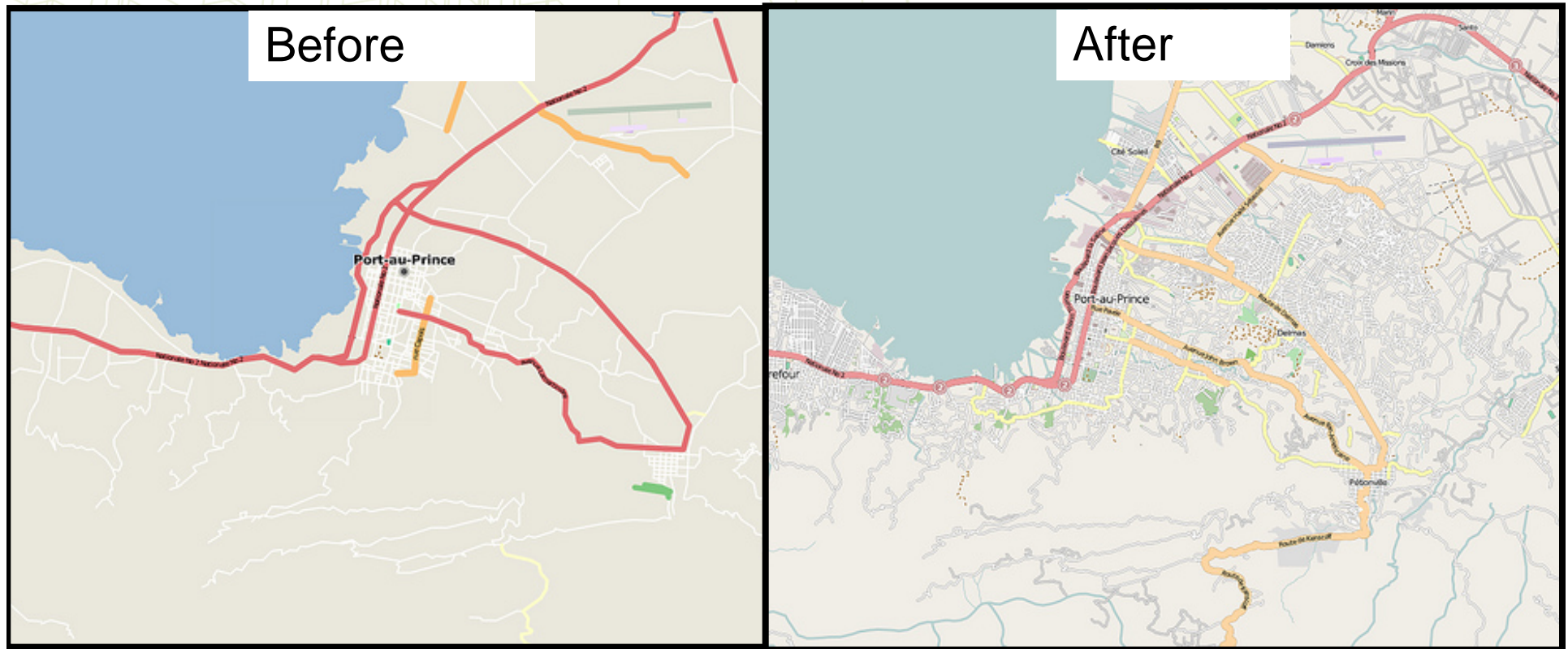
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OpenStreetMap (OSM)

- OpenStreetMap (OSM) is a collaborative project to create a free and open digital map of the world
- Thanks to the collaborative efforts of participants from all over the world (individuals, public agencies, private companies, NGOs...)
- Data collected include streets, footpaths, parks, rivers, buildings, shops and other point of interests...



OSM and Open Data Kit



- Ongoing exposure data survey using OSM in Indonesia, Nepal and Sri Lanka, Philippines using remote tracing and field papers.
- In Dominica, mobile exposure data collection initiative with smartphones and the Open Data Kit

Data Sharing and Dissemination



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Challenges with the Spatial Data Sharing

- Not enough data to carry out analysis
- Existing data not readily available
- Numerous data format
- Poor or questionable data quality
- Scale of the data not sufficient
- Metadata non-existent or scant
- Data Vintage
- Data not in digital format or not in raw machine readable format

No comprehensive
Data Sharing
mechanism

Search, Catalog and Manage Geographic Data

GeoNode



An approach to spatial data infrastructure focused around users and collaboration

Simple web-based tools :

- Search data catalog
- Metadata management
- User and permission management
- Standards compliant (OGC)

Create and Share Interactive Map


Haiti Data

bishwa Change password Log out

Home Data Maps Partners Profile Admin

Title: Haiti Administrative Boundaries Admin Level1 (Department), CNIGS - polygons

File name: hti_boundaries_departements_adm1_cnigs_polygon



Download

[Download raw data](#)

Other formats: [Zipped Shapefile](#) [GML 2.0](#) [GML 3.1.1](#) [CSV](#) [Excel](#) [GeoJSON](#) [JPEG](#) [PDF](#) [PNG](#) [KML](#) [View in Google Earth](#)

Metadata: [TC211](#) [Excel](#)

Legend

Maps

This layer is not currently used in any maps.

[Create new map](#)

Styles

The following styles are associated with this data set. Choose a style to view it in the preview to the left. Click on a style name to view or edit the style.

- [Hti_Boundaries_Departements_Adm1_Cnigs_Polygon_Fr](#) [SLD](#)
- [Hti_Boundaries_Departements_Adm1_Cnigs_Polygon_Labels_En](#) [SLD](#)
- [Hti_Boundaries_Departements_Adm1_Cnigs_Polygon_En](#) [SLD](#)
- [Hti_Boundaries_Departements_Adm1_Cnigs_Polygon_Labels_Fr](#) [SLD](#)

Default style: [Hti_Boundaries_Departements_Adm1_Cnigs_Polygon_Fr](#) [Create new style](#)

Manage

- [Update the description of this data](#)
- [Upload a new version of this data](#)
- [Remove](#)

Abstract: This polygon vector layer shows the official boundary data intended to provide the delimitation of the 10 departments within Haiti. This dataset has been published by the Centre National de l'Information Géospatiale in Haiti (CNIGS). There is no sharing restriction.

Metadata language: eng

Map date: May 9, 2012, 10:05 a.m. **Date Type:** publication **Edition:**

Type: vector

Update frequency: unknown

Point of Contact: [bishwa](#); bishwa - None

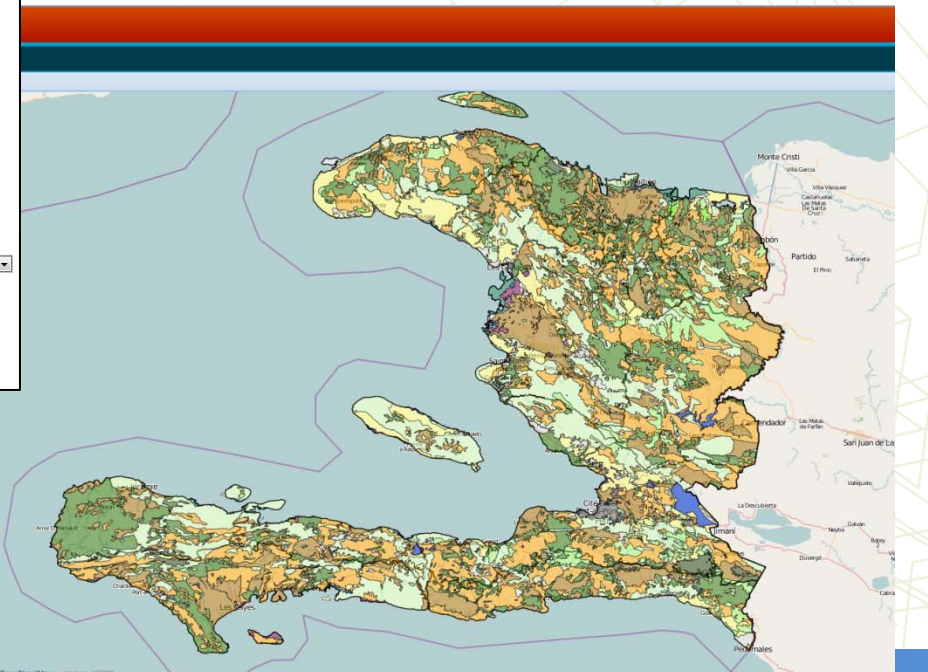
Country and Region: HTI

Use Constraints (Legal): copyright

Topic Category: boundaries

Citation: copyright

- Urbain discontinu
- Zones industrielles
- Haiti Administrative Boundaries Admin Level1 (Department), CNIGS - polygons
- Haiti International boundary with the Dominican Republic, MINUSTAH - lines



Deployments

Countries currently engaged:

Haiti	www.haitidata.org
St Lucia	http://sling.gosl.gov.lc/
SVG	http://geonode.gov.vc/
Dominica	www.dominode.net
Grenada	Intranet version only
Belize	http://geoserver.bnsdi.gov.bz/
Cariska	http://cariska.mona.uwi.edu/
Guyana	Coming soon
Bolivia	http://geosinager.defensacivil.gob.bo/

Current Activities to promote OpenDRI

- Institutional Support
- Technical Support
- Innovation
- Capacity Building
- Knowledge Exchange
- Partnership

Disaster Risk Management Decision support Analysis



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InaSAFE



InaSAFE

InaSAFE is a free software tool that produces realistic natural hazard impact scenarios for better planning, preparedness and response activities.

Easy to use tool to empower local government to make informed decision:

- Uses exposure, hazard and vulnerability to calculate risk
- Risk information is classified to facilitate decision support
- Desktop tools (QGIS plugin), web-based (GeoNode plugin)



InaSafe

Quantum GIS 1.7.4-Wisclaw

File Edit View Layer Settings Plugins Builder Vector Help

InaSAFE 0.3.0 alpha

Questions

In the event of
Mauere Tsunami

How many
OpenStreetMap buildings

High
Be-affected by tsunami

Results

In case of "Mauere Tsunami" the estimated impact to "OpenStreetMap buildings" is:

Impact	Number of buildings
Low:	449
Medium:	477
High:	0

Assumption:
Levels of impact are defined by BNPB's Pengkajian Wabah Bencana

Impact	Tsunami height
Low:	<3 m
Medium:	1-3 m
High:	>3 m

Supported by AusAID and World Bank

BNPB

Help Print... Run

InaSAFE 0.3.0 alpha Layers

Coordinate: 13603194,-960616 Scale: 1:9019 Render EPSG:31466

InaSafe

InaSAFE 0.3.0 alpha

Pertanyaan
 Jika terjadi
 Sebuah terulangnya banjir Jakarta 2007
 Berapa banyak
 Penduduk Jakarta
 Yang mungkin
 Perlu Evakuasi

Hasil

Apabila terjadi "Sebuah terulangnya banjir Jakarta 2007" perkiraan dampak terhadap "Penduduk Jakarta" kemungkinan yang terjadi:

Perlu Evakuasi (x 1000):	335
Bantuan	Jumlah
Beras [kg]	937
Air Minum [l]	9862
Air Bersih [l]	22445
Kit Keluarga	67
Jamban Keluarga	16

Catatan:

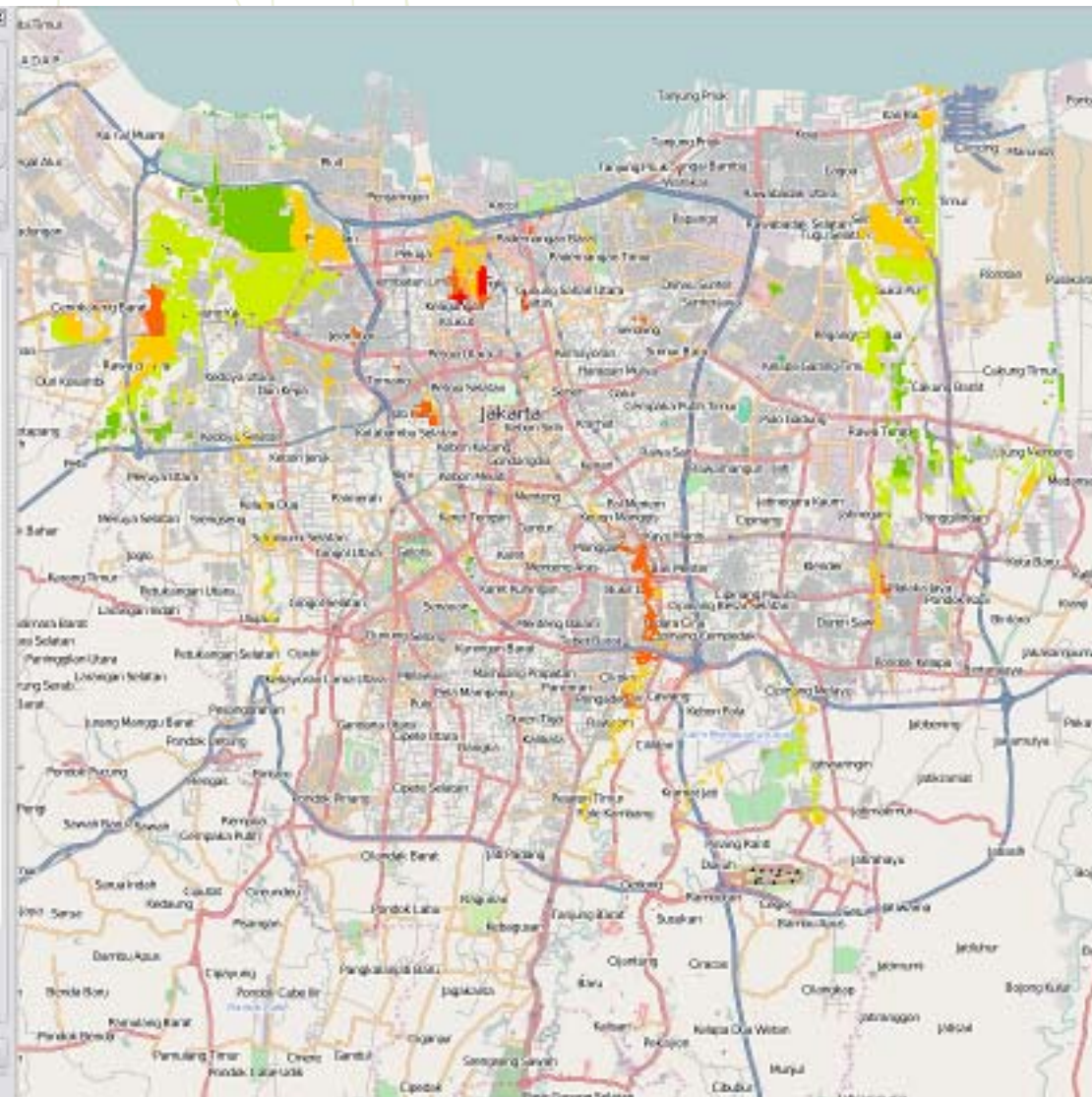
- Jumlah penduduk Jakarta 6378
- Jumlah dalam ribuan
- Penduduk perlu dievakuasi ketika banjir lebih dari 1 m
- Minimum Bantuan per minggu (BNPB Perka 7/2008)

Didukung oleh AusAID dan Bank Dunia

BNPB

Bantuan Print... Hilang

InaSAFE 0.3.0 alpha Lapisan-Apikon



Capacity building, knowledge exchange and partnerships



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Capacity Building and Knowledge Exchange

Training/Workshop	Date	Location
Spatial Data Management Training	January, 2013	Belize
Advanced Training on spatial data management	Feb. 18-23, 2013	UWI - Trinidad
Training on Exposure and Hazard Risk Mapping	April 2013	SVG
DVRP Data Management Workshop	Fall 2013	SVG
Regional Workshop on Guyana- Conservancy Adaptation Project	Late 2013	Guyana
Caribbean Risk Information Program – Kickoff	Late 2013	TBD



- Strong community of practitioners - about 80 active participants
- Monthly Webinar
- Continuous engagement with community of practitioners

Partnerships on local projects

- Partnership with local entities (government agencies)
- Local tech companies and communities
- Local universities (e.g. University of West Indies)
- The Nature Conservancy
- Caribbean Community Climate Change Center
- USAID
- OCHA, UNDP
- Humanitarian OpenStreetMap Team
- MapAction
- NASA

Open Source Communities



GFDRR
Global Facility for Disaster Reduction and Recovery



GEM



JRC

EUROPEAN COMMISSION



OPENGEO



Center for
Geographic Analysis
Harvard University

**Australian
AID**



BNPB

Indonesian Disaster
Management Agency



MapBox



WFP

wfp.org



HOT

Humanitarian
OpenStreetMap
Team

And more...



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Thank You

Vivien Deparday
Technical Lead – Open Data for Resilience
Global Facility for Disaster Reduction and Recovery
vdeparday@worldbank.org

Bishwa Pandey
Senior Data Management Specialist
The World Bank – Latin America and Caribbean
bpandey@worldbank.org



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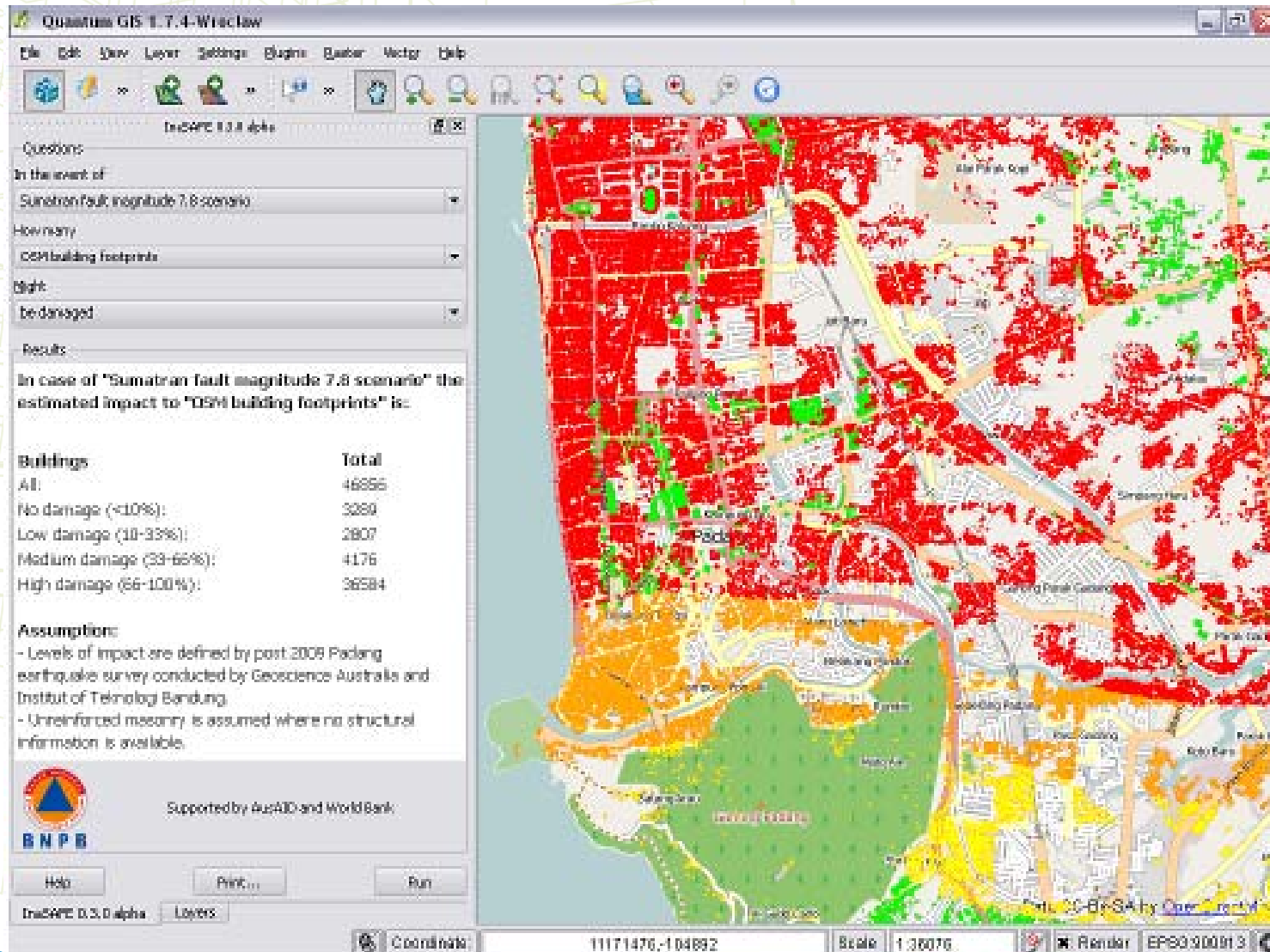


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OpenDRI Field Guide

- Based on 2 years of GFDRR experience and input from a variety of other groups working (OCHA, USAID,...) on the issue
- To make the practices of the open data movement relevant to disaster risk management work
- Practical guide on designing, piloting, scaling and sustaining an OpenDRI project
- Will launch in November

InaSafe



Mobile Data Collection- Structural Survey



ODK Collect 1.2.2 (1023)

Data collection made easier...

Fill Blank Form

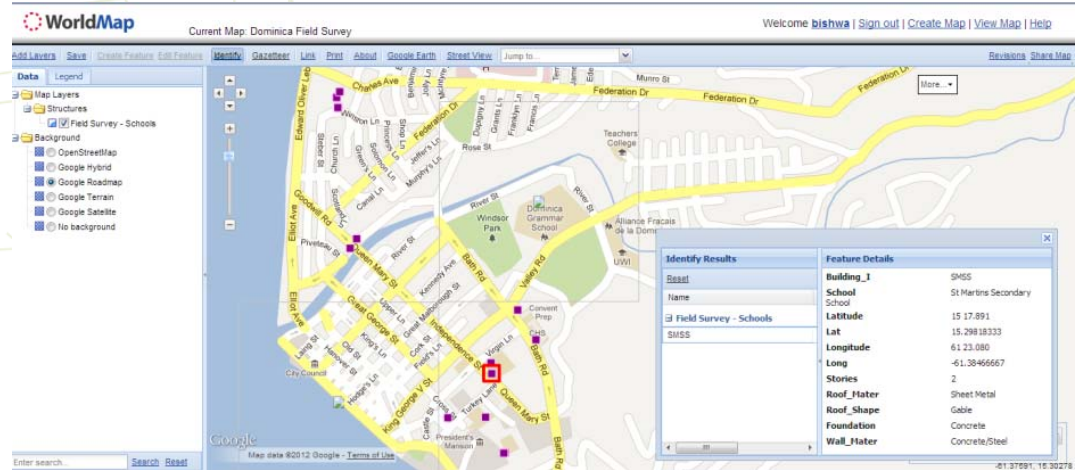


Today's Date

+	+	+
Feb	17	2013
-	-	-

Number of Stories

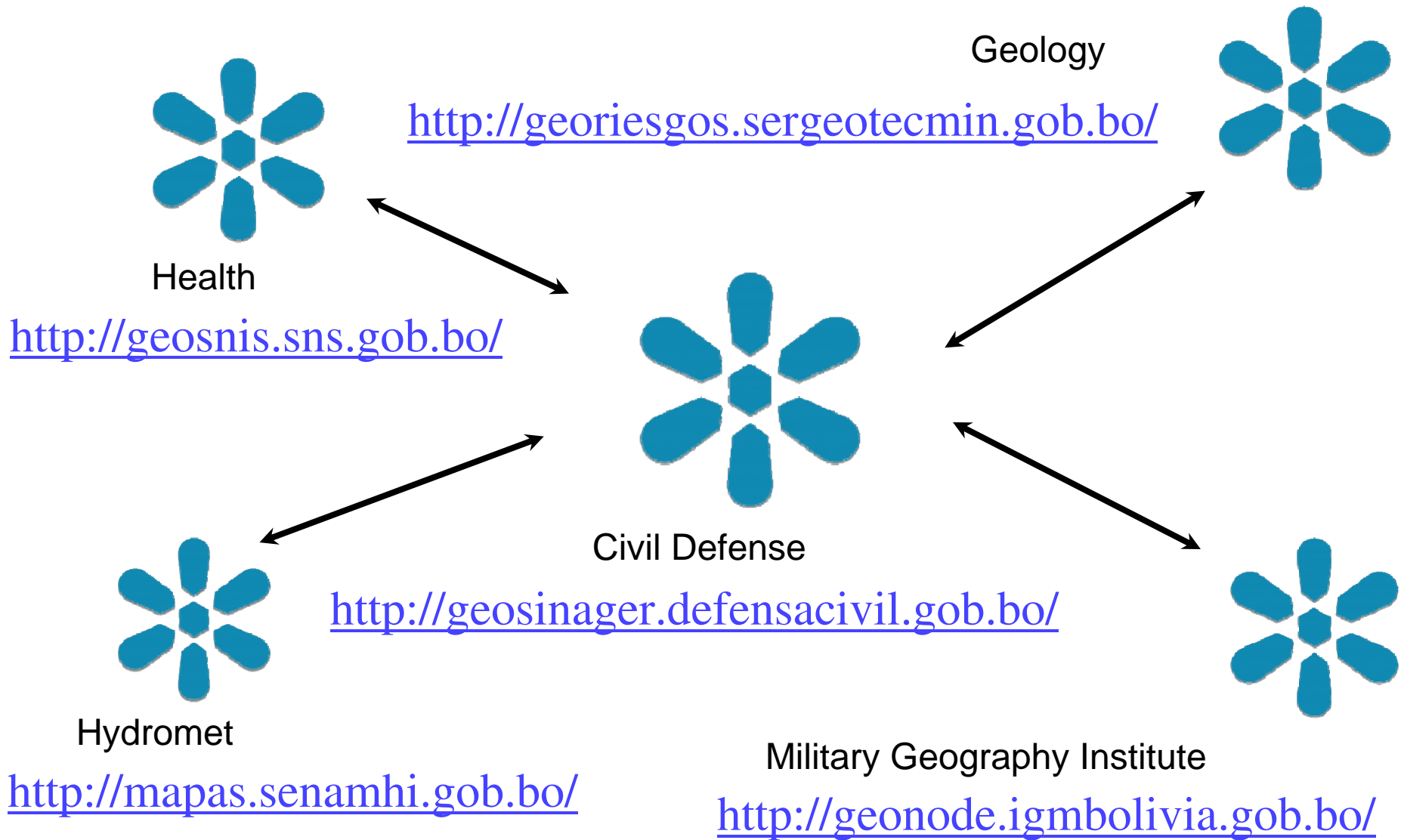
<input type="radio"/> 1	<input type="radio"/> 4
<input type="radio"/> 2	<input type="radio"/> 5
<input checked="" type="radio"/> 3	<input type="radio"/> More than 5



Open Data Kit in Dominica



- Custom survey forms can be developed for any type of data collection
- Smartphones has mobile application (app) development platform
- Has GPS, digital compass
- Camera/voice recorder/barcode reader
- Real time data



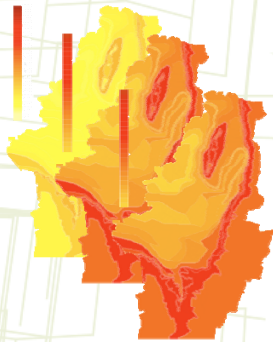
GeoNode Bolivia – Federation Model

Example: Risk Assessments

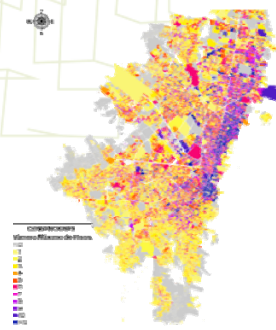
A critical step toward understanding risk and building resilience

Vulnerability

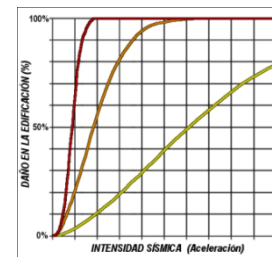
Hazard
(i.e. earthquake)



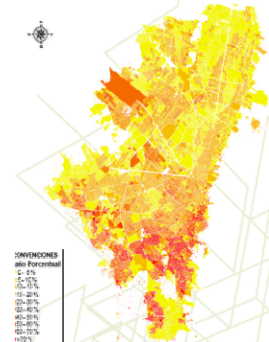
Exposure
(i.e. houses)



Vulnerability function
(of house to quake)



Impact estimate to
manage risk
(i.e probable loss)



Answers questions such as:

- How should we target retrofitting projects towards most at-risk infrastructure?
- What is the likely impact of an earthquake of a given magnitude on housing stock?
- Where should disaster management agencies preposition response assets in order to best respond to an event?

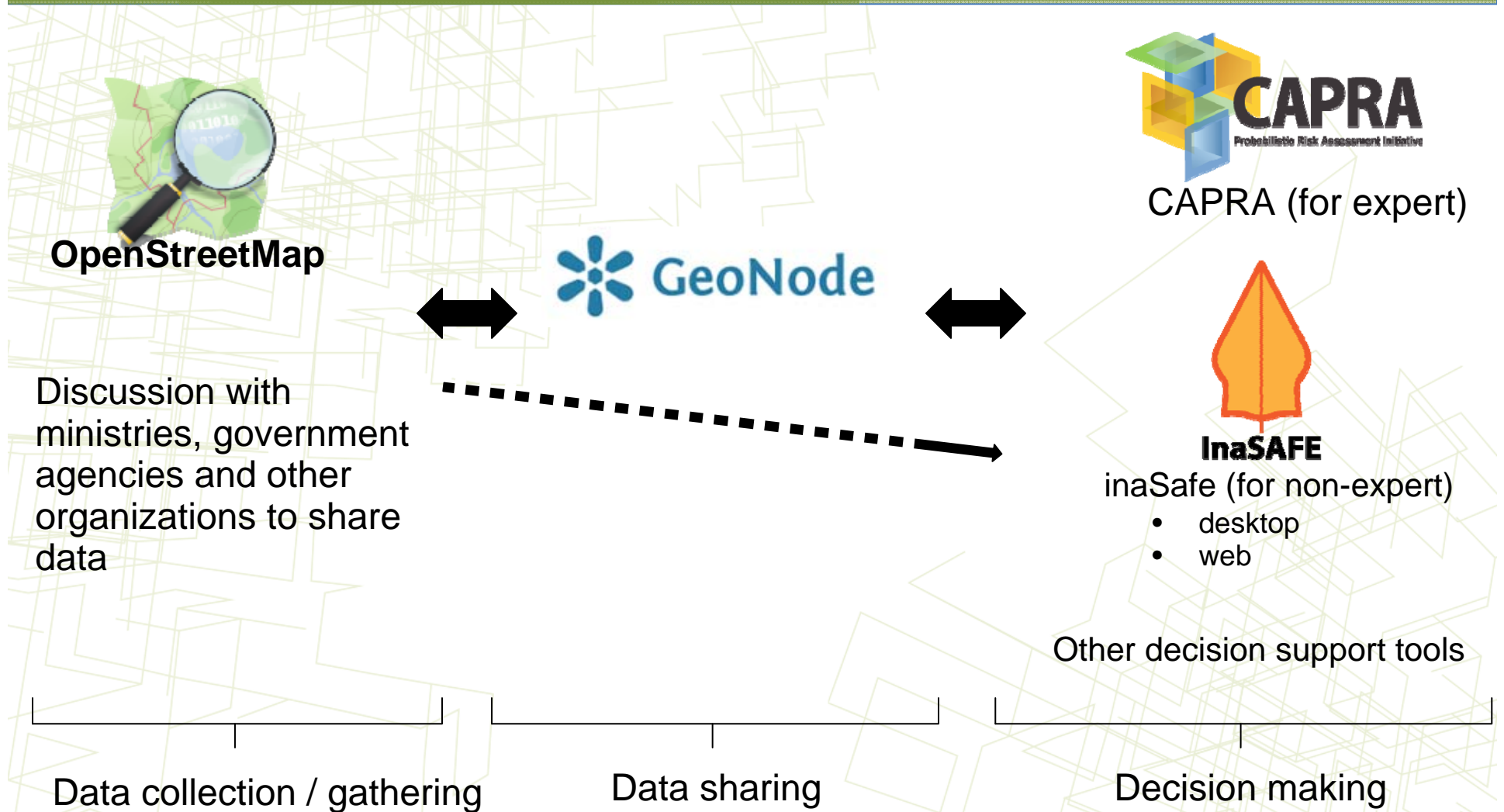
Examples of use

- Simple data export for further use
- Creation of nice base maps: MapBox, Stamen
- Routing applications: OpenTripPlanner
- Thematic maps: accessibility, conservation, leisure, etc...
- Disaster risk management: inaSAFE
- Update of national datasets: Indonesian Mapping Agency (BIG), South Africa (NGI)

Put into practice

1. Helping ensure that data created by GFDRR-funded projects is made available to the public
2. Partnering with ministries to help establish better institutions for managing and sharing risk information
3. Facilitating partnerships with international organizations to help them release their data
4. Engaging Communities in Participatory Mapping
5. Designing tools and building capacity to help decision-makers take better advantage of their risk information

OpenDRI Tools



Why OSM?

- ✓ possibility to get richer and more detailed data
- ✓ data can get corrected and be kept up to date
- ✓ open source tools for online or offline mapping
- ✓ a common platform for uploading and hosting data with free and open access
- ✓ an active global community of users
- ✓ resources for growing your community: training materials, communication platforms

OSM Community Building in Indonesia to create exposure data

In 14 months:

25+ training workshops

5 Universities: Universitas Indonesia,
Institut Teknologi Sepuluh
November, Institut Teknologi
Bandung, Universitas Gadjah
Mada, Universitas Andalas

500+ people trained

200,000+ buildings mapped

<http://id.openstreetmap.or.id/>

*Humanitarian OpenStreetMap (HOT) *Badan Nasional untuk Penanggulangan Bencana (BNPB)
*Australia-Indonesia Facility for Disaster Reduction (AIFDR) *World Bank's Global Facility for Disaster Reduction and Recovery

PRESENT

 **openstreetmap**
mapping competition

RAIH BEASISWA SENILAI RP 22.000.000,-
(dua puluh dua juta rupiah)
untuk menghadiri 'State of the Map' (konferensi tahunan bebas dan open source) dan FOSS4G (konferensi geospasial perangkat lunak bebas dan open source) pada bulan September, 2011 di Denver, USA.
Dalam persiapan kontes, masing-masing Universitas akan diberikan pelatihan OpenStreetMap. Workshop ini akan mengajarkan metodologi untuk pengumpulan data dan informasi kompetisi lebih lanjut.

ROADSHOW & WORKSHOP

27 JUNI 2011	DEPARTEMEN GEOGRAFI UNIVERSITAS INDONESIA CP: Adi Wibowo, S.Si, M.Si adi.w@ui.ac.id	JURUSAN TEKNIK SIPIL INSTITUT TEKNOLOGI SEPULUH NOVENBER CP: Putu Artama Wiguna, Ir., MT, PhD. ce@its.ac.id	
28 JUNI 2011	FAKULTAS TEKNIK SIPIL & LINGKUNGAN INSITUT TEKNOLOGI BANDUNG CP: Dr. Ir. I Wayan Sengara, MSEM, MSCE iws@si.itb.ac.id		
05 JULI 2011	DEPARTEMEN TEKNIK GEODESI UNIVERSITAS GADJAH MADA CP: Trias Aditya K. M. takmid@gmail.com	06 JULI 2011	JURUSAN TEKNIK SIPIL UNIVERSITAS ANDALAS CP: Dr. Fauzan Msc. Fauzan@ft.unand.ac.id

DIMOHON UNTUK MEMBAWA LAPTOP MASING-MASING PADA SAAT WORKSHOP!

 @OSM_ID  Open Street Map Mapping Competition  Emir (emir.hartato@gmail.com)
Vasanthi (va.santhi@yahoo.com)

Map production process

Collect data



Upload and edit the data



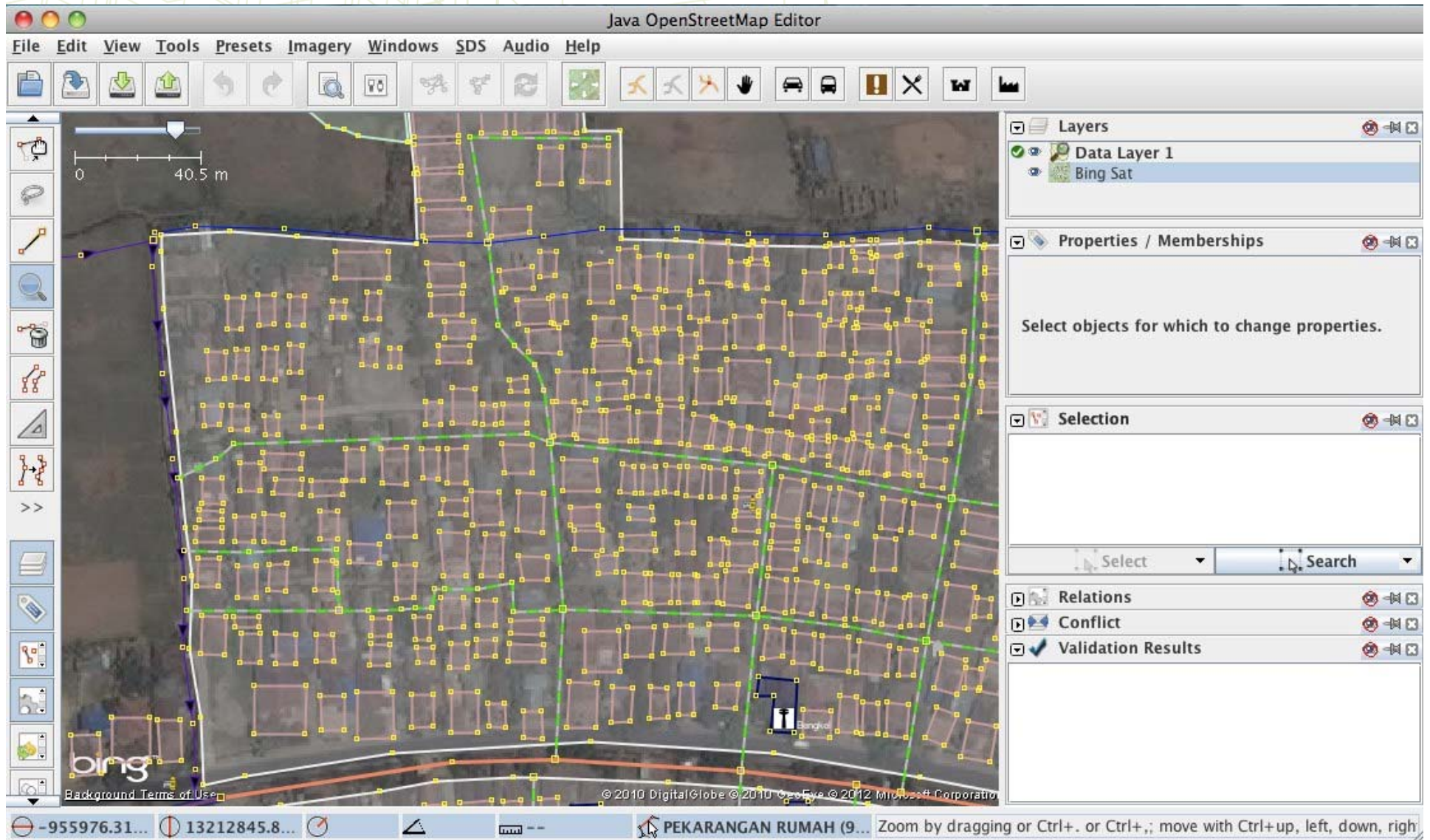
See the live map and use the data

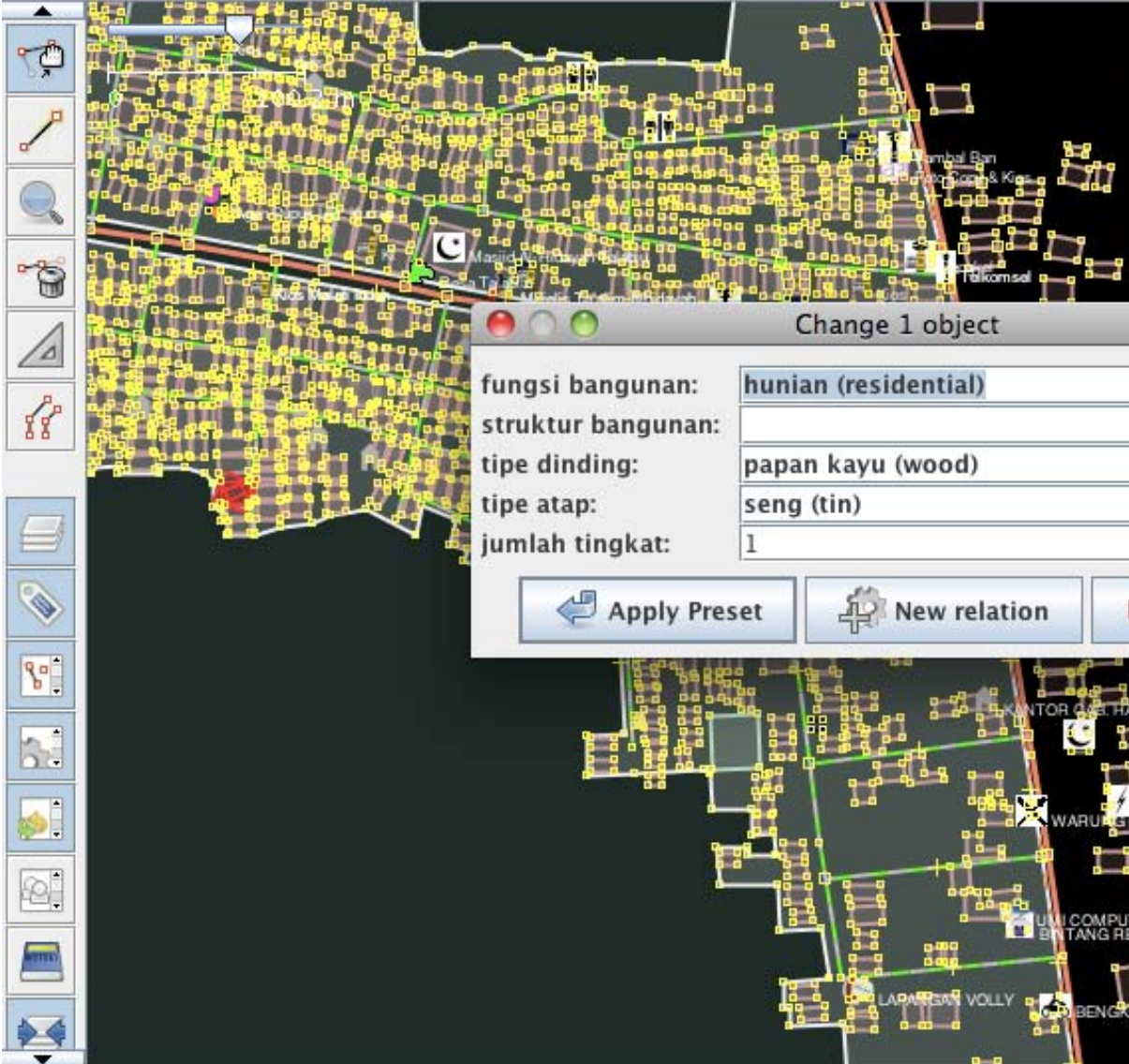
Data collection

- Tracing available imageries
 - Field survey with: GPS, annotations on Walking Papers, mapping parties / workshop, phone applications...
- Bulk import from existing large datasets

Java OpenStreetMap Editor (JOSM)

Open source desktop software





Change 1 object

fungsi bangunan: hunian (residential)

struktur bangunan:

tipe dinding: papan kayu (wood)

tipe atap: seng (tin)

jumlah tingkat: 1

Apply Preset New relation Batal

Layer

Data Layer 1

Properties: 5 / Memberships: 0

Key	Nilai
	yes

Edit Hapus

0 / Ways:1 / Nodes:0

Command Stack

Konflik

Validation results

Pilih Validasi Perbaiki Abaikan

Filter Hidden:0 Disabled:0

Global Data Collection

Videos of the evolution of OpenStreetMap around the world



Source: ITO World

InaSafe Web



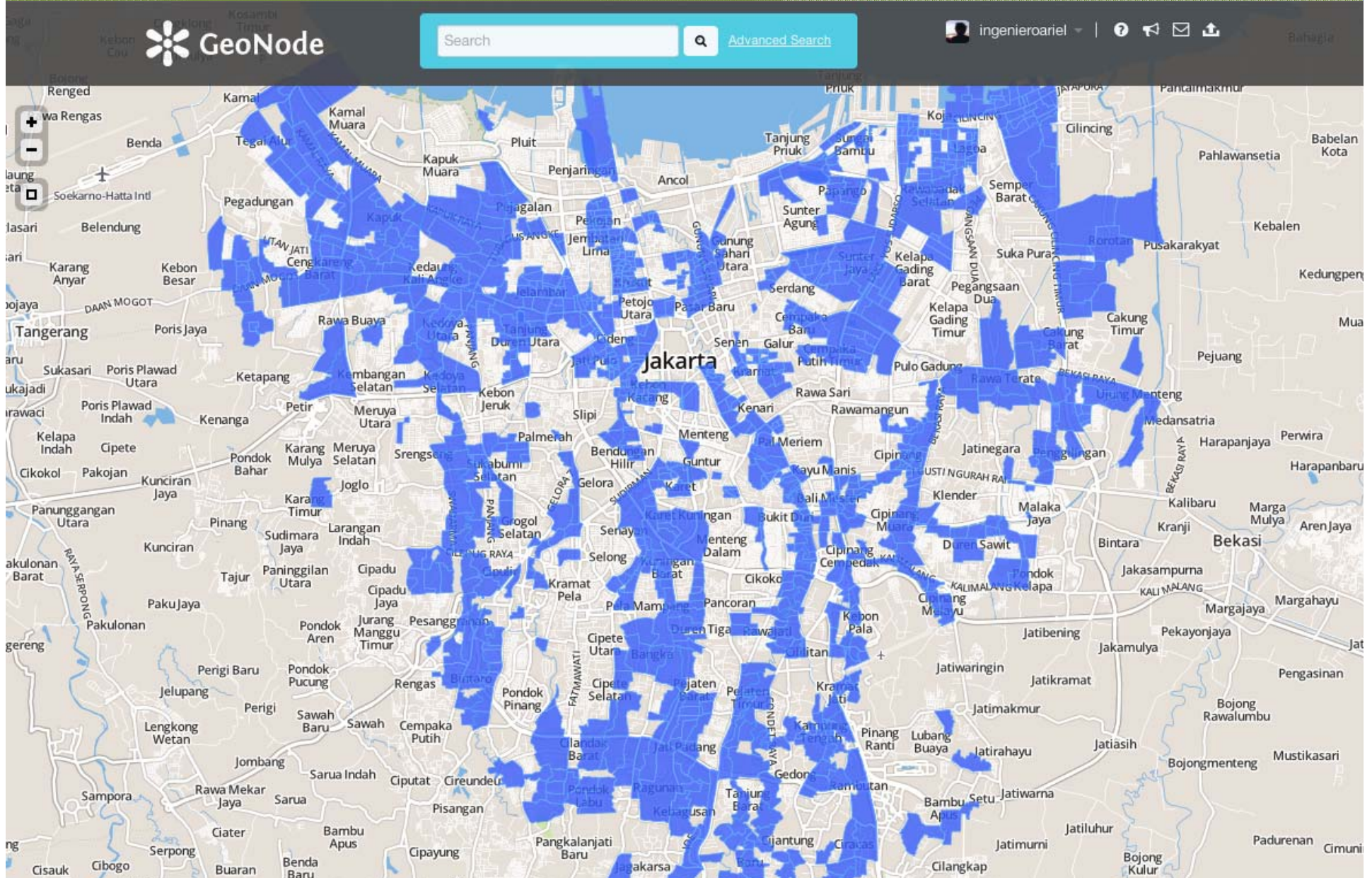
Search [Advanced Search](#)

Sign in



In the event of how many might ?

Flood analysis in Jakarta Province



Leveraging the online data catalog

[Advanced Search](#)

ingenieroariel

[HOME](#)[LAYERS](#)[MAPS](#)[PROFILES](#)[SEARCH](#)[SAFE](#)[EXPLORE LAYERS](#)[SEARCH LAYERS](#)[UPLOAD LAYERS](#)

EXPLORE LAYERS

[Most Recent](#)[Most Popular](#)[Most Shared](#)

View by



CATEGORIES

All Categories

Biota

Boundaries

Climatology Meteorology Atmosphere

Economy

Elevation

Environment

Farming

Geoscientific Information

No Image Available

Hospitals (OSM)

by [geonode](#), 13 minutes ago

No abstract provided

3 views | Average rating ☆☆☆☆☆

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padang_coastline

by [geonode](#), 2 weeks, 5 days ago

No abstract provided

2 views | Average rating ☆☆☆☆☆

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No Image Available

subduction_zones

by [geonode](#), 2 weeks, 5 days ago

No abstract provided

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Visualizing critical infrastructure data



Search



Advanced Search



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HOME LAYERS MAPS PROFILES SEARCH SAFE

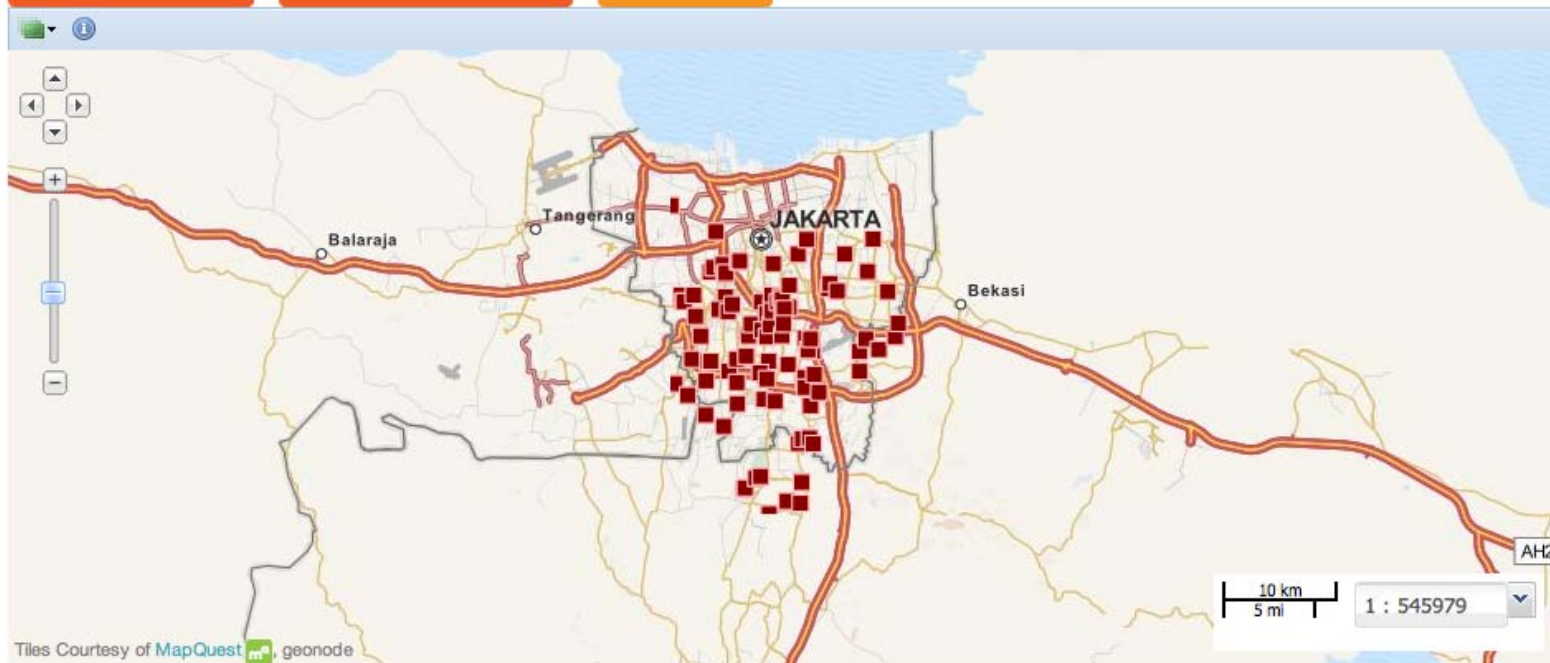


HOSPITALS (OSM)

Download Layer

Download Metadata

Edit Layer



Info

Attributes

Share

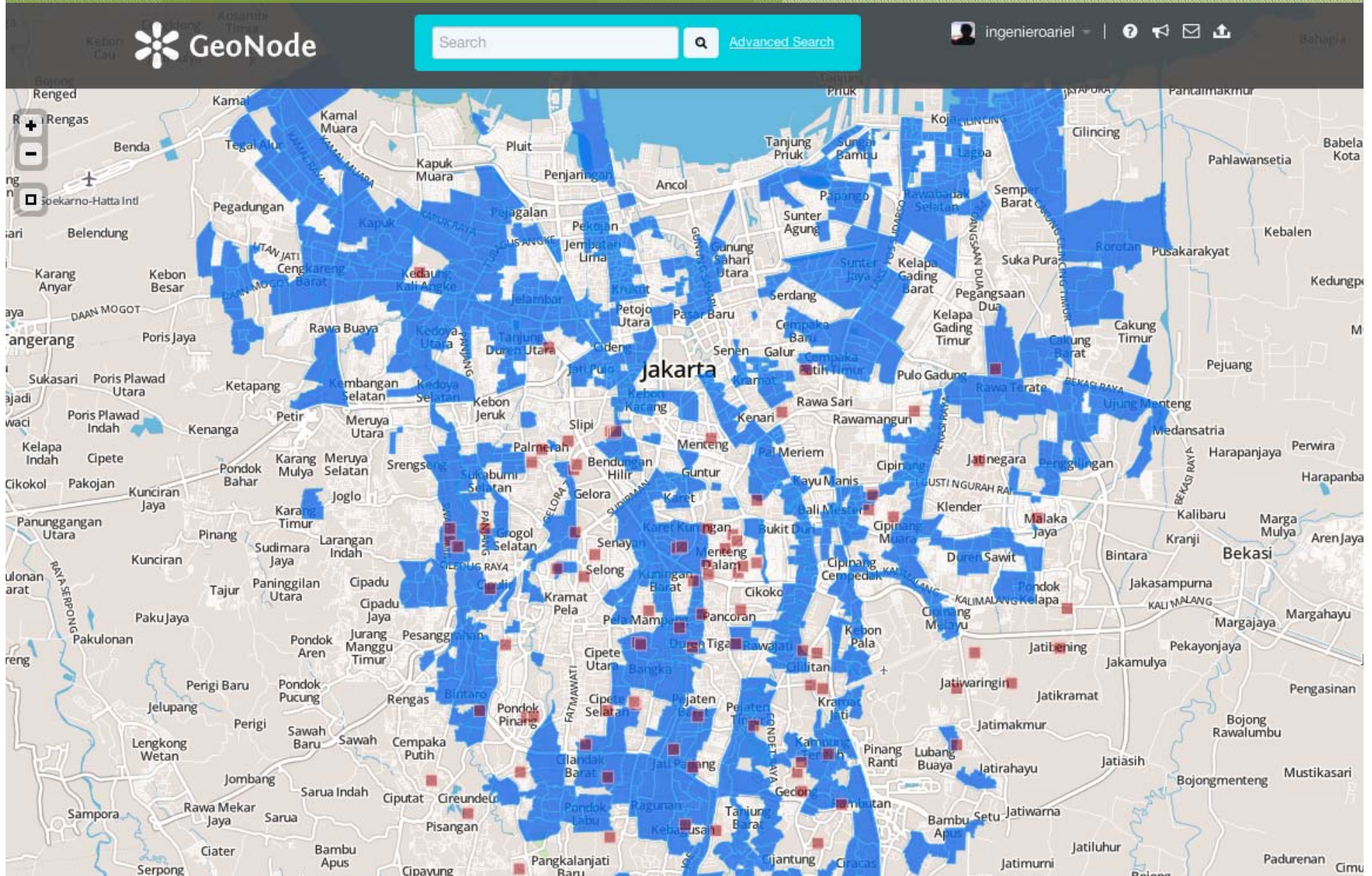
Flag

Layer Information

MAPS USING THIS LAYER

This layer is not currently used in any maps.

Jakarta flood prone areas and hospitals



Result: Number of hospitals potentially flooded



Search



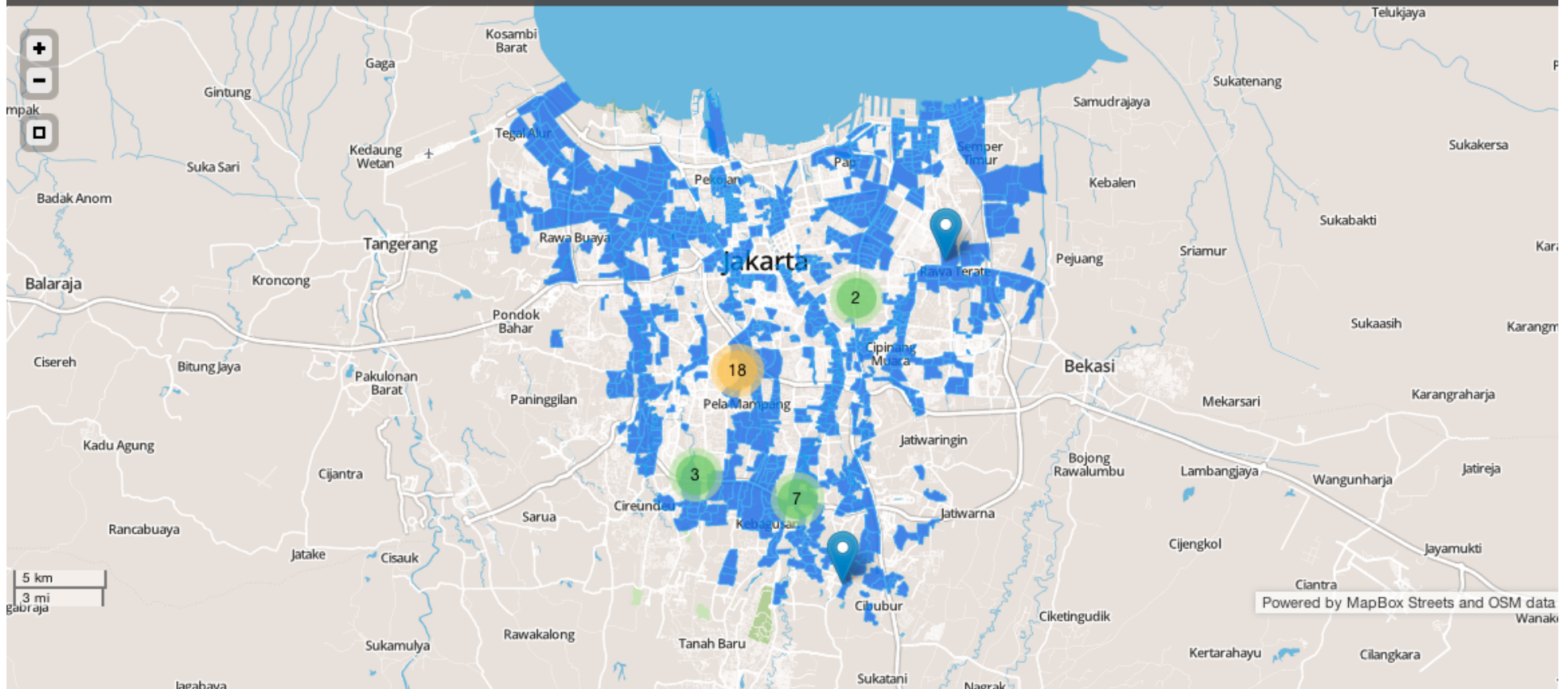
Advanced Search



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Segarjaya



SAFE
Scenario Assessment
For Emergencies

In the event of

A flood in Jakarta in areas identified

how many

Hospitals

might

Be temporarily closed



Ask again

Action Checklist

- Are the critical facilities still open?
- Which structures have warning capacity (eg. sirens, speakers, etc.)?
- Which buildings will be evacuation centres?

32 buildings would have to be closed from a total of 96

Running time 8.42 seconds

Running date 2012-10-22 20:03:00