Open Data for Resilience in Latin America and the Caribbean

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10th United Nations Regional Cartographic Conference for the Americas

GFDRR
Global Facility for Disaster Reduction and Recovery

OpenDRI
OPEN DATA FOR RESILIENCE INITIATIVE

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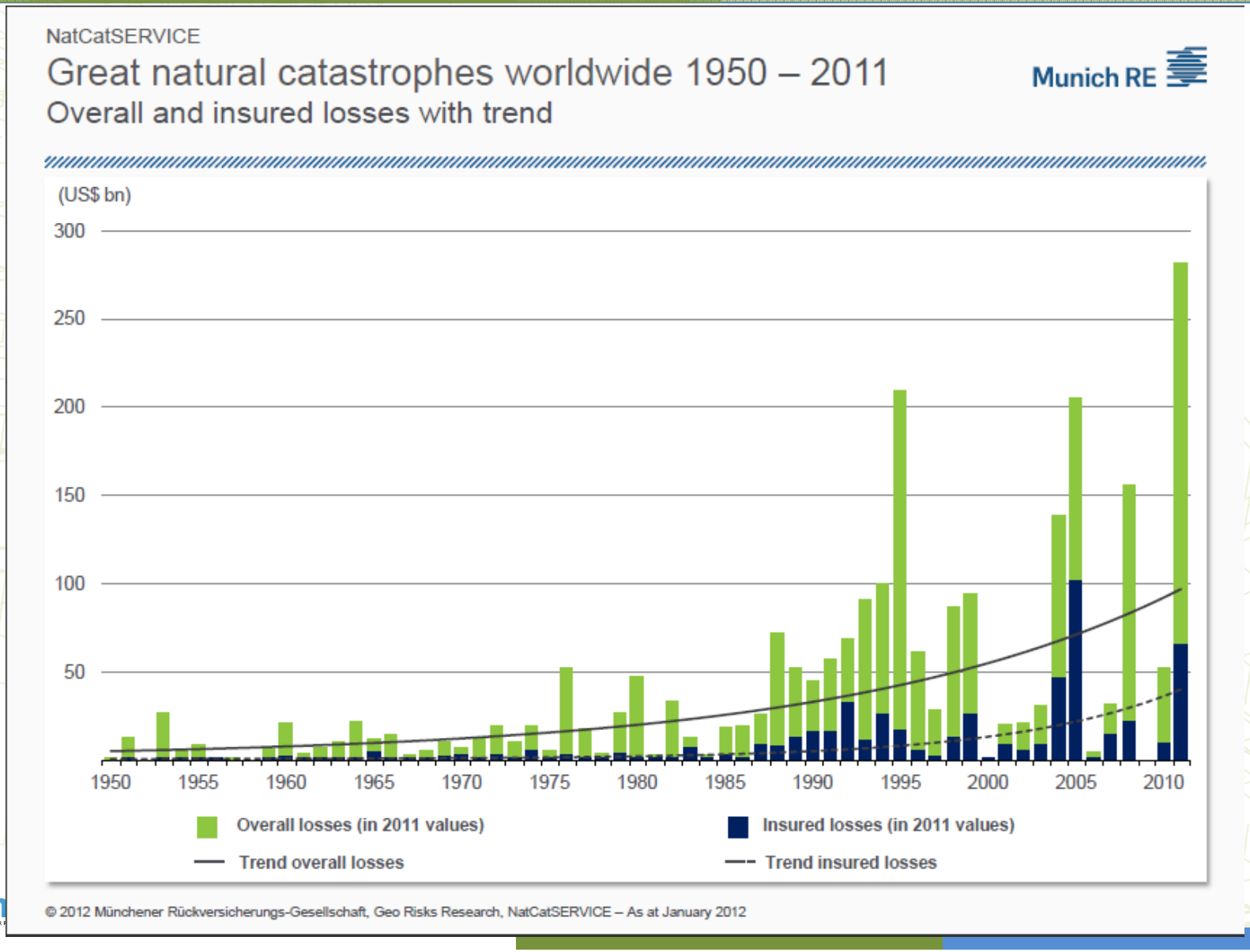
Why it matters?



Building resilience and better decision-making

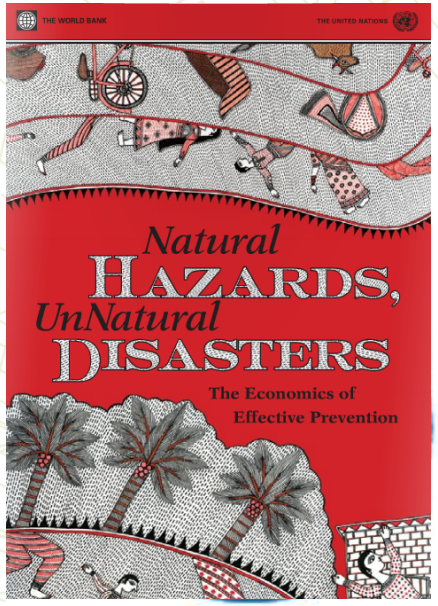
- Latin America and the Caribbean (LAC) region is one of the most vulnerable region with respect to natural disasters
- 20 countries in LAC region have half of the GDP exposed to natural disasters
- Damages due to natural hazards happen because of how and where we build
- The key is using (geospatial)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



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OpenDRI in the Carribean (video)

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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
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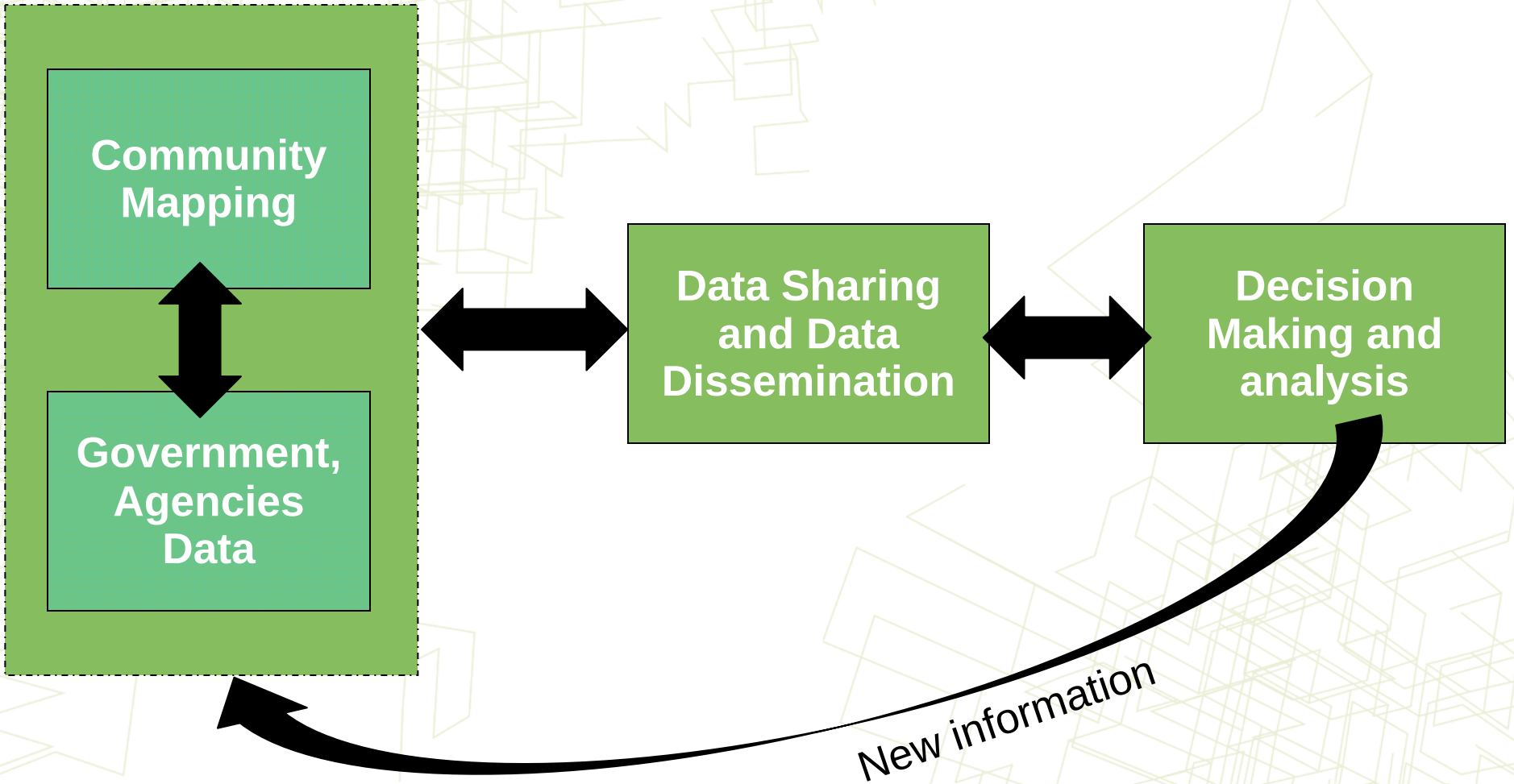
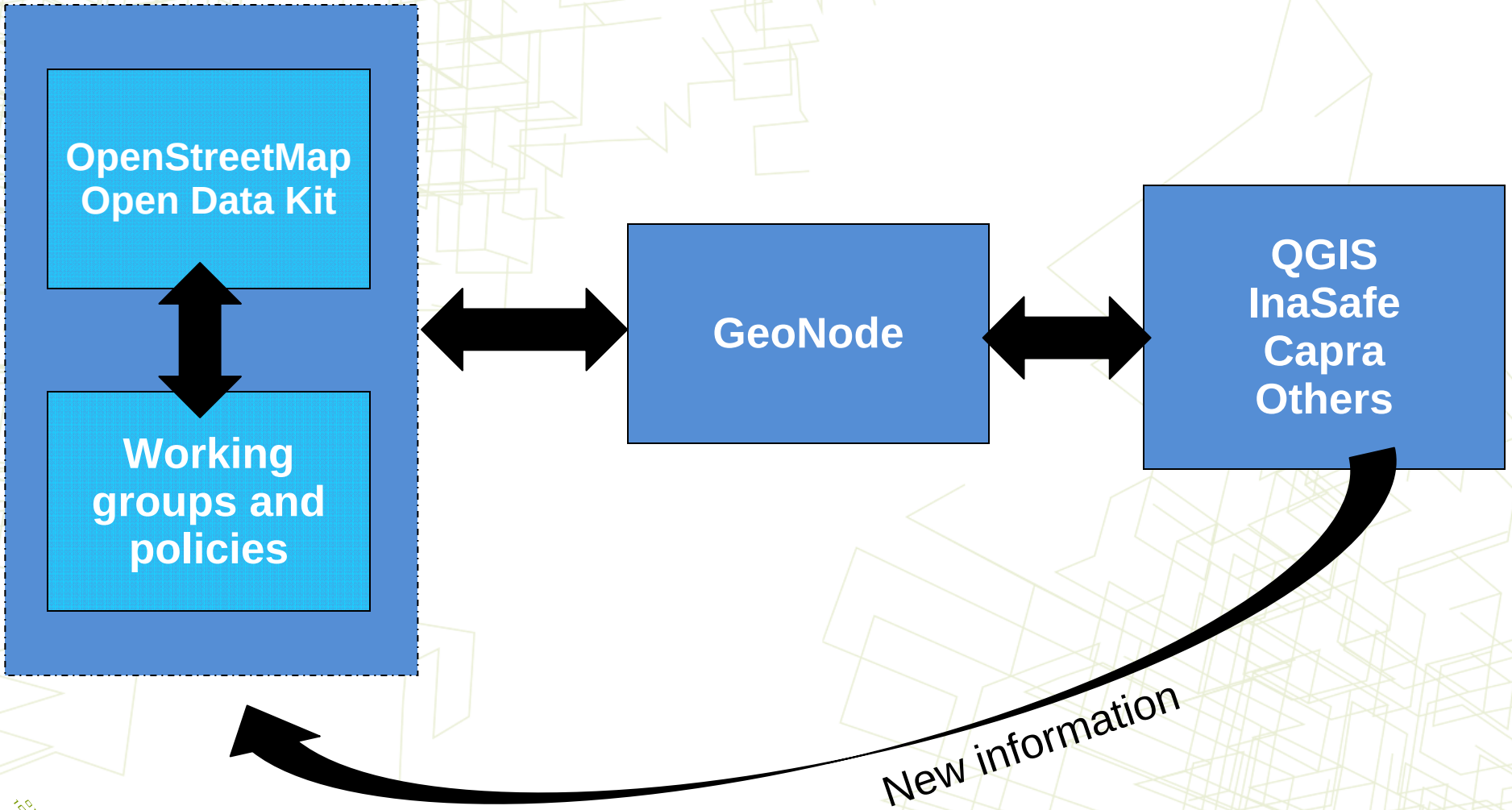
OpenDRI Overview



OpenDRI Technologies



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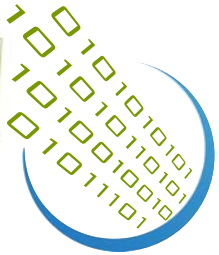
Community Mapping



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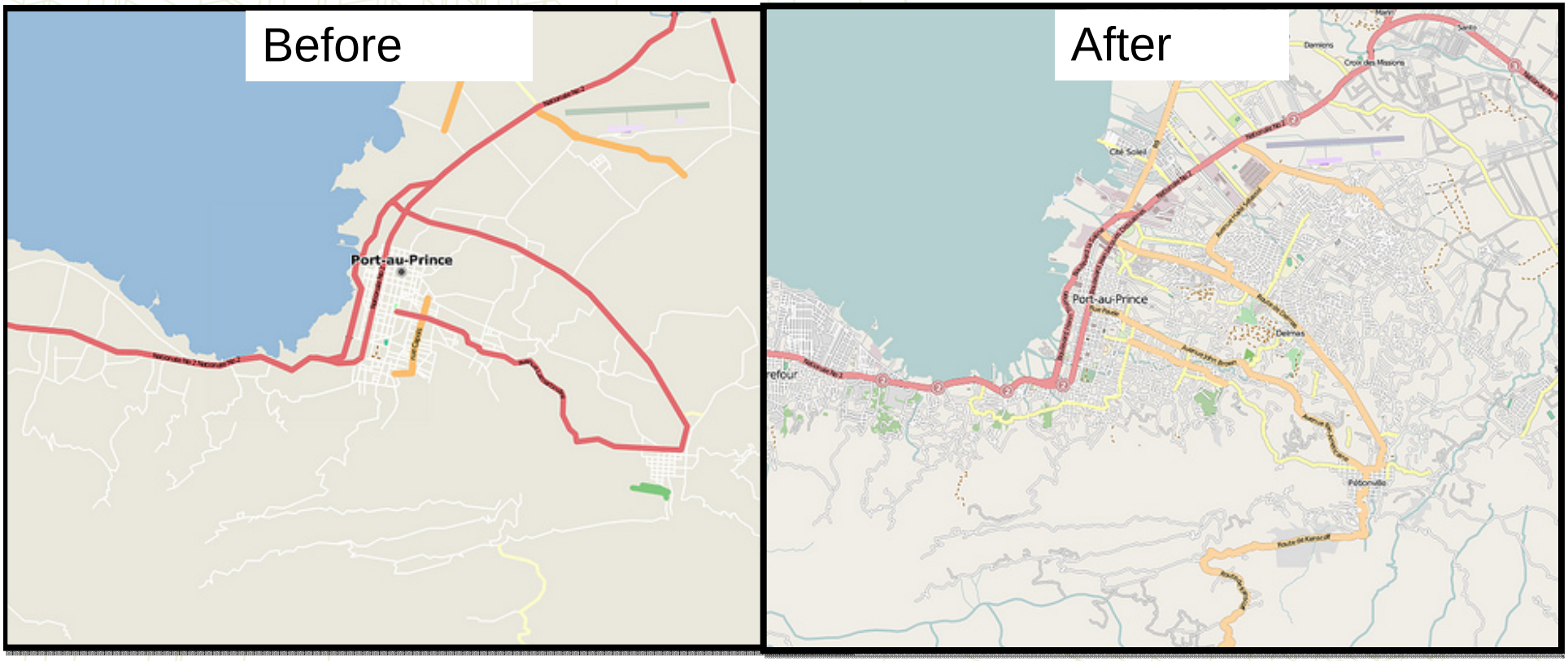
OpenStreetMap (OSM)

- 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

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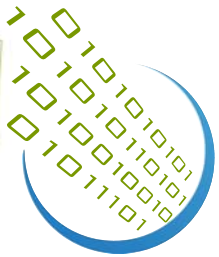
Data Sharing and Dissemination



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Challenges with the Spatial Data Sharing

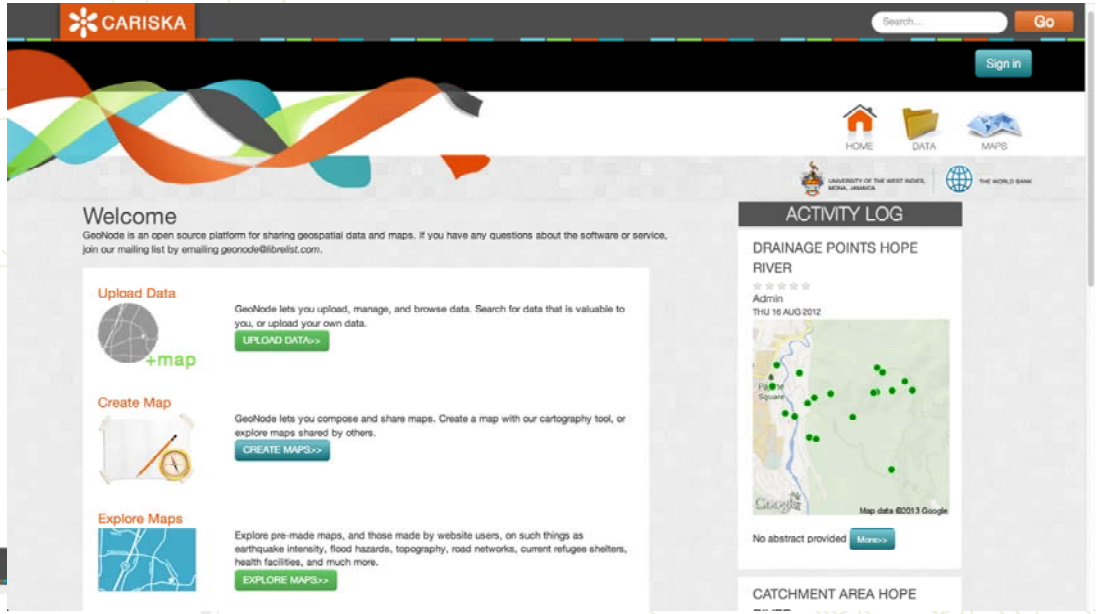
- Not enough data to carry out analysis
- Existing data not readily available
- Numerous data format
- Poor or questionable data quality
- Scale of the data not sufficient
- Metadata non-existent or scant
- Data Vintage
- Data not in digital format or not in raw machine readable format

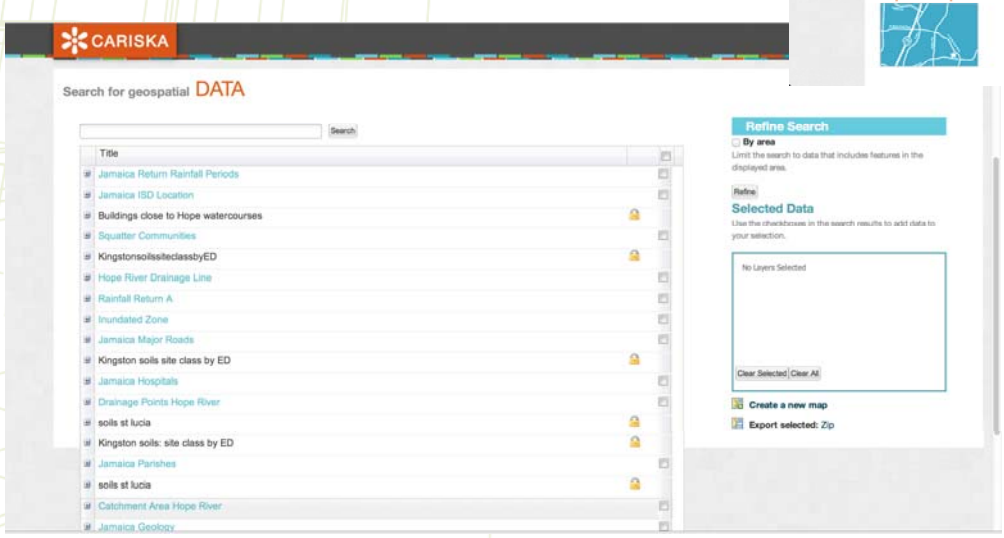
No comprehensive Data Sharing mechanism

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)

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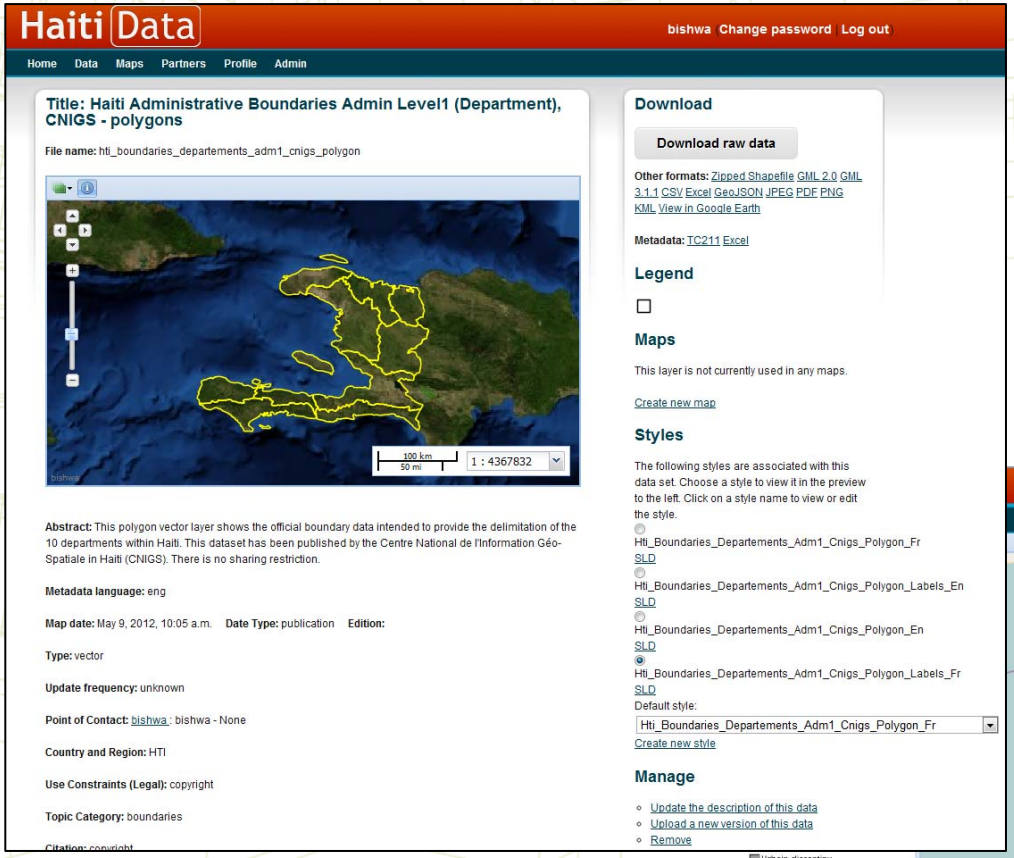
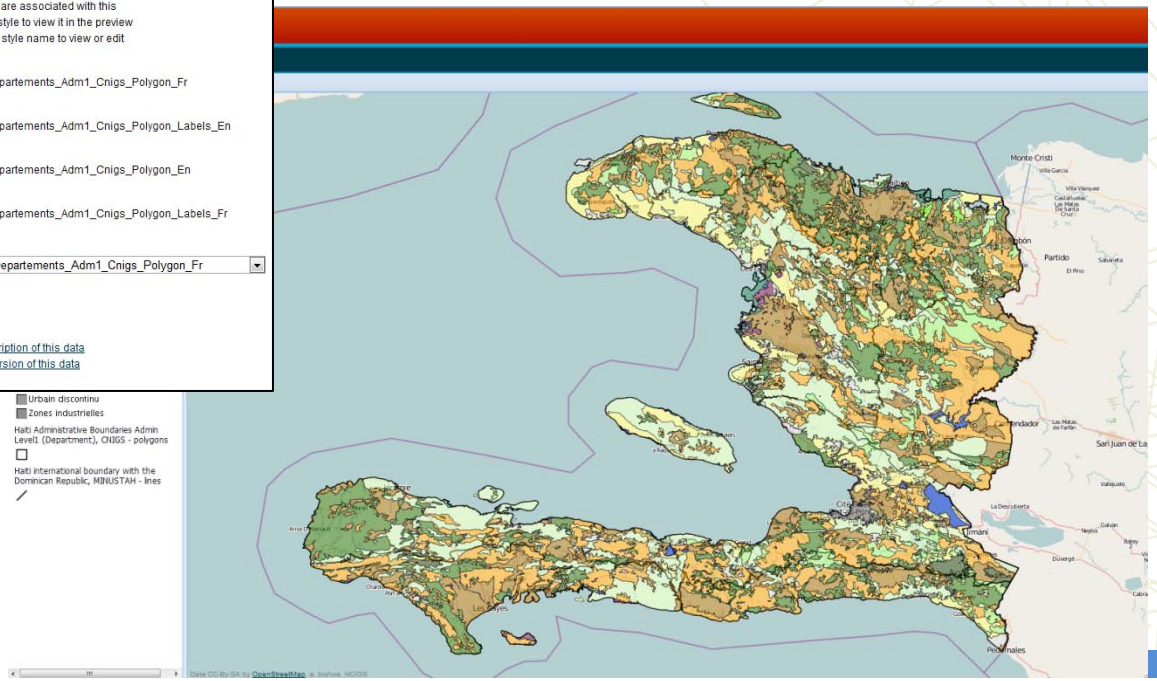
Create and Share Interactive Map





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Deployments

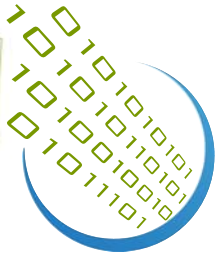
Countries currently engaged:

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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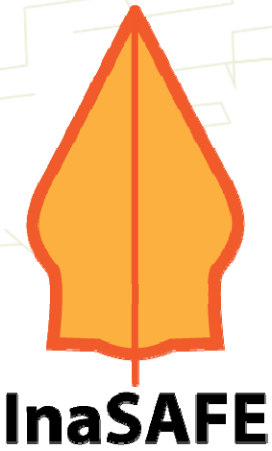
InaSafe

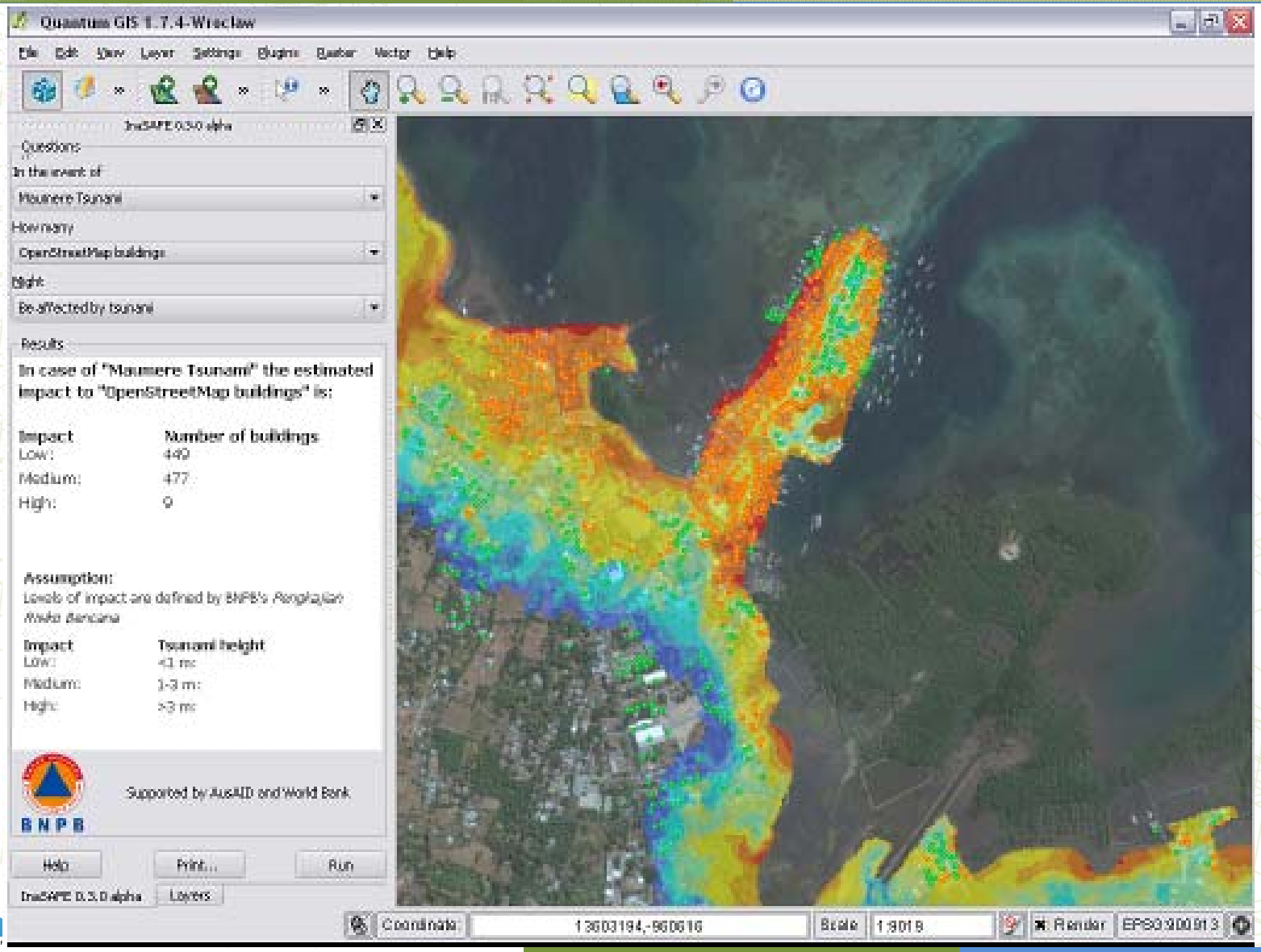


InaSAFE is a free software tool that produces realistic natural hazard impact scenarios for better planning, preparedness and response activities.

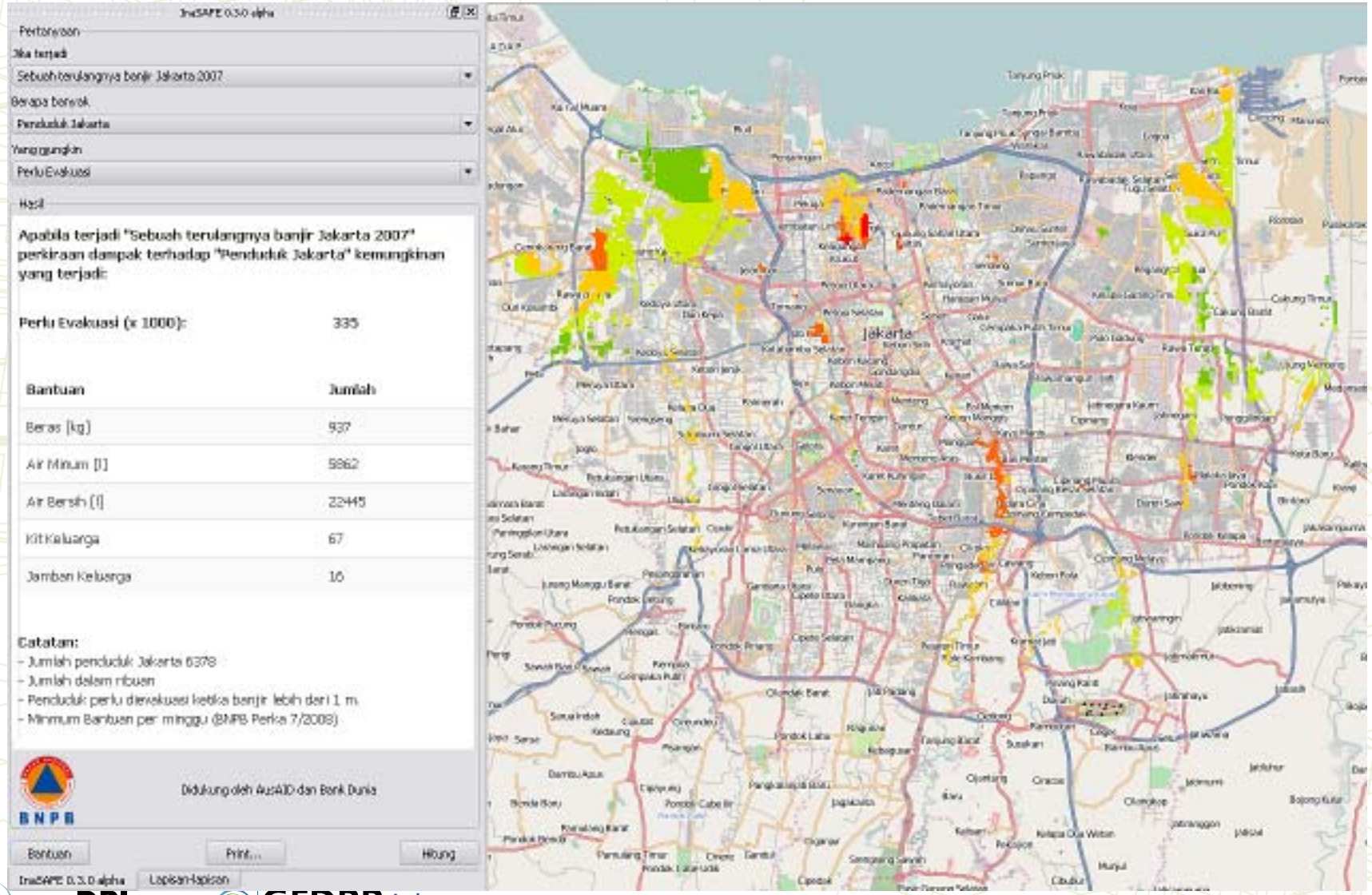
Easy to use tool to empower local government to make informed decision:

- 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-Wroclaw
InaSAFE 0.5.0 alpha
Questions
In the event of
Maumere Tsunami
How many
OpenStreetMap buildings
Be affected by tsunami
Results
In case of "Maumere Tsunami" the estimated impact to "OpenStreetMap buildings" is:
Impact
Number of buildings
Low:
449
Medium:
477
High:
9
Assumption:
Levels of impact are defined by BNPB's Rangkajian Kota Bencana
Impact
Tsunami height
Low:
<1 m
Medium:
1-3 m
High:
>3 m
Supported by AusAID and World Bank
BNPB
Help
Print...
Run
InaSAFE 0.5.0 alpha
Layers
Coordinate:
13603194,-960616
Scale
1:9019
Render
EPSG:900913

InaSafe



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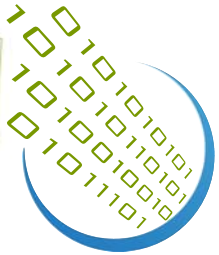
Capacity building, knowledge exchange and partnerships



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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

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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

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GEM

ITHACA
INFORMATION TECHNOLOGY FOR HUMANITARIAN ASSISTANCE, COOPERATION AND ACTION

JRC
EUROPEAN COMMISSION

OpenGeo

Australian AID

Center for Geographic Analysis
Harvard University

MapBox

WFP
wfp.org

BNPB
Indonesian Disaster Management Agency

HOT
Humanitarian OpenStreetMap Team

And more…

openDRI
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Thank You

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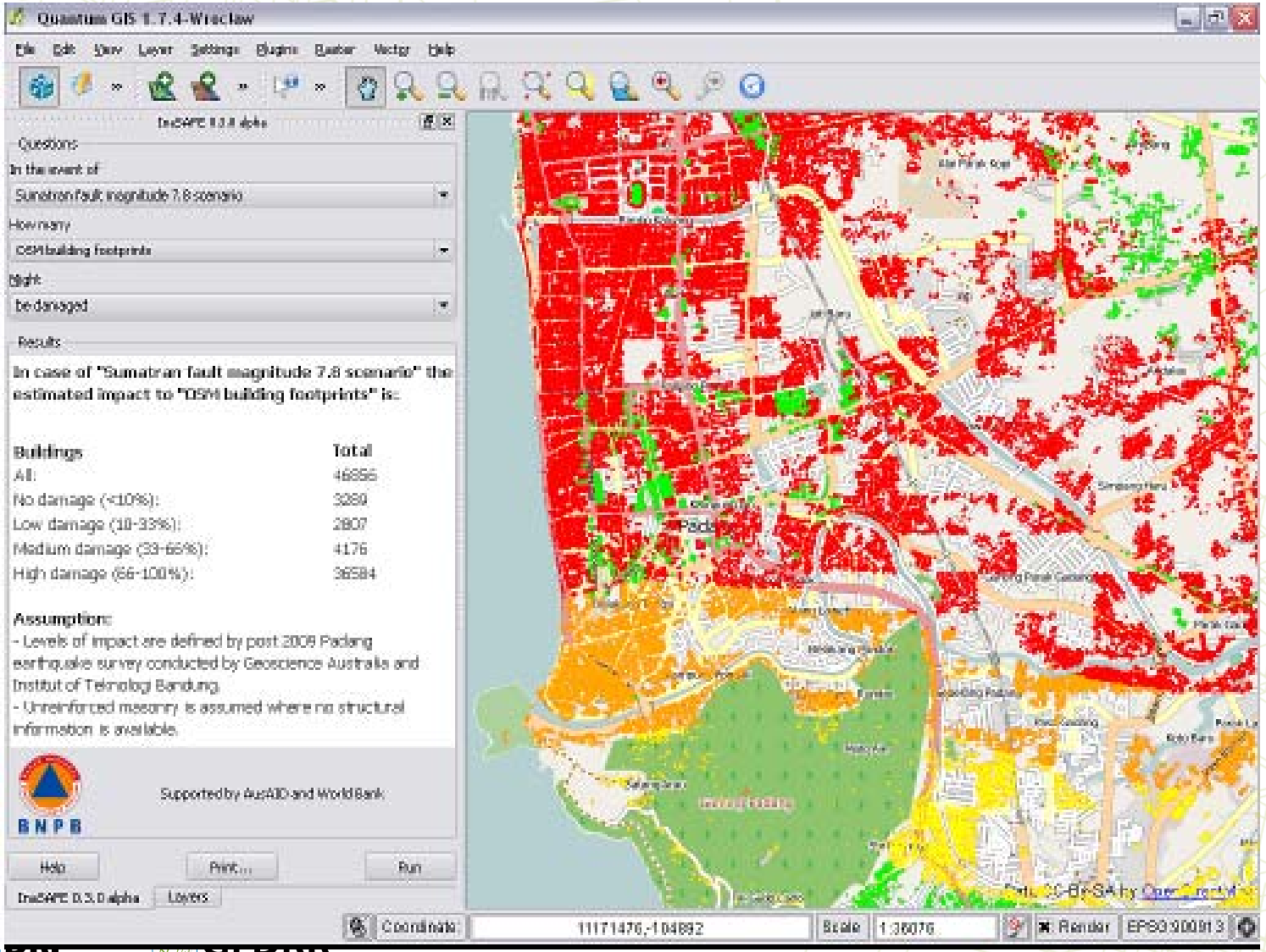
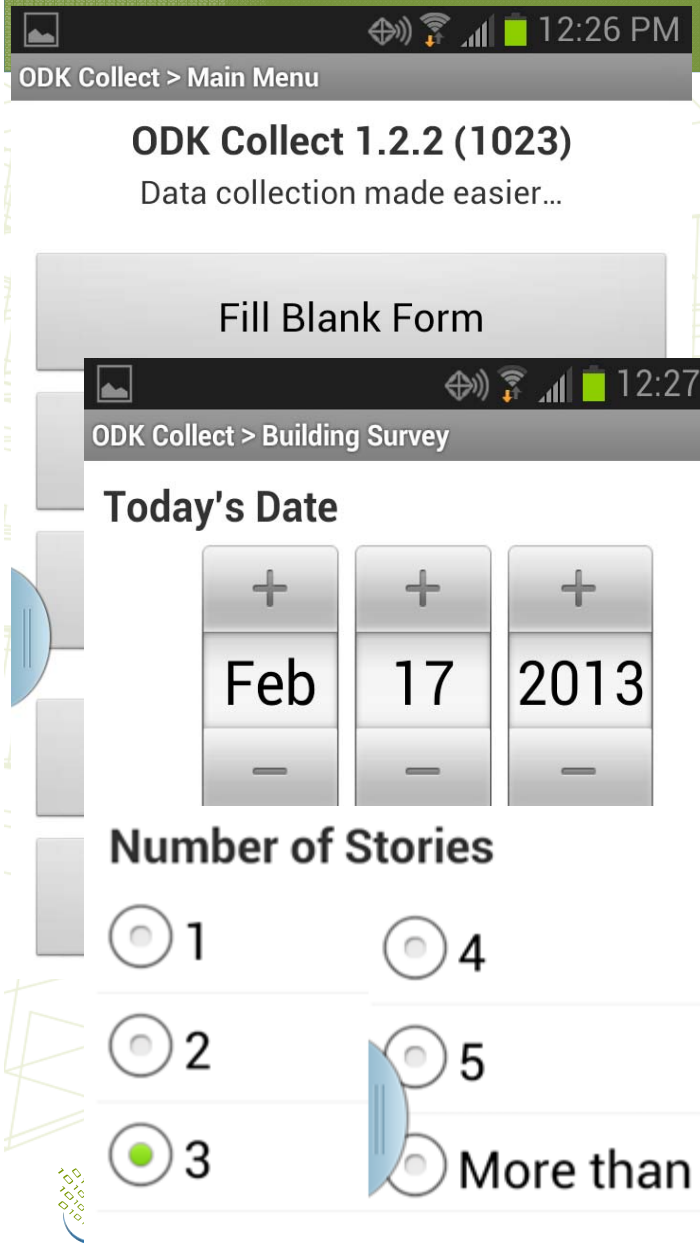
OpenDRI Field Guide

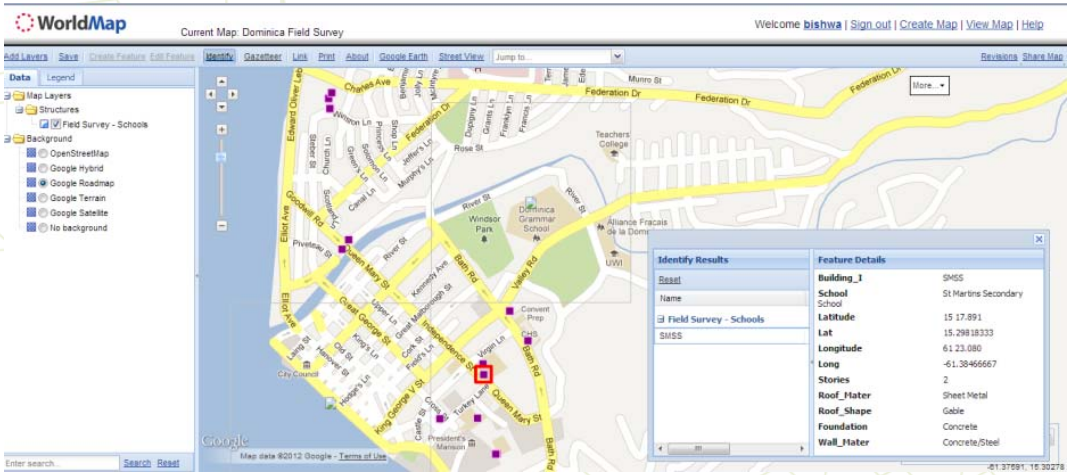
- Based on 2 years of GFDRR experience and input from a variety of other groups working (OCHA, USAID,…) on the issue
- To make the practices of the open data movement relevant to disaster risk management work
- Practical guide on designing, piloting, scaling and sustaining an OpenDRI project
- Will launch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

InaSafe


Quantum GIS 1.7.4-Wroclaw
File Edit View Layer Settings Plugins Raster Vector Help
InaSAFE 0.3.0 alpha
Questions
In the event of
Sumatran fault magnitude 7.8 scenario
How many
OSM building footprints
Might
be damaged
Results
In case of "Sumatran fault magnitude 7.8 scenario" the estimated impact to "OSM building footprints" is:
Buildings Total
All 46856
No damage (<10%) 3289
Low damage (10-33%) 2807
Medium damage (33-66%) 4176
High damage (66-100%) 36584
Assumption:
- Levels of impact are defined by post 2009 Padang earthquake survey conducted by Geoscience Australia and Institut of Teknologi Bandung.
- Unreinforced masonry is assumed where no structural information is available.
Supported by AusAID and World Bank
BNPB
Help
Print...
Run
InaSAFE 0.3.0 alpha
Layers
Coordinate:
111171476,-104892
Scale
1:36076
Render
EPSG:900913

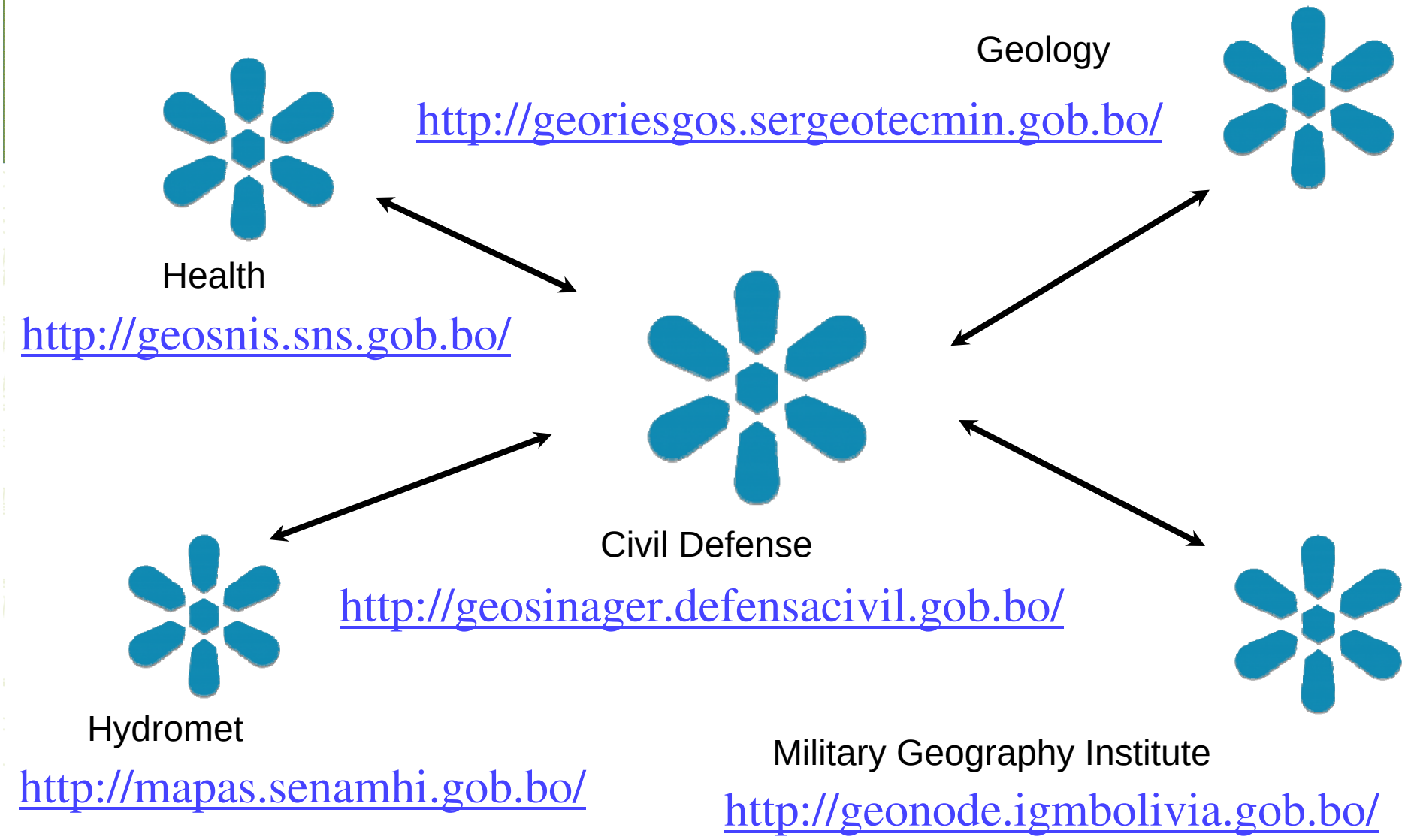
Mobile Data Collection- Structural Survey





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



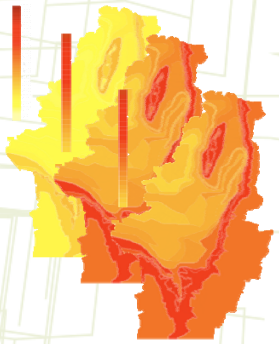
GeoNode Bolivia – Federation Model

Example: Risk Assessments

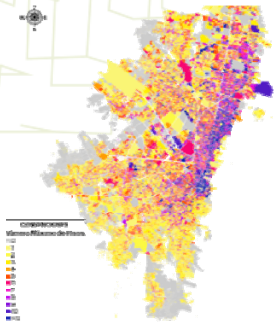
A critical step toward understanding risk and building resilience

Vulnerability

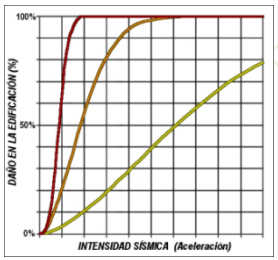
Hazard
(i.e. earthquake)



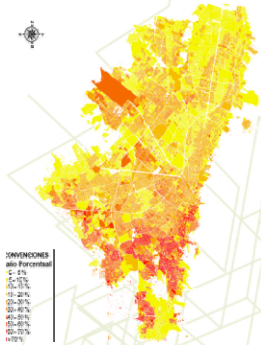
Exposure
(i.e. houses)



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?

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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

OpenStreetMap

GeoNode

CAPRA (for expert)

Discussion with ministries, government agencies and other organizations to share data

InaSAFE

inaSafe (for non-expert)

- desktop
- web

Other decision support tools

Data collection / gathering

Data sharing

Decision making

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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/

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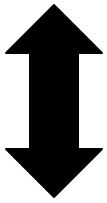
Map production process

Collect data

Upload and edit the data



See the live map and use the data

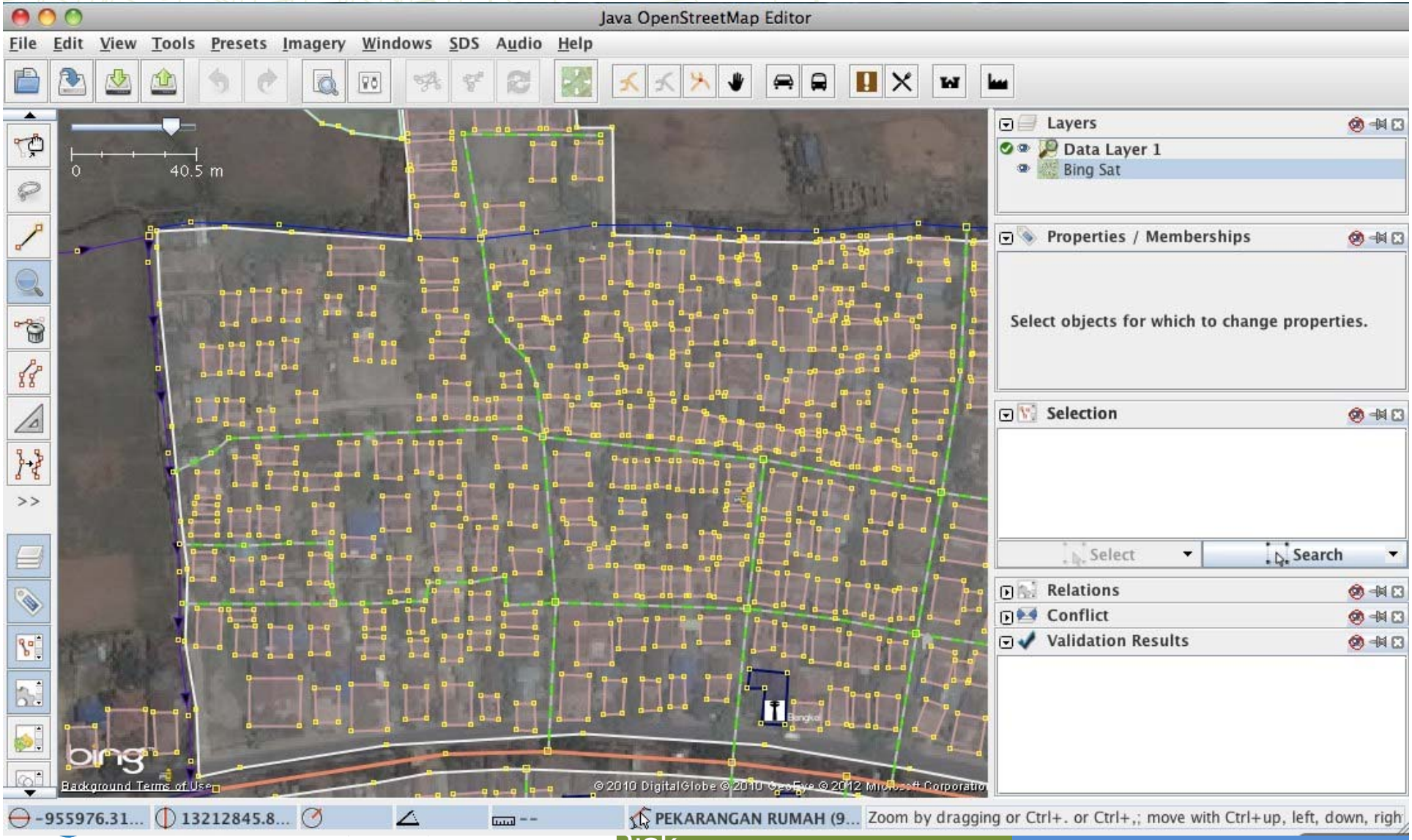
Data collection

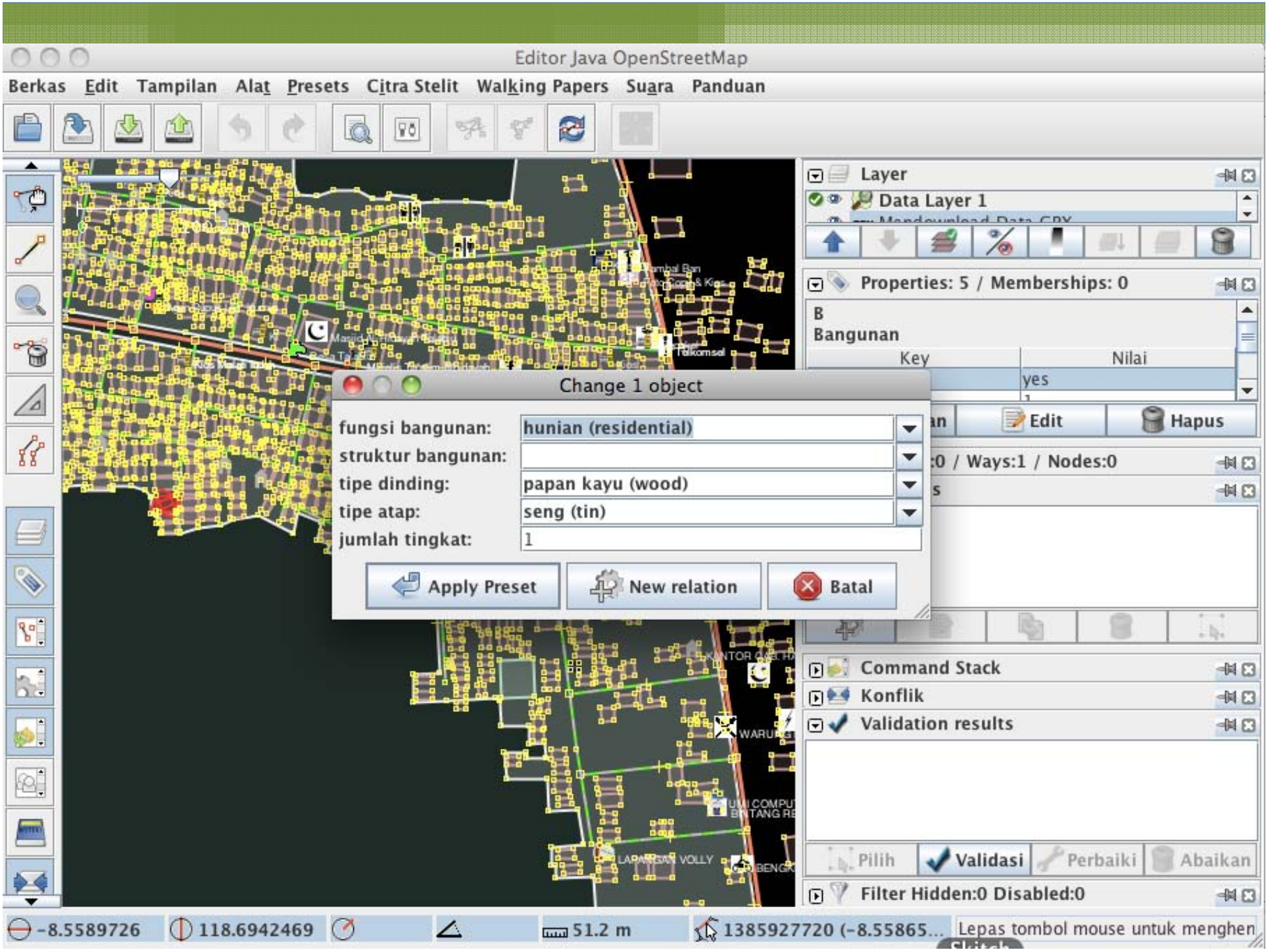
- Tracing available imageries

- 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




Editor Java OpenStreetMap
Berkas Edit Tampilan Alat Presets Citra Stelit Walking Papers Suara Panduan
Layer
Data Layer 1
Properties: 5 / Memberships: 0
B
Bangunan
Key
Nilai
yes
Edit
Hapus
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
Command Stack
Konflik
Validation results
Pilih
Validasi
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Abaikan
Filter Hidden:0 Disabled:0
-8.5589726
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51.2 m
1385927720 (-8.55865...
Lepas tombol mouse untuk menghen

Global Data Collection

Videos of the evolution of OpenStreetMap around the world

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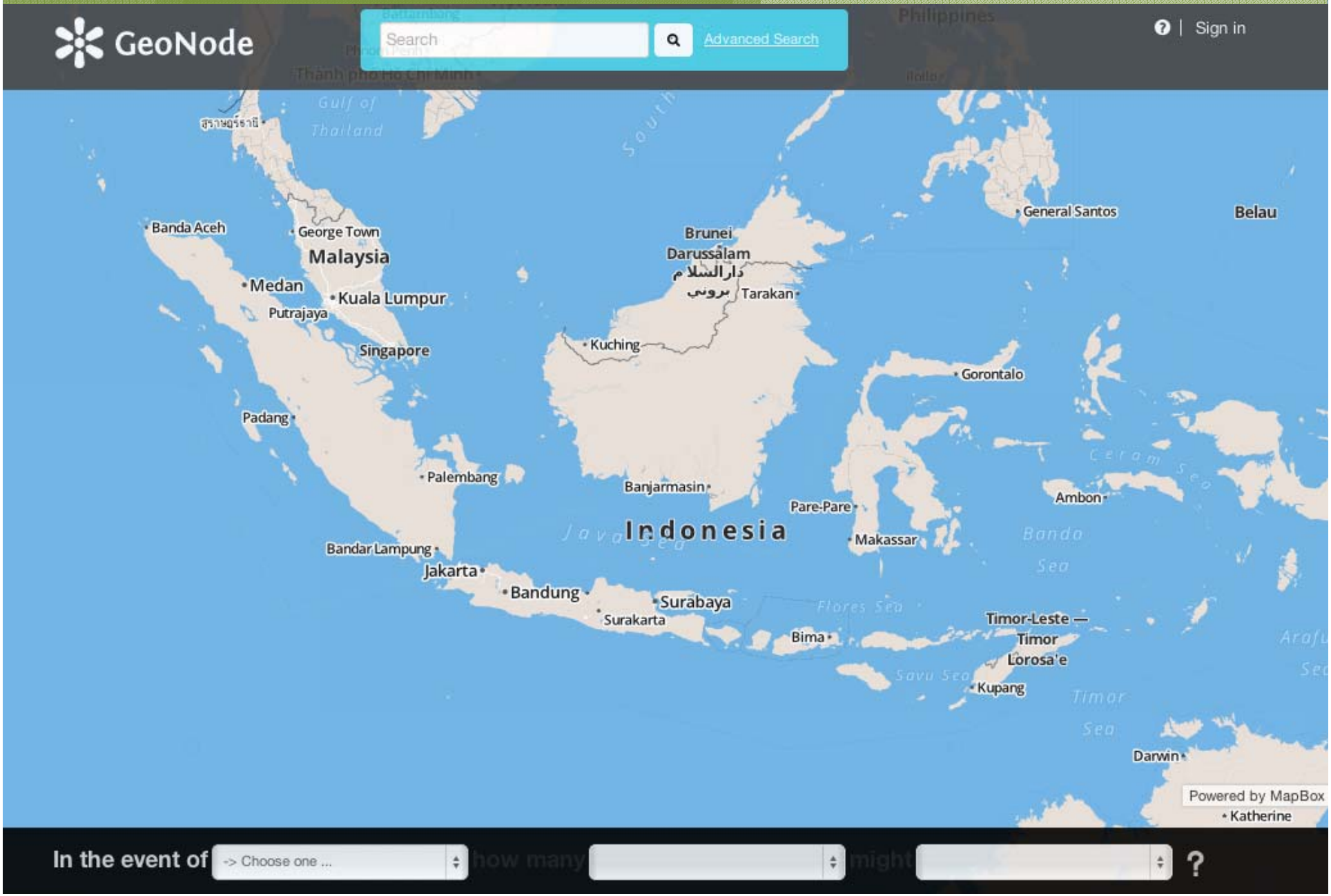
InaSafe Web


GeoNode
Search
Advanced Search
Sign in
Banda Aceh
George Town
Malaysia
Medan
Kuala Lumpur
Putrajaya
Singapore
Padang
Palembang
Brunei Darussalam
Tarakan
Kuching
General Santos
Belau
Gorontalo
Banjarmasin
Pare-Pare
Ambon
Indonesia
Makassar
Bandar Lampung
Jakarta
Bandung
Surabaya
Surakarta
Bima
Timor-Leste
Timor Lorosa'e
Kupang
Darwin
Katherine
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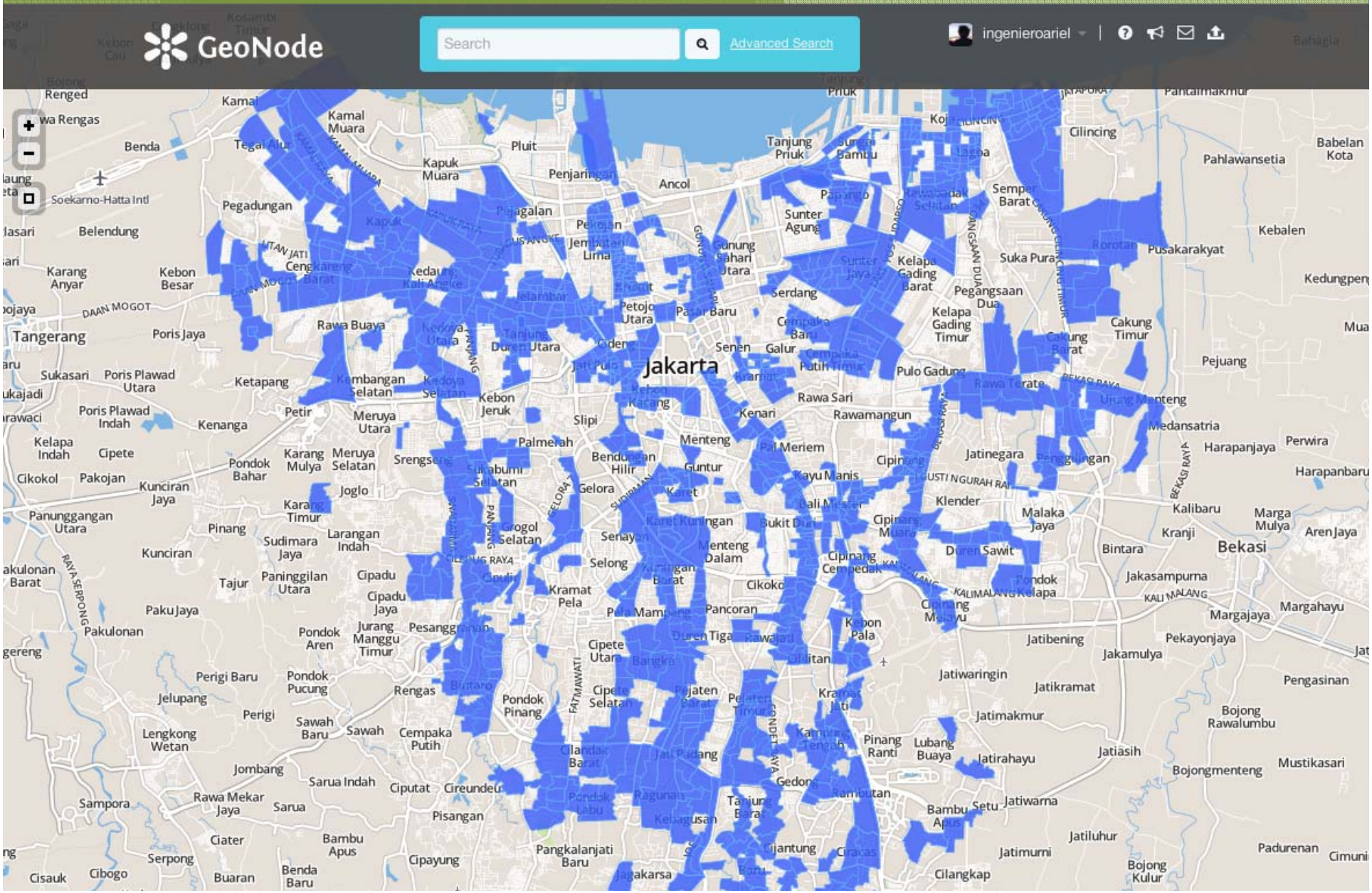
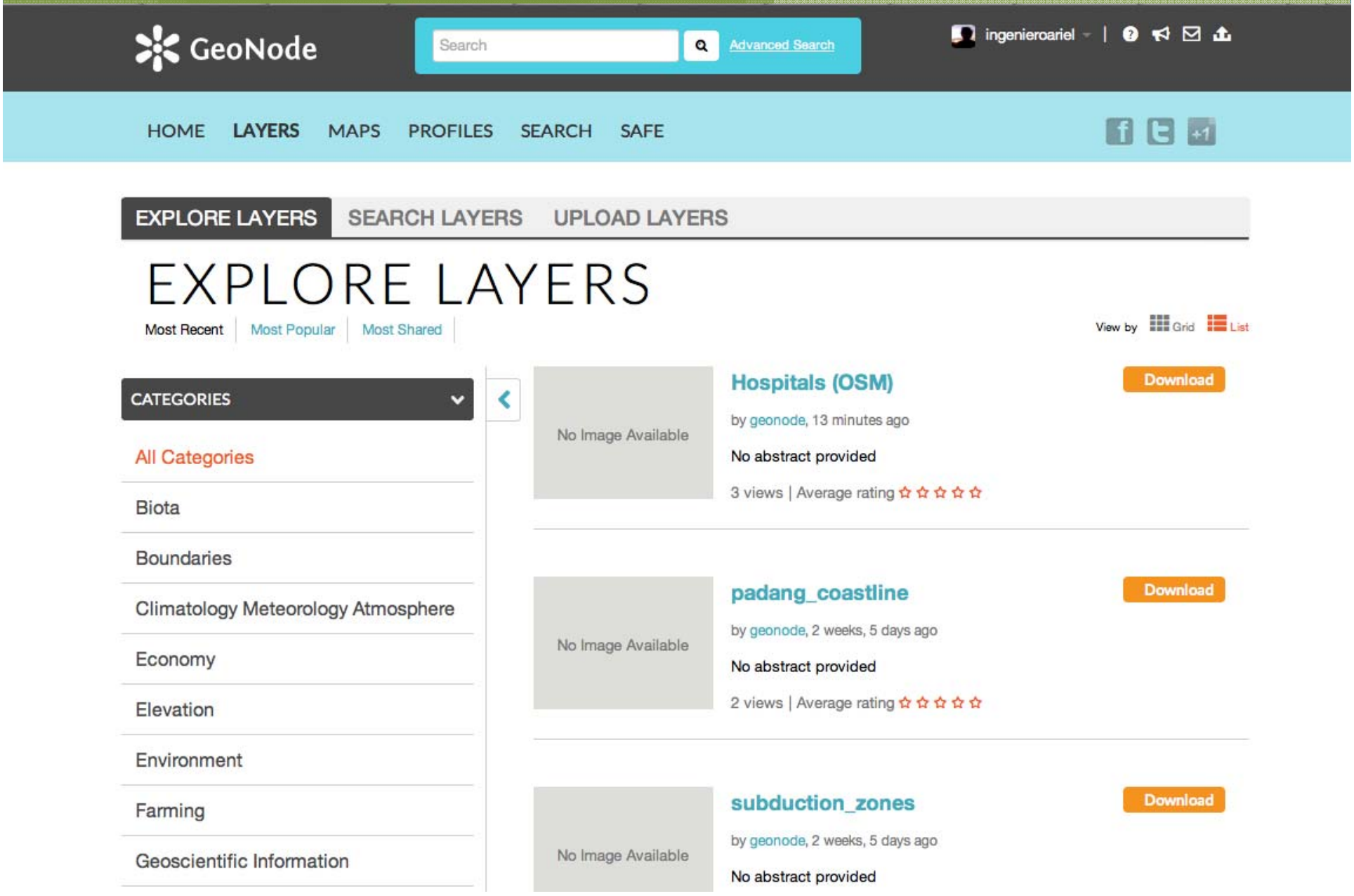
In the event of
-> Choose one ...
how many
might
?

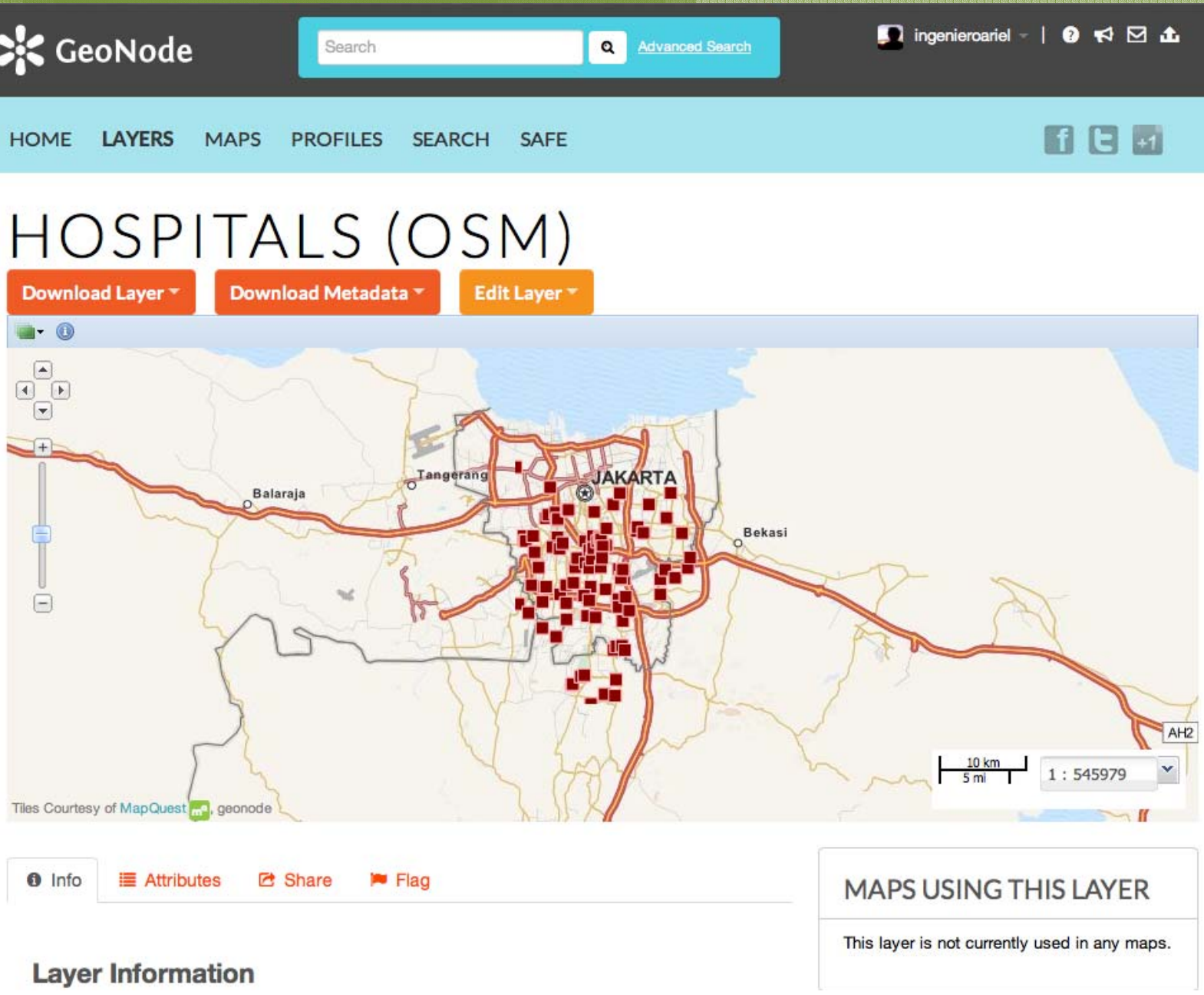
Flood analysis in Jakarta Province



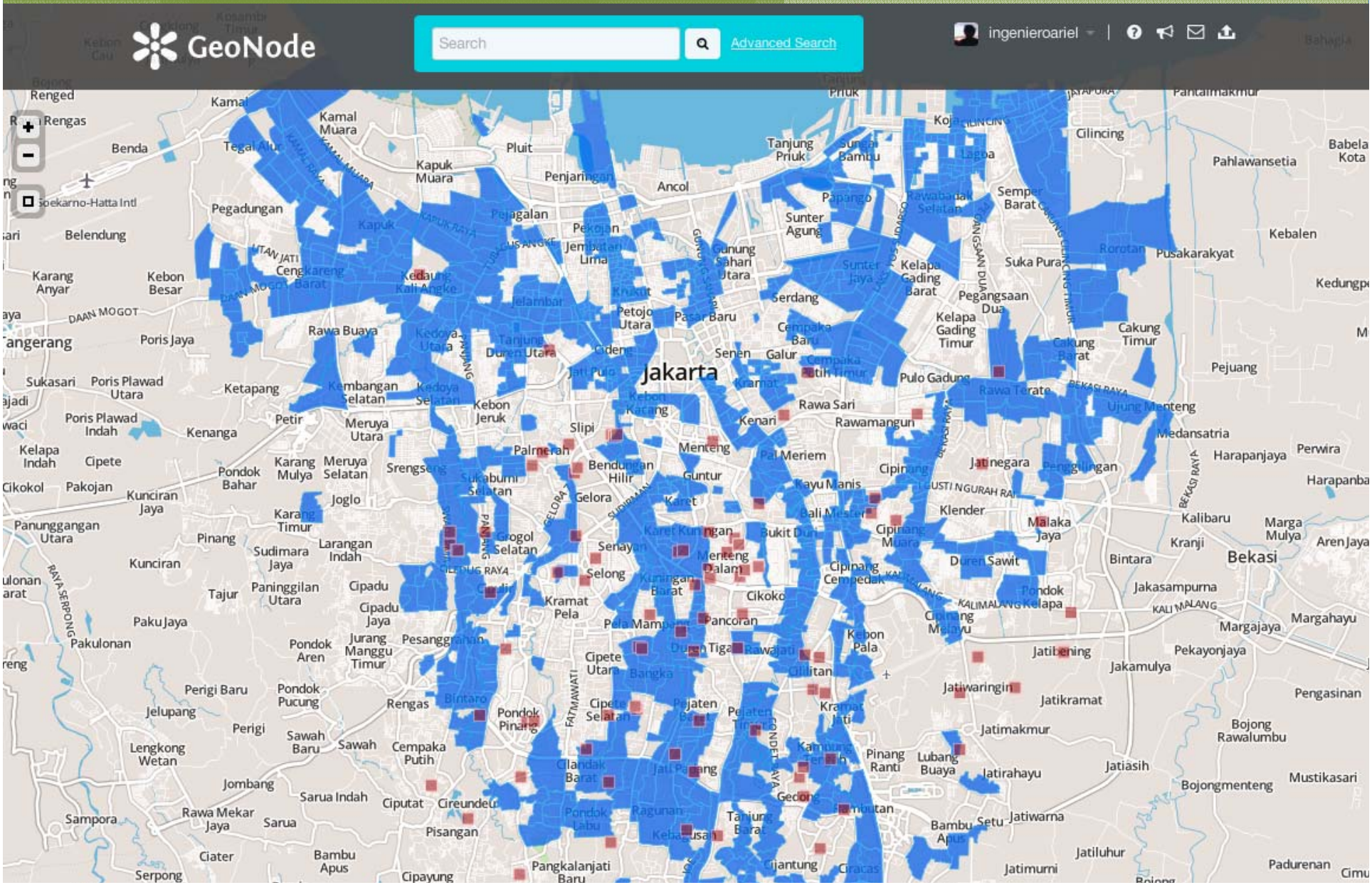
Leveraging the online data catalog



Visualizing critical infrastructure data



Jakarta flood prone areas and hospitals



Result: Number of hospitals potentially flooded