



Thanks to my sponsors for this talk



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Who am I?



InaSAFE developer team lead

www.inasafe.org



QGIS Project Steering Committee
member and long-time developer
(since 2002)

qgis.org



Kartoza director
and Open Source geek

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InaSAFE Key Concepts



Data Supplier

HAZARD



Keywords Wizard



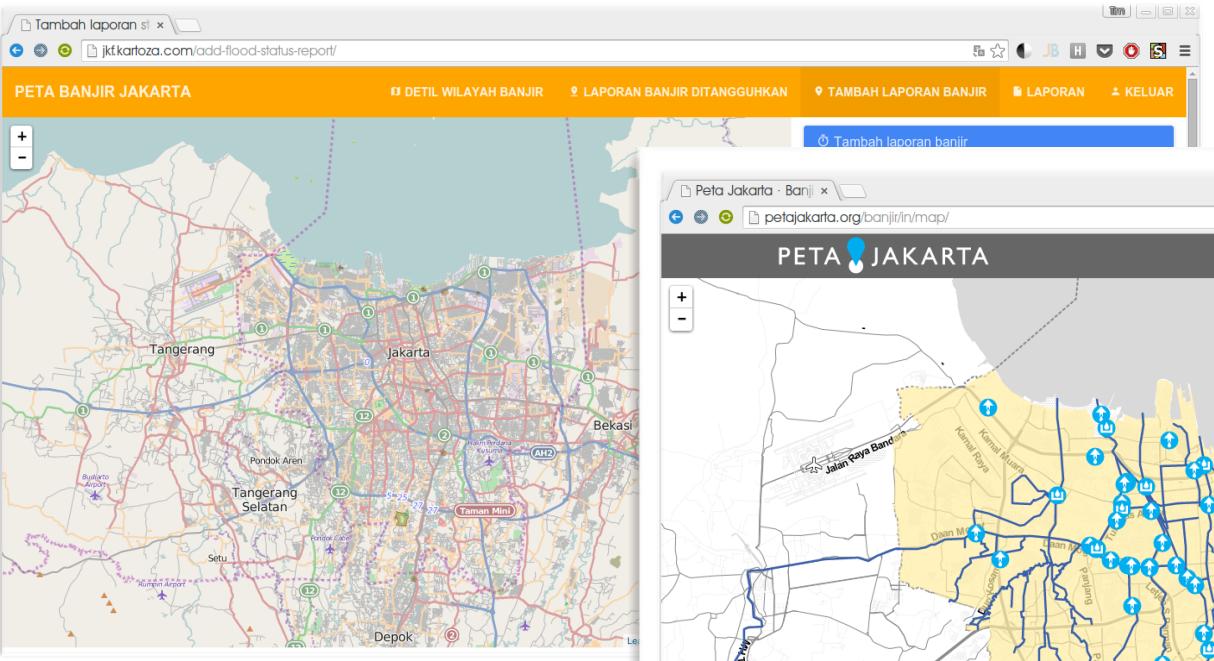


Acquiring flood data using **remote sensing**

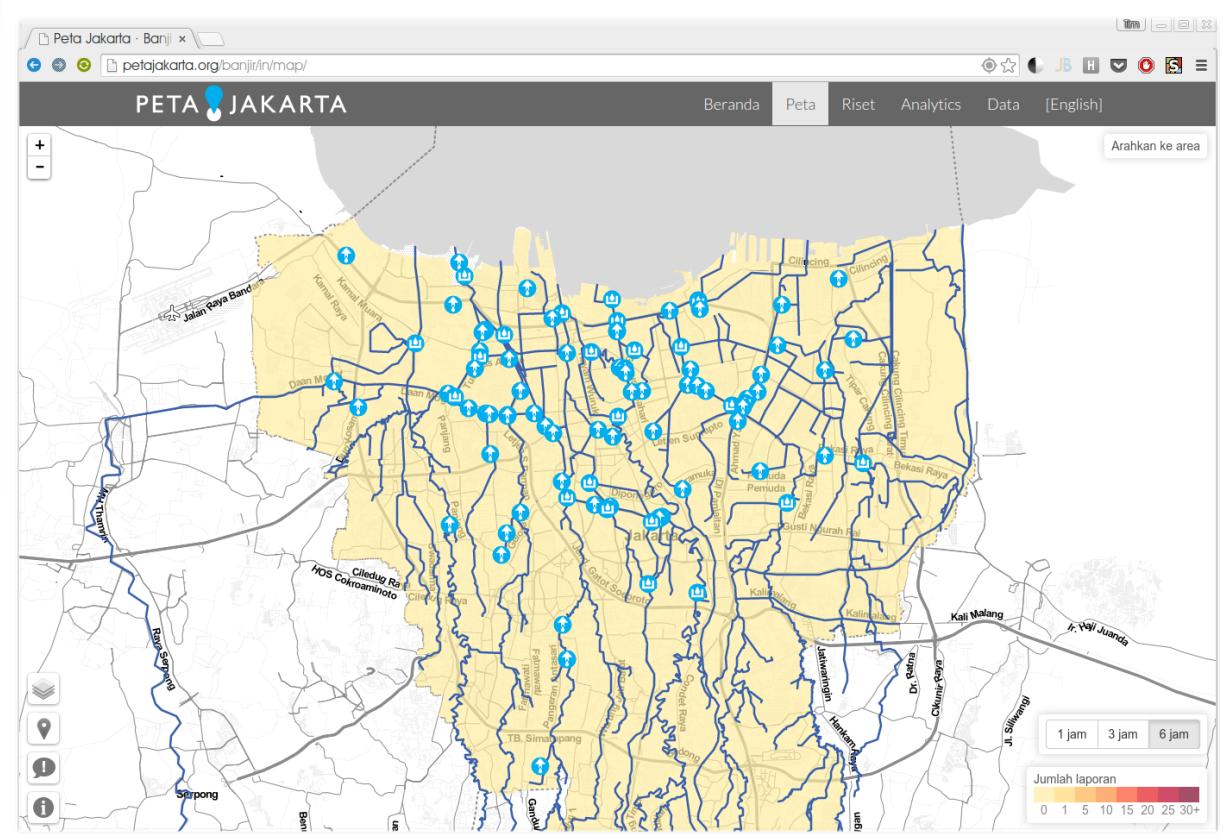
Summary	
Single event usage?	Yes - each dataset is typically for a single event
<i>Multi event usage?</i>	<i>Yes, by combining flood areas from two or more events</i>
Accuracy	Can be very good
Pros	<i>Can cover large areas</i>
Cons	May not work due to cloud cover, can be expensive to circumvent this.

Acquiring flood data using **local knowledge**

Summary	
Single event usage?	Yes
Multi event usage?	<i>Yes, local knowledge typically will span multiple events</i>
Accuracy	Typically only accurate to subward level
Pros	<i>Fairly quick to create the data, does not require sophisticated technology</i>
Cons	Susceptible to human error and coarse accuracy



Acquiring flood data using local knowledge



Acquiring flood data using **modelling techniques**

<i>Summary</i>	
Single event usage?	Yes
<i>Multi event usage?</i>	Yes
Accuracy	Accuracy may be very variable depending on the datasets used the the algorithms employed.
Pros	<i>Does not require large amounts of human input, may provide insight into the impact of extraordinary events such as 100 year floods.</i>
Cons	A large number of techniques available make it difficult to choose an appropriate one. Algorithm parameters need to be carefully tuned and a high confidence in the input data used for modelling is needed.

Data format requirements for **flood data** in InaSAFE

<i>Key notes for floods</i>	
Format	Vector polygon data or raster data
Required fields	<i>Applies to vector flood data only: A field representing whether the polygon is flood prone or not. We recommend calling this field 'FLOODPRONE' and using a value of 'YES' to indicate that it is flood prone.</i>
Notes	InaSAFE does not need 'engineering quality' data. When provided in raster format, each cell value will typically represent a flood depth in meters.
Sourcing	<i>Can be sourced from community mapping efforts, from your national mapping agency.</i>



OSM Downloader

EXPOSURE



Keywords Wizard





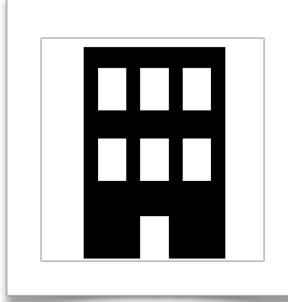
Data format requirements for **population data** in InaSAFE

<i>Key notes for population data</i>	
Format	Raster ‘cell’ data
Requirements	<i>Currently the data should be in EPSG:4326 CRS</i>
Notes	Be sure you know whether you are dealing with density or count data.
Sourcing	<i>WorldPop or from national government datasets.</i>



Data format requirements for **roads data** in InaSAFE

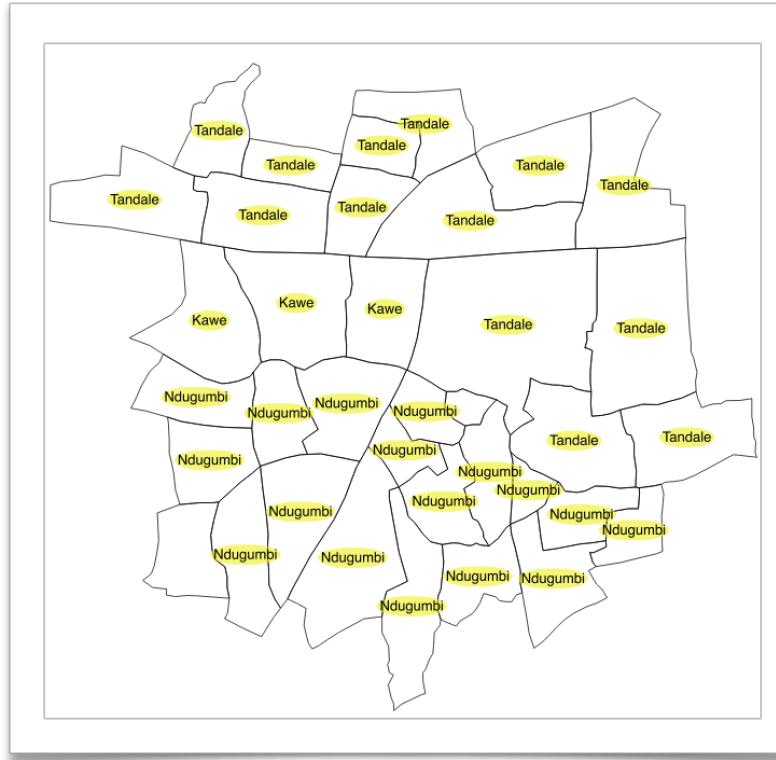
<i>Key notes for roads</i>	
Format	Vector line data
Required fields	<i>A field representing road type</i>
Notes	Topologically correct data is ideal - that is road intersections should converge properly
Sourcing	<i>Can be sourced from community mapping efforts in OSM (using the built in tool in InaSAFE makes this easy) or from national government datasets.</i>



Data format requirements for **buildings** data in InaSAFE

<i>Key notes for buildings</i>	
Format	Vector polygon data
Required fields	<i>A field representing building type</i>
Notes	InaSAFE does not need ‘engineering quality’ data.
Sourcing	<i>Can be sourced from community mapping efforts in OSM (using the built in tool in InaSAFE makes this easy) or from national / local government datasets.</i>

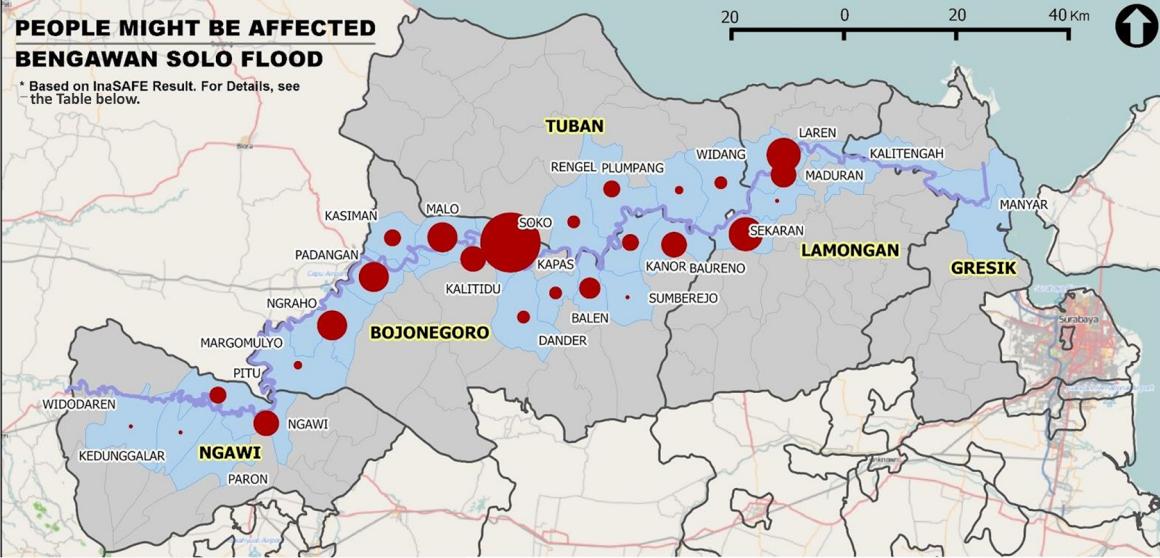
Aggregation



PEOPLE MIGHT BE AFFECTED

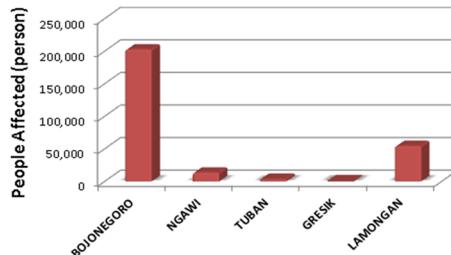
BENGAWAN SOLO FLOOD

* Based on InaSAFE Result. For Details, see the Table below.



PEOPLE MIGHT BE AFFECTED BY BENGAWAN SOLO FLOOD *

* Based on analysis using InaSAFE



District	People Might be Affected	People Need Evacuation **	Population By Age			Female Population ***
			Youth	Adult	Elderly	
Bojonegoro	202,821	2,000	53,342	133,659	15,802	101,411
Ngawi	13,701	130	3,603	9,029	1,069	6,851
Tuban	3,669	30	965	2,418	286	1,835
Gresik	803	8	211	529	63	393
Lamongan	54,540	540	14,344	35,942	4,254	27,270
TOTAL	275,534	2,708	72,465	181,577	21,474	137,760

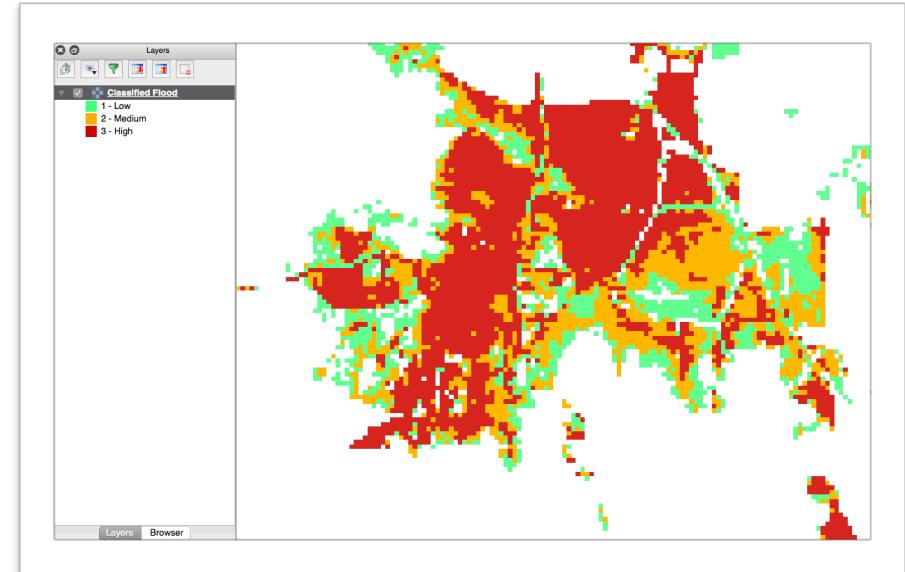
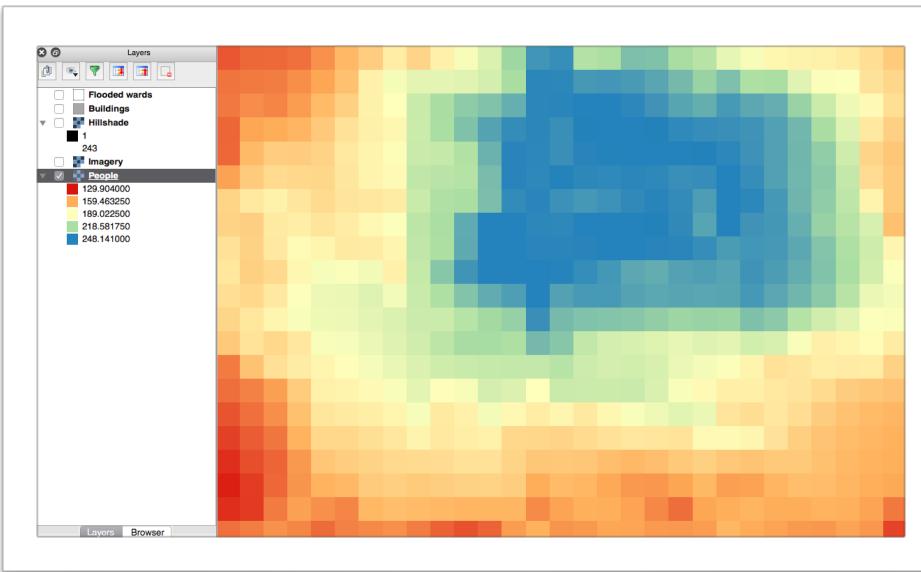
** Population threshold of people need evacuation : 1% of the people might be affected

*** Estimated based on sex ratio (male—female ratio) of the district

Contextual Data



Continuous vs Classified data



Analysis Extents



Impact Function



SET ANALYSIS EXTENT

InaSAFE combines one set of exposure data
with one hazard scenario

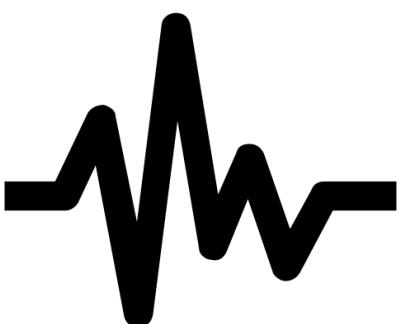


Impact Function Wizard

IMPACT FUNCTION

InaSAFE produces maps, reports & action lists

Earthquake



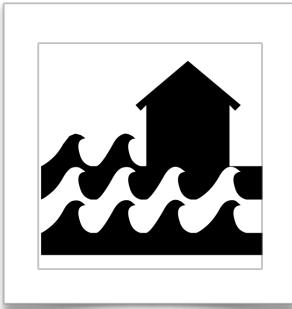
<i>Hazard Type</i>	<i>Supported Hazard Layers</i>	<i>Supported Exposure Layers</i>
Earthquake	Raster	Continuous raster population count Classified polygon vector buildings Classified point vector building centroids

Generic

?

<i>Hazard Type</i>	<i>Supported Hazard Layers</i>	<i>Supported Exposure Layers</i>
Generic	Classified polygon	Continuous raster population count Classified polygon vector buildings
	Classified raster	Continuous raster population count Classified polygon vector buildings
	Continuous raster	Continuous raster population count

Flood



<i>Hazard Type</i>	<i>Supported Hazard Layers</i>	<i>Supported Exposure Layers</i>
Inundation	Continuous raster	Continuous raster population count Classified polygon vector buildings Classified point vector building centroids Classified line vector roads
	Classified polygon	<i>Continuous raster population count</i> <i>Classified polygon vector buildings</i> <i>Classified point vector building centroids</i> <i>Classified line vector roads</i>

Volcano

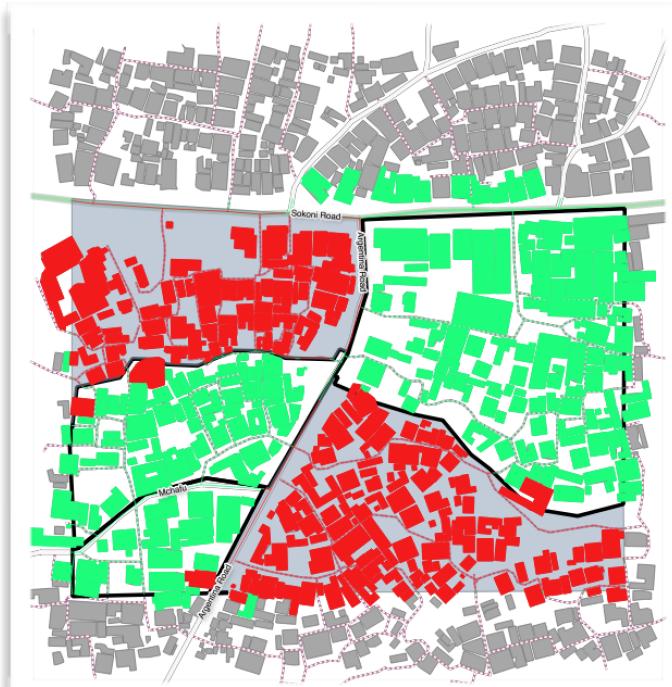


<i>Hazard Type</i>	<i>Supported Hazard Layers</i>	<i>Supported Exposure Layers</i>
Volcano	Classified point	Continuous raster population count Classified polygon vector buildings
	Classified polygon	<i>Continuous raster population count</i> <i>Classified polygon vector buildings</i>

Impact Function Products



Impact Layer





Impact Summary

Analysis Results

In the event of tandale-floods how many buildings might be flooded

Hazard Category	Buildings Affected	
Flooded	247	
Buildings Not Affected	242	
All Buildings	489	
Building type	Flooded	Total
Other	2	2
Residential	245	245

Action Checklist:

Are the critical facilities still open?

Which structures have warning capacity (eg. sirens, speakers, etc.)?

Which buildings will be evacuation centres?

Where will we locate the operations centre?

Where will we locate warehouse and/or distribution centres?

Notes

Buildings are said to be inundated when in a region with field "FLOODPRONE" = "YES".

Minimum Needs

Needs should be provided weekly	Total
Rice [kg]	56
Drinking Water [l]	350
Clean Water [l]	1,340
Family Kits	4
Needs should be provided single	Total
Toilets	1

Action checklists

Action Checklist:

How will warnings be disseminated?

How will we reach stranded people?

Do we have enough relief items?

If yes, where are they located and how will we distribute them?

If no, where can we obtain additional relief items from and how will we transport them to here?