Using advanced science and technology for disaster risk management

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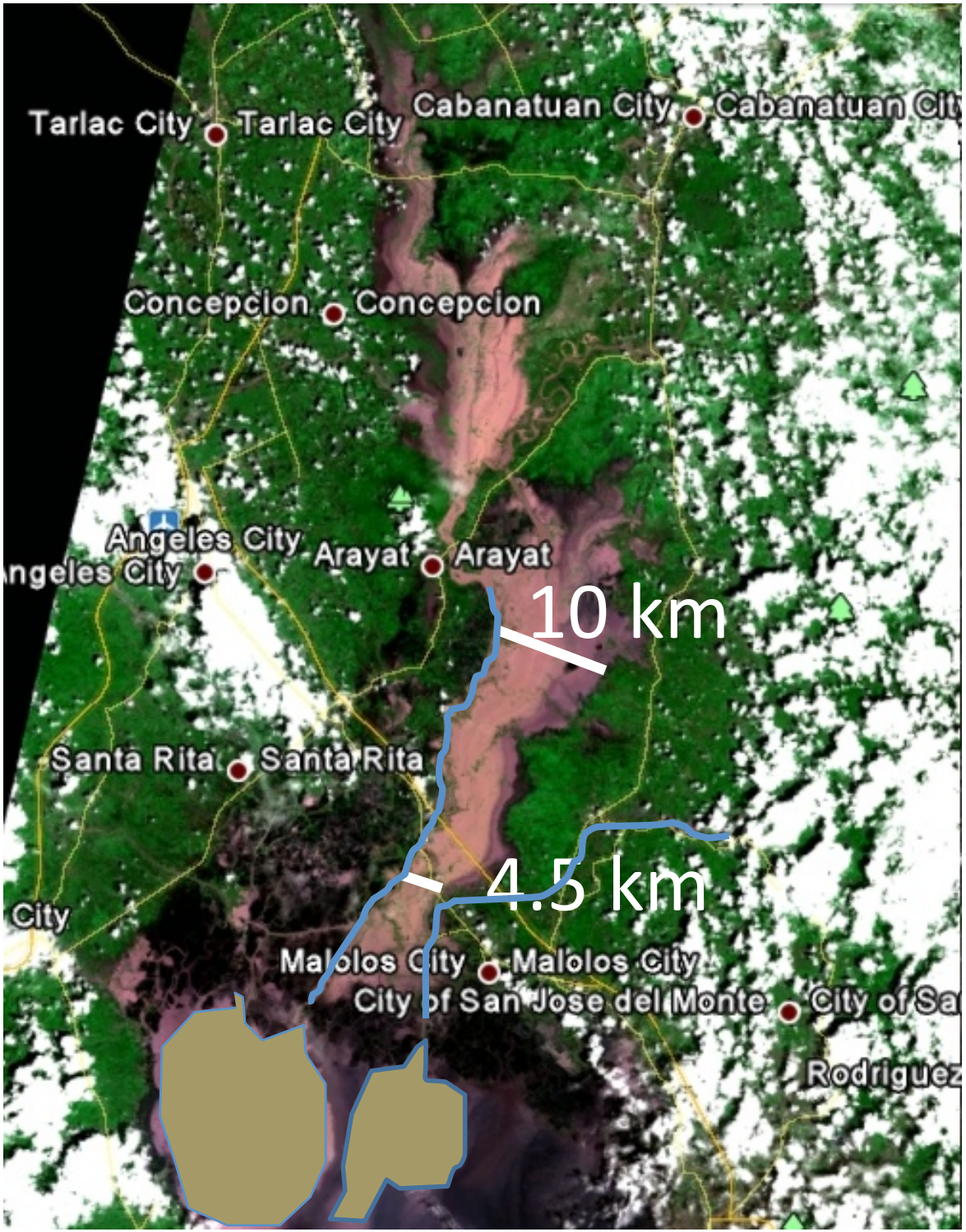
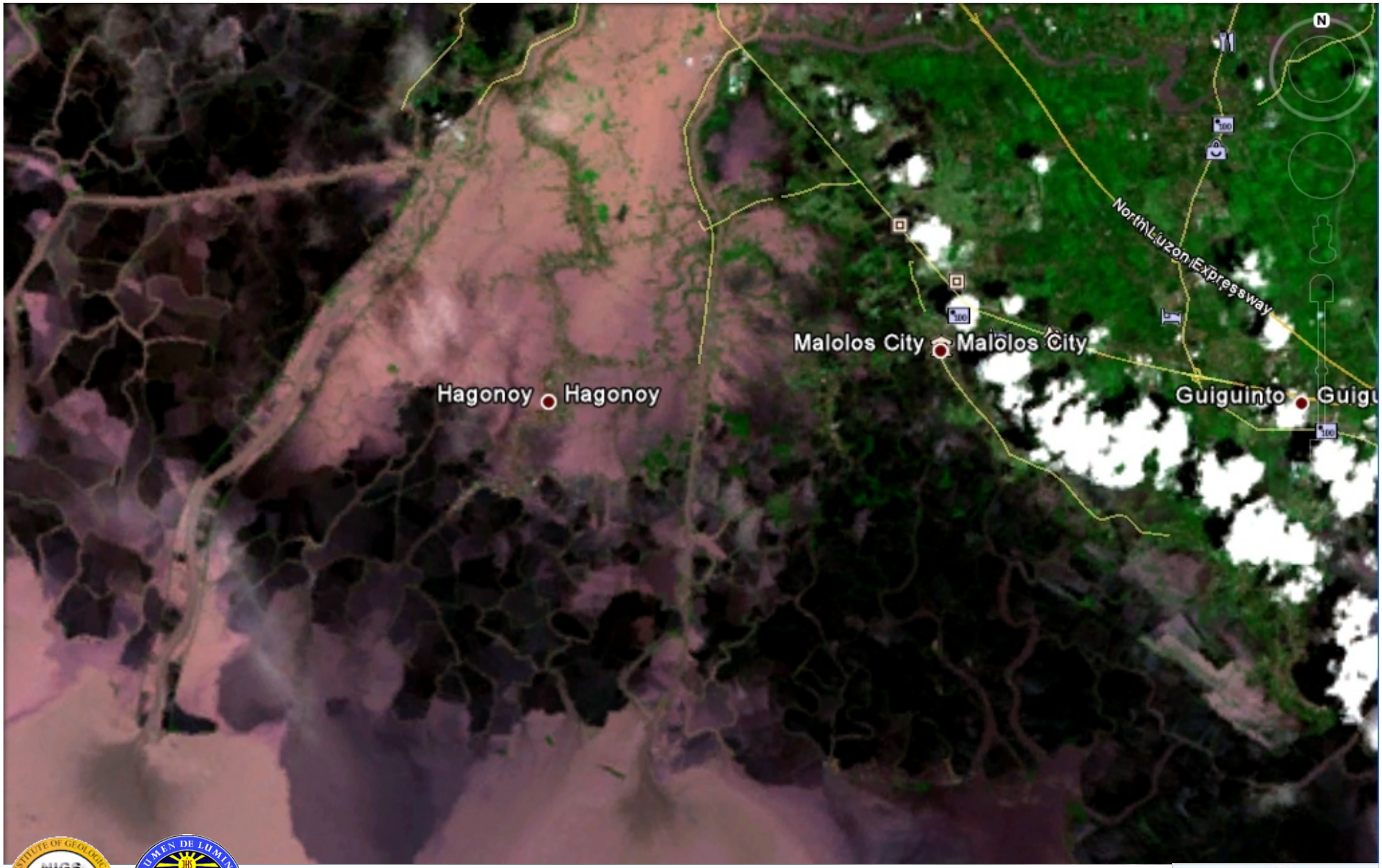
Investing in knowledge

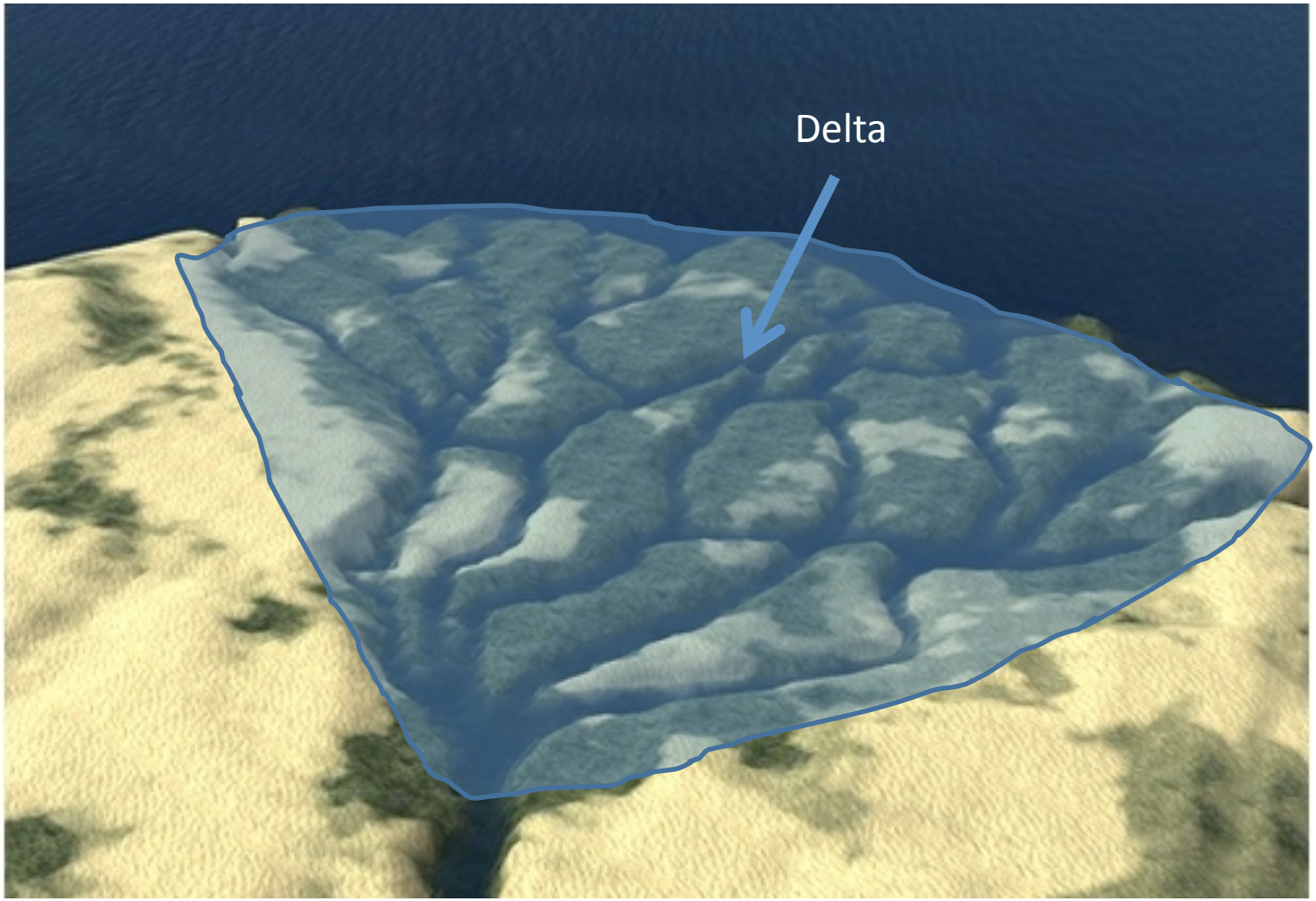
- Science-based disaster preparedness
- Space-based radar, automated rain/river gauge systems and LIDAR are all readily available.
- Geographic Information Systems
- Information Technology
- Any serious hazard mitigation program would have to capitalize on these technologies.



Vicente et al, 2011



Vicente et al, 2011

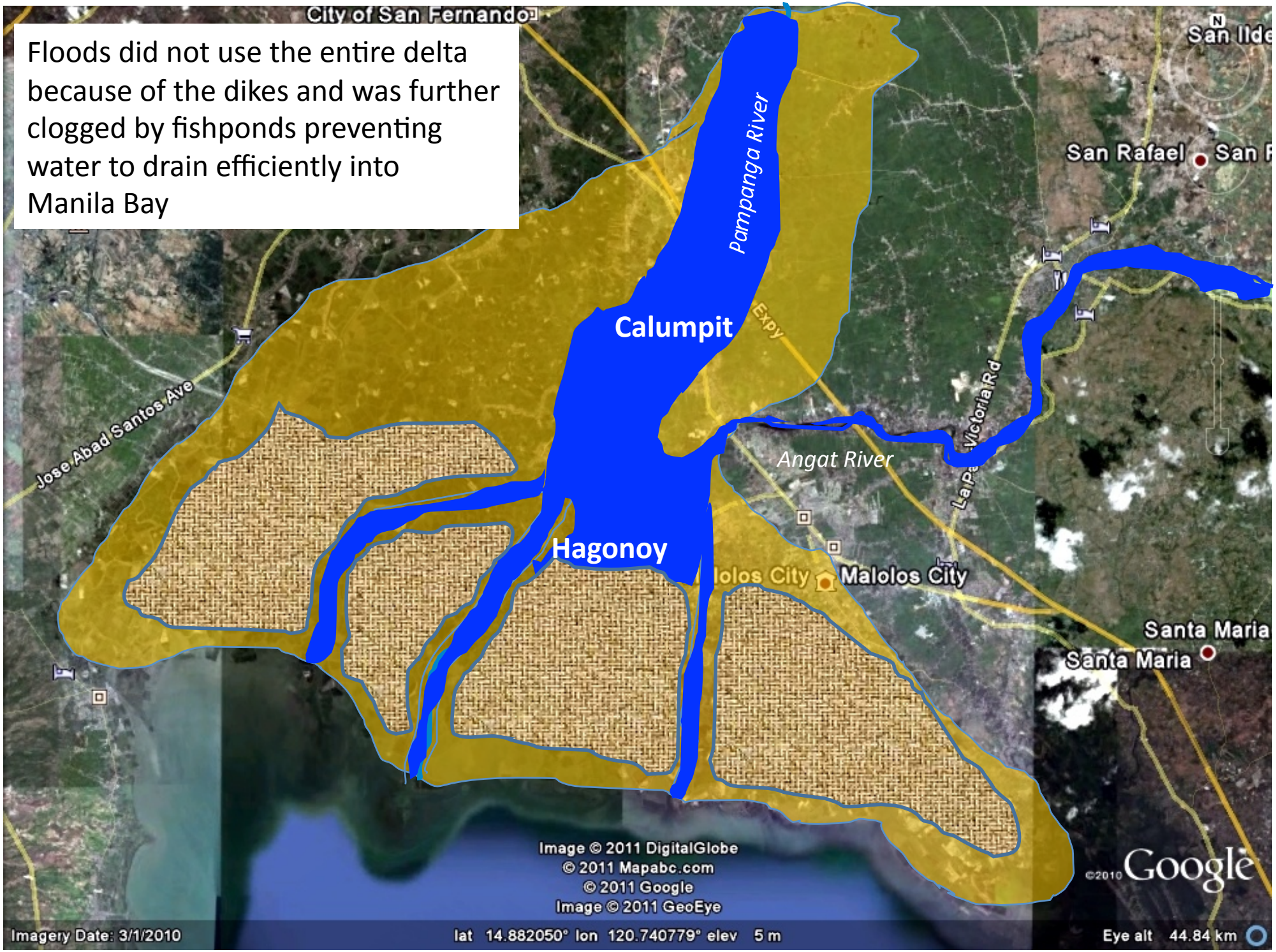


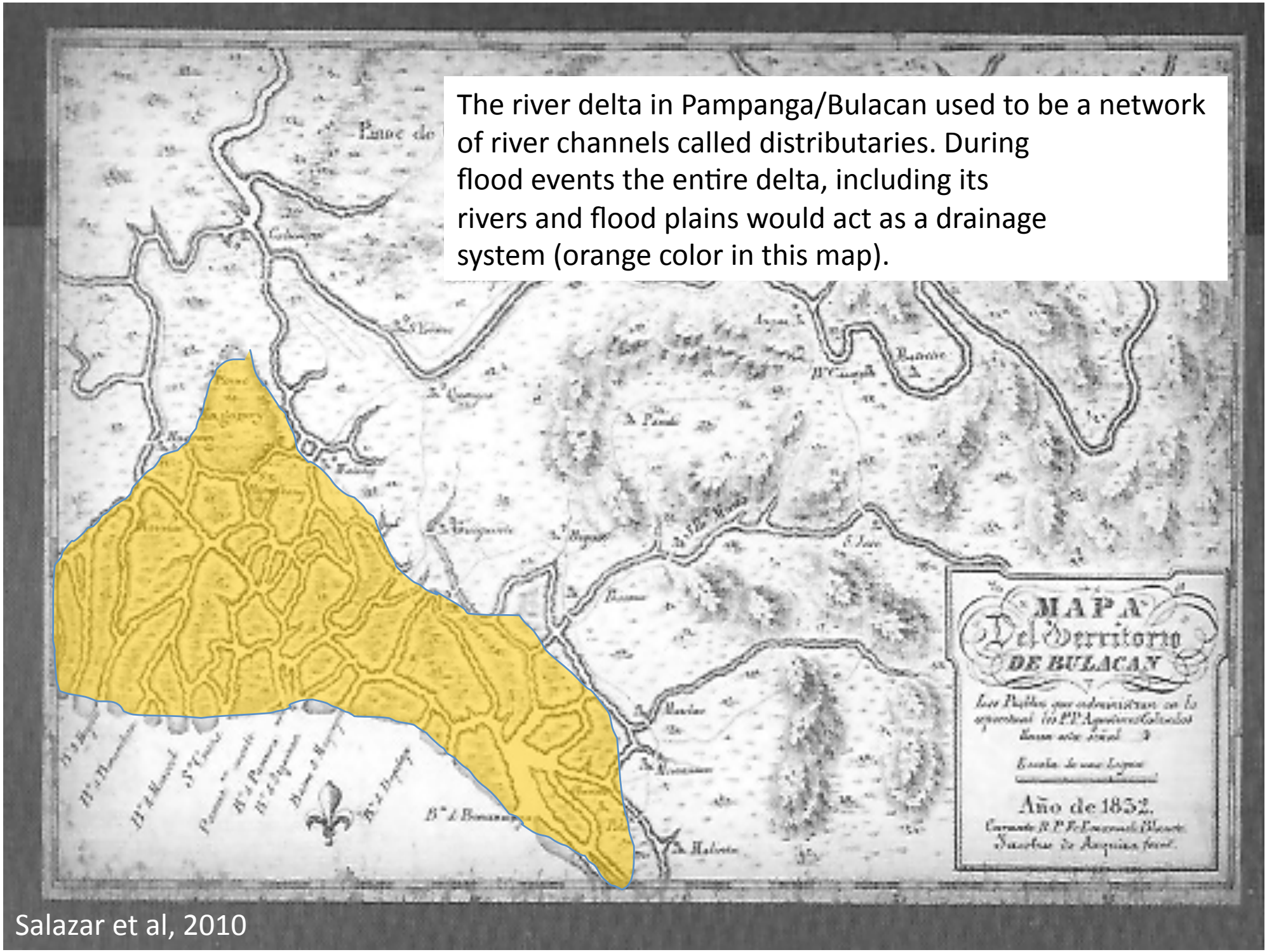
A **delta** is a landform that is formed at the mouth of a river where that river flows into an ocean, sea, estuary, lake, reservoir, flat arid area, or another river. Deltas are formed from the deposition of the sediment carried by the river as the flow leaves the mouth of the river. Over long periods of time, this deposition builds the characteristic geographic pattern of a **river delta**.

http://www.flickr.com/photos/avatrian/2279411722/lightbox/


Google earth


Lagmay 2010

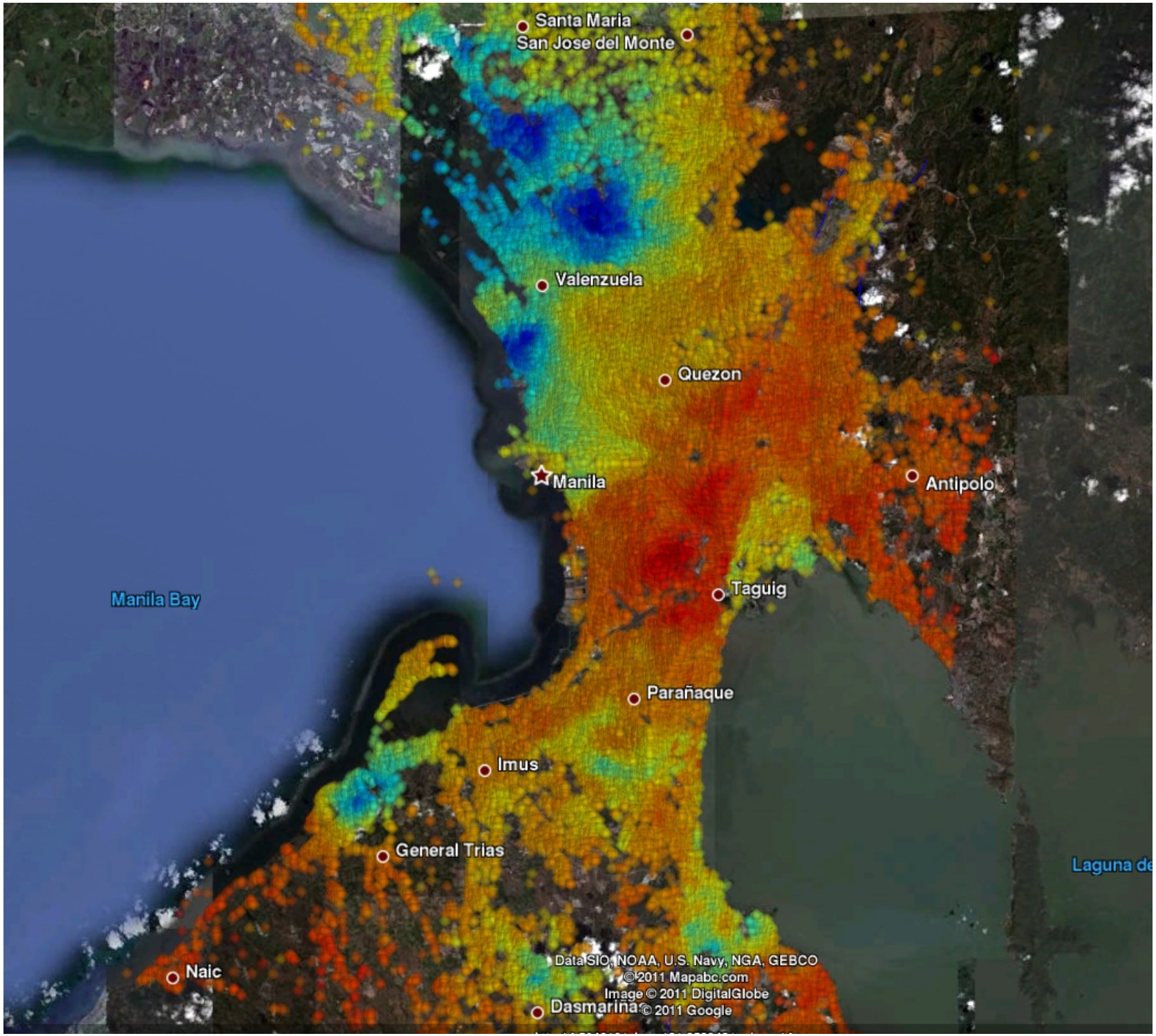

Floods did not use the entire delta because of the dikes and was further clogged by fishponds preventing water to drain efficiently into Manila Bay
City of San Fernando
Pampanga River
Calumpit
Hagonoy
Angat River
Jose Abad Santos Ave
Victoria Rd
Malolos City
San Rafael
Santa Maria
Image © 2011 DigitalGlobe
© 2011 Mapabc.com
© 2011 Google
Image © 2011 GeoEye
©2010 Google
Imagery Date: 3/1/2010
lat 14.882050° lon 120.740779° elev 5 m
Eye alt 44.84 km



Salazar et al, 2010

June 20, 2008 Typhoon Fenshen 644 dead US$ 135 million

Credit goes to the photographer – from AFP archive


Santa Maria
San Jose del Monte
Valenzuela
Quezon
Manila
Antipolo
Manila Bay
Taguig
Parañaque
Imus
General Trias
Naic
Dasmarinas
Laguna de
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2011 Mapabc.com
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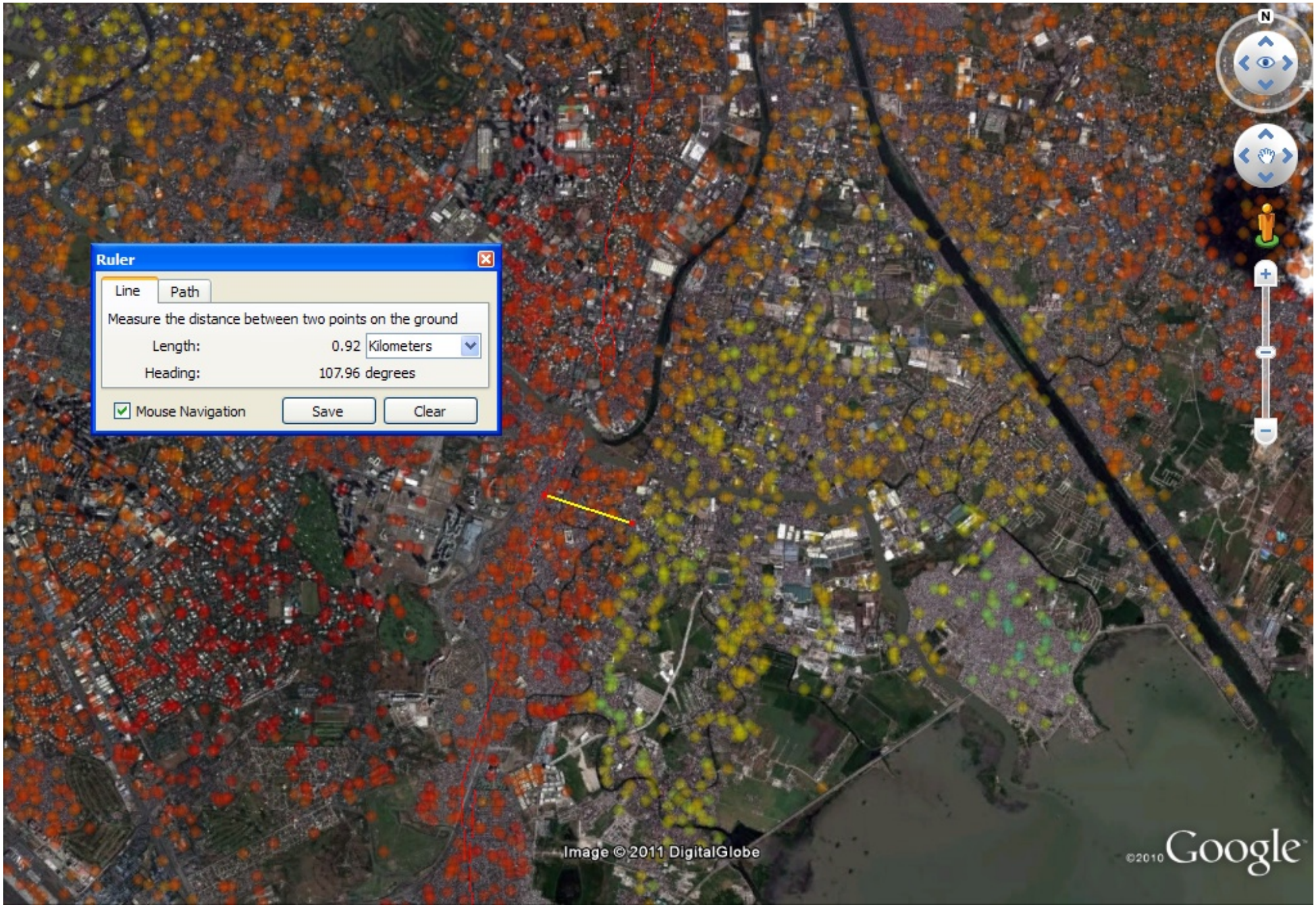
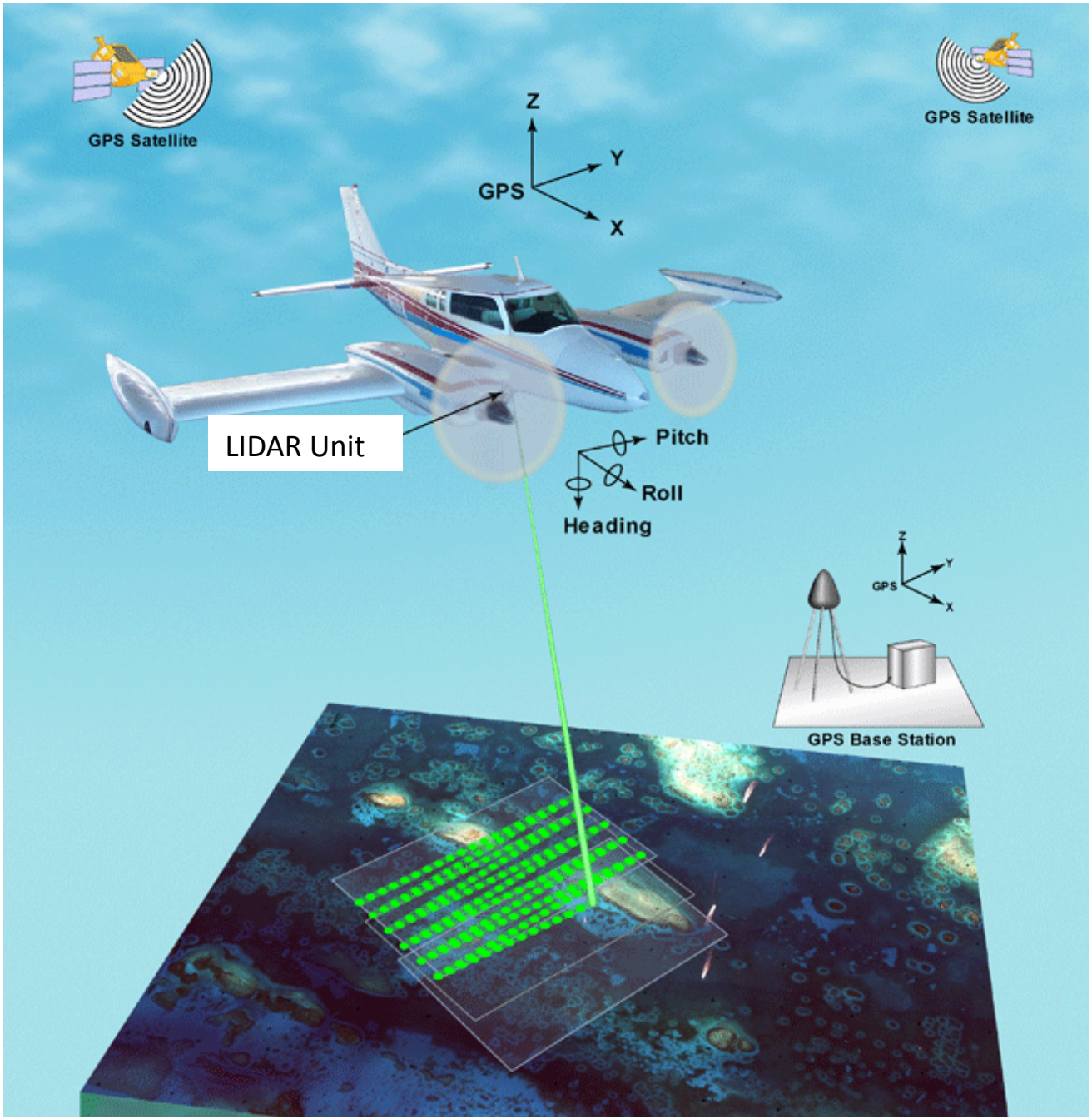

Ruler
Line
Path
Measure the distance between two points on the ground
Length:
0.92
Kilometers
Heading:
107.96 degrees
Mouse Navigation
Save
Clear
N
Image © 2011 DigitalGlobe
©2010 Google

Principals of airborne LIDAR survey:

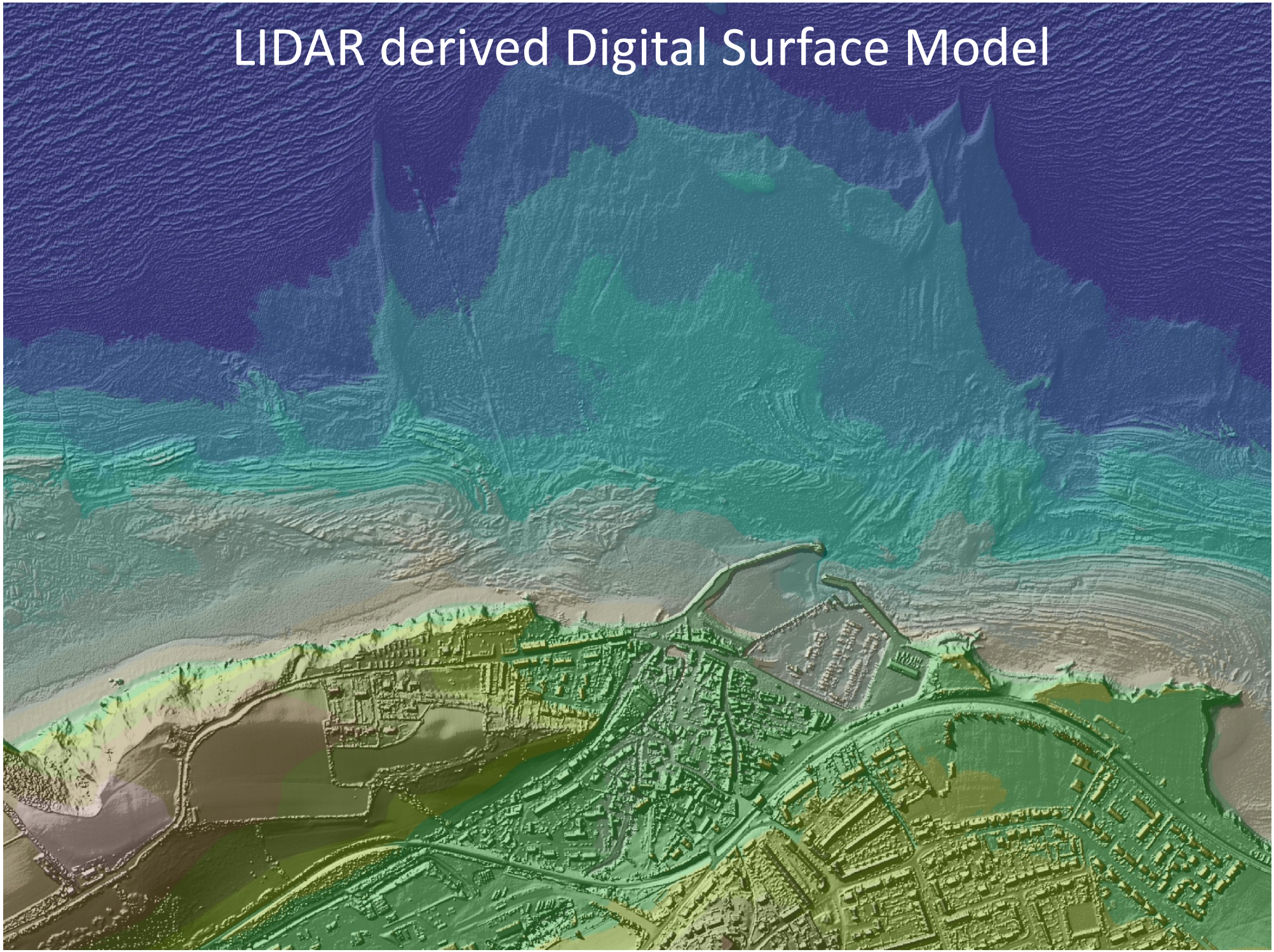
- GPS

- IMU

- Laser Rangefinder



LIDAR derived Digital Surface Model

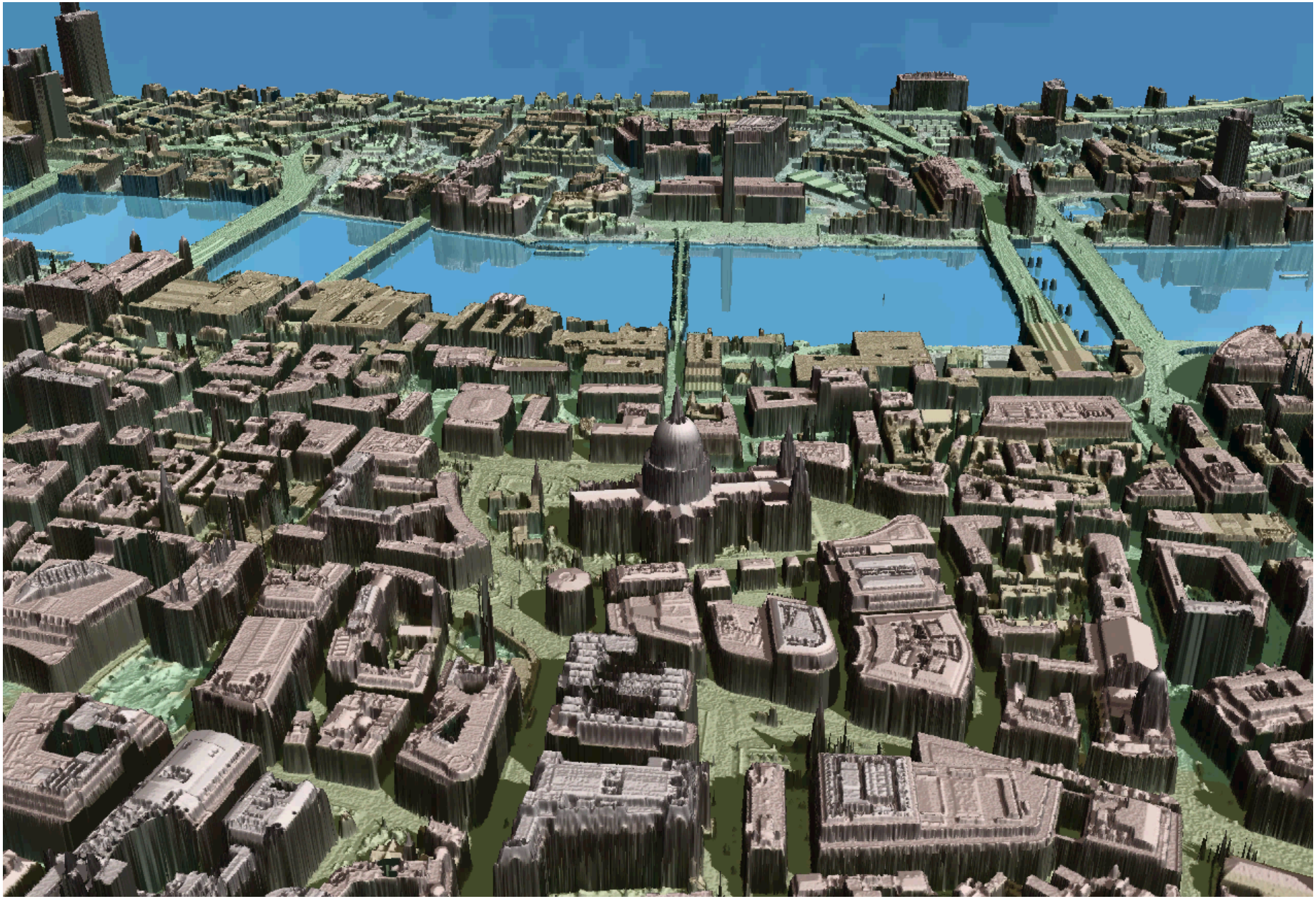


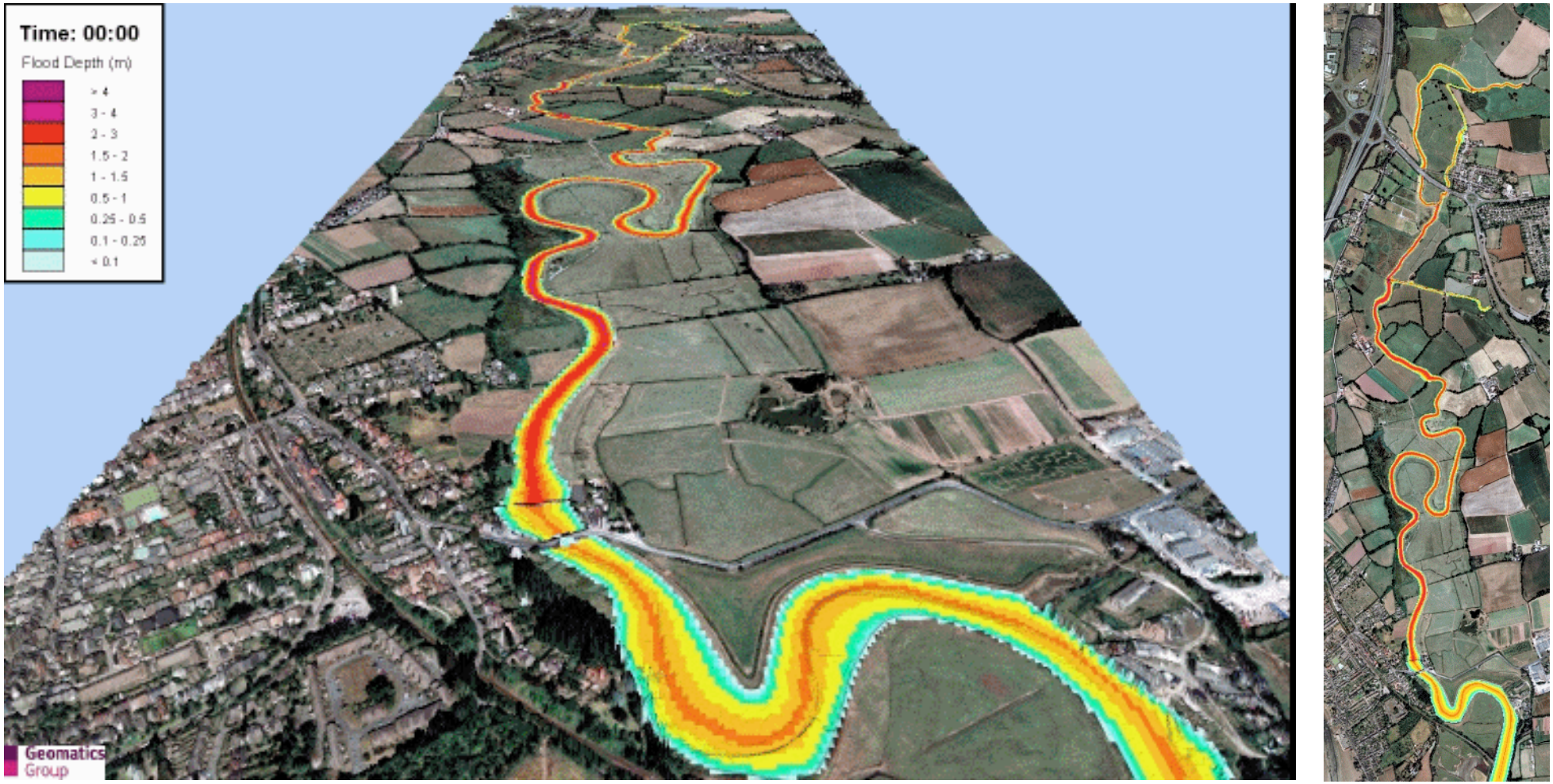

2m Resolution
LIDAR DSM


1m Resolution
LIDAR DSM


50cm Resolution
LIDAR DSM

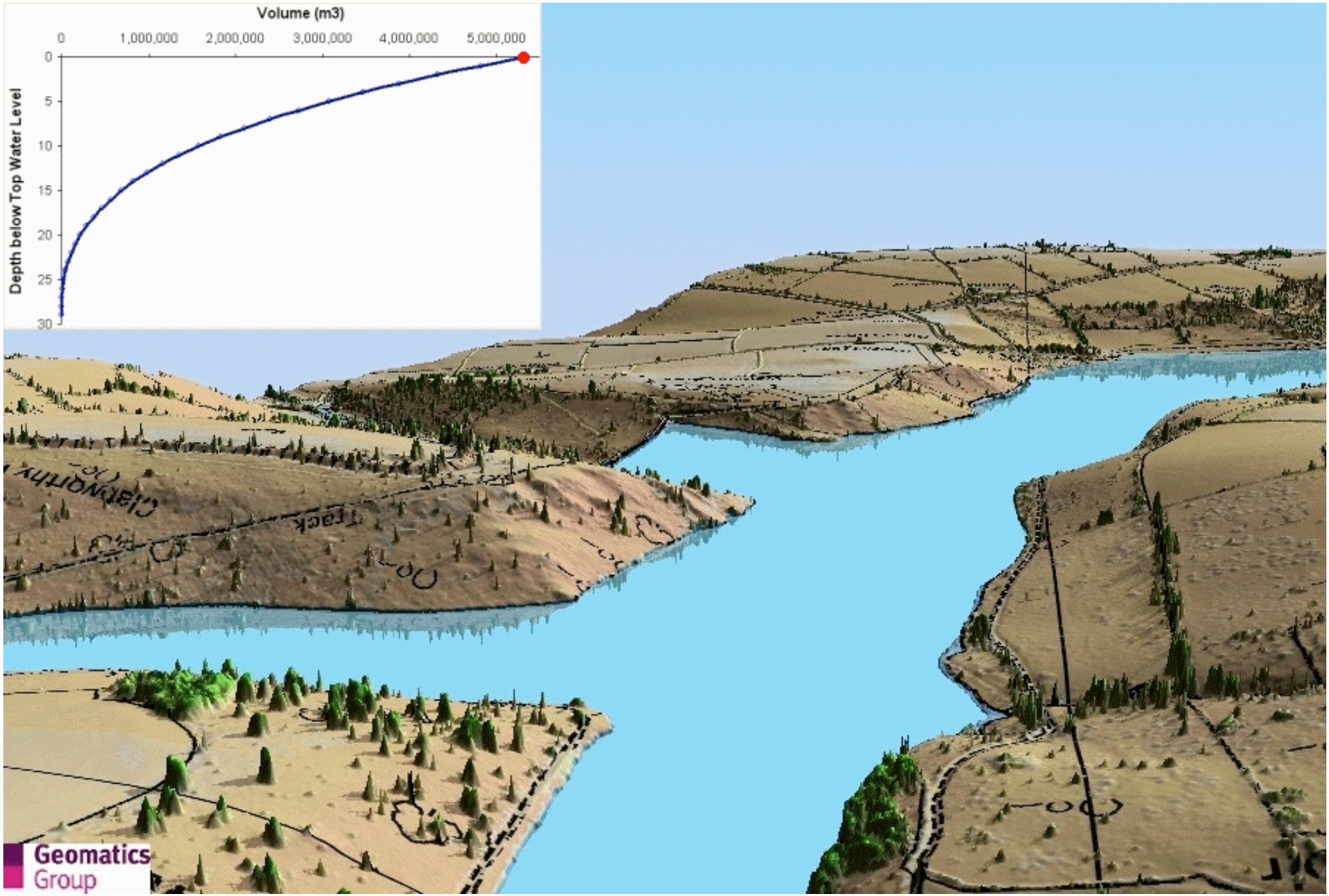

25cm Resolution
LIDAR DSM





Geomatics Group

Integrated spatial data


Volume (m3)
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
Depth below Top Water Level
0
5
10
15
20
25
30
Geomatics
Group

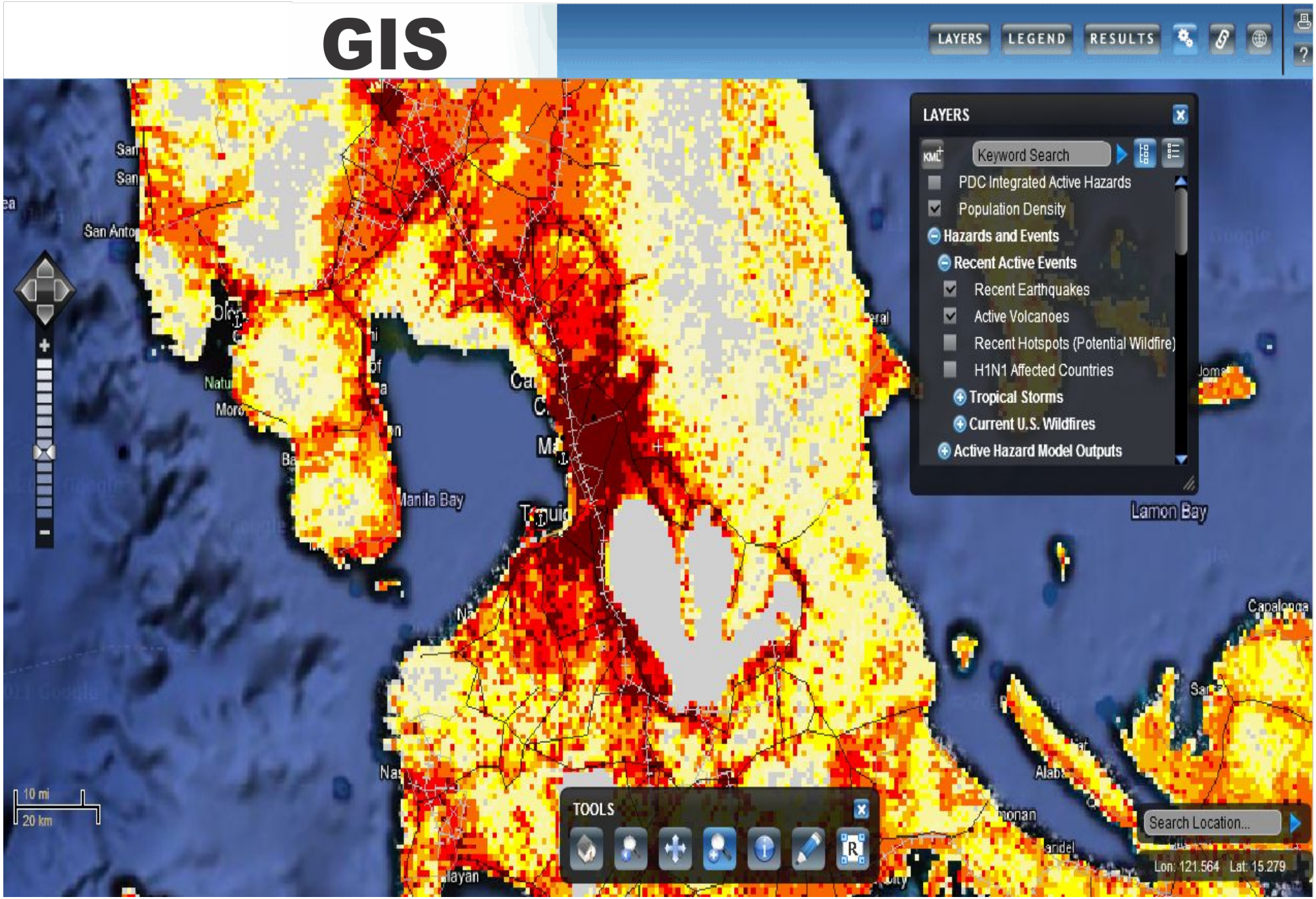
There are two general conceptual frameworks for DRR

1. Conventional hazard-based statistical framework
2. Development oriented vulnerability-based framework.

Disaster risk reduction is a development issue.

Yulo, 2012 " not the movie"

GIS

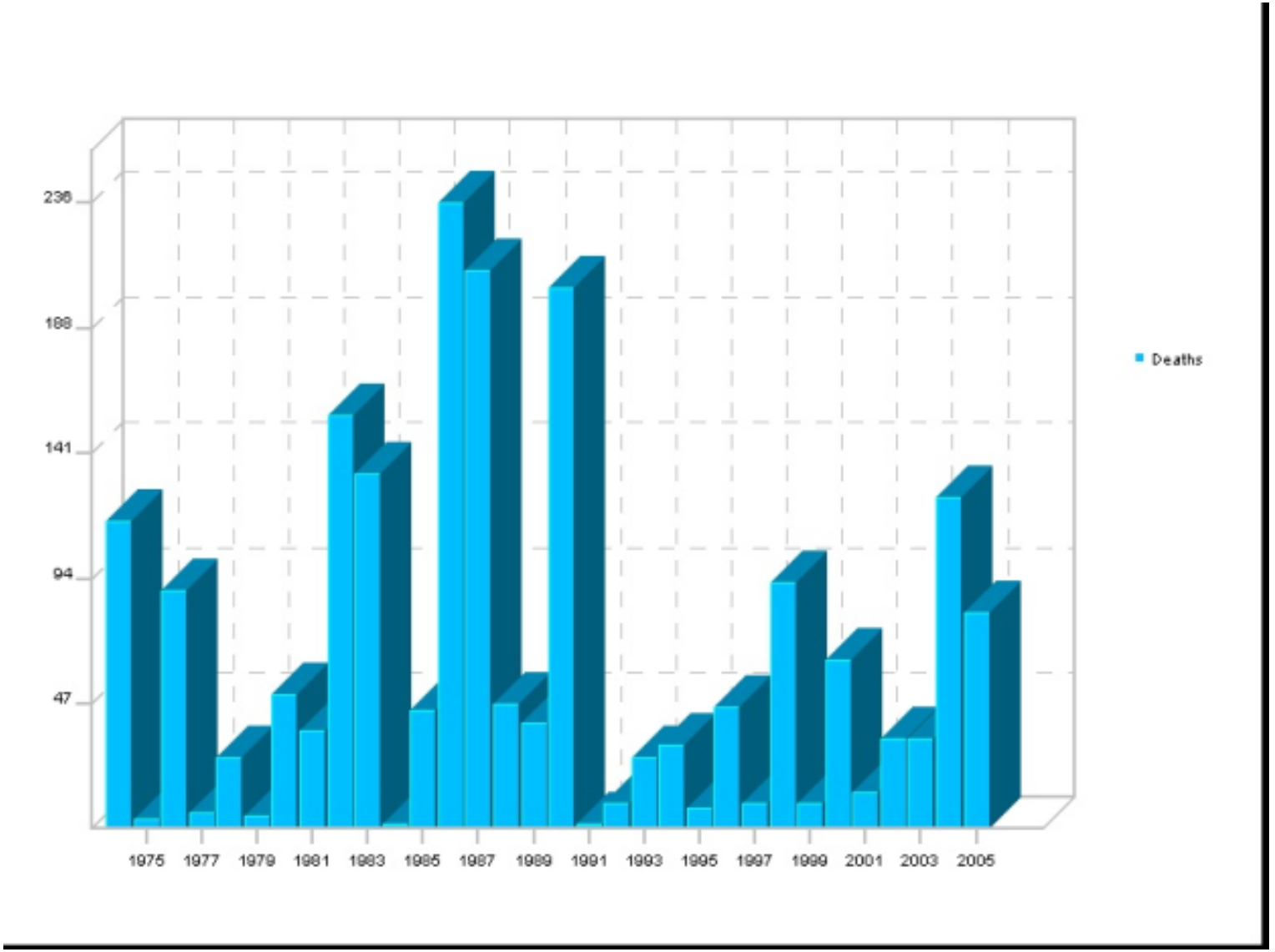

LAYERS
LEGEND
RESULTS
LAYERS
Keyword Search
PDC Integrated Active Hazards
Population Density
Hazards and Events
Recent Active Events
Recent Earthquakes
Active Volcanoes
Recent Hotspots (Potential Wildfire)
H1N1 Affected Countries
Tropical Storms
Current U.S. Wildfires
Active Hazard Model Outputs
Lamon Bay
Manila Bay
TOOLS
Search Location...
Lon: 121.564 Lat: 15.279
10 mi
20 km

Disaster inventory

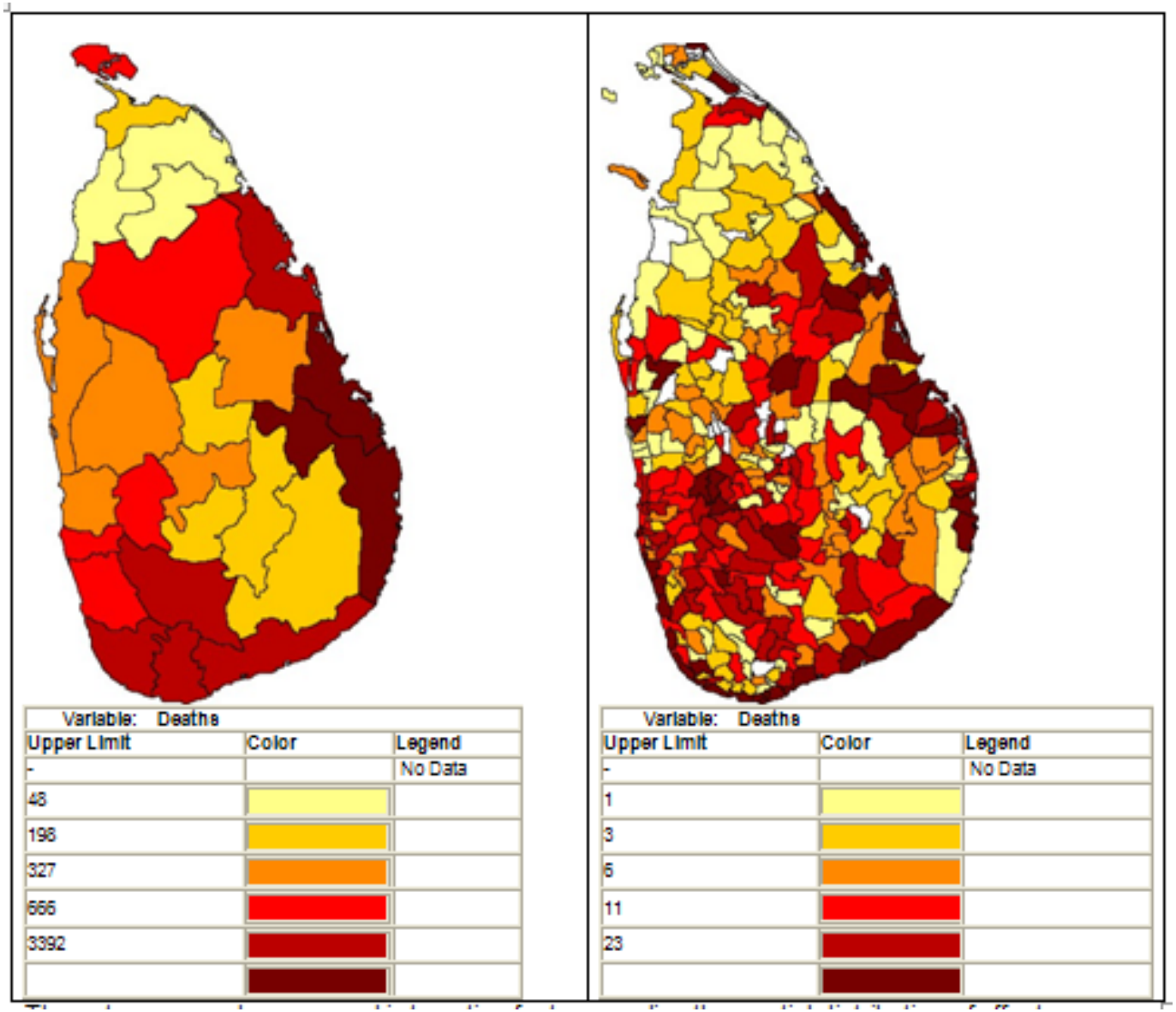
Purpose

- Analysis and mapping of risk (Hazard **x** Vulnerability **x** Exposure) hotspots
- Improve understanding of where, how often and how severe geological and meteorological disasters have occurred in the past and those likely to occur in the future.
- Guide for disaster risk reduction activities and investments.

Trends & Patterns on most lethal disaster types



Distribution of Human life losses



Variable: Deaths		
Upper Limit	Color	Legend
-		No Data
48		
196		
327		
666		
3392		

Variable: Deaths		
Upper Limit	Color	Legend
-		No Data
1		
3		
6		
11		
23		