Typhoon Ondoy : Experiences & Way Forward

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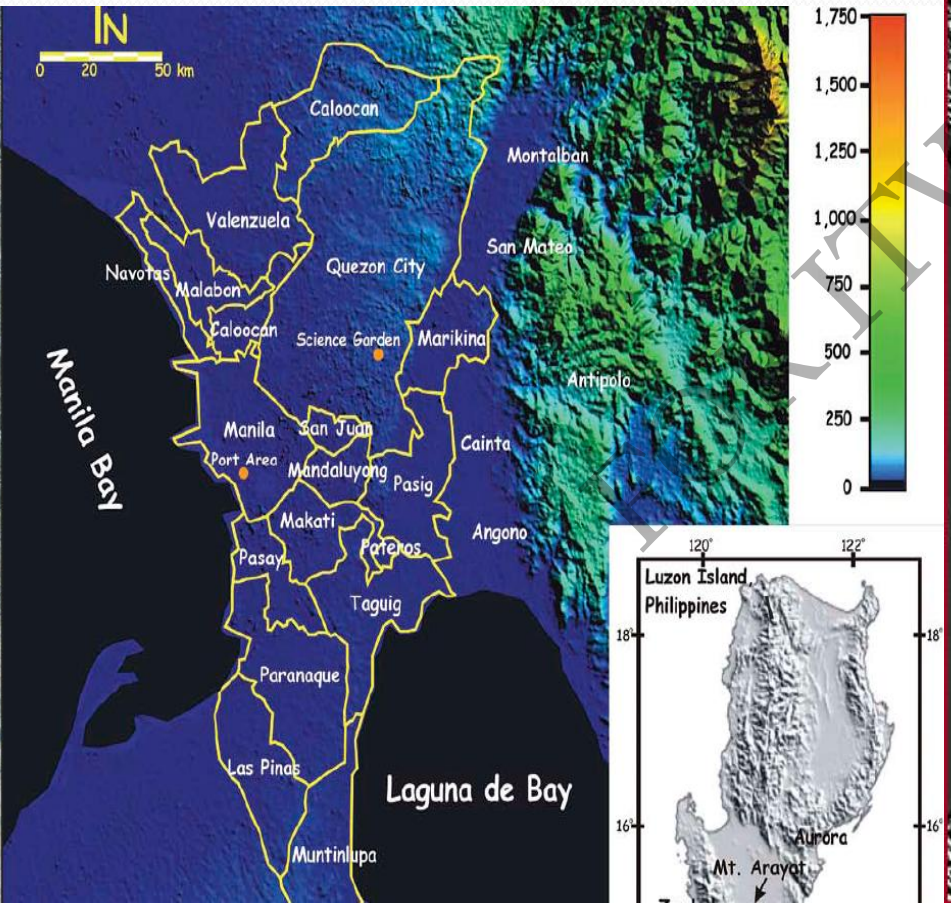
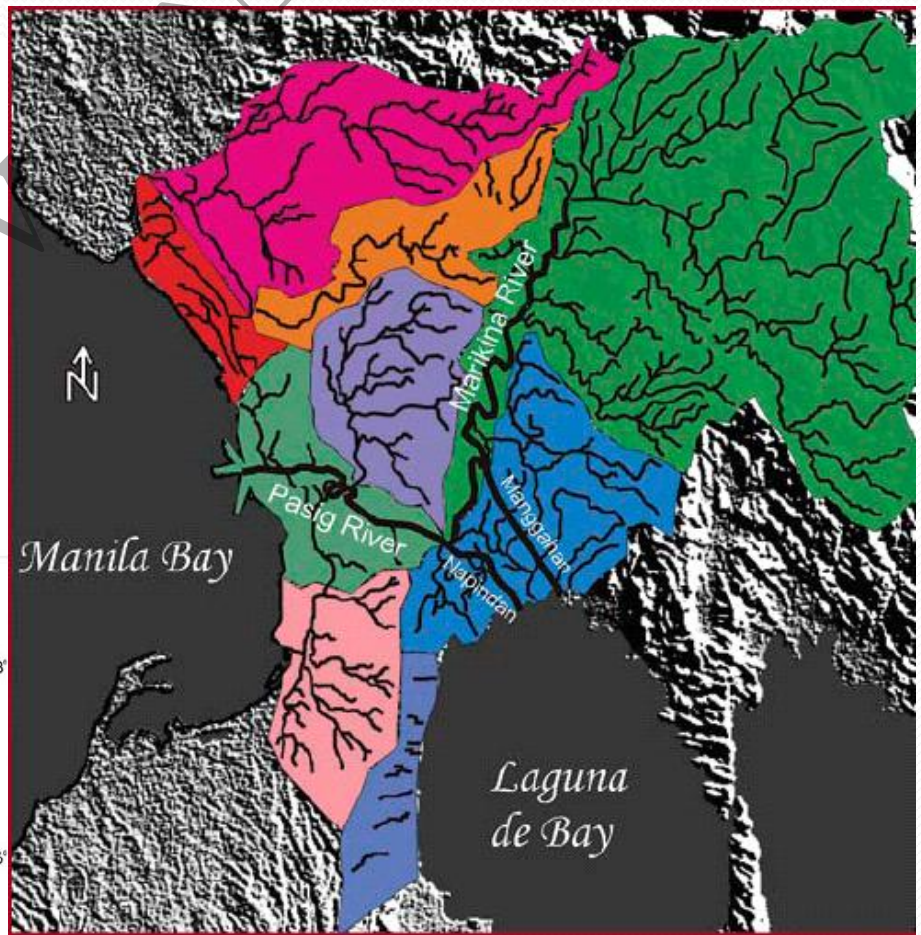
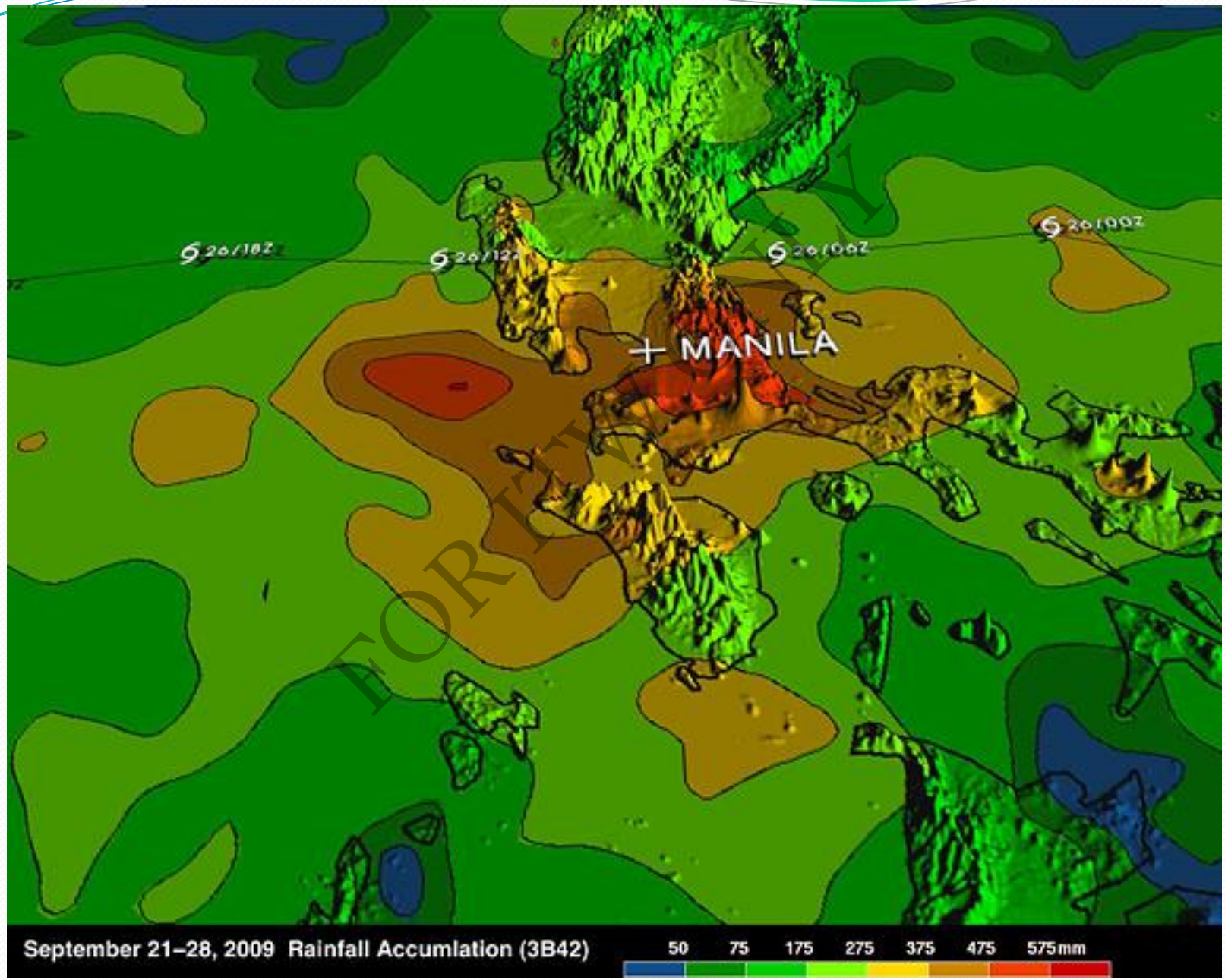
Geographic factors

- Metro Manila in between Manila Bay and Laguna de Bay (LDB)
  - Manggahan Floodway: divert floodwaters into LDB
  - Napindan Hydraulic Control System to regulate tidal flow and intrusion of polluted waters into LDB





The Storm



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Flooding

464 fatalities; 37 missing; 529 injured
4.73 million people affected; 26, 959 damaged houses

RITW

Devastation at USD 226.14 million = 79.72 million Php (infrastructure)
+ 146.42 million (agriculture)

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Discussion: Compounding Factors

- Extreme flood due to heavy downpour
- Informal settlers in crowded shantytowns with liitle or no infrastructure
- Landscape alteration
  - Concrete surfaces encroachment
  - Densification of buildings/residential areas
  - Silting of riverbeds/canals
  - Obstruction of waterways: informal settlers
  - Clogging of floodways by garbage
  - Narrowing of rivers: development of floodplains, draining-filling of small rivers
  - Forest degradation
  - Reclamation of coastal land
- Ground subsidence (1978-2000, ~0.16 to 1.46 m at rates of ~4 cm/yr by Rodolfo)
  - Excessive groundwater extraction
  - Soil compaction
  - Tectonic movement

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The Recipe for a perfect storm

- Metro Manila is composed of a series of floodplains with multiple large rivers running through them
- It is subsiding, faster in some parts than others
- Overpopulation: impoverished residents in shantytowns that could not withstand heavy rains and floods
- 44 cm of rain in a 12-hr period

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Citizen-based flood hazard map (Ondoy)

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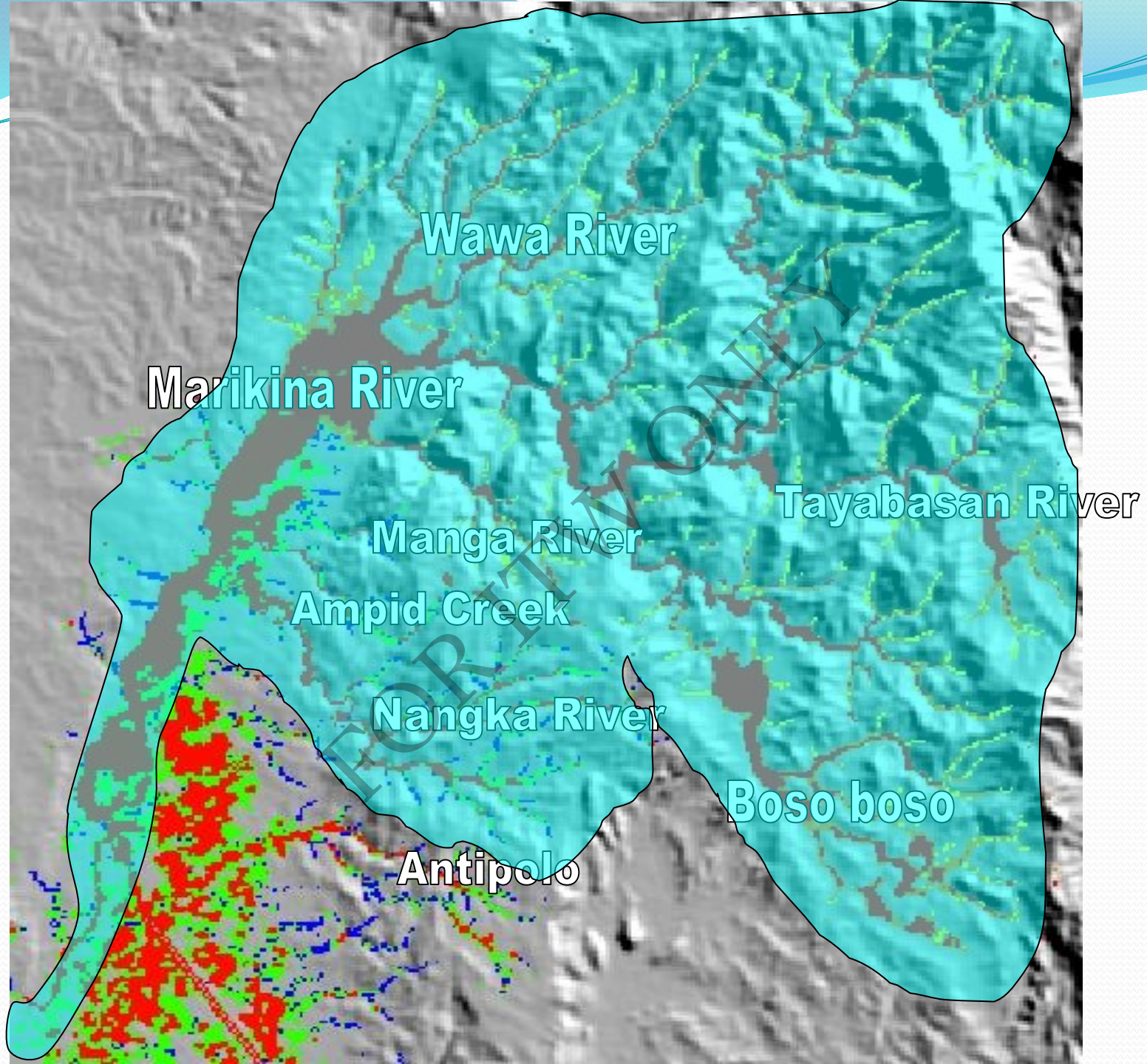
A.M.F. Lagmay, R. Rodolfo, G. Bato

Can also be viewed in Google Earth


Wawa River
Marikina River
Tayabasan River
Manga River
Ampid Creek
Nangka River
Boso boso
Antipolo

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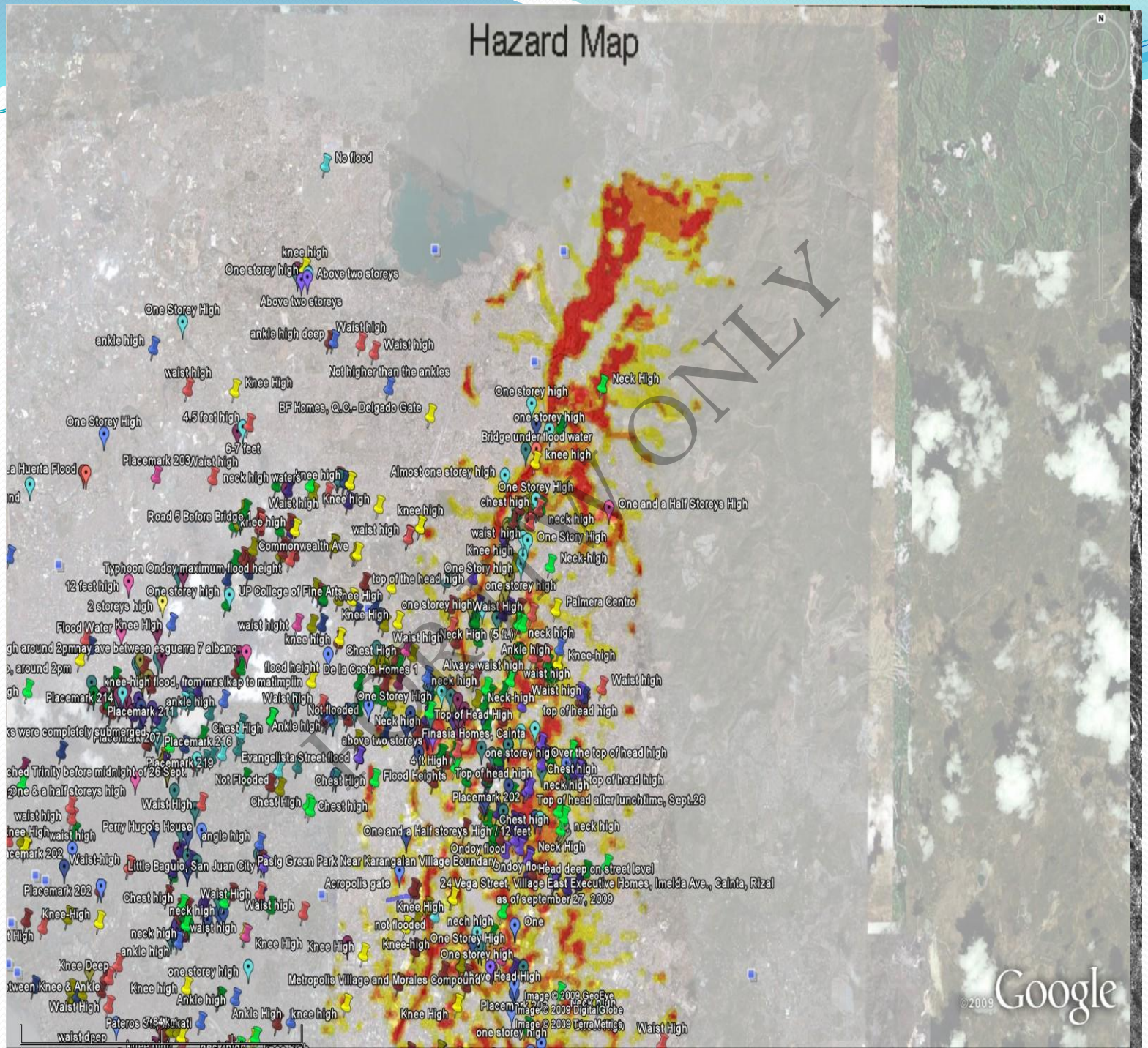
ALOS/PALSAR

14:35, Sept. 26, 2009

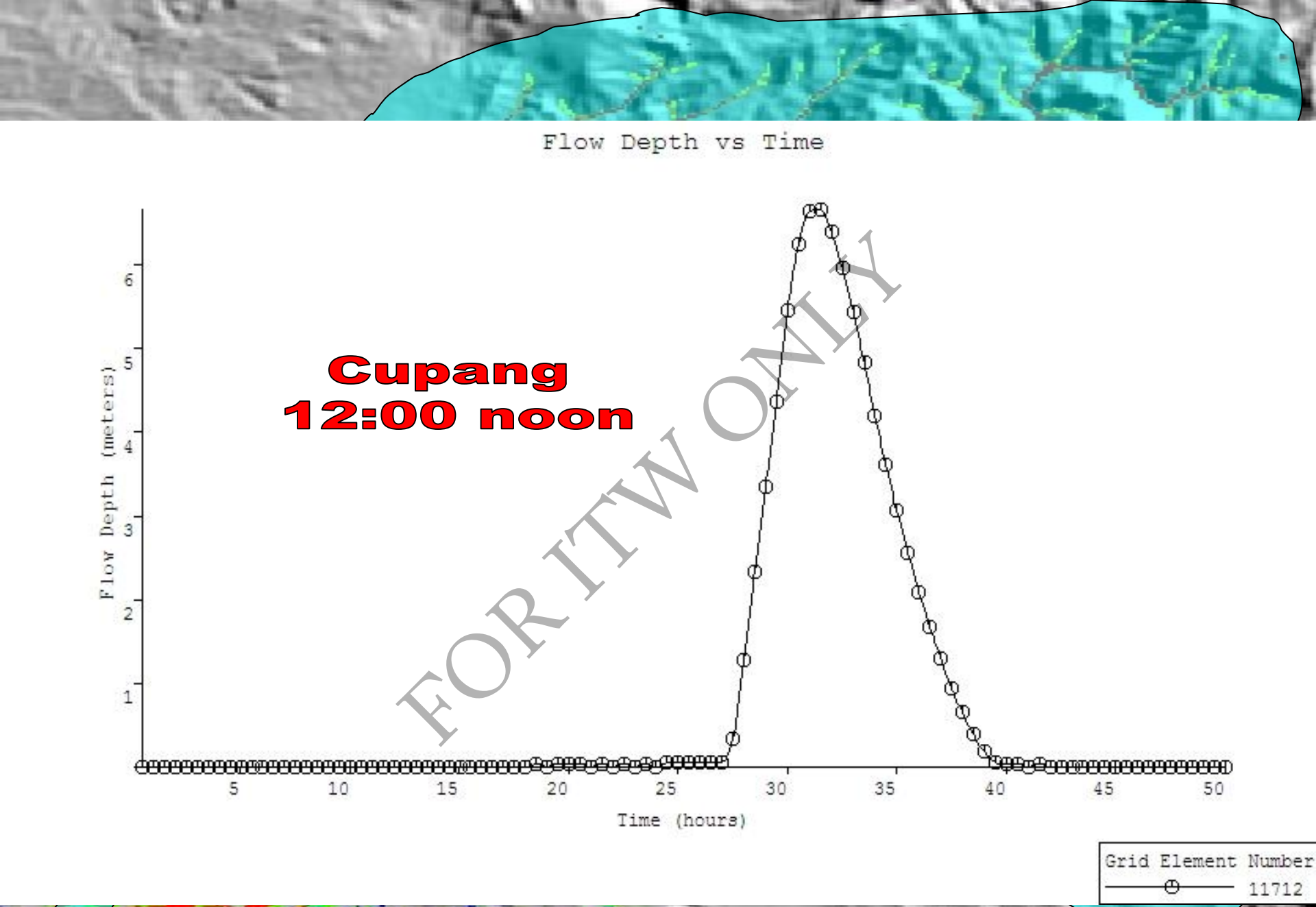
METI/JAXA

Resource provider

Hazard Map



FOR VIEW ONLY


Flow Depth vs Time
Cupang
12:00 noon
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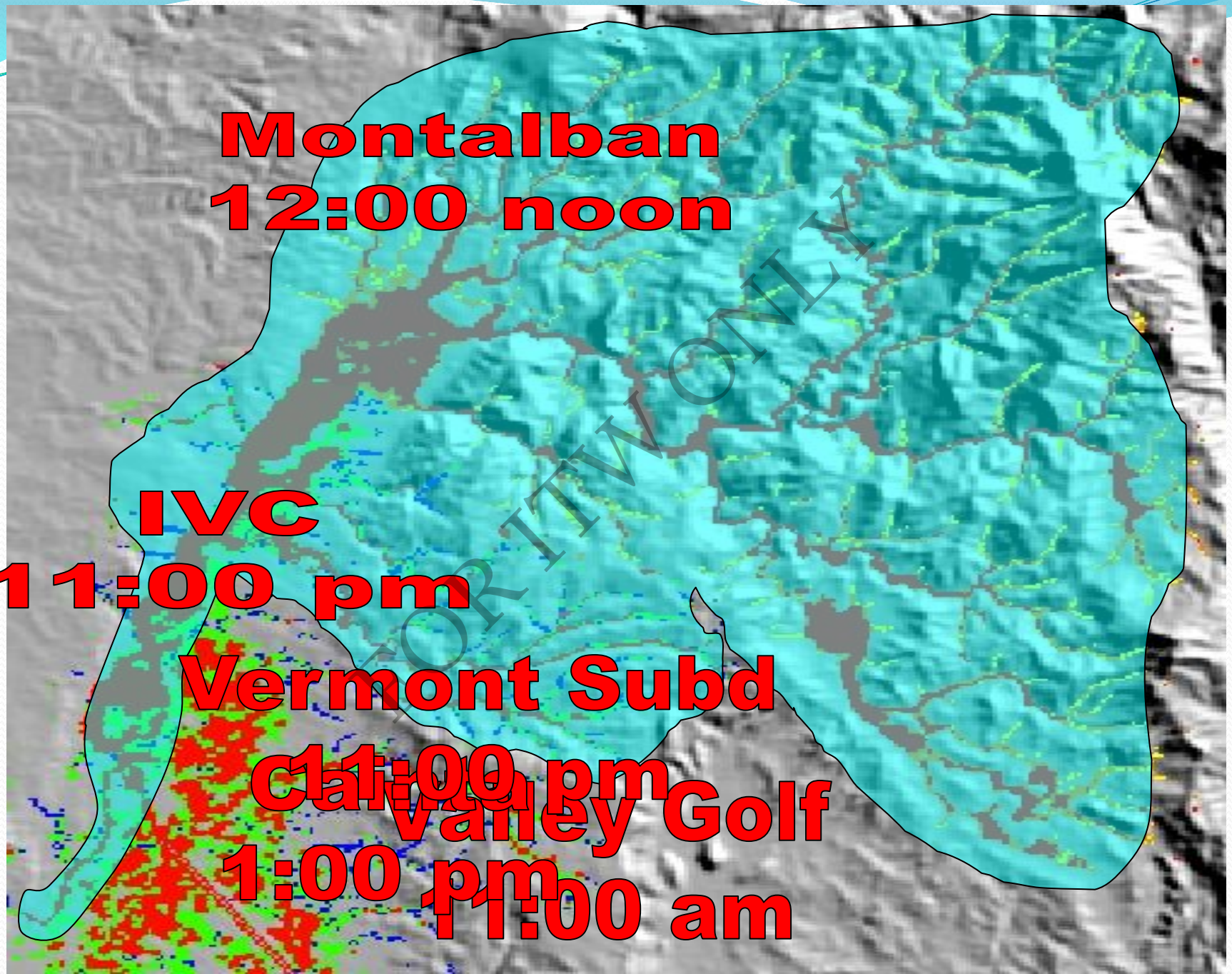
Flow Depth (meters)
1
2
3
4
5
6
5
10
15
20
25
30
35
40
45
50
Time (hours)
Grid Element Number
11712


Montalban
12:00 noon
IVC
11:00 pm
Vermont Subd
11:00 pm
Valley Golf
11:00 am
1:00 pm
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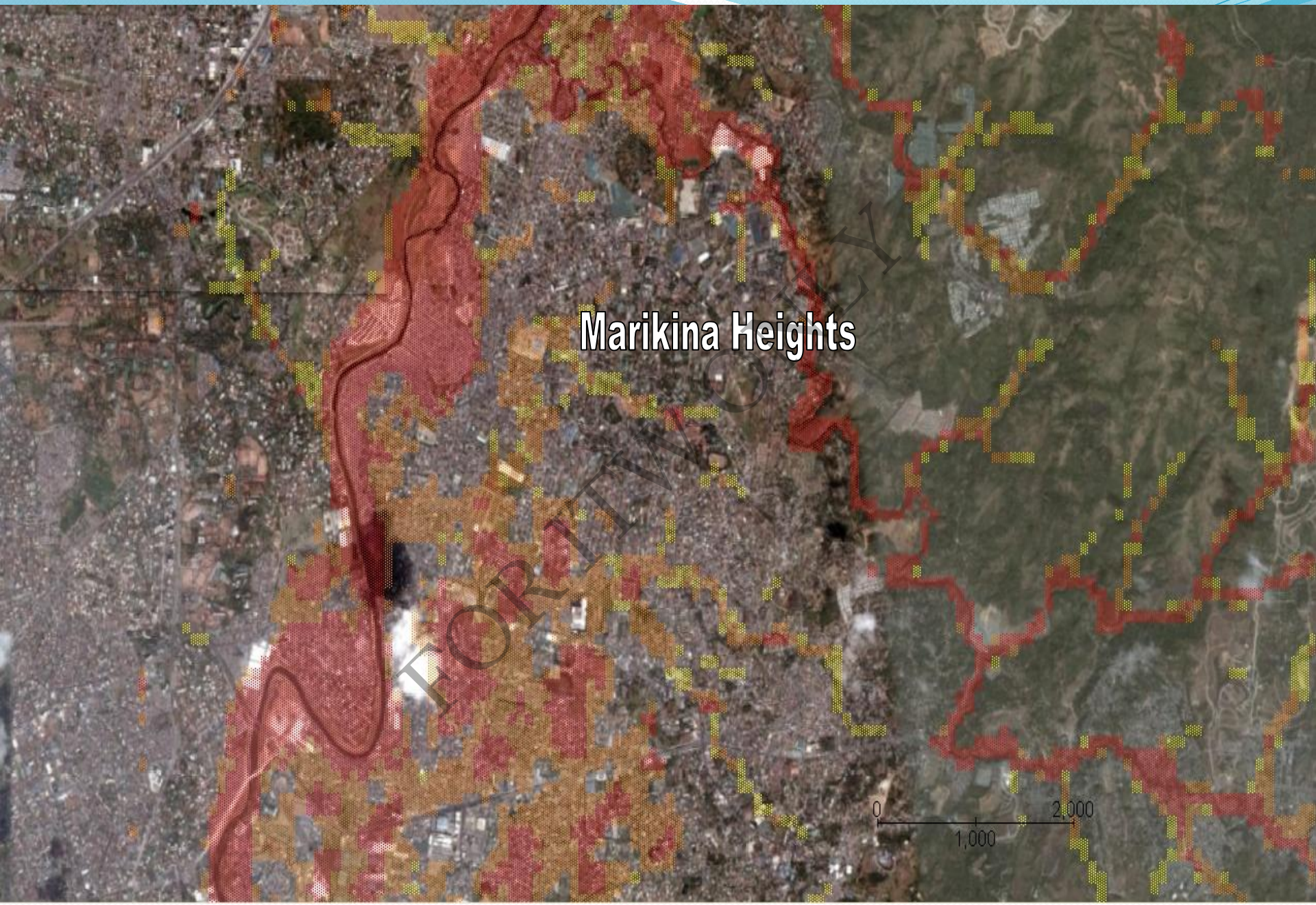

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Valley Golf
0
500
1,000
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Discussion

- Discharge rates – 3400 - 4000 cms
- Timing variable along the Marikina River
- Peak flood as early as 11:00 am and as late as 11:00 pm of Sept. 26
- Not all of Marikina was flooded (mainly along rivers, floodplains
- Antipolo River Basin (?) contributed to the flooding of Cainta and Pasig

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Discussion

- 2D Flood hazard maps validated by anecdotal accounts and satellite imageries taken during or (at least) right after the event are valuable
- Can be used for disaster planning (i.e. planning evacuation routes, siting of key emergency facilities)

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Check out:

www.nababaha.com

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