Second High Level Forum on Global Geospatial Information Management

Global Map for Sustainable Development (GM4SD)

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Outline

1. Background of GM4SD
2. Second UN-GGIM in NY
3. GM4SD Working Group
4. Preliminary Result on WG Assignments
5. What's next?

1. Background of GM4SD

- Key issue for UN-GGIM
  - Establishment of an operating platform to support the delivery of authoritative and consistent global reference datasets for disaster risk reduction, humanitarian aid, sustainable development, etc.

The 1st HLF on UN-GGIM in Seoul

1. Background of GM4SD

- Rio+20 “The Future We Want”
  - “We further recognize the importance of comprehensive hazard and risk assessments, and knowledge and **information sharing**, including **reliable geospatial information**.” (para. 187 on Disaster risk reduction)

Rio+20 Side Event
“Monitoring Sustainable Development: Why Location Matters”
Organized by UN-GGIM, UK,
Australia and Brazil

Rio+20 Side Event
“Global Map for Sustainable Development”
Organized by Japan

1. Background of GM4SD

- Questions:
  - Do we share a common understanding/view on the concept of such a platform?
  - Already existing?/Reinventing the wheel?
  - What would be the architecture of the platform?
  - How would the infrastructure/arrangements to support the platform be efficiently established, and made operational and sustainable?

2. Second UN-GGIM in NY

- What is GM4SD?
  - An operationally ready, standard global geospatial information* platform of authoritative and consistent geospatial data and information that is to be built and managed by the Member States and operated under the supervision of UN-GGIM.

(*: Including maritime data)

2. Second UN-GGIM in NY

- GM4SD can be built on the existing global map.
- GM4SD should be technical in nature and would not address issues of political concern.
- A working group should be established to lead the discussion and advancement of the GM4SD.

2nd UN-GGIM in NY August 2012

2. Second UN-GGIM in NY

- Working Group:
  - Member States should be the custodians of key datasets, and update them for sharing.
  - The platform should be developed in a cost-effective manner with distributed systems and open standards to ensure interoperability, while avoiding duplication.
  - A phased, modular approach should be taken to achieve the GM4SD vision step by step, identifying the users and their needs.

2. Second UN-GGIM in NY

- Assigned tasks to the Working Group

i. Provide the current status and overlaps in the availability of the geospatial information on the web, and the value that a global map for sustainable development could add;

ii. Provide a clear understanding of user requirements and appropriate case studies, as necessary;

iii. Determine the potential applications of a global map for sustainable development, based on existing global map experiences; and

iv. Review existing portals, such as those adopted by Spain and the United States of America, and assess their applicability as the basis for a global map for sustainable development.

3. GM4SD Working Group

- Established in December 2012
- Members (*: Chair) :
  - Africa: Burkina Faso, Nigeria, South Africa
  - America: Chile, USA
  - Asia/Pacific: China, Korea, Japan*
  - Europe: Belgium, Italy, UK
  - International Organizations: IHO, ISCGM, ISO/TC211, OGC
  - Private Sector: Centre for Spatial Law and Policy, ESRI

4. Preliminary Result on WG Assignments

(i) Current status and overlaps in the availability of geospatial information

- 20 different global geospatial data sources visited.
- Data contents:
  - Administrative data (boundary and geographic names
  - Topographic data (transportation, drainage, elevation, land cover, vegetation, etc.).
  - Scales of most data range from 1:250K to 1:1M.
  - DEM and land cover datasets are developed by different projects.
- Data policy:
  - Provided free of charge.
  - Some have restrictions for commercial use.

4. Preliminary Result on WG Assignments

(ii) User requirements and case studies

- More time is needed to have a clear understanding.
- Focus on a simple application may help.

(iii) Potential applications of GM4SD based on GM experience

- Global Map: regional natural disasters, flood analysis and forest distribution, etc.
- Potential applications of GM4SD:
  - Disaster response activities.
  - Forest/ biodiversity conservation.
  - Water resources management, etc.

4. Preliminary Result on WG Assignments

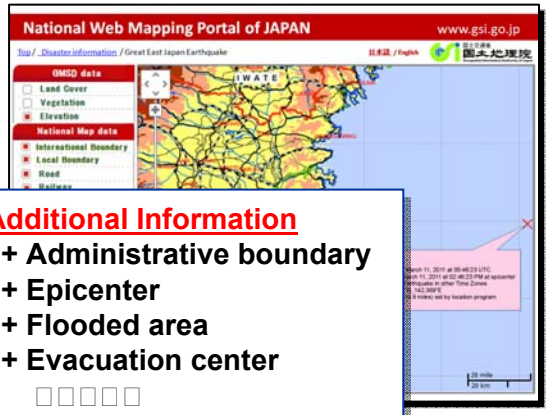
(iv) Review of existing portals and assessment of their applicability to GM4SD

- Ten existing portals visited.
- Many can overlay thematic layers.
  - Environment, disaster preparedness, etc.
- Web technology and open standards enable users to easily integrate geospatial information from distributed web services via the internet.
- GM4SD needs to find a way to ensure that such data integration through the platform will not address issues of political concern of the developed platform.

Draft conceptual architecture of a GM4SD

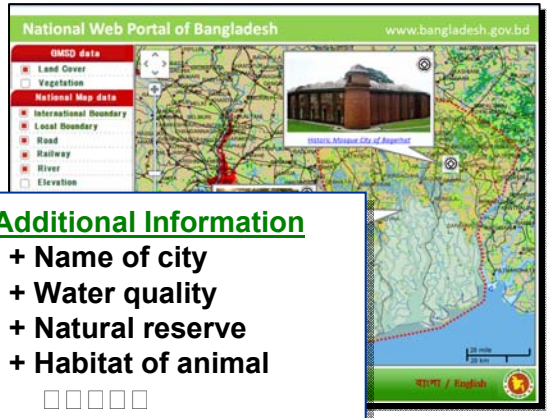
User **User** **User**

"A" Country Website for Natural Disaster



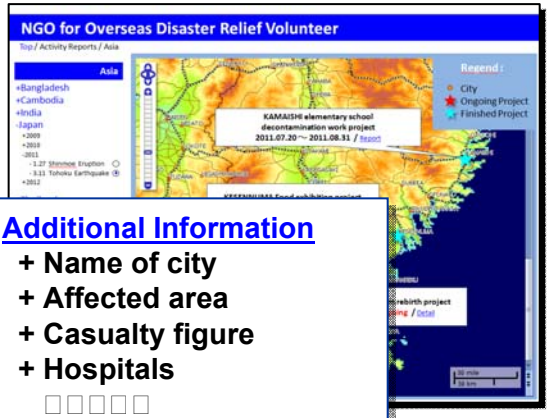
Additional Information
+ Administrative boundary
+ Epicenter
+ Flooded area
+ Evacuation center
□□□□□

"B" Country Website for Environment Issue



Additional Information
+ Name of city
+ Water quality
+ Natural reserve
+ Habitat of animal
□□□□□

"C" NGO Website for Disaster Relief Volunteer

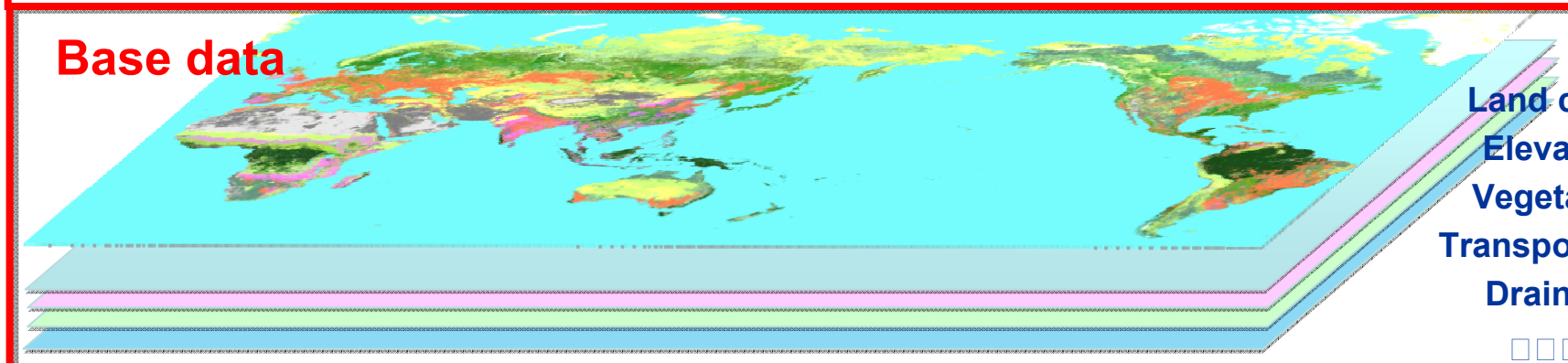


Additional Information
+ Name of city
+ Affected area
+ Casualty figure
+ Hospitals
□□□□□

GM4SD Web platform(Base data+API)

API (Application Program Interface)

Base data



Land cover
Elevation
Vegetation
Transportation
Drainage
□□□etc

Base data do not address issues of political concern

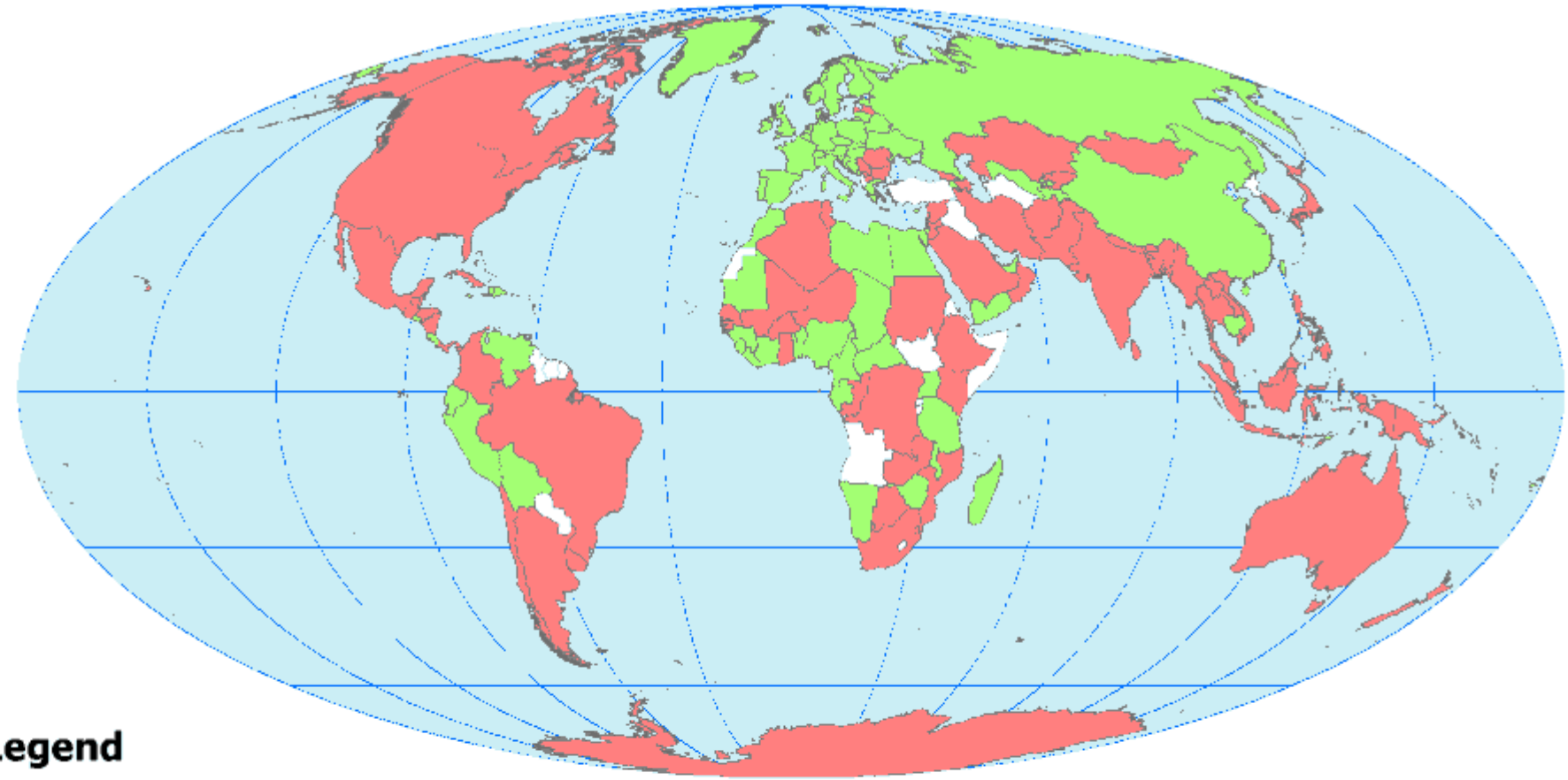
5. What's next?

- Research on user requirements may require time/resources beyond the WG capacity.
- Small, focused projects are proposed to take a phased, modular approach and make tangible outcomes.
  - Peer review of the Global Map data.
  - Case study on urban hazard and disaster mapping.

Peer review of the Global Map data

- GM4SD can be built on the existing Global Map
- Current Global Map has both strengths and shortcomings
  - Strengths
    - Contains a wealth of information and knowledge on which a GM4SD can build.
    - We can learn from the lessons learned through Global Map.
  - Shortcomings
    - Inhomogeneity of data acquisition density, spatial accuracy and data currency exists between different countries.
    - Quality assessment will help understand potential applications of a GM4SD based on the current Global Map and could provide some clues on additional requirements or data needed for GM4SD.

Peer review of the Global Map data

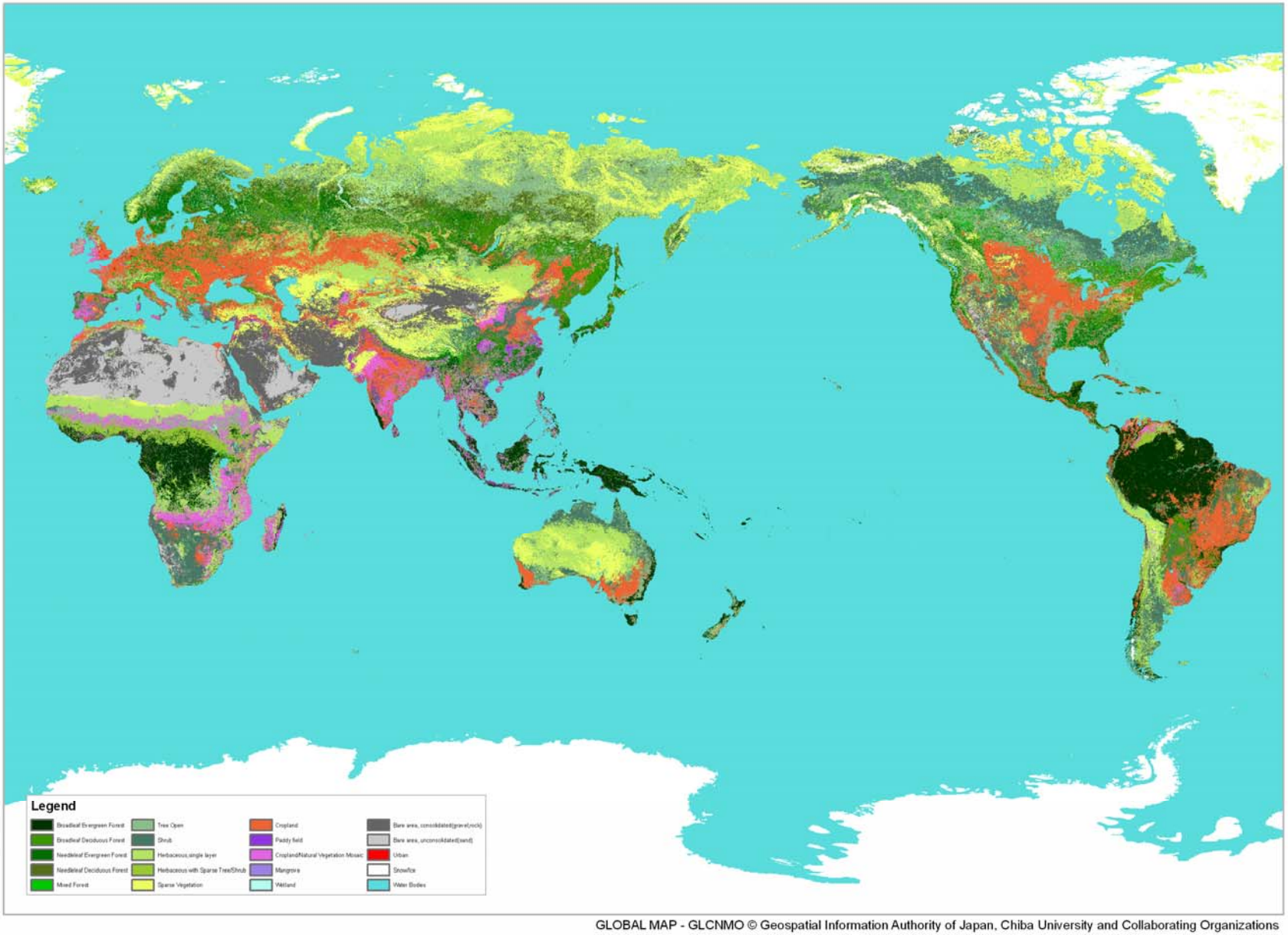


Participants: 182 countries and regions

Data available: 81 countries and regions

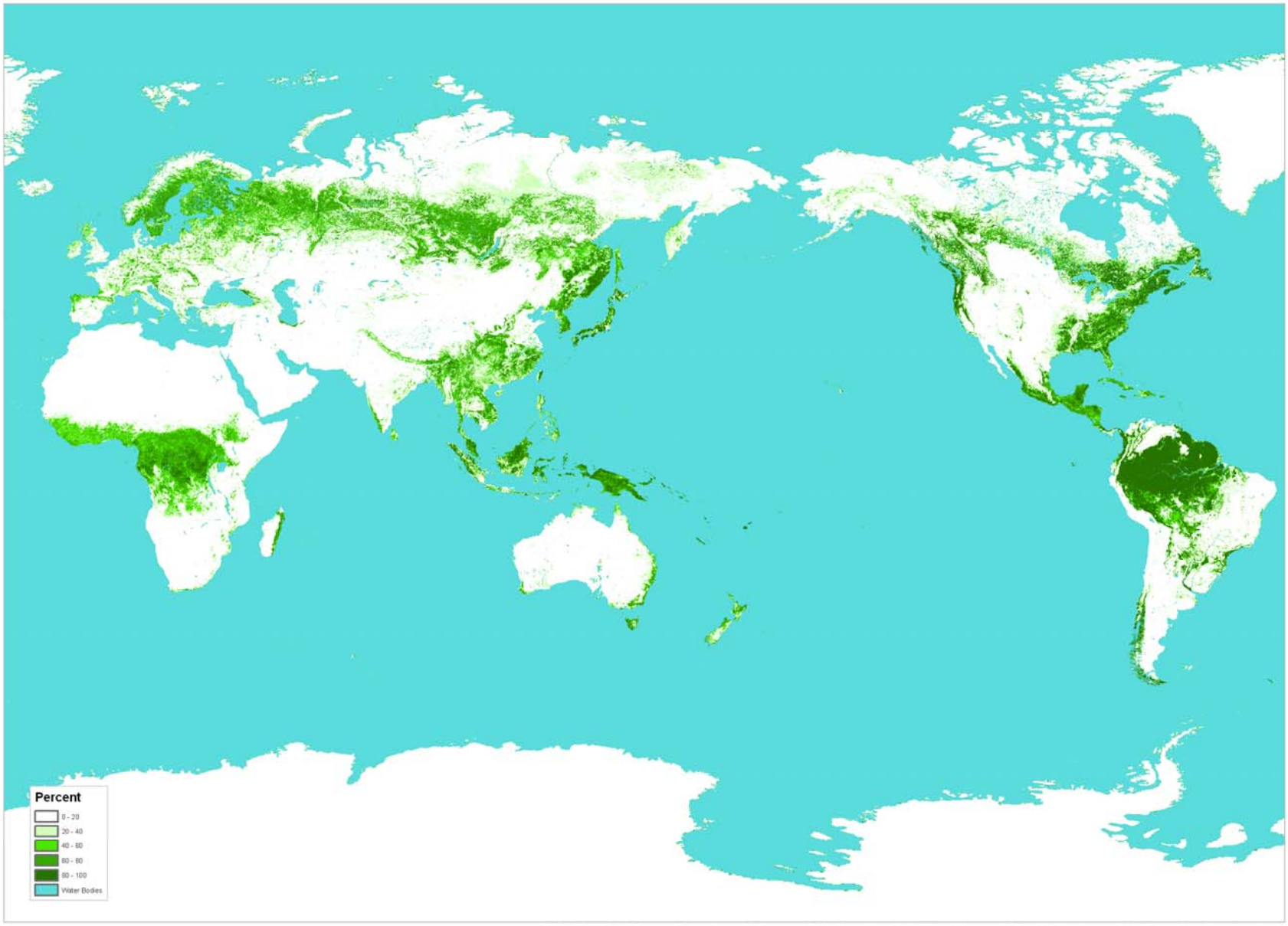
(Covering more than 60% of global land area)

Global Map V.1 (Global version)



Global Land Cover

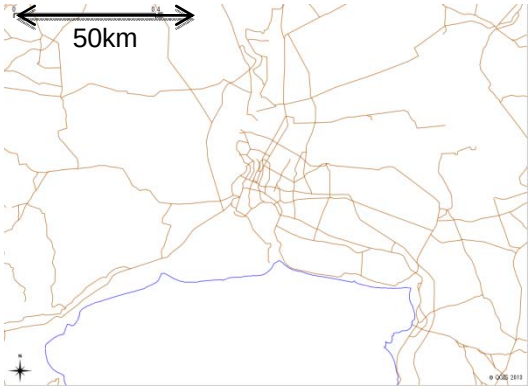
Global Map V.1 (Global version)



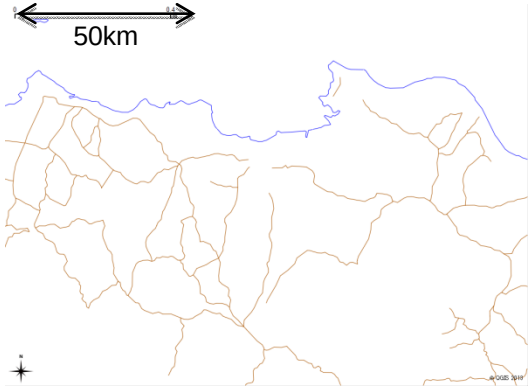
Percent Tree Cover

Shortcomings: Data Density

- Maps show, at the same scale, the road network data of different cities whose population is over10 million.

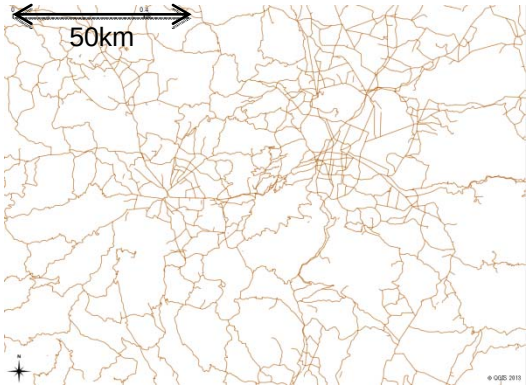


Bangkok

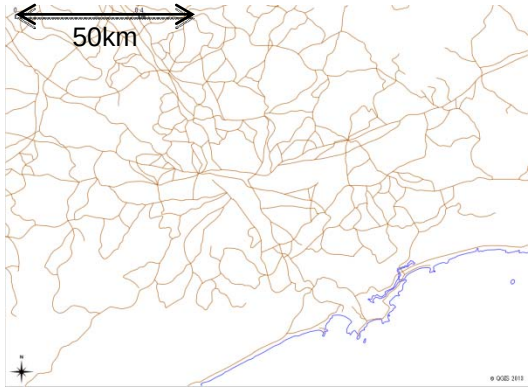


Jakarta

Tokyo



Mexico city



Sao Paulo

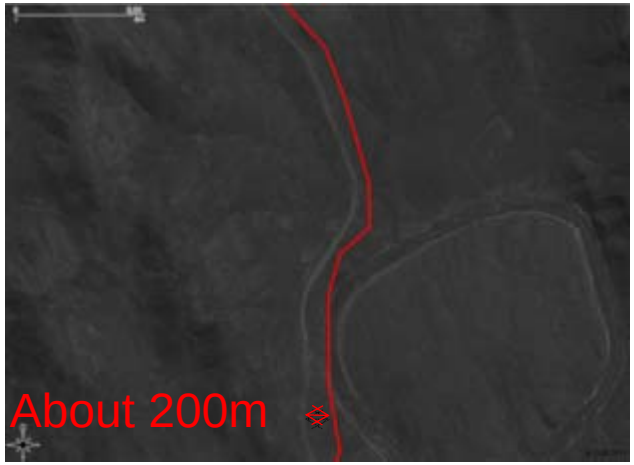
Manila

Shortcomings: Spatial Accuracy

- Road data of Global Map in different countries are shown in red on ALOS images.
- Horizontal errors range from 200m to 1300m.

Country A

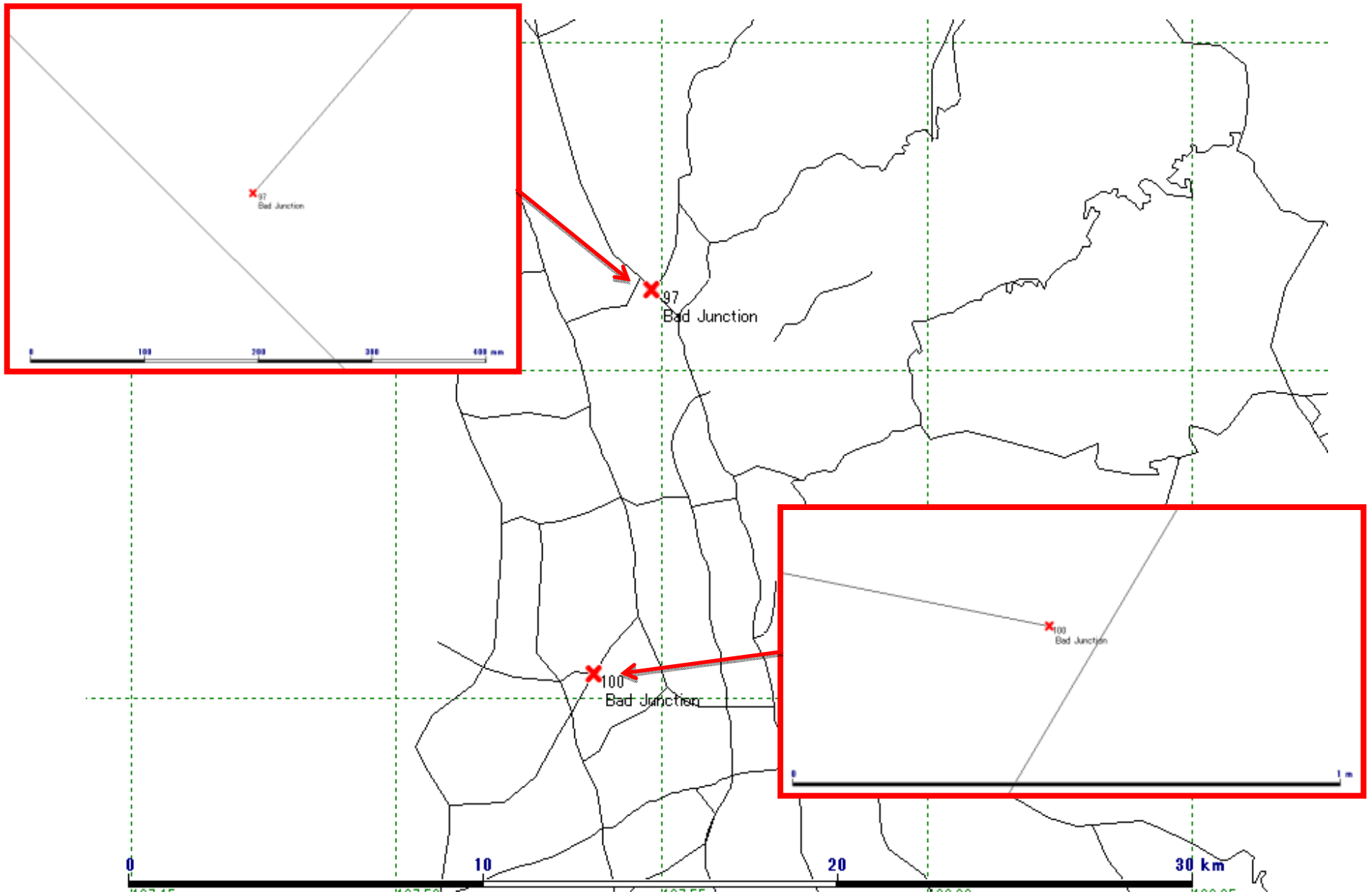
Country B



Country C

Country D

Shortcomings: Topological Errors



Peer review of the Global Map data

- Under the auspices of UN-GGIM, ISCGM is willing to conduct a pilot on the validation of current Global Map data.
- GSI (ISCGM Secretariat), in cooperation with JAXA, plans to provide ALOS imagery for free for the peer review project.
- Draft schedule
  - Feb.: Develop technical procedures for the pilot validation
  - Mar.: Distribute ALOS images and start the validation
  - Jul.: Report the validation result at GGIM3

Case Study: Urban hazard and disaster mapping

- Purpose
  - Identify the requirements of GM4SD.
  - Identify technical and institutional issues to make GM4SD an operational and sustainable system.

- Why urban hazard and disaster mapping ?
  - Growing needs of Member States (Rio+20 outcome document) due to increasing risks of urban areas in the world.
  - Well defined, focused topic makes it easy to indentify technical and institutional issues relevant to GM4SD.
  - Need of integrating a variety of geospatial information will help identify the requirements of a platform for GM4SD.
  - Relatively confined geographic areas will make the project manageable.

Examples: Floods

The water flows into the urban area over a levee.

Photo :Cabinet Office web page

Examples: Earthquake (Kobe in 1995)

The earthquake caused both fires and collapses.

Aerial Photo :Nakanihon Air Service CO.,LTD

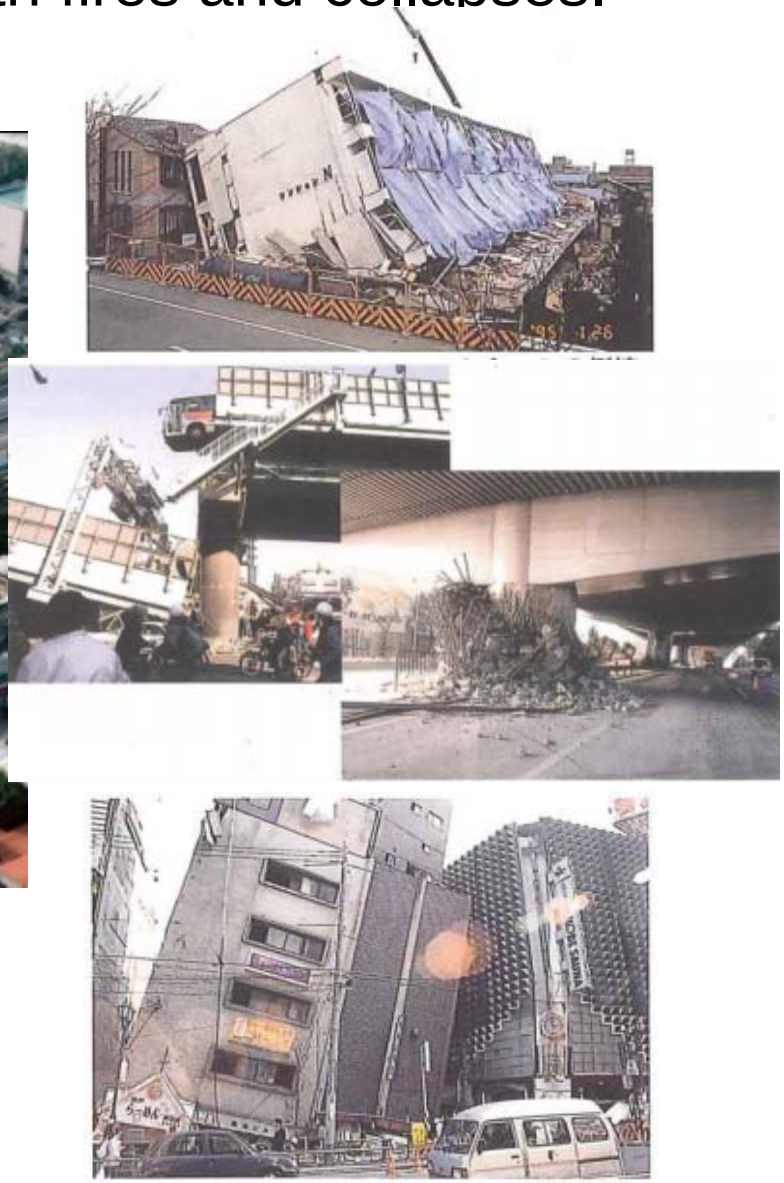


Photo :Cabinet Office web page

Examples: Great East Japan Earthquake

The tsunami after the 3/11 earthquake almost totally wiped out the community.

Natori City, Miyagi Prefecture

(left: May 2005 right: Apr. 2011)

Photo : Natori City web page

Examples: Great East Japan Earthquake

Damage of Liquefaction

Inclined power poles

From Urayasu City web page

Sand boil

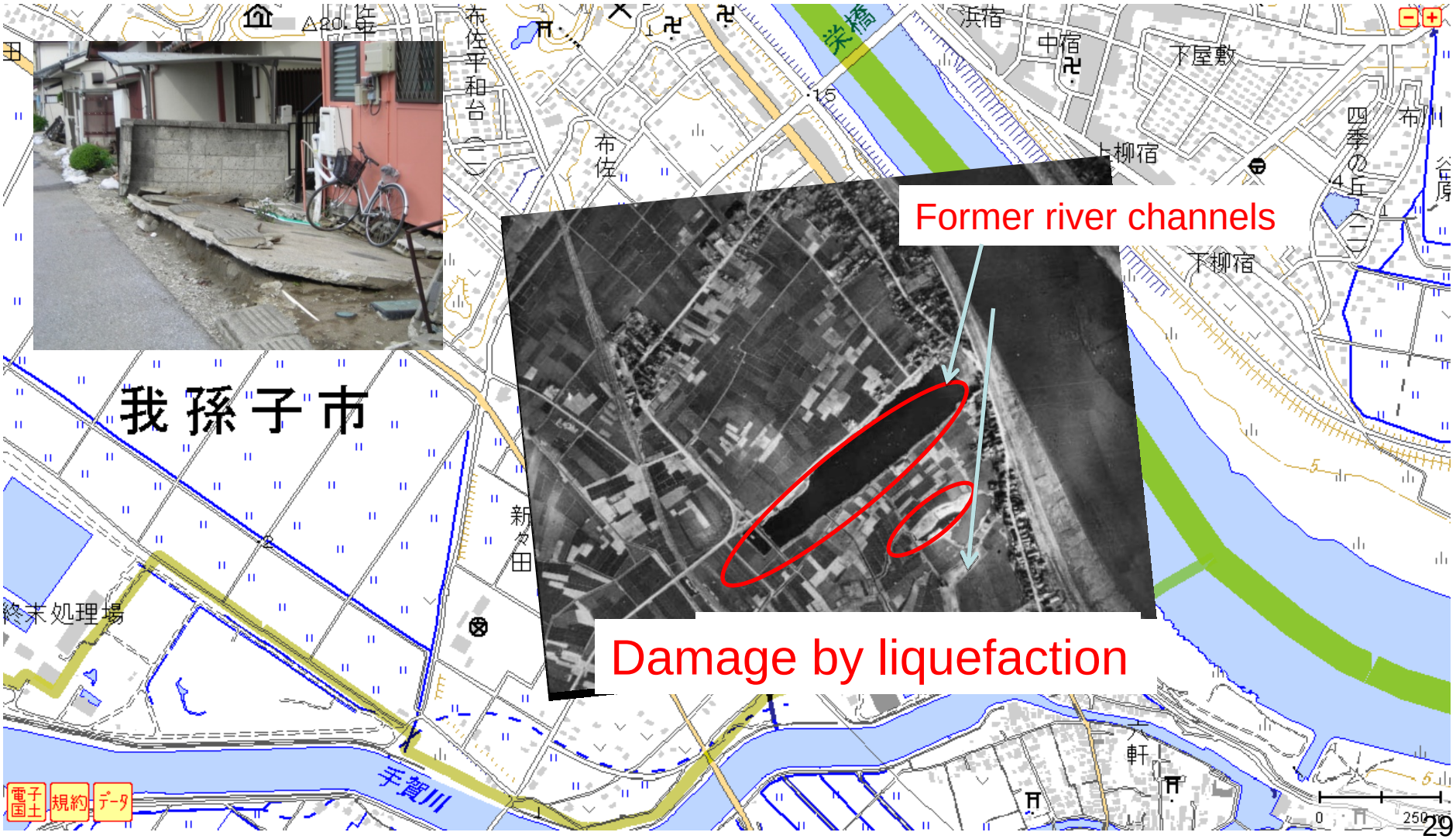
From YouTube

Uplift of sewerage manhole

From Urayasu City web page

Examples: Great East Japan Earthquake

Damage caused by liquefaction was concentrated in reclaimed land of former river channels, proving the usefulness of time-series geospatial information.



Geospatial Information for Urban Hazards

- Base geospatial information
  - Buildings/houses, transportation, waters, elevation, air photos, etc. (including historical data)
- Thematic information
  - Demography, evacuation centers, hospitals, landslides, landuse, etc.
- Damage information
  - Flooded areas, closed roads, collapsed buildings, injured people, etc.

- Different types of geospatial information.
- Managed by different organizations.
- Required at different phases of hazards.

Data integration platform for disasters

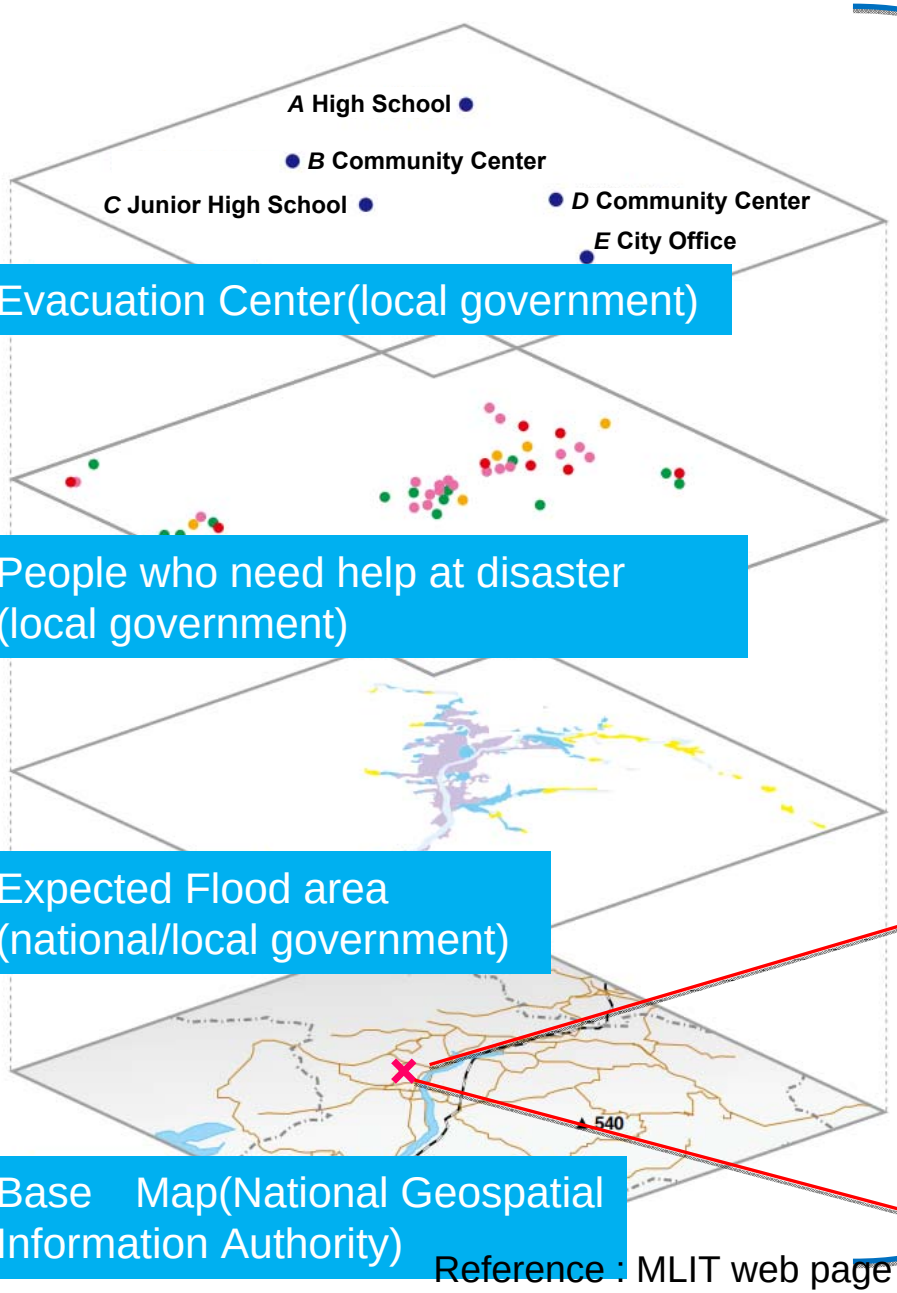
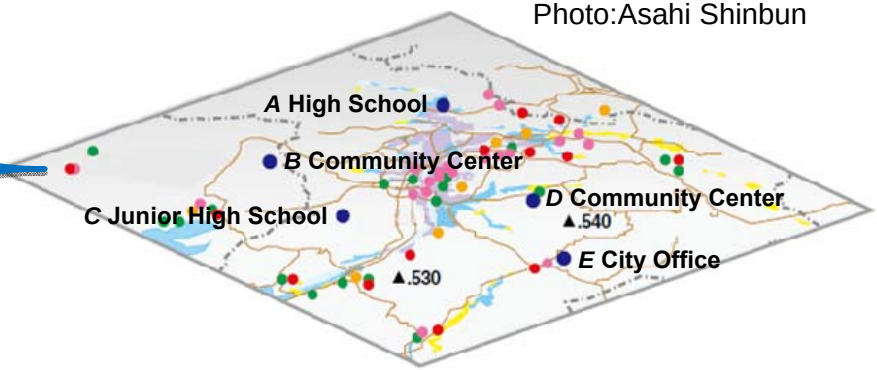


Photo:Asahi Shinbun



Reference : MLIT web page

Second Hangzhou Forum

- Theme: Urban Hazard and Disaster Mapping
  - Wealth of good examples of successfully employing geospatial information and lessons learned.
- Venue/Date: in Chengdu, China on 24-26 April 2013.
- First step to assess the requirements of GM4SD by using urban hazards as a case study.

Summary

- In accordance with Decision 2/108, WG was established and has started the process of developing GM4SD, taking a phased, modular approach.
- WG will conduct two projects:
  - Peer review of Global Map data
  - Case study on urban hazard and disaster mapping (2nd Hangzhou Forum in April)

  and report the outcomes at 3rd UN-GGIM.
- Starting with the projects, WG plans to explore all aspects of GM4SD in the future.

Thank you.