Utilizing Global Map for addressing Climate Change

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Outline of the Global Map

What is Global Map ?

Digital Geographic Dataset

- Covering the whole land area of the globe
- With unified specifications
- Open to the public

  freely downloadable for non-commercial use

Aims of Global Mapping

Global Mapping aims to contribute to

- Solving and tackling with global environmental issues
- Achieving sustainable development
- Mitigating large scale disasters

Global Map Specifications

- Spatial resolution: **1km**
  （equivalent to 1:1,000,000 scale）
- **8 layers**

– Vector data（point, line, area）

Transportation, Boundaries

Drainage, Population centers

– Raster data（grid）

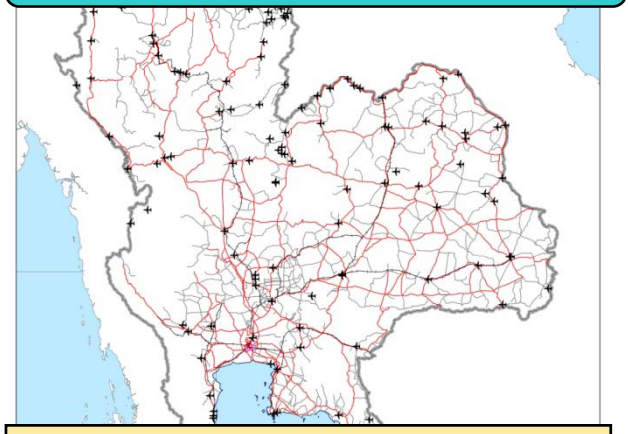
Elevation, Vegetation (Percent Tree Cover),

Land Cover, Land Use

- Update interval: **Five years**

Vector Data

Transportation

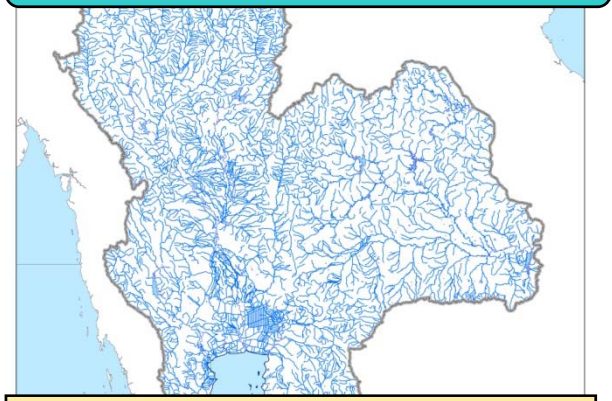


Road, Railway, Airport

Boundary

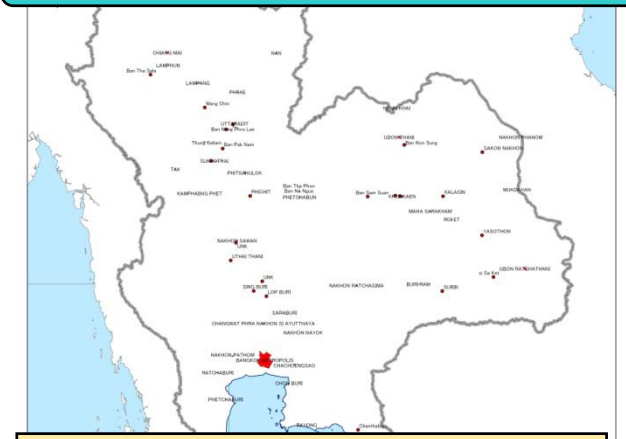
Coastline, Administrative boundaries

Drainage



River, Inland water, Dams

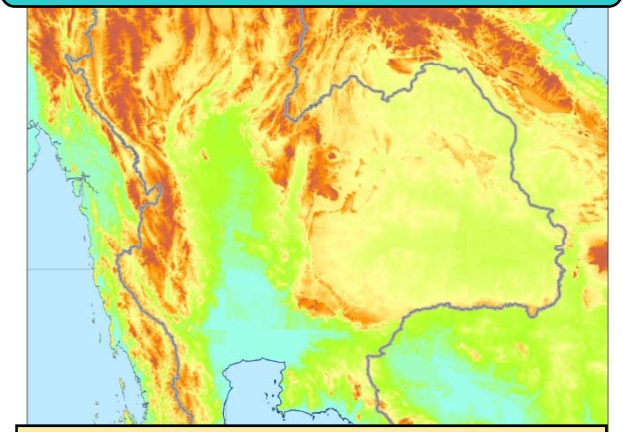
Population centers



Location, Name of Cities

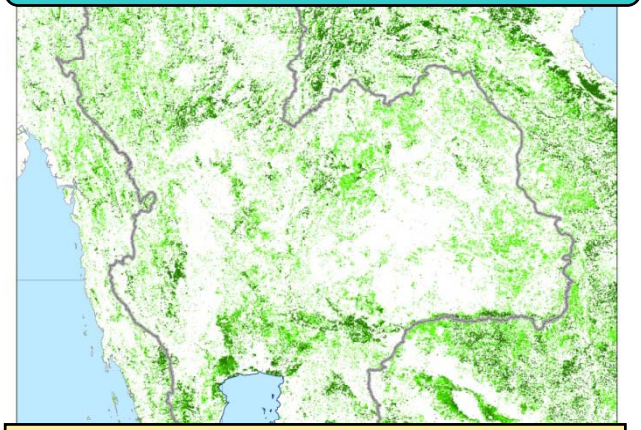
Raster Data

Elevation



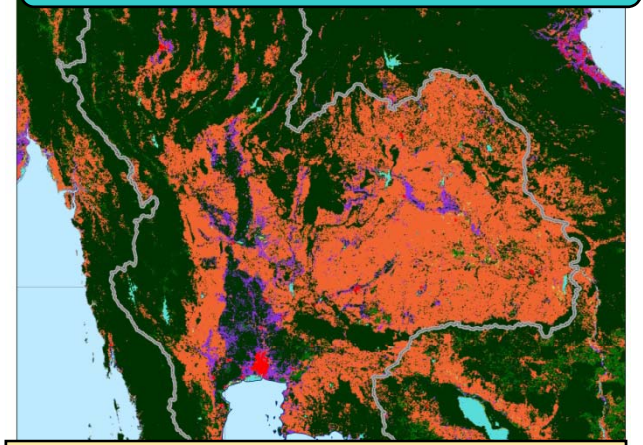
1m step information

Vegetation(Percent Tree Cover)



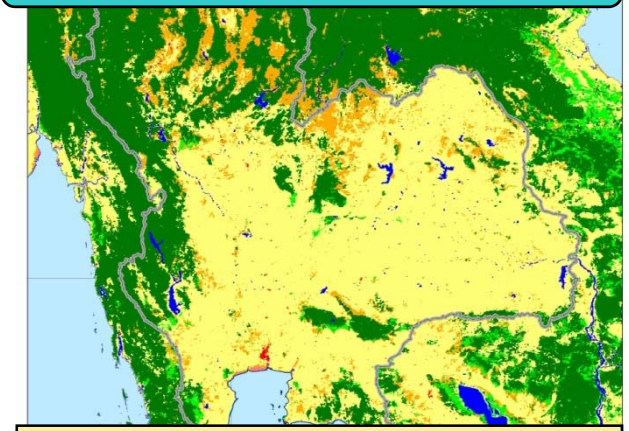
Percent tree cover

Land cover



20 categories

Land use



9 categories

Global Mapping Project

Who makes Global Map?

Each National Mapping Organization (NMO)

- Responsible for developing data of its own country
- Supported by other NMOs, aid organizations

Coordinating Mechanism

ISCGM (International Steering Committee for Global Mapping)

- Established in 1996
- Conducts policy making and progress management
- Secretariat :Geographical Survey Institute(GSI), Japan

History of Global Mapping Project

Establishment of the Project

Development of Global Map Data

1992

Agenda 21 was adopted at the Earth Summit.

Japan advocated “Global Map” concept.

1996

ISCGM was established.
(Secretariat: Geographical Survey Institute ,Japan)

2002

Johannesburg Summit（WSSD）
Global mapping is included
in adopted “Implementation Plan”.

WSSD

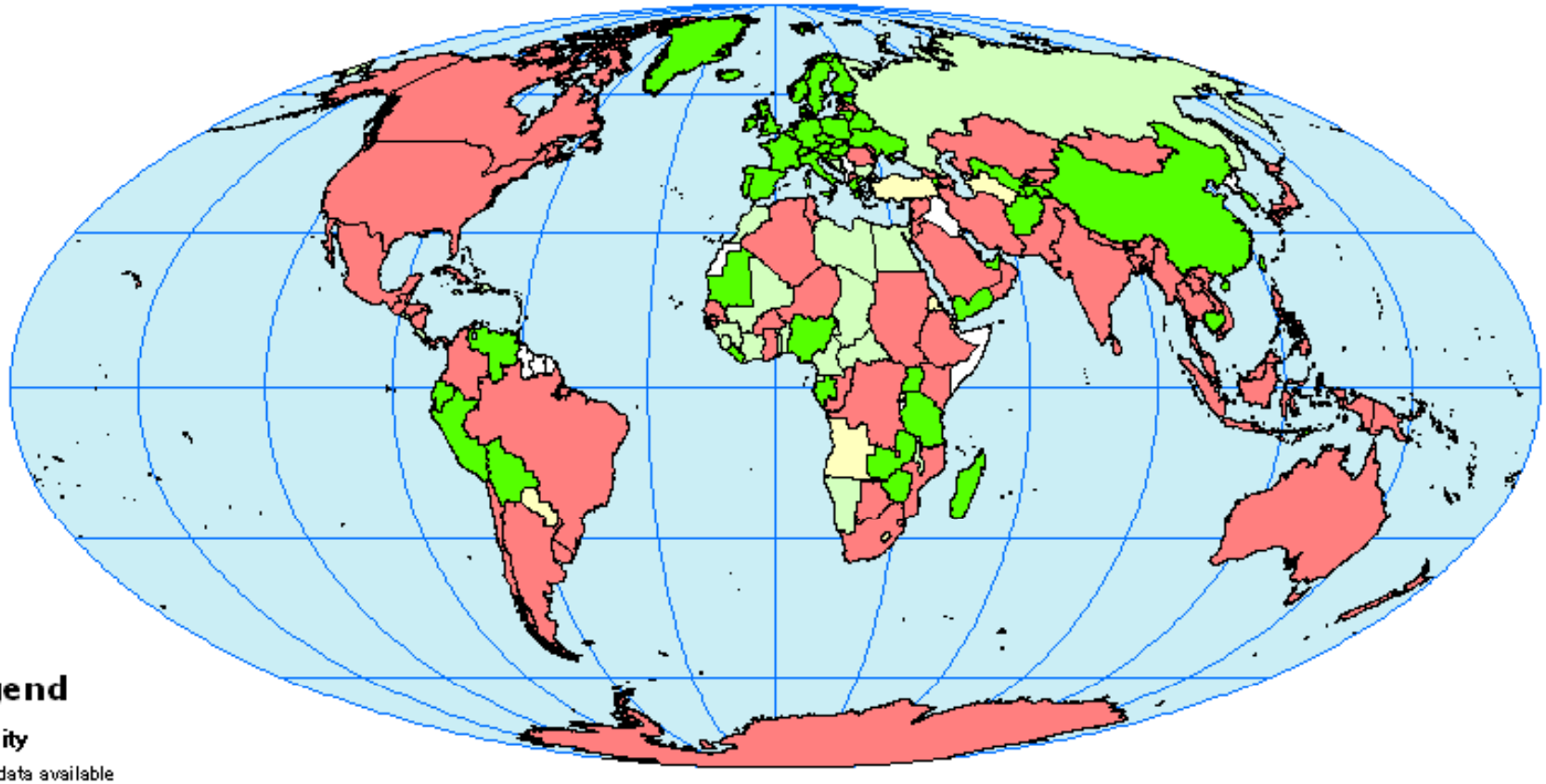
2008

Release of
Global Map Version 1

180 countries and regions are participating in the project

Progress of Global Mapping Project

As of 2009-01-16
International Steering Committee for Global Mapping



Legend

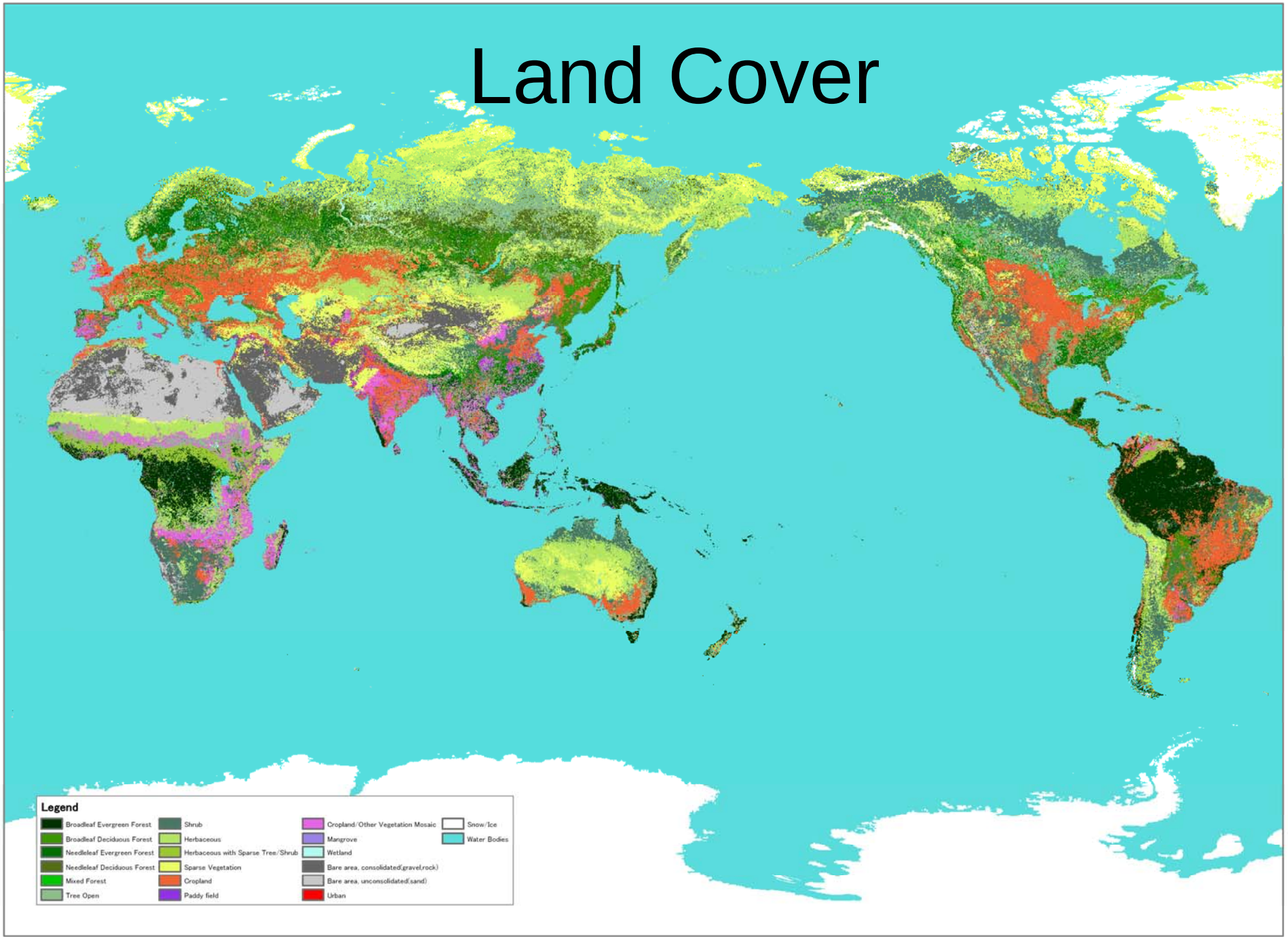
maturity

- data available
- data for verification
- developing data
- considering joining the project
- not participating in the project

Most elevation data of current Global Map are compiled from GTOPO30, contribution of United States of America.

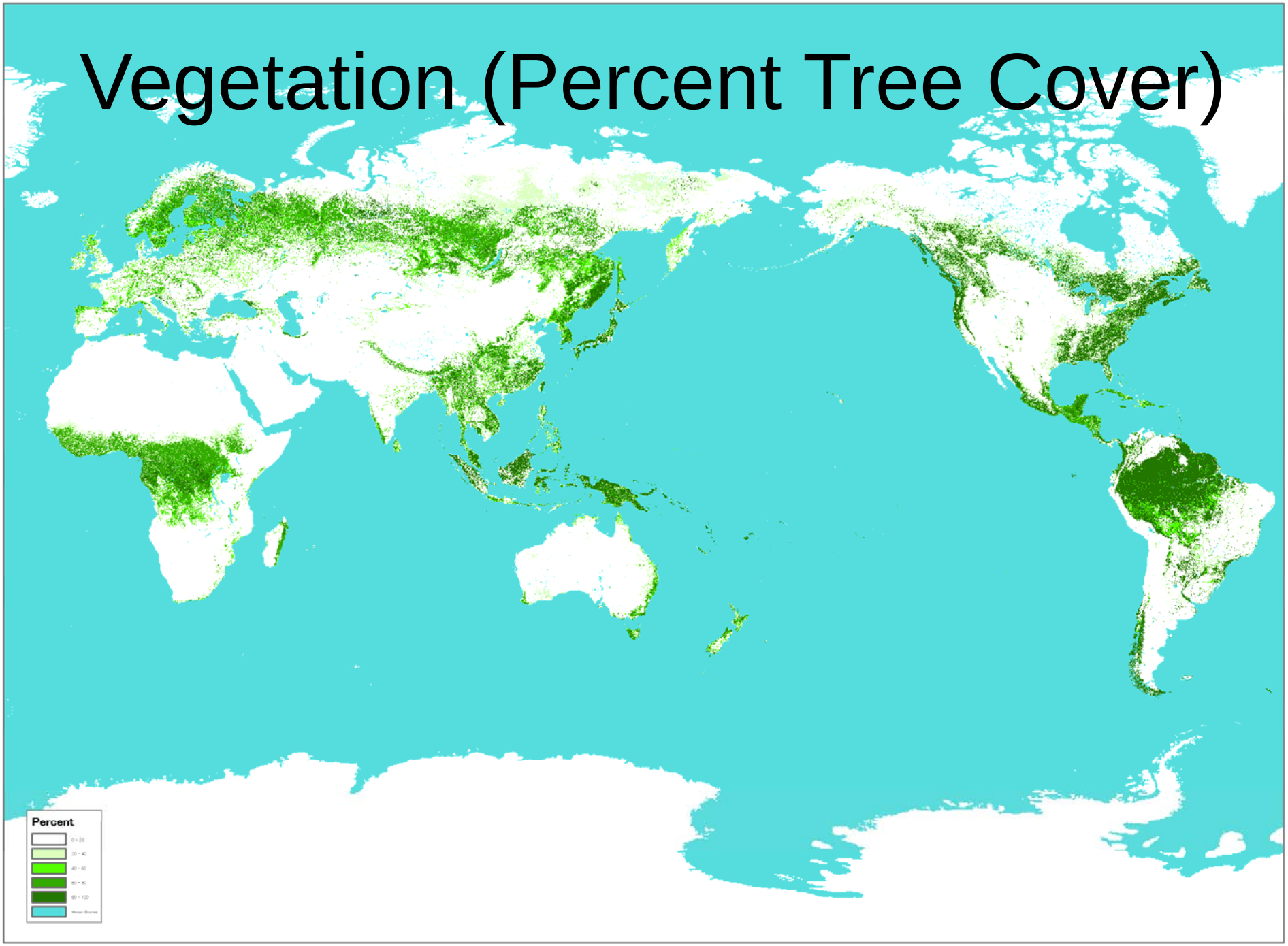
This map is for the purpose of reference and the boundaries in this map are not authorized by any organizations.

Land Cover



Global Map – Land Cover (GLCNMO) © Geographical Survey Institute, Chiba University and Collaborating Organizations

Vegetation (Percent Tree Cover)



GLOBAL MAP – Percent Tree Cover © Geographical Survey Institute, Chiba University and Collaborating Organizations

For Addressing Climate Change

Why Global Map？

for addressing Climate Change

Comparability ⇐
- Global Coverage
- Unified specifications
- 5-year update

Usability ⇐
- Essential environmental data
- Open data policy

Reliability ⇐
- Government authorization

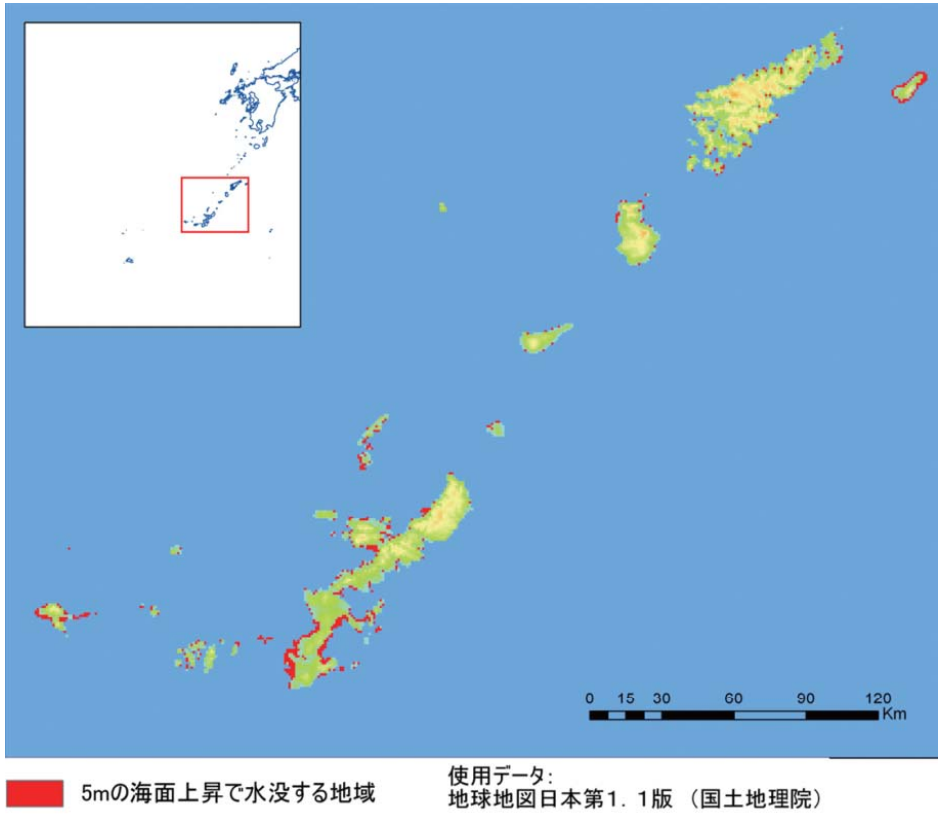
⇓

Analyses based on Global Map
contribute to ensuring equitability and effectiveness
in Climate Change Policy Framework

Adaptation

- Global Map is used for various simulations for adaptation measures.

Ex: sea level rise, inundation, drought



Red areas: to be inundated at 5m- rise in sea level, NANSEI SHOTO (Japan)

REDD

Vegetation (Percent Tree Cover) of GM is used to

- Grasp the forest areas and distribution and their changes
- Policy formulation and planning

Percent tree cover data

compare

Percent tree cover data after several years

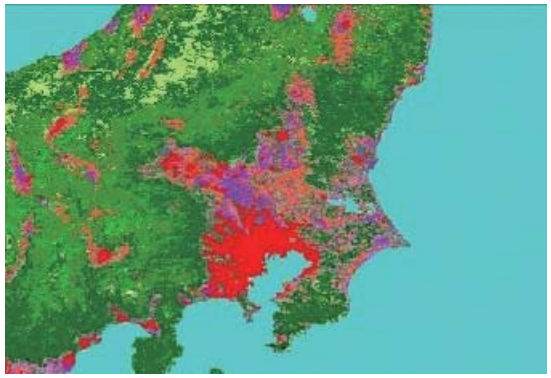
Understand places which need priority of measures and take measures for these places

LULUCF

Land Cover data of GM is used to

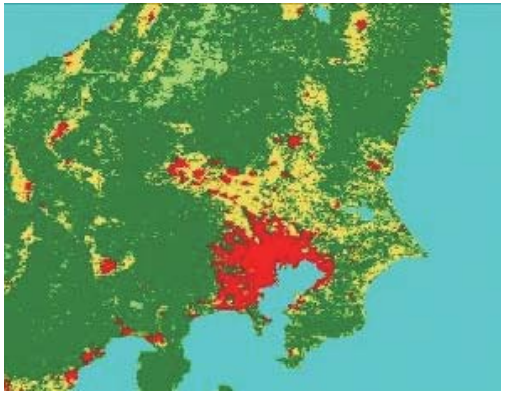
- •GHGs inventory calculation
- •Policy formulation and planning

*Global Map is introduced in “IPCC GPG for LULUCF” and “2006 IPCC Guidelines for national Greenhouse Gas Inventories”



20 classes
of land cover data

Integrate
classification



6 classes of LULUCF

calculate emission and removal of GHGs and formulate measures against it

For LULUCF

Procedure to calculate
each area of land cover 6 classes

Outline

① Download GM Land Cover (LC) data

② Interpret GM 20 classes to LULUCF 6 classes

③ Convert LC data from raster to vector

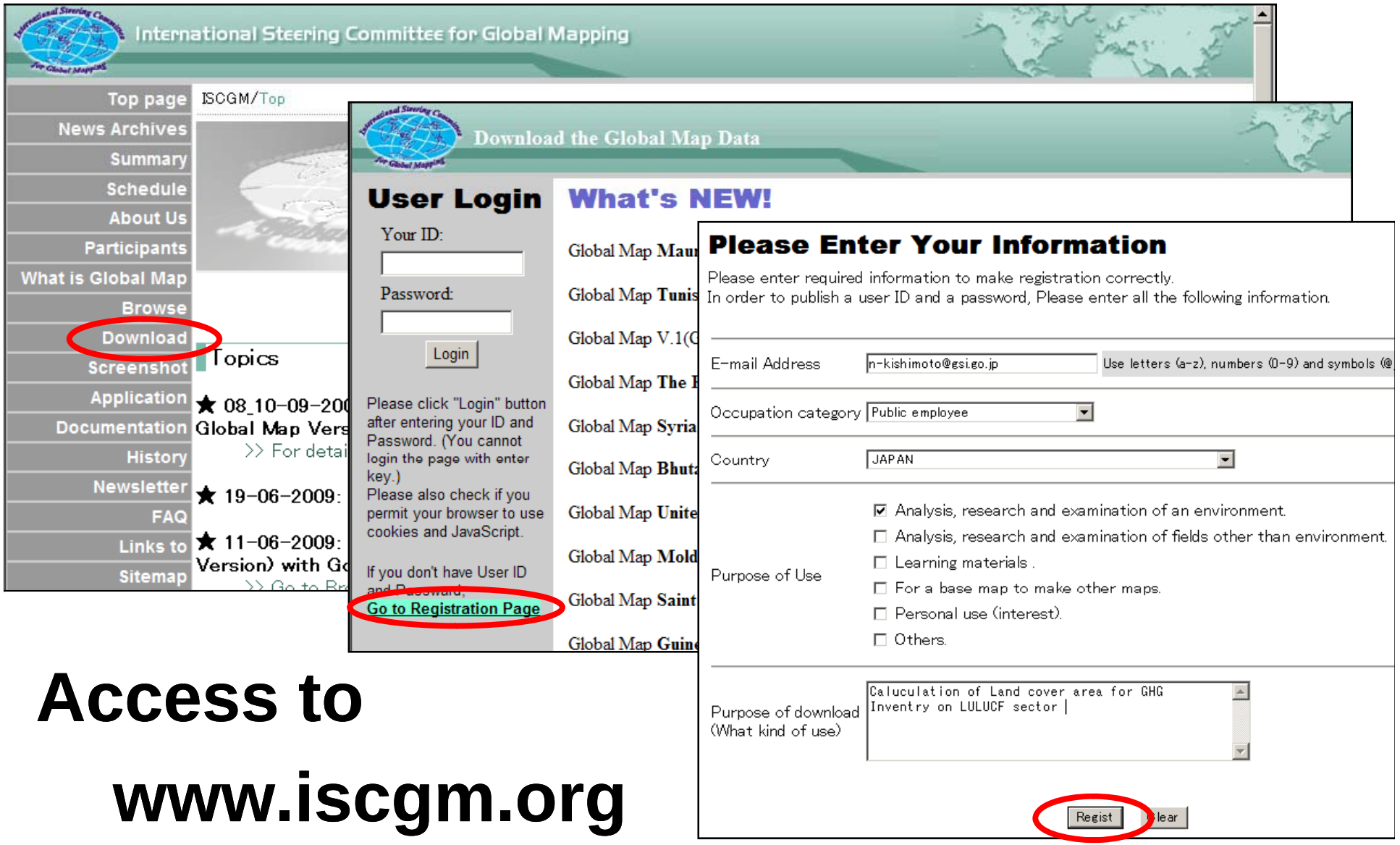
④ Clip vector data using International boundary data

⑤ Give a map projection

⑥ Calculate each area of 6 classes

Process by
GIS Software

① Download GM Land Cover data



Access to

www.iscgm.org

① Download GM Land Cover data

- **Global Version**
- **National and Regional Version**
  - Produced by National Mapping Organizations of respective countries

➢ TIFF and BIL format data are downloadable

➢ Detailed information about data is described in metadata

② Interpret GM 20 classes to LULUCF 6 classes

- Decide classes of interpretation

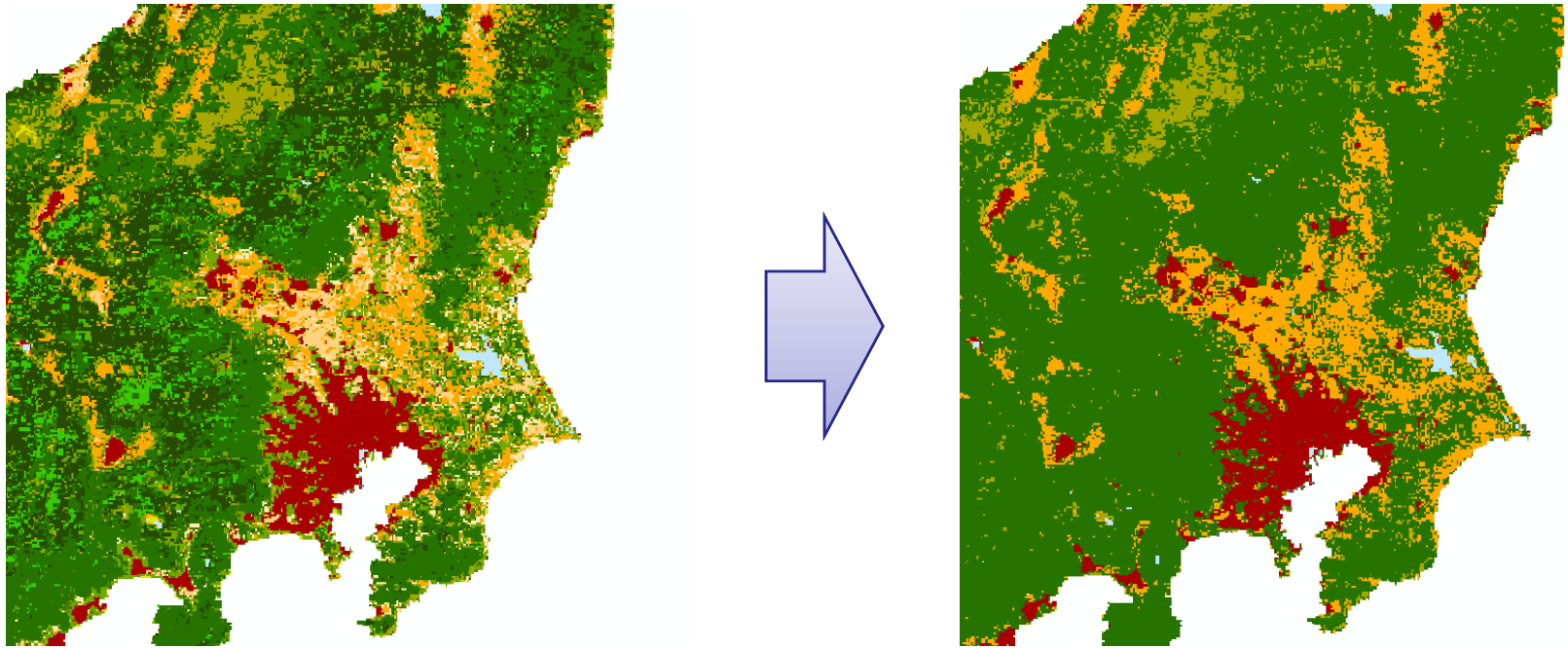
  by referring to …
  - Definition of each class on the GM LC data
  - Definition of the IPCC guideline, GPG-LULUCF and KP

  ➢ GM Global version is Adopting Land Cover Classifications System version 2 (LCCS2) developed by FAO as definition of LC class

Example of interpretation Interpretation requires further consideration

GM LC 20 Classes	LULUCF 6 Classes
Broadleaf Evergreen Forest	Forest land
Broadleaf Deciduous Forest	Forest land
Needleleaf Evergreen Forest	Forest land
Needleleaf Deciduous Forest	Forest land
Mixed Forest	Forest land
Tree Open	Forest land
Mangrove	Forest land
Shrub	Grassland
Herbaceous	Grassland
Herbaceous with Sparse Tree/Shrub	Grassland
Sparse vegetation	Grassland
Cropland	Cropland
Paddy field	Cropland
Cropland/Other Vegetation Mosaic	Cropland
Wetland	Wetlands
Urban	Settlements
Bare area, consolidated (gravel, rock)	Other land
Bare area, consolidated (sand)	Other land
Snow/Ice	Other land
Water	Other land

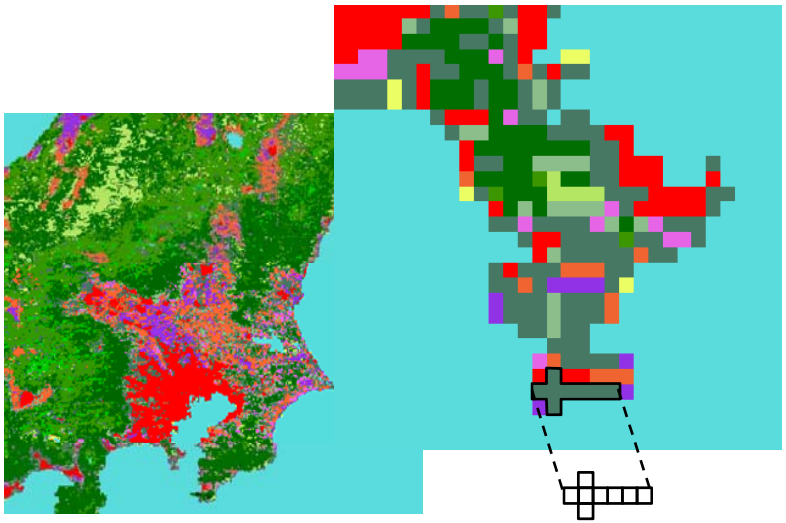
② Interpret GM 20 classes to LULUCF 6 classes

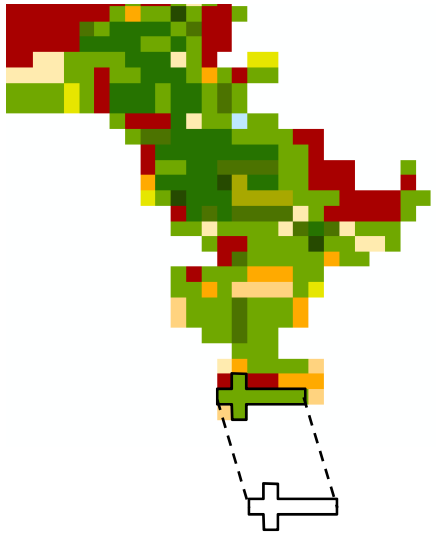


GM 20 classes

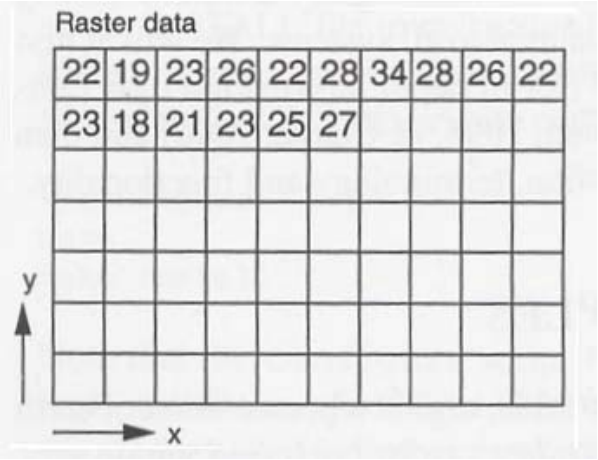
LULUCF 6 classes

③ Convert LC data from raster to vector



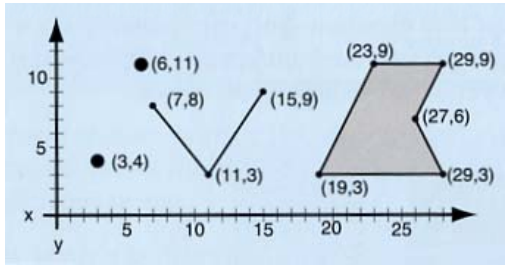


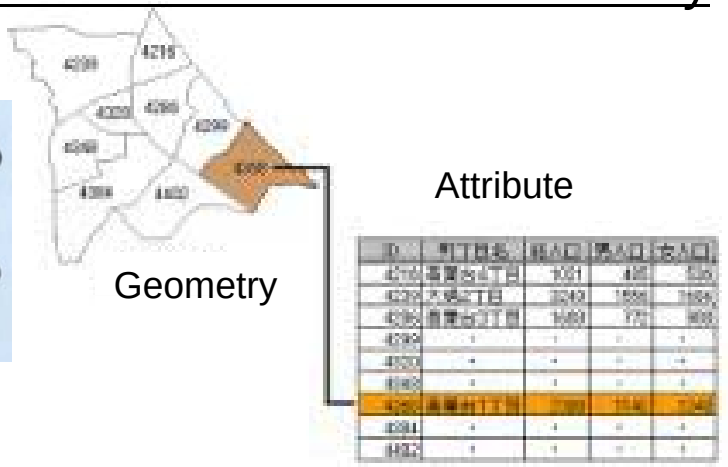
Raster : Grid Cell based



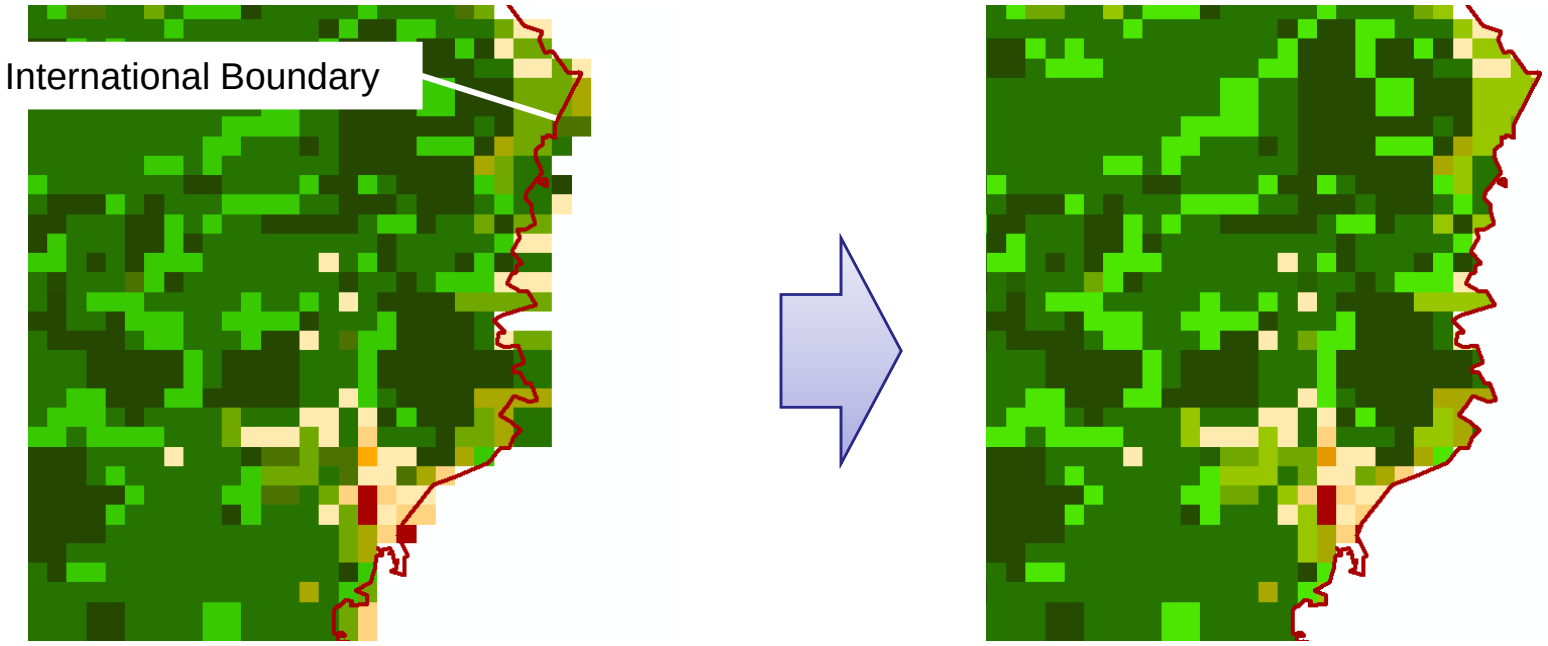
Vector:areas, lines, and points

- ➢ <u>can measure the area more accurately</u>





④ Clip vector data using International boundary



Before Clipping

After Clipping

- Clip data to cut outside of the country area
- International Boundary is also available from GM dataset

⑤ Give a map projection

latitude/longitude

(**Geographic Coordinate system**)

- Downloaded GM data is represented in latitude/longitude

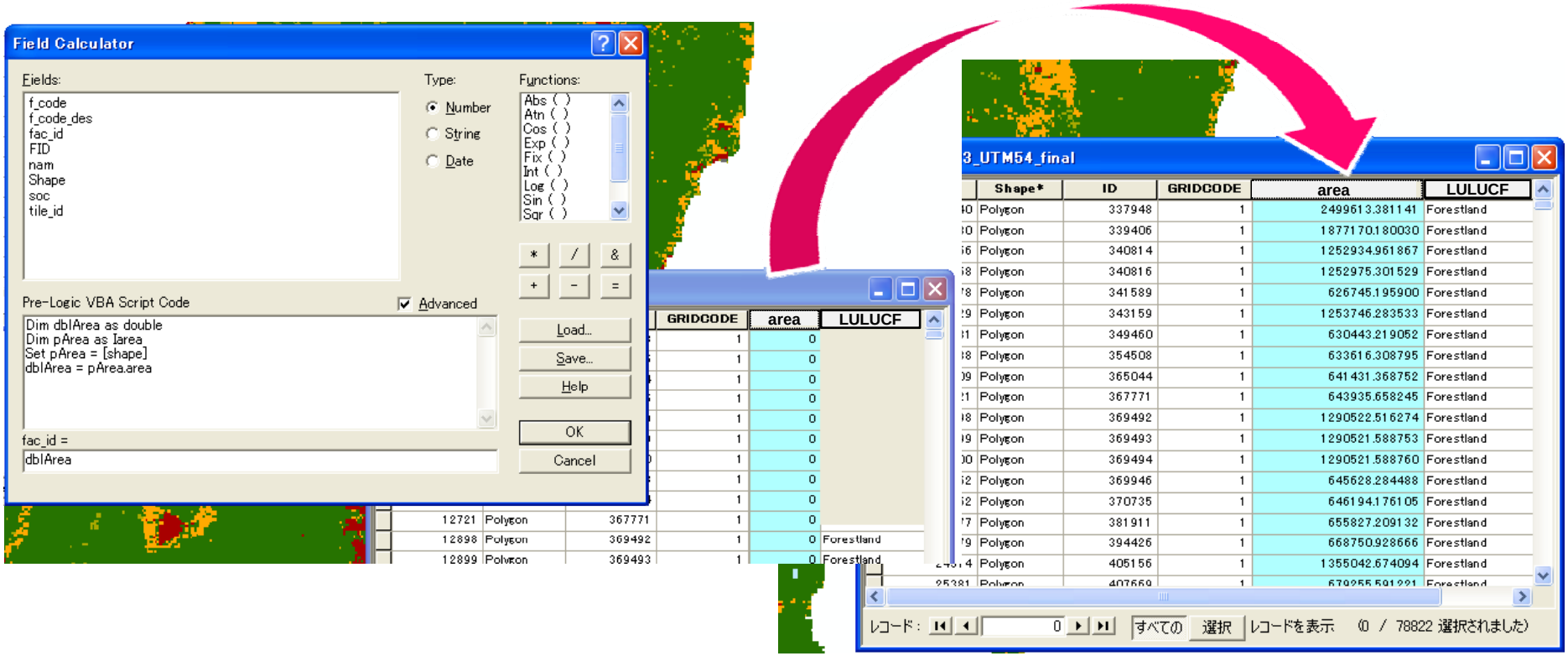
Appropriate projection

to represent accurate area of each country

- This time I used Mollweide projection for Japan

⑥ Calculate each area of 6 classes

- Calculate areas of respective polygons



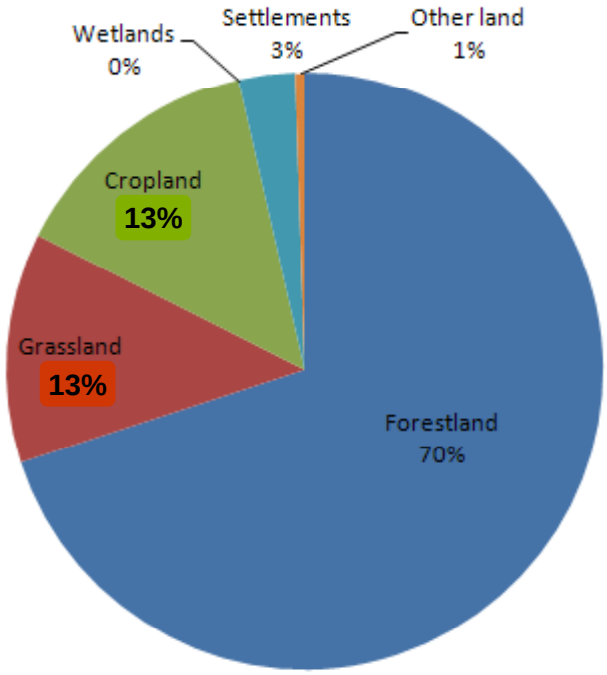
- Sum up areas of polygons
  of respective classes

⑥ Calculate each area of 6 classes

LULUCF class	Area (Mha)
Forestland	26.5
Grassland	4.8
Cropland	5.0
Wetlands	0.0
Settlements	1.2
Other land	0.2
Total	37.7

Area of LULUCF 6 classes

Rate of area of LULUCF 6 classes



Conclusion

- Required thing to calculate LC areas
  - GM data, GIS software, Fundamental GIS skills
- Useful points of GM for LULUCF
  - Comparability (Continuity), Usability, Reliability

➢ If you have any questions about GM data or how to process GM data by GIS software, Please e-mail to sec@iscgm.org (Secretariat of ISCGM)

Others

Capacity Building Programs

- JICA Group Training Course on Global Mapping
  （implemented by GSI Japan）
  94 experts of 57 countries participated(1994～2008)
- Global Mapping Partnership Program (by MLIT Japan)
  Global Map Africa Seminar:
  86 experts of 35 countries in participated(2002～2007)

Thank you

http//www.iscgm.org

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