

Utilizing Global Map for addressing Climate Change

WGIA7

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Seoul, Republic of Korea

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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

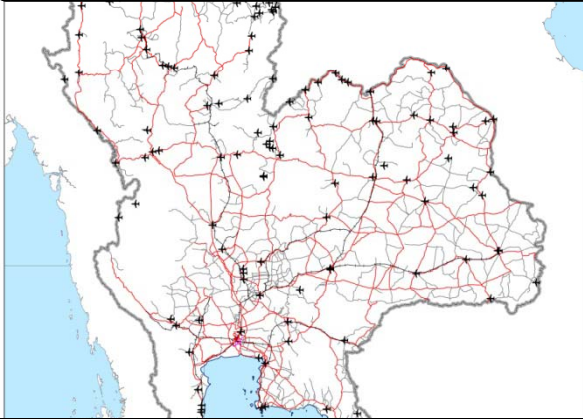
- Solving and tackling with global environmental issues
- Achieving sustainable development
- Mitigating large scale disasters

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



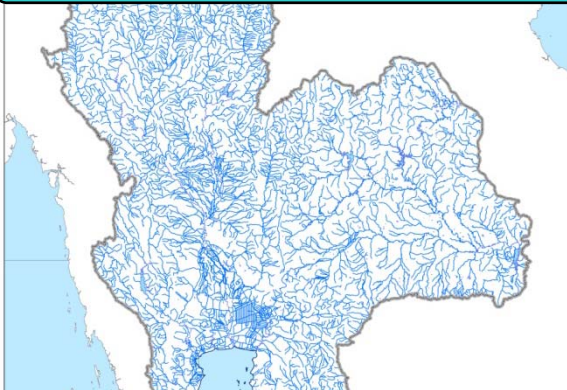
Road, Railway, Airport

Boundary



Coastline, Administrative boundaries

Drainage



River, Inland water, Dams

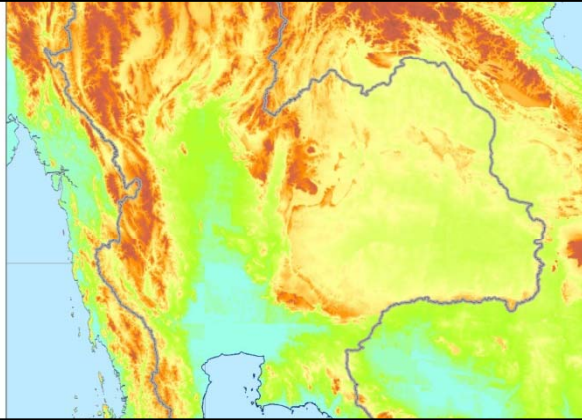
Population centers



Location, Name of Cities

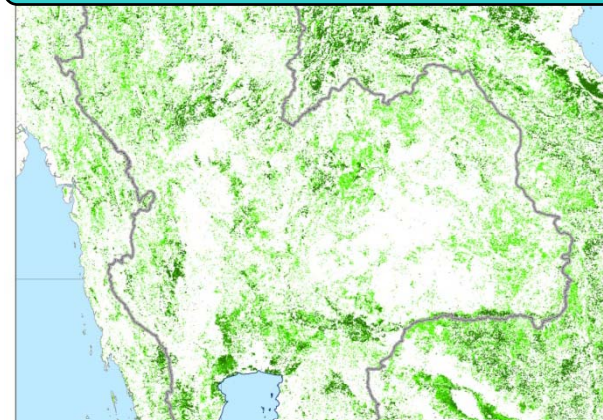
Raster Data

Elevation



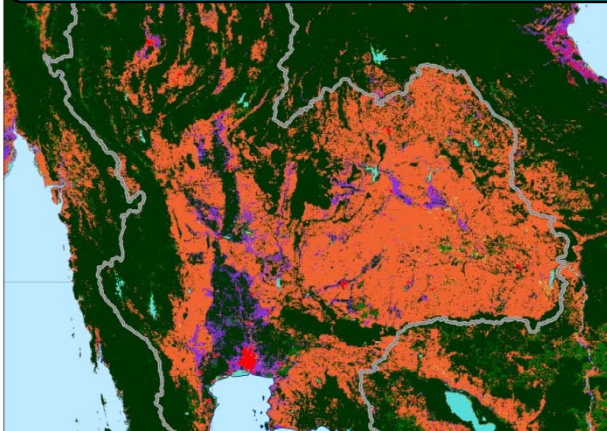
1m step information

Vegetation(Percent Tree Cover)



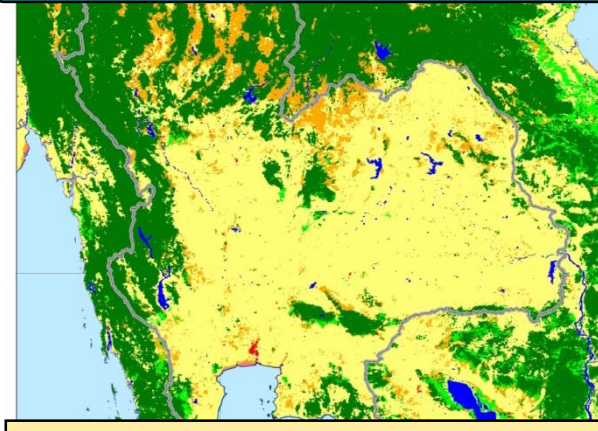
Percent tree cover

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

1992

Agenda 21 was adopted at the Earth Summit.

Japan advocated “Global Map” concept.

1996

ISCGM was established.

(Secretariat: Geographical Survey Institute ,Japan)

Development
of Global Map Data

2002

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

2008

Release of
Global Map Version 1



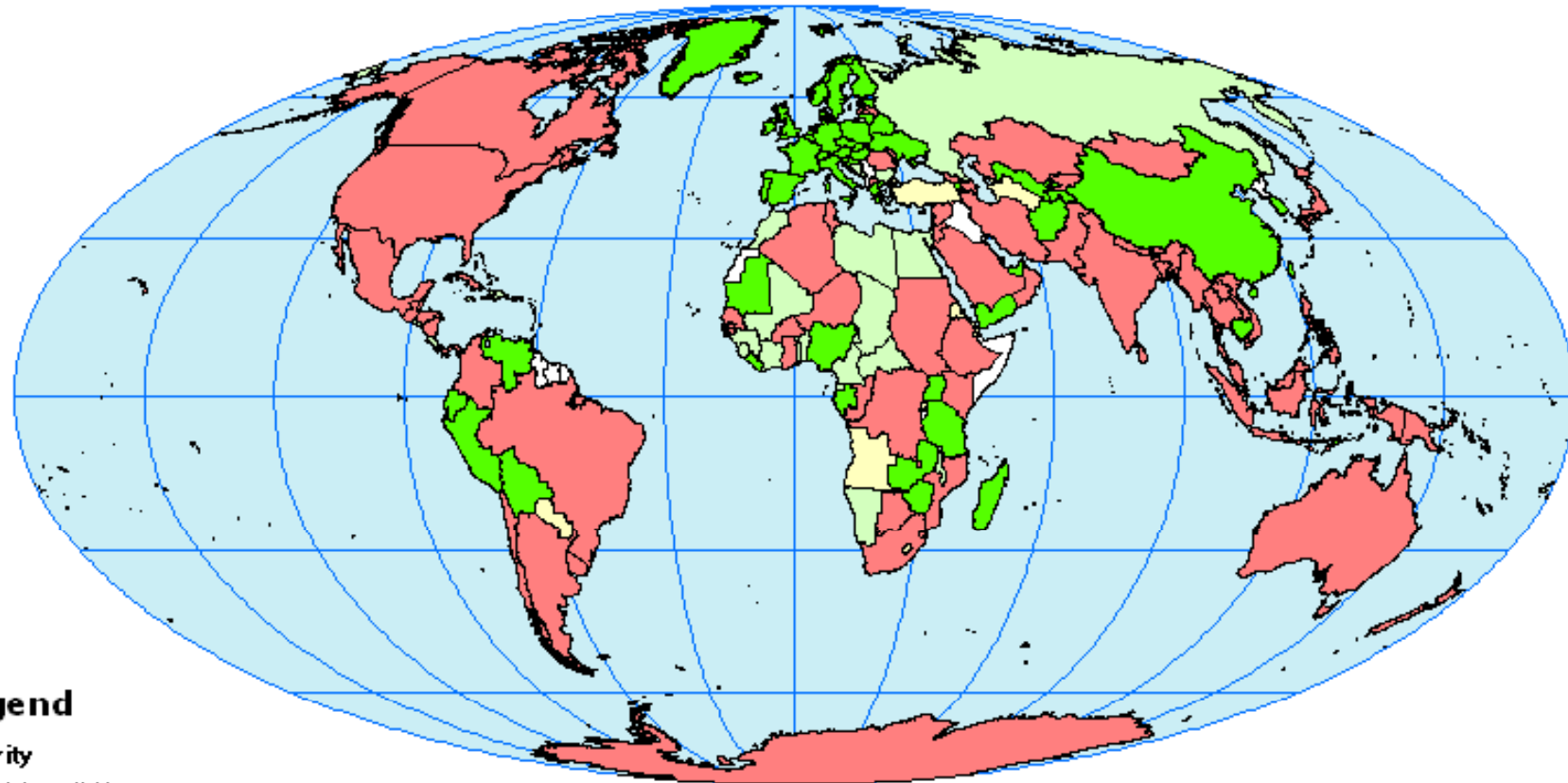
WSSD

**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

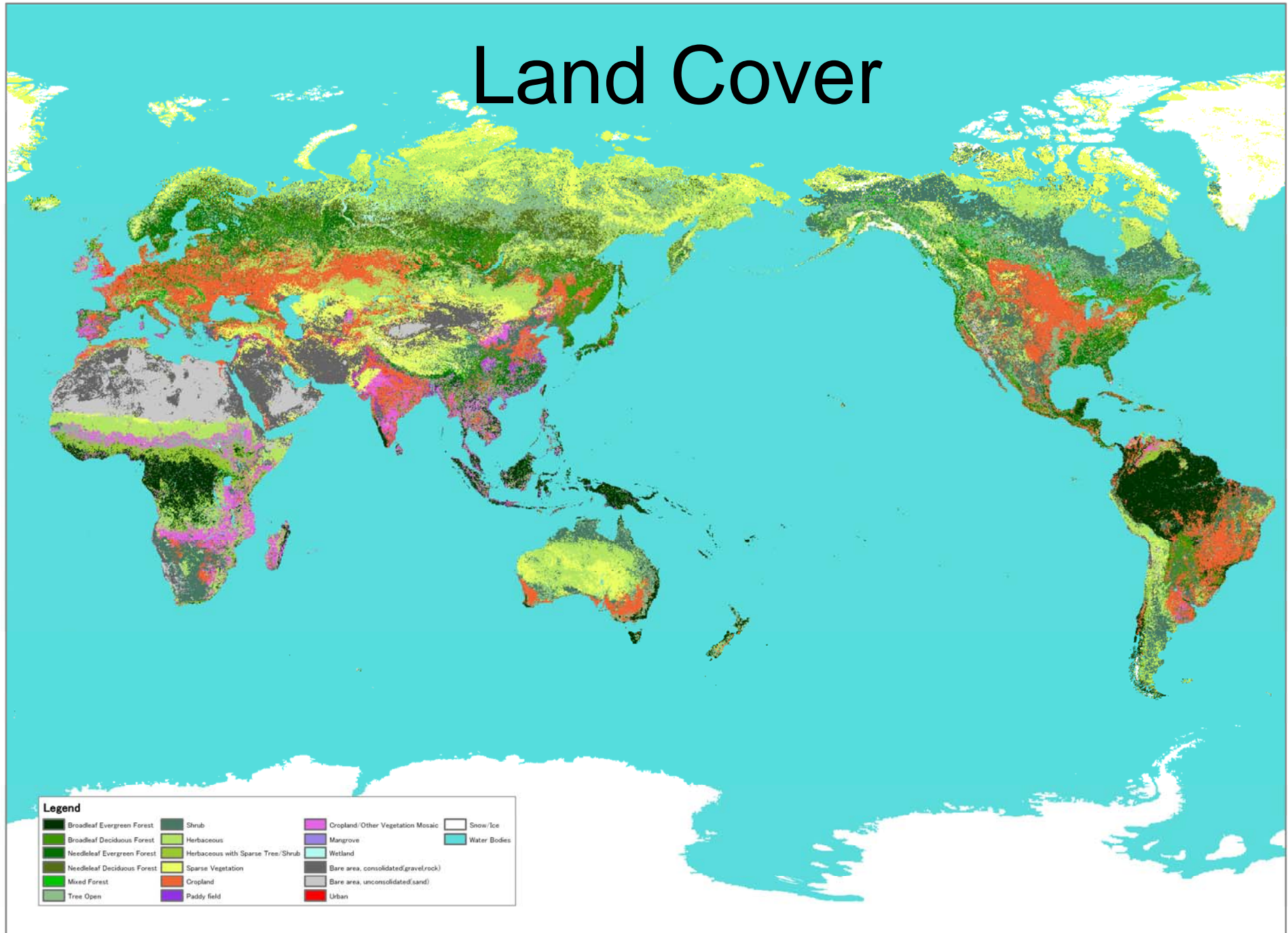
maturity

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

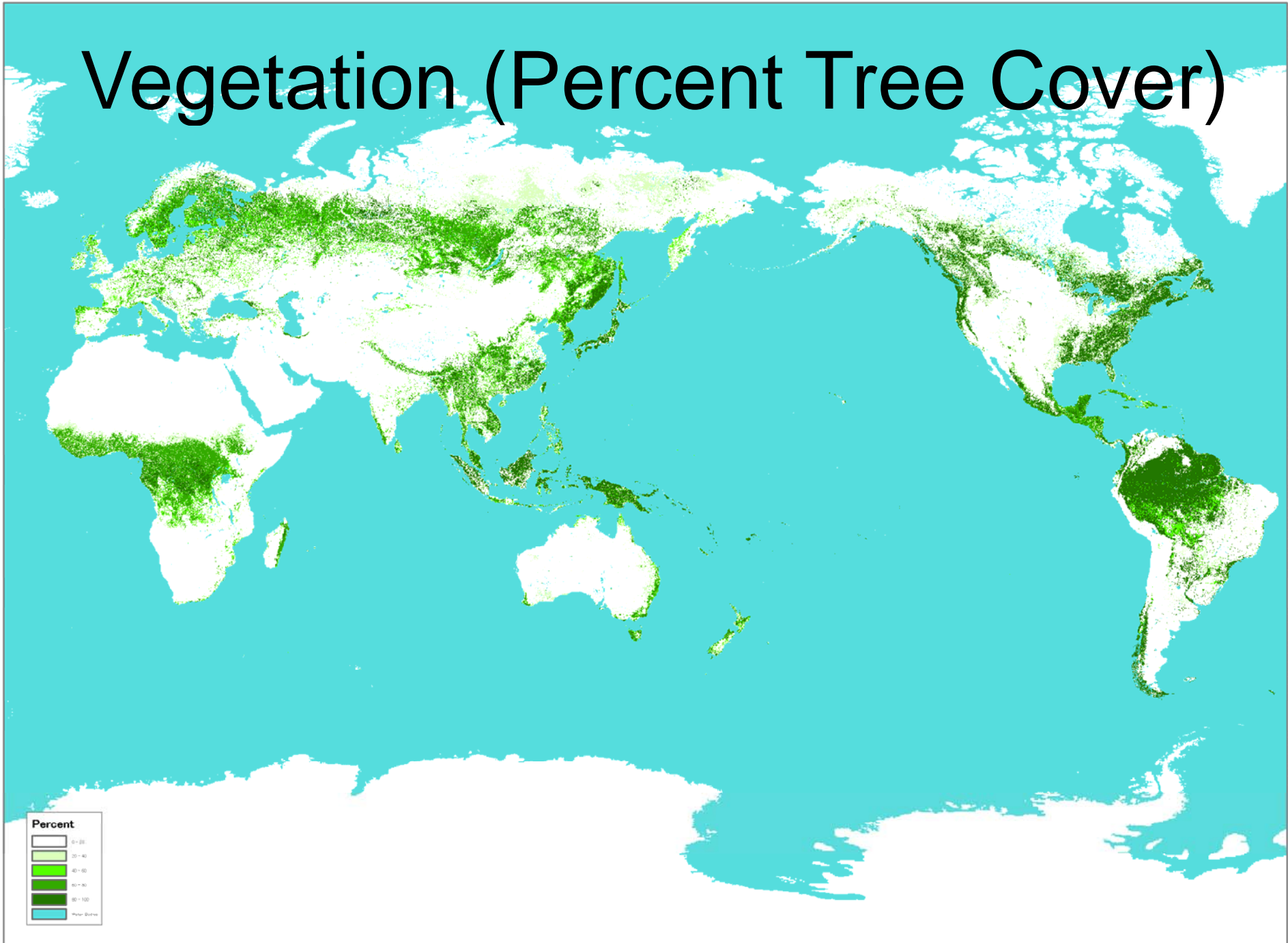
Most elevation data of current Global Map are compiled from GTOPO30, contribution of United States of America.

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

Land Cover



Vegetation (Percent Tree Cover)

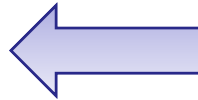


For Addressing Climate Change

Why Global Map ?

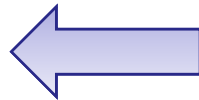
for addressing Climate Change

Comparability



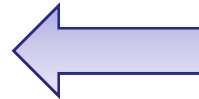
- Global Coverage
- Unified specifications
- 5-year update

Usability



- Essential environmental data
- Open data policy

Reliability



- Government authorization

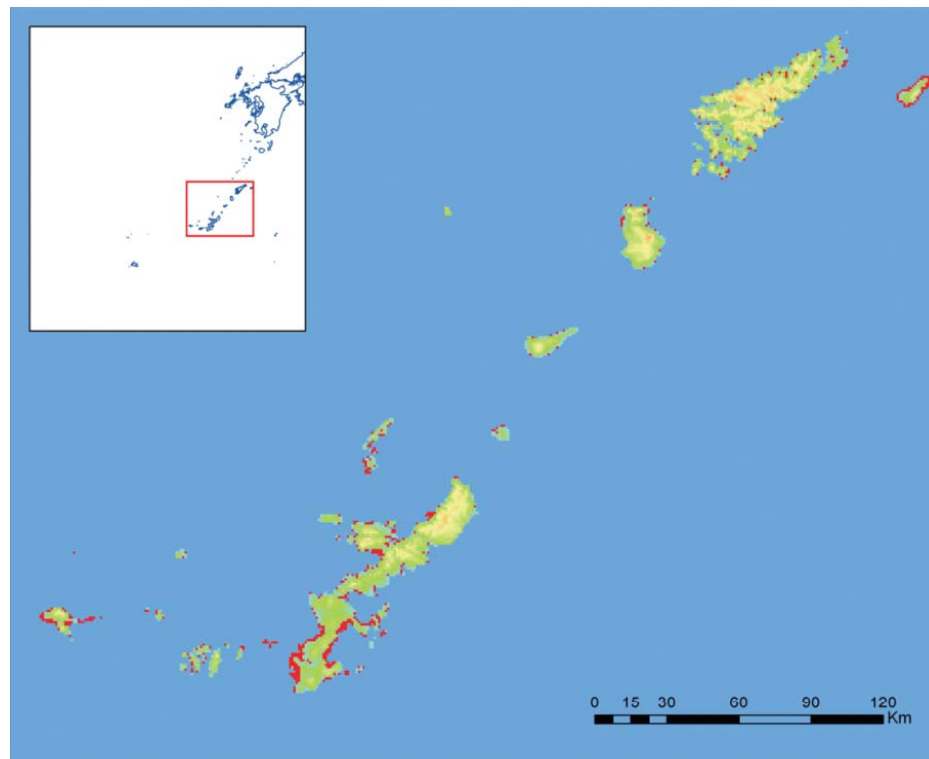


Analyses based on Global Map
contribute to ensuring equitability and effectiveness
in Climate Change Policy Framework

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)

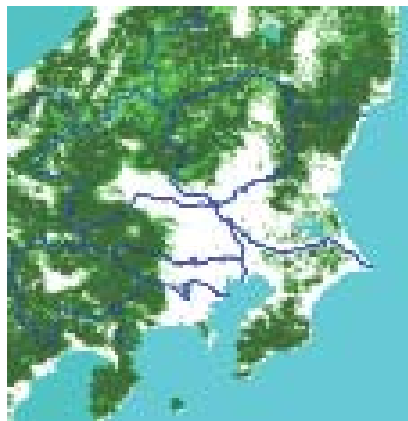
5mの海面上昇で水没する地域

使用データ:
地球地図日本第1.1版 (国土地理院)

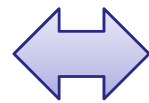
REDD

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

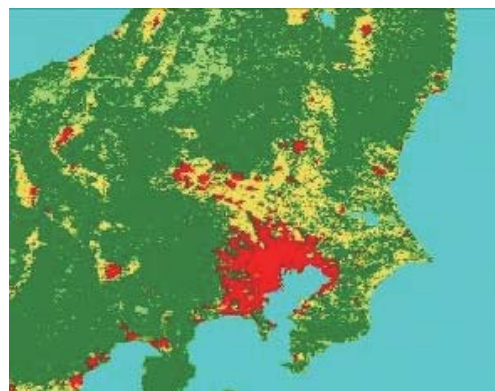
*Global Map is introduced in “IPCC GPG for LULUCF” and “2006 IPCC Guidelines for national Greenhouse Gas Inventories”



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

The screenshot displays the ISCGM website interface. On the left, a navigation menu includes links such as 'Top page', 'News Archives', 'Summary', 'Schedule', 'About Us', 'Participants', 'What is Global Map', 'Browse', 'Download' (circled in red), 'Screenshot', 'Application', 'Documentation', 'History', 'Newsletter', 'FAQ', 'Links to', and 'Sitemap'. The main content area features a 'User Login' section with input fields for 'Your ID:' and 'Password:', and a 'Login' button. Below this, a 'What's NEW!' section lists various Global Map versions and regions. A 'Please Enter Your Information' registration form is overlaid on the right, containing fields for 'E-mail Address' (with the value 'n-kishimoto@gsi.go.jp'), 'Occupation category' (set to 'Public employee'), and 'Country' (set to 'JAPAN'). The 'Purpose of Use' section includes several checkboxes, with 'Analysis, research and examination of an environment' selected. The 'Purpose of download (What kind of use)' field contains the text 'Calculation of Land cover area for GHG Inventory on LULUCF sector |'. At the bottom of the form, a 'Regist' button is circled in red.

International Steering Committee for Global Mapping

Download the Global Map Data

User Login

Your ID:
[Input Field]

Password:
[Input Field]

Login

What's NEW!

Global Map Mau...
Global Map Tunis...
Global Map V.1(C...
Global Map The B...
Global Map Syria...
Global Map Bhut...
Global Map Unite...
Global Map Mold...
Global Map Saint...
Global Map Guin...

Please Enter Your Information

Please enter required information to make registration correctly.
In order to publish a user ID and a password, Please enter all the following information.

E-mail Address [n-kishimoto@gsi.go.jp] Use letters (a-z), numbers (0-9) and symbols (@)

Occupation category [Public employee]

Country [JAPAN]

Purpose of Use

- Analysis, research and examination of an environment.
- Analysis, research and examination of fields other than environment.
- Learning materials .
- For a base map to make other maps.
- Personal use (interest).
- Others.

Purpose of download (What kind of use)

Calculation of Land cover area for GHG Inventory on LULUCF sector |

Regist Clear

Go to Registration Page

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





























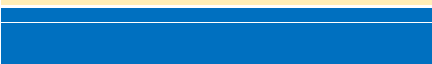











- TIFF and BIL format data are downloadable

- Detailed information about data is described in metadata

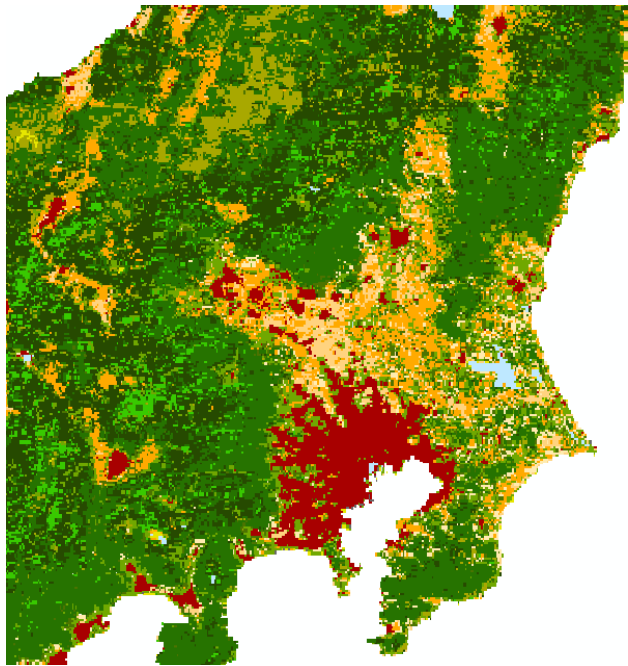
② Interpret GM 20 classes to LULUCF 6 classes

- 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

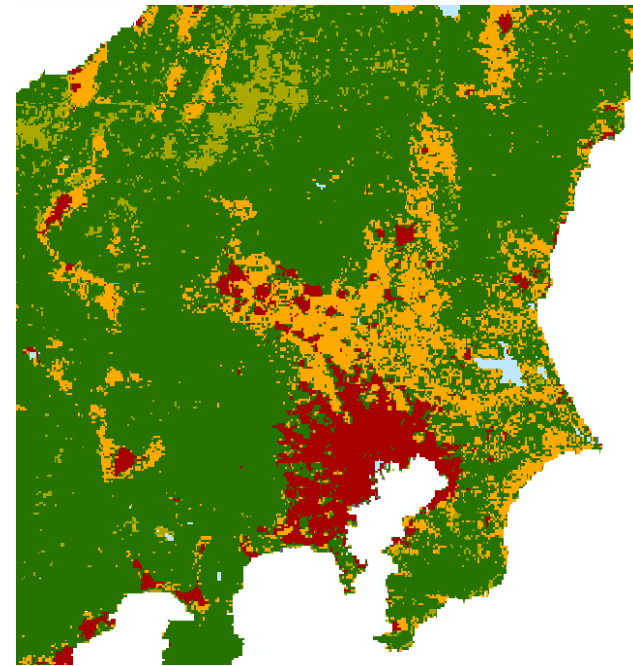
Example of interpretation Interpretation requires further consideration

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

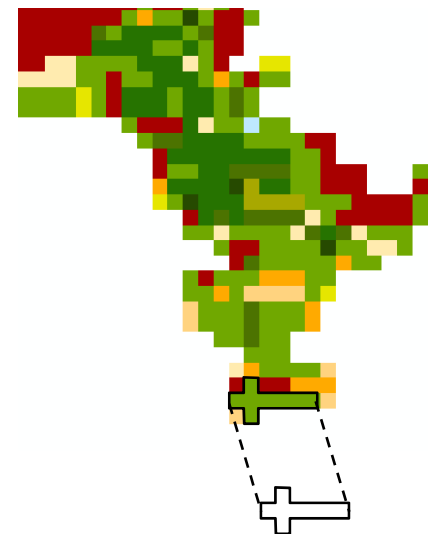
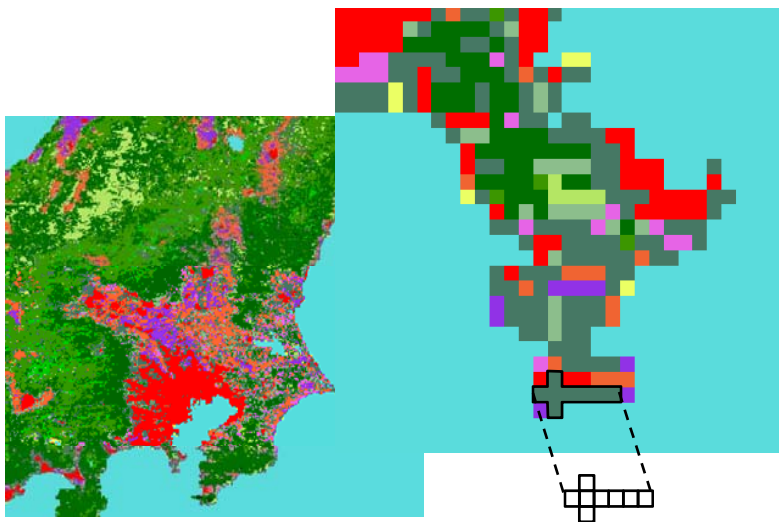


GM 20 classes



LULUCF 6 classes

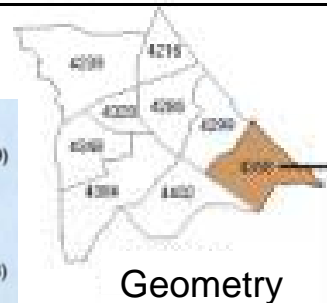
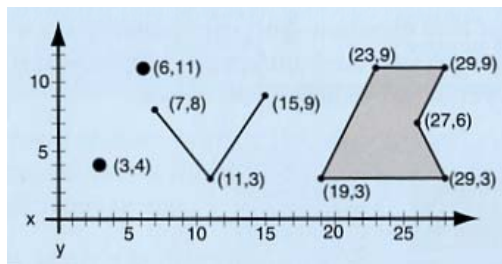
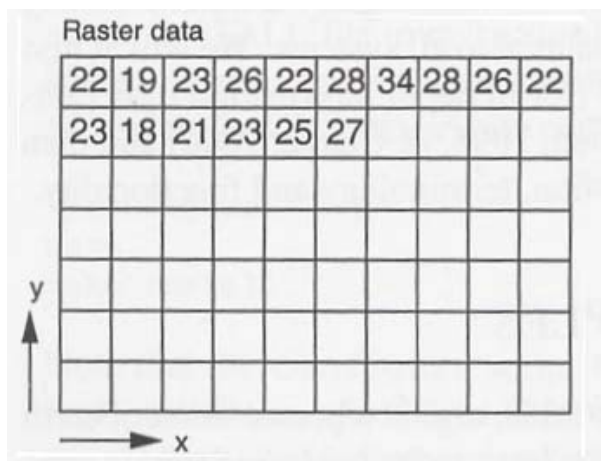
③ Convert LC data from raster to vector



Raster : Grid Cell based

Vector: areas, lines, and points

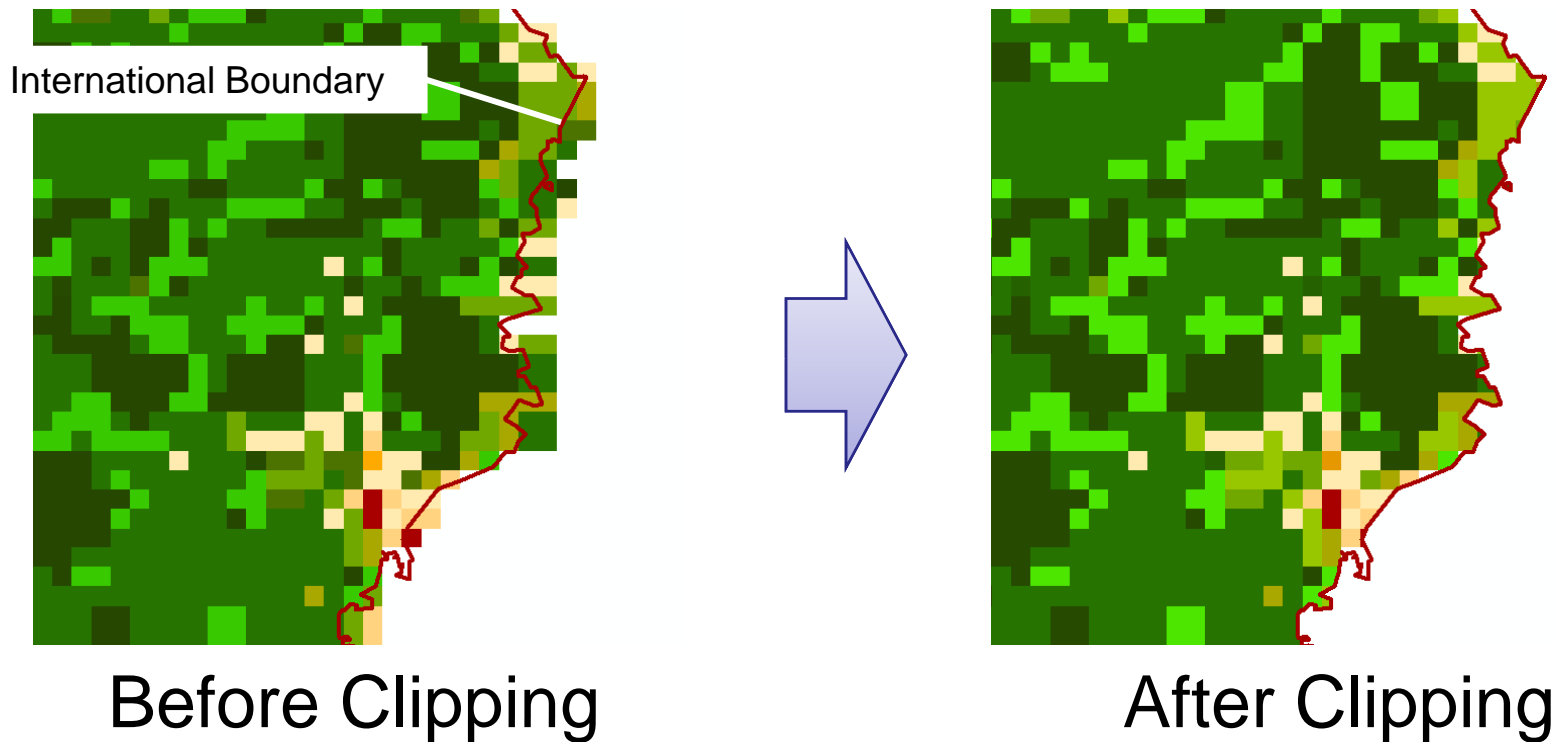
➤ can measure the area more accurately



Attribute

ID	町丁名称	面積	属性	注
4210	東郷町丁	1001	4210	320
4211	大森町丁	1040	4211	1100
4212	西郷町丁	1000	4212	400
4213	...	...	...	...
4214	...	...	...	...
4215	...	...	...	...
4216	...	...	...	...
4217	...	...	...	...
4218	...	...	...	...
4219	...	...	...	...
4220	...	...	...	...

④ Clip vector data using International boundary



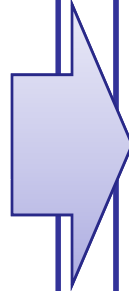
- Clip data to cut outside of the country area
- International Boundary is also available from GM dataset

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

The screenshot shows the ArcGIS Field Calculator window on the left and a Data Table window on the right. The Field Calculator is set to calculate the area of polygons. The Data Table shows the results of the calculation, with columns for Shape#, ID, GRIDCODE, area, and LULUCF. A pink arrow points from the Field Calculator to the Data Table.

Shape#	ID	GRIDCODE	area	LULUCF
10	Polygon	337948	2499613.381141	Forestland
10	Polygon	339406	1877170.180030	Forestland
16	Polygon	340814	1252934.961867	Forestland
18	Polygon	340816	1252975.301529	Forestland
18	Polygon	341589	626745.195900	Forestland
19	Polygon	343159	1253746.283533	Forestland
11	Polygon	349460	630443.219052	Forestland
18	Polygon	354508	633616.308795	Forestland
19	Polygon	365044	641431.368752	Forestland
11	Polygon	367771	643935.658245	Forestland
18	Polygon	369492	1290522.516274	Forestland
19	Polygon	369493	1290521.588753	Forestland
10	Polygon	369494	1290521.588760	Forestland
12	Polygon	369946	645628.284488	Forestland
12	Polygon	370735	646194.176105	Forestland
17	Polygon	381911	655827.209132	Forestland
19	Polygon	394426	668750.928666	Forestland
10	Polygon	405156	1355042.674094	Forestland
18	Polygon	407659	679255.591221	Forestland

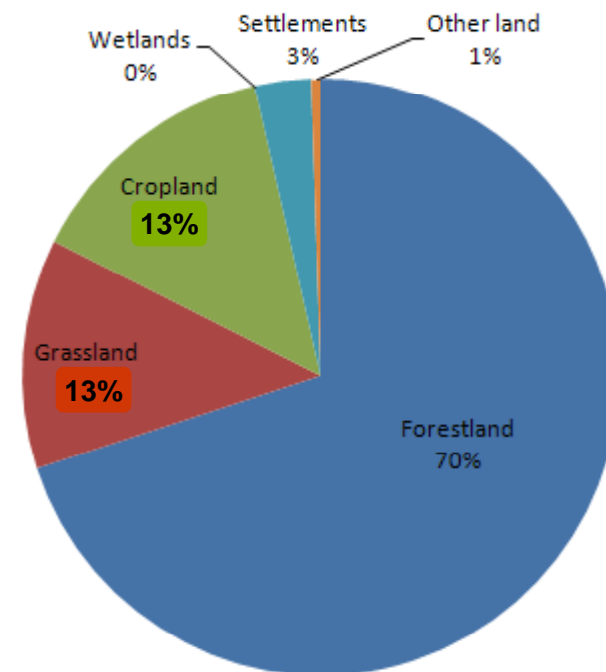
- Sum up areas of polygons of respective classes

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>

sec@iscgm.org