

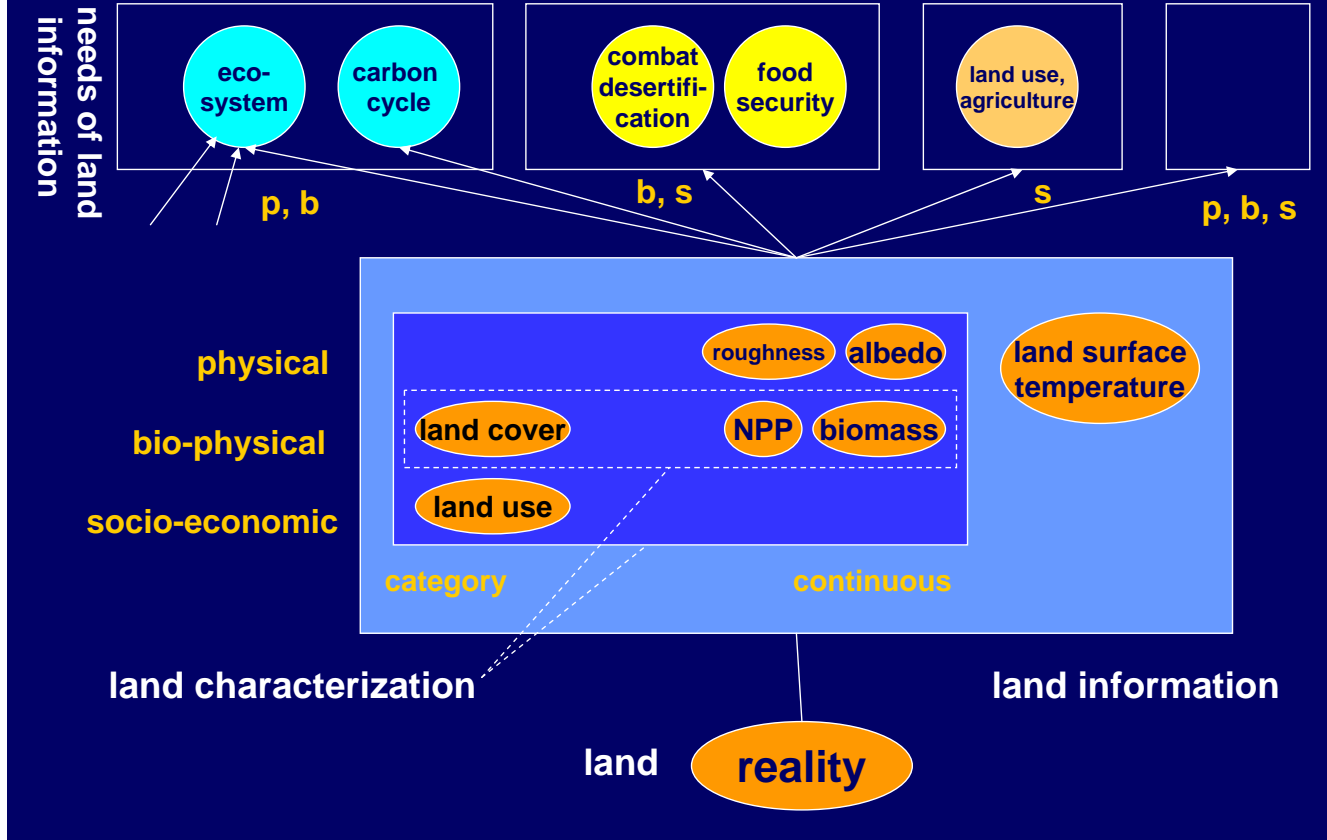
# Land Cover Mapping by GLI data



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## Outline

- needs of land cover
- global land cover projects
- GLI land cover product
  - Cooperation with “Global Mapping” project
  - legend
  - ground truth data --- need your input

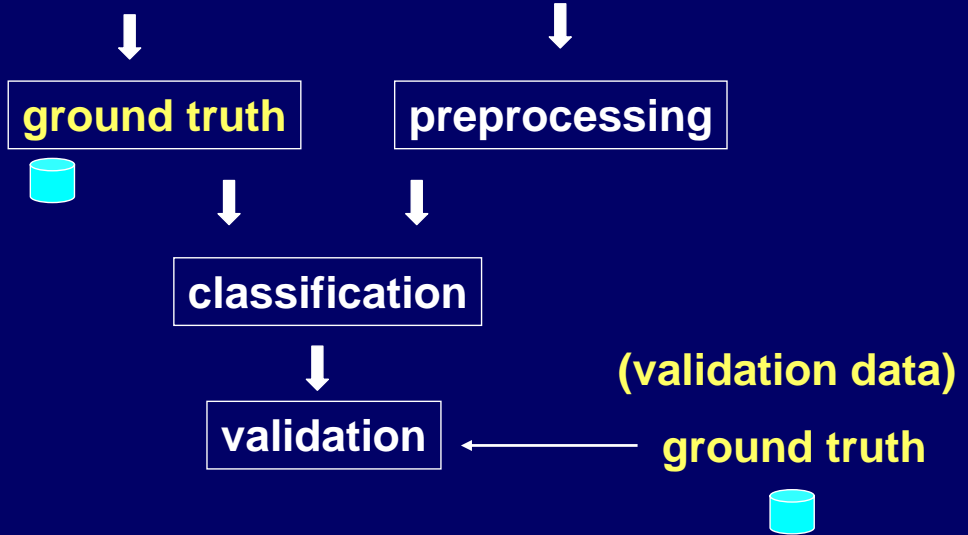


## Ongoing global land cover mapping projects

- **MODIS land cover** by **NASA USA**  
Boston Univ. Mapping every 6 months 1km
- **GLC2000 (VEGETATION)** by **JRC Europe**  
GLOBECOVER ENVISAT/MERIS 300m 2005
- **GLI land cover** by **NASDA Japan**  
250m
- **IGBP-DISCOVER ver.2** by **USGS USA**
- **Global Mapping** by **ISCGM (GSI)**  
satellite data: not yet decided 1km production by 2007
- **Global land cover network** by **FAO / UNEP**  
LCCS national to global

**data)**

- satellite image
- existing maps
- field survey
- expert's knowledge



## Flow of Land Cover Classification

ground truth :

A group of adjacent pixels which have “similar” land cover type

**Legend:** Global Mapping project legend (not yet decided)  
similar to IGBP legend and JRC legend

**GLI data:** 250 m 6 channels, NDVI, EVI

**Ground truth data:** input from Global Mapping project and other sources including the K&C group

**Preprocessing:** NASDA/EORC

**Classification:** supervised classification, combination of maximum likelihood method and decision tree method

**Validation:** qualitative validation (visual comparison with other maps) and quantitative validation (using validation data)

**GLI data:** 250 m 6 channels, NDVI, EVI

pursue better processing capability

5 scenes/day →

**Ground truth data:**

needs inputs from the K&C group

## **Land Cover Classification System (LCCS) by FAO**

- **eight basic classes based on vegetation, water, and artificial**
- **hierarchical**
- **comprehensive**
- **well defined**

- |   |   |
|---|---|
| 3. Tree Cover, broadleaved, deciduous, open                                 | 18. Mosaic: Cropland / Tree                     |
| 4. Tree Cover, needle-leaved, evergreen                                     | 19. Mosaic: Cropland / Other natural vegetation |
| 5. Tree Cover, needle-leaved, deciduous                                     | 20. Bare Areas                                  |
| 6. Tree Cover, mixed leaf type  | 21. Water Bodies (natural & artificial)         |
| 7. Tree Cover, regularly flooded, fresh (-brackish)                         | 22. Snow and Ice (natural & artificial)         |
| 8. Tree Cover, regularly flooded, saline, (daily variation)                 |   |
| 9. Mosaic: Tree cover / Other natural vegetation                            |   |
| 10. Tree Cover, burnt   |   |
| 11. Shrub Cover, closed-open, evergreen (with or without sparse tree layer) |   |
| 12. Shrub Cover, closed-open, deciduous (with or without sparse tree layer) |   |
| 13. Herbaceous Cover, closed-open   |   |
| 14. Sparse Herbaceous or sparse shrub cover                                 | 23. Artificial surfaces and associated areas    |
| 15. Lichens & Mosses  |   |
| 16. Regularly flooded shrub and/or herbaceous cover                         |   |
| 17. Cultivated and managed areas  |   |

## Sato-Tateishi (ST) land cover guideline legend

- |                                      |                      |
|--------------------------------------|----------------------|
| 1. Broadleaf Evergreen Forest        | 14. Wetland          |
| 2. Broadleaf Deciduous Forest        | 15. Lichens / Mosses |
| 3. Needleleaf Evergreen Forest       | 16. Bare Areas       |
| 4. Needleleaf Deciduous Forest       | 17. Urban            |
| 5. Mixed Forest                      | 18. Snow / Ice       |
| 6. Tree Open                         | 19. Water            |
| 7. Shrub                             |                      |
| 8. Herbaceous, single layer          |                      |
| 9. Herbaceous with Sparse Tree/Shrub |                      |
| 10. Sparse Herbaceous / Shrub        |                      |
| 11. Cropland                         |                      |

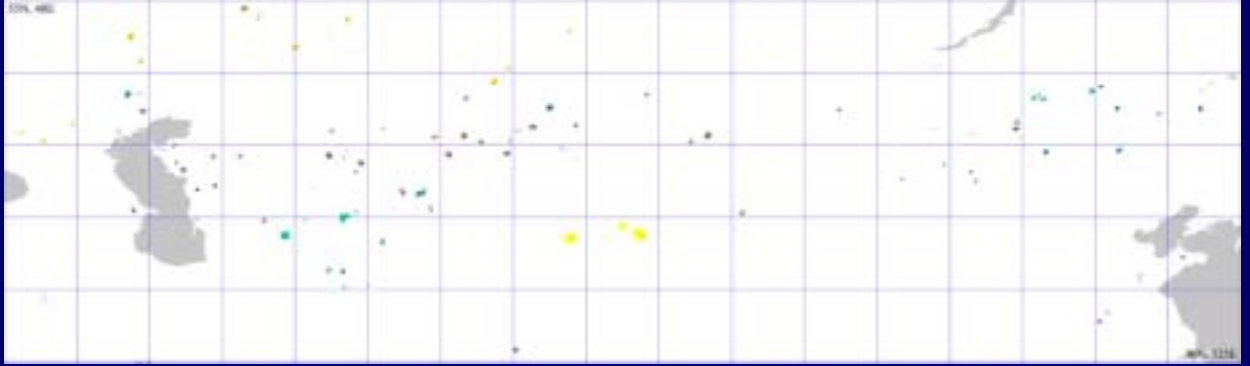
GLI Ch.	Wavelength Range[nm]	Resolution [m]	Radiance[ W/m <sup>2</sup> /sr/ mic]	[ W/m <sup>2</sup> /sr/ mic]	S/N
Ch1	375-385	1000	365	59	600
Ch2	395-405	1000	139	70	800
Ch3	407-417	1000	130	65	800
Ch4	438-448	1000	109/560#	54	800
Ch5	455-465	1000	108/624#	54	800
Ch6	485-495	1000	86	43	800
Ch7	515-525	1000	64/539#	31	600
Ch8	540-550	1000	56/549#	28	600
Ch9	560-570	1000	47	23	800
Ch10	620-630	1000	33	17	800
Ch11	661-671	1000	26	13	800
Ch12	675-685	1000	24	12	800
Ch13	673-683	1000	438	12	200
Ch14	705-715	1000	18	10	700
Ch15	705-715	1000	311	10	250
Ch16	744-754	1000	14	7	550
Ch17	759-767	1000	350	6	130
Ch18	855-875	1000	9	5	450
Ch19	860-870	1000	304	5	130
Ch20	425-495	250	624	36	200
Ch21	520-570	250	549	25	150
Ch22	630-690	250	150	14	100
Ch23	770-880	250	257	21	140
Ch24	1040-1060	1000	203	8	300
Ch25	1100-1170	1000	200	8	350
Ch26	1230-1250	1000	138	5.4	70
Ch27	1360-1400	1000	94	1.5	120
Ch28	1540-1740	250	69	5	109
Ch29	2100-2320	250	30	1.3	105
# : piecewise linear		1 km Land	250m Land		

Ch30	1.715	345	H: 300 L: 250	0.87-0.87	1800
Ch31	6.7	307	285 200	0.82-0.83	1800
Ch32	7.3	322	300 200	0.82-0.83	1800
Ch33	7.5	324	300 200	0.82-0.82	1800
Ch34	8.4	350	300 180	0.83-0.85	1800
Ch35	10.8	354	300 180	0.84-0.85	1800
Ch36	12	358	300 180	0.84-0.86	1800
		1 km land			

## Land Cover Ground Truth sites



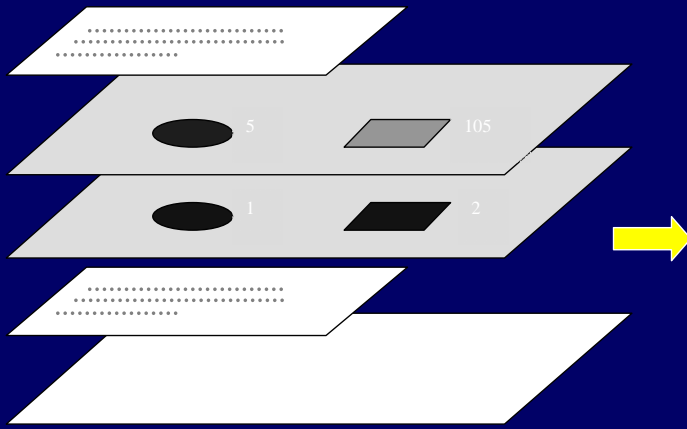
# Ground Truth in Central Asia



**Ground Truth  
in Middle East**

# Ground Truth (LCGT) data

Global LCGT database consists of multiple Regional LCGT data



Metadata of Regional LCGT data

Ground truth (GT) land cover code data

Ground truth (GT) site code data

Description of GT sites

Optional data

## Example of Description of ground truth (GT) sites

Site code: 4

Lat/long: N43d18', E141d45'

Land cover code: 1

Land cover: Paddy (70%) and soybean (30%)

Information source: Land use map 1:200,000, 1982 (By Geographical Survey Institute, Japan) + Knowledge (Tateishi and Hongo)

Site code: 17

Lat/long: N43d39'37'', E127d22'55''

Land cover code: 209

Land cover: Rice and corn

Information source: Field survey, Jul-Aug 2001 (Zhu) (FS -Point No. 20)

Site code: 34

Lat/long: Northwest direction from N53d53', E109d57.7'

Land cover code: 203



input from the K&C group

wetland, rice paddy, mangrove, (evergreen, deciduous, broadleaf, needleleaf) forest

homogeneous in 1 x 1 arc-minute (2km) at smallest, the larger the better

**Wetland and forest products** in the K&C initiative can be included in global land cover data based on the Land Cover Classification System (LCCS)

## Product 1.1

*Description:* global 250m land cover data

*Product Developers:* Ryutaro Tateishi

*Product Deliverables:* open

*Targeted End Users:* environmental scientists/policy makers

### Milestone 1.1.1

*Description* 250m land cover data of the whole Asia

*Input Data Requirements:* one-year monthly GLI 250m level 2 data of the whole Asia and land cover ground truth data of Asia

*Achievement date:* one year after the preparation of land cover ground truth data of Asia, and one year after the acquisition of one-year monthly GLI 250m level 2 data of the whole Asia

### Milestone 1.1.2

*Description* global 250m land cover data

*Input Data Requirements:* global one-year monthly GLI 250m level 2 data and global land cover ground truth data



**Thank you**