

Spatial Planning Platform Meeting

August 1st 2018

Part II Session 1

Design and Implementation of National and Regional
Planning for Inclusive Growth

Spatial info from space based technologies

RESTEC

(Remote Sensing Technology Center of Japan)

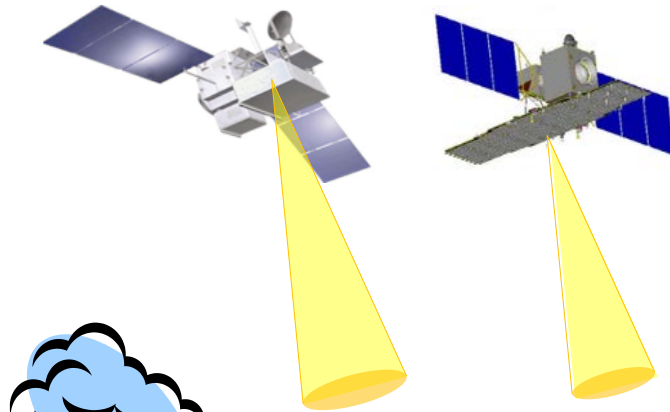
Yuzuru Kushiyama



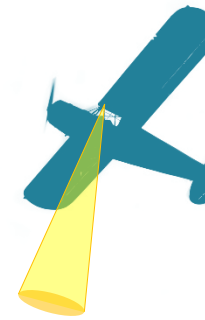
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What Remote Sensing is?

Satellite



Airplane



UAV



Rain
Atmosphere



Factory



House



Forest



Sea/Water

Remote Sensing is a measuring technology for land/sea from satellite etc.

History of RESTEC

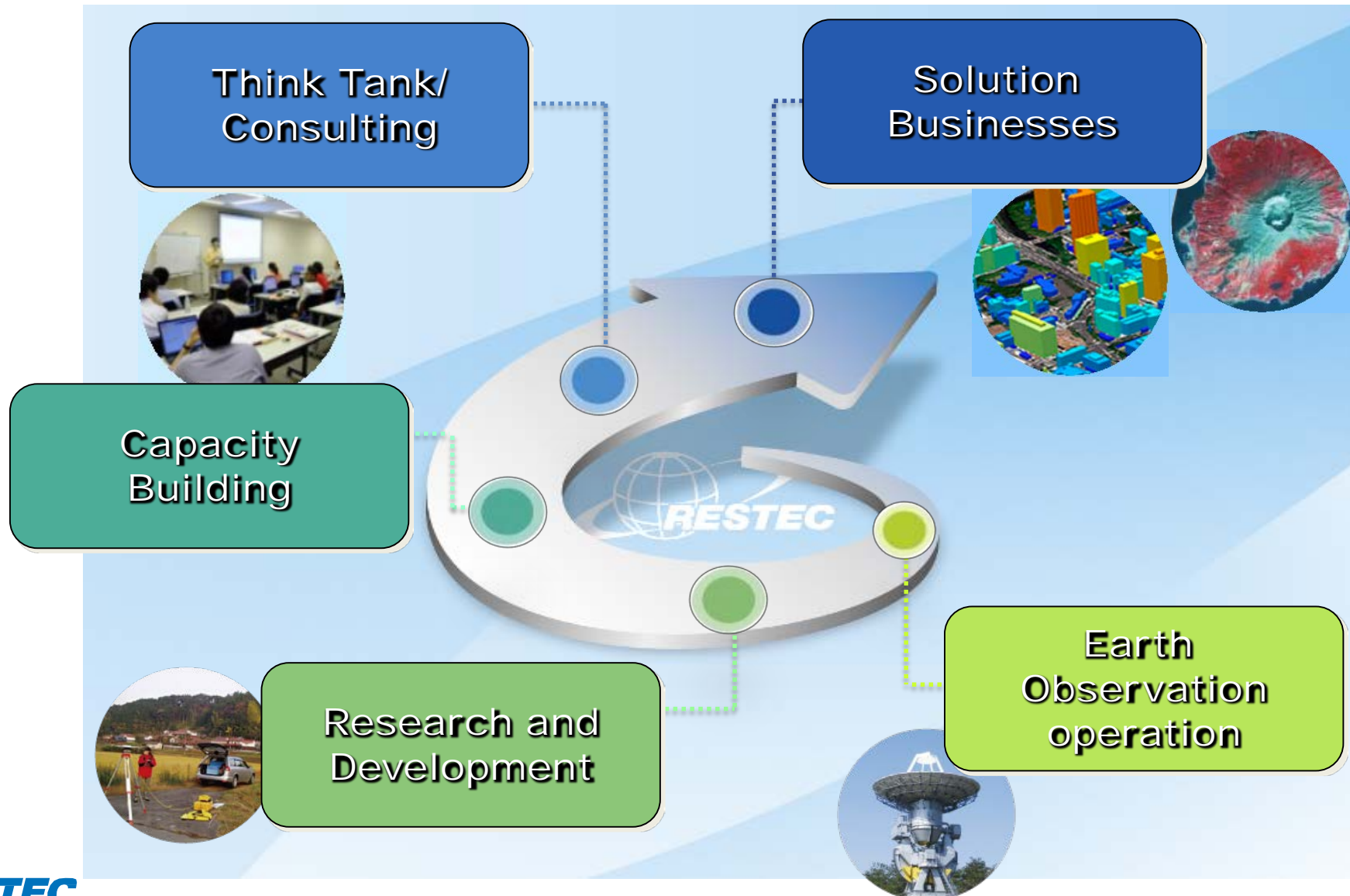
1975 Aug.	RESTEC was established as foundation
1978	Satellite data distribution business for Landsat imagery
	Remote sensing training funded by JICA ^{*1}
1979	Operational support business for NASDA ^{*2} receiving station
1998	RESTEC's ordinary remote sensing training business
2011 Sep.	Headquarters moved to Toranomom
2013	Solution Service Department was organized

*1: Japan International Cooperation Agency

*2: NASDA(National Space Development Agency of Japan)

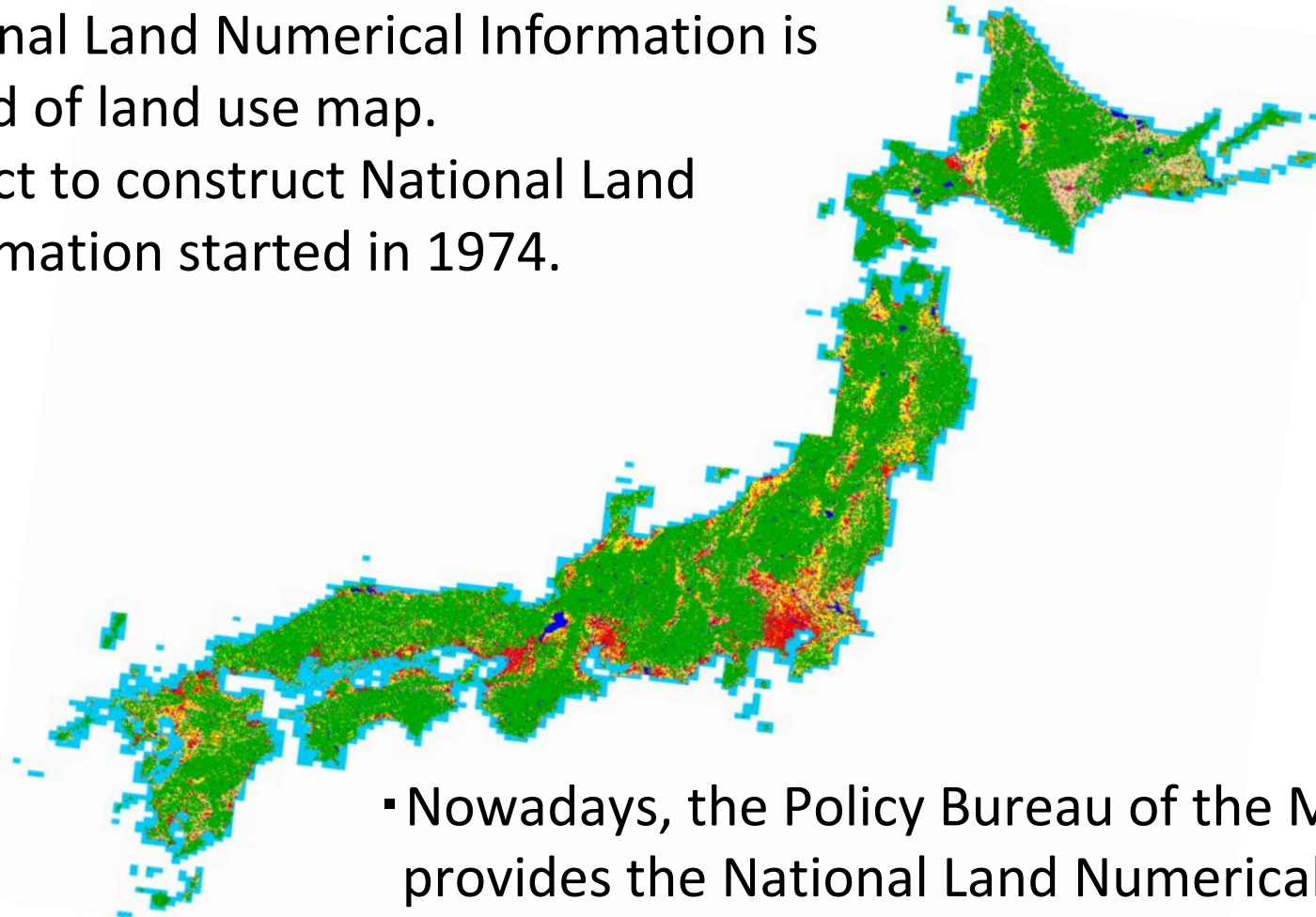
becomes JAXA (Japan Aerospace Exploration Agency) in 2003

RESTEC Five Activities



National Land Numerical Information (Land Use Map)

- National Land Numerical Information is a kind of land use map.
- Project to construct National Land Numerical Information started in 1974.



- Nowadays, the Policy Bureau of the MLIT provides the National Land Numerical Information.
- It supports national development plan, national land use planning and national spatial strategy.

What kinds of Land Use are in?

It is classified into 12 categories of usage in 100 m mesh on the map .



Land Use of Fukuoka City

Categories	Color
Paddy Field	Yellow
Other Agriculture Field	Light Orange
Forest	Green
Bare Soil	Orange
Building/House	Red
Road	Grey
Rail Road	Light Grey
Other Land Use	Brown
River/Lake	Blue
Beach	Light Yellow
Sea Water	Light Blue
Golf Course	Bright Green

History of Land Use Map

The land use map has been created from aerial photo or satellite image.

1976 : Created from topographic map and information government owns

1985 : Update

1991: Update using topographic map and satellite(Landsat) image
by image interpretation, NVI (normalized vegetation index) etc.

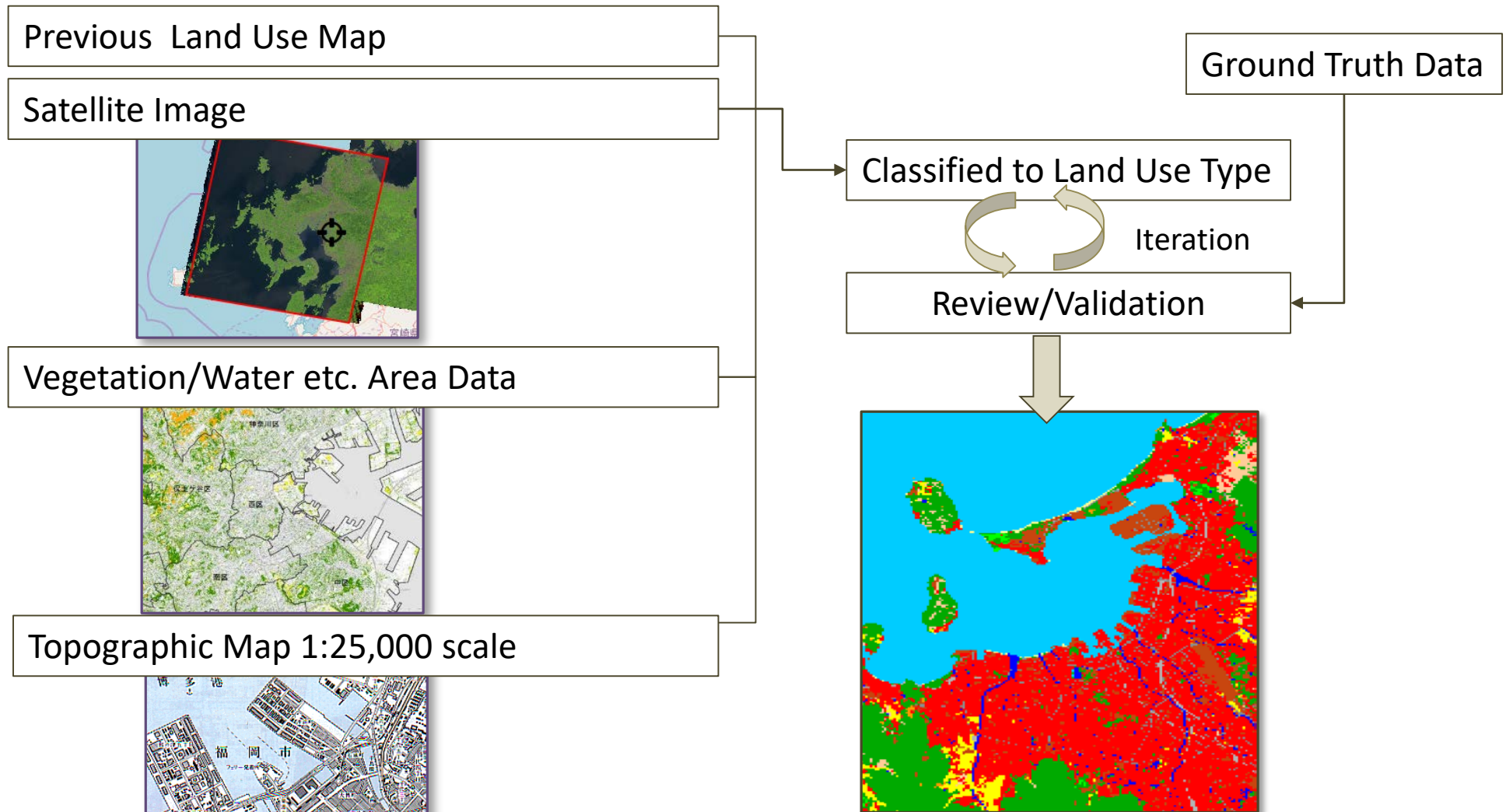
1997: Update

2006: Update using the satellite image (ALOS, ASTER)

2014: Update the satellite image (SPOT, RapidEye)

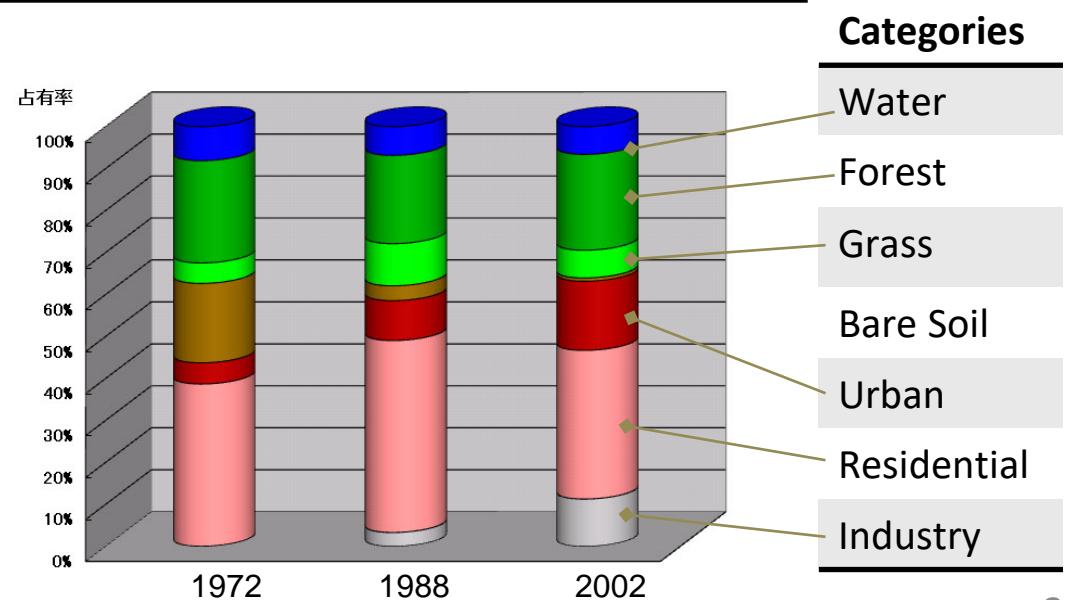
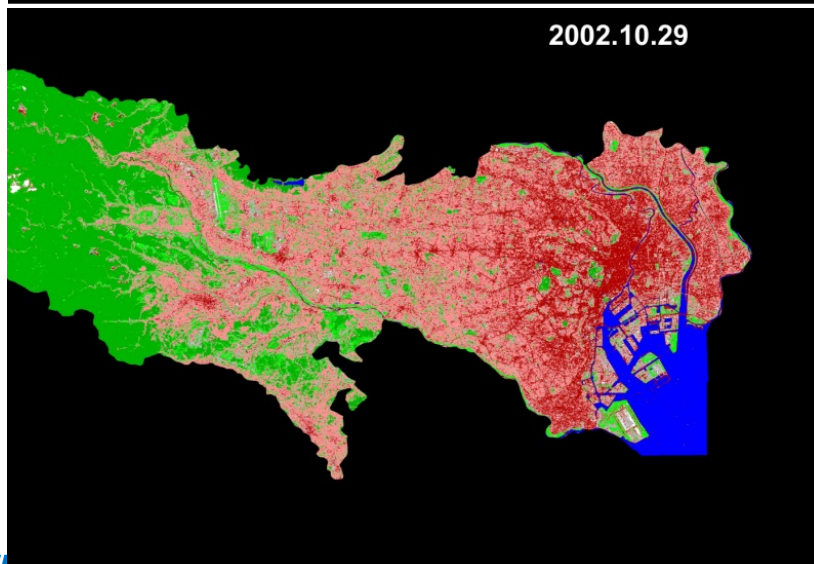
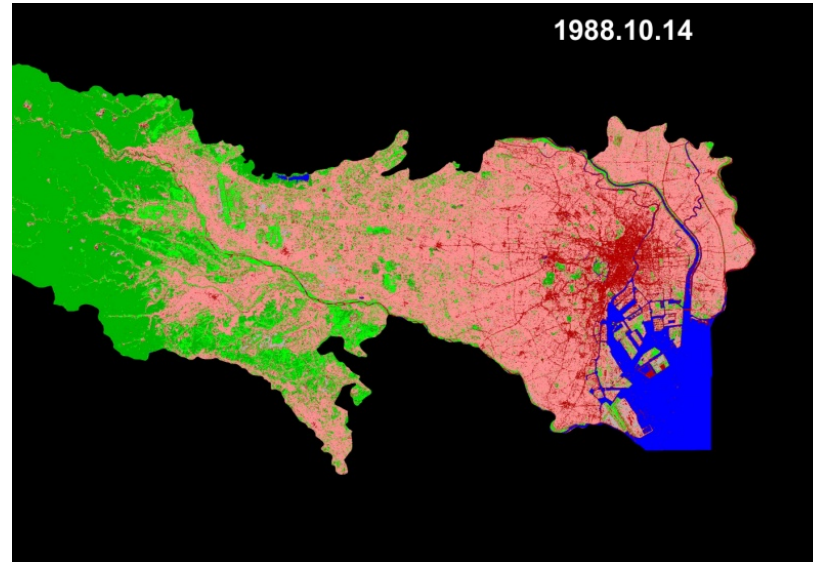
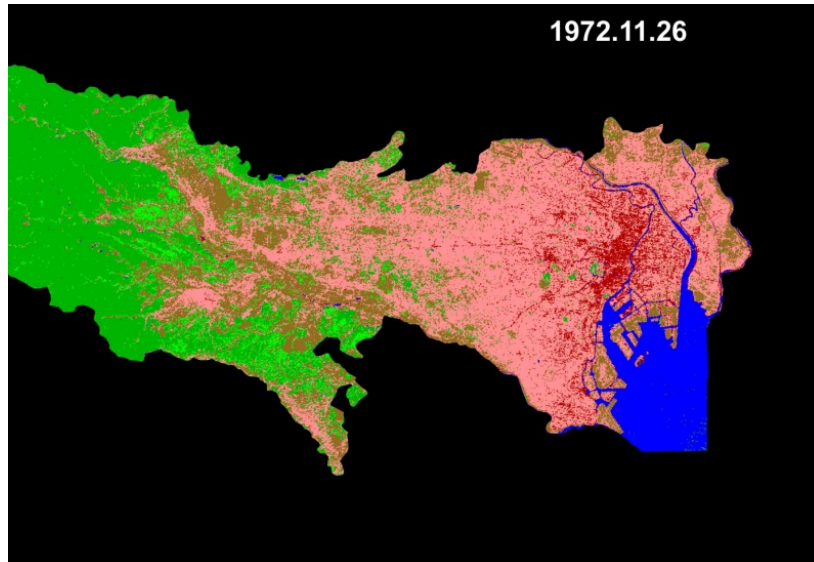
Flow Chart of Land Use Map Creation

Mesh area is classified into the categories using satellite image and topographic map etc. It is reviewed/validated using ground truth data.



Trend of Land Use in Tokyo

It is possible to monitor the trend of land use. Comparing land use map in 16yrs, we find that urban and residential increase and bare soil decreases.

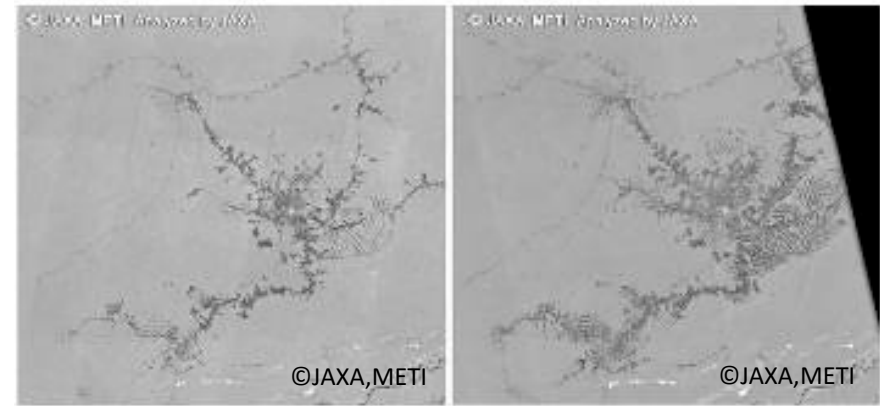
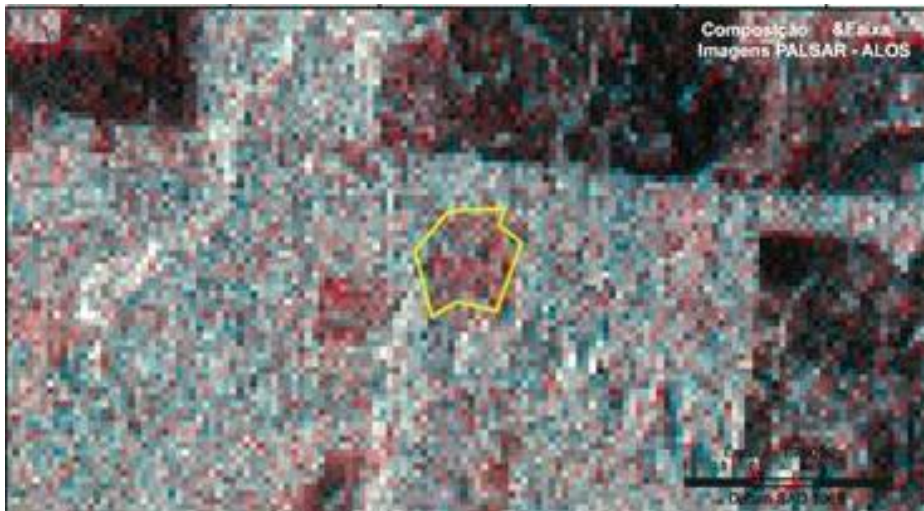


Illegal Logging Detection using Satellite Technology in Brazil

It is possible to detect logging area by using satellite data.

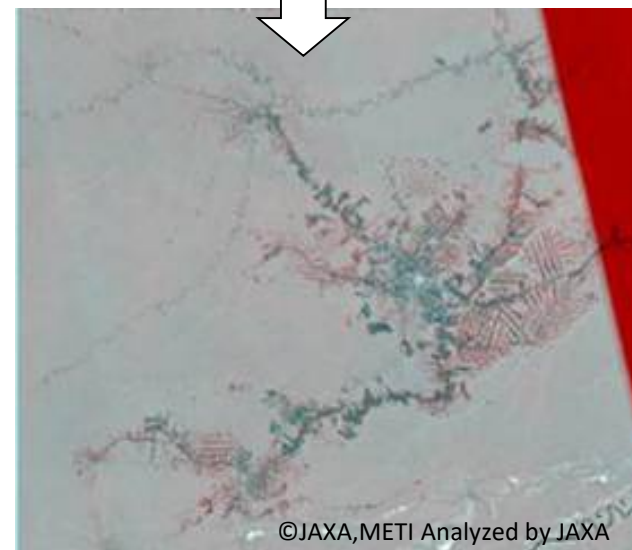
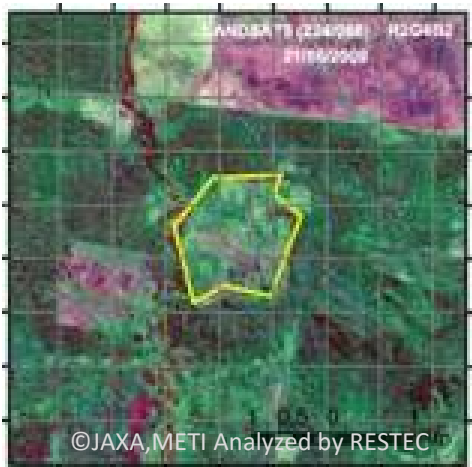
Advantages using satellite data are to detect it widely and cyclical observation.

The technology was transferred through the training program funded by JICA.



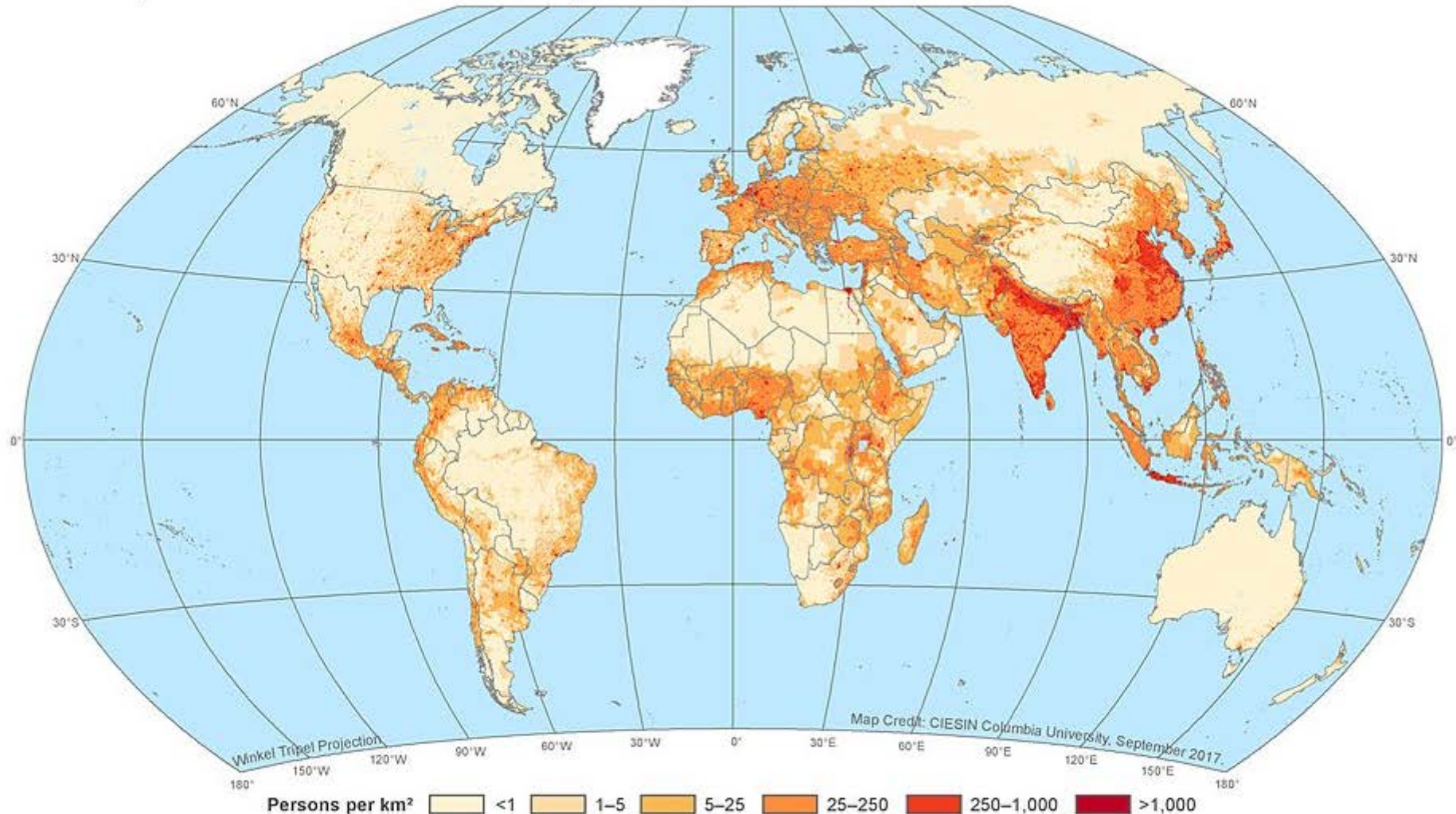
Before (JERS-1, 1995)

After (ALOS-1, 2006)



Examples of Useful Data for Land Use Planning and Monitoring

Gridded Population of the World, Version 4 (GPWv4)

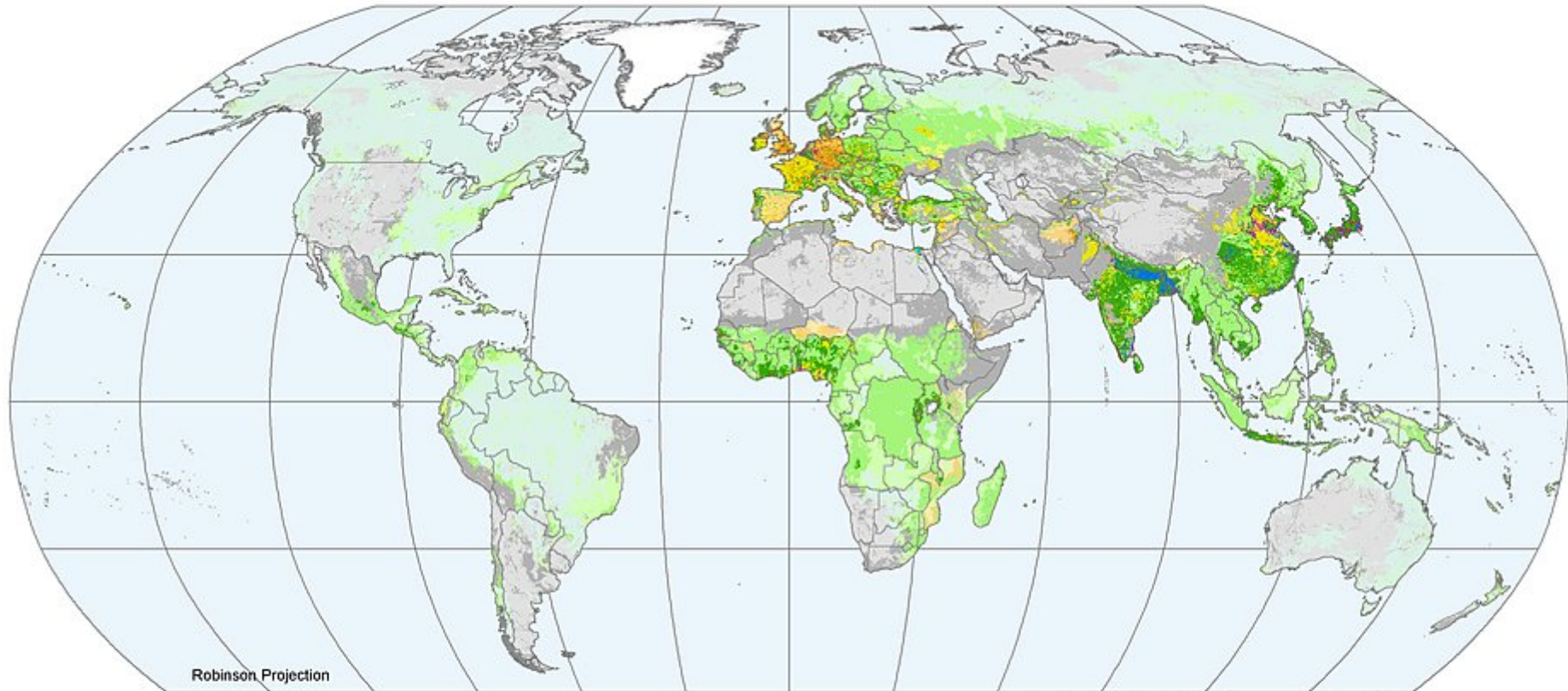


Gridded Population of the World, Version 4 (GPWv4) Population Density, Revision 10 consists of estimates of human population density based on counts consistent with national censuses and population registers for the years 2000, 2005, 2010, 2015, and 2020. A proportional allocation gridding algorithm, utilizing approximately 13.5 million national and sub-national administrative units, is used to assign population counts to 30 arc-second (approximately 1 km at the equator) pixels. The population count rasters are divided by the land area raster to produce population density rasters with pixel values representing persons per square kilometer.

Please access to NASA/Socioeconomic Data and Applications Center (sedac)
<http://sedac.ciesin.columbia.edu/data/sets/browse>

Examples of Useful Data for Land Use Planning and Monitoring

Anthropogenic Biomes



Robinson Projection

Map Credit: CIESIN Columbia University, September 2013

Anthropogenic biomes data sets describe potential natural vegetation, biomes, as transformed by sustained human population density and land use including agriculture and urbanization. Anthropogenic biome categories (Anthromes) are defined by population density and land-use intensity. The data consists of 19 anthrome classes in six broad categories.

Croplands Residential irrigated croplands Residential rainfed croplands Populated croplands Remote croplands	Dense Settlements Urban Mixed settlements	Villages Rice villages Irrigated villages Rainfed villages Pastoral villages
Rangelands Residential rangelands Populated rangelands Remote rangelands	Seminatural Residential woodlands Populated woodlands Remote woodlands Inhabited treeless and barren lands	Wildlands Wild woodlands Wild treeless and barren lands

Data Source: Ellis, E.C., K.K. Goldewijk, S. Siebert, D. Lightman, and N. Ramankutty. 2013. Anthropogenic Biomes of the World, Version 2: 1700. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). <http://sedac.ciesin.columbia.edu/data/set/anthromes-anthropogenic-biomes-world-v2-1700>.

Center for International Earth
Science Information Network
EARTH INSTITUTE | COLUMBIA UNIVERSITY

Examples of Useful Data for Land Use Planning and Monitoring

www.aw3d.jp/en/

90%

検索

FAQ | Sample request | Price list

Japanese

NTT DATA

RESTEC

News About Technology Products Case studies

Demo Contact

Anywhere in the World

▶ Concept movie

▶ Metro 3D map (Tokyo)

▶ 2m resolution 3D map (Mt. Everest)

News

List

2018/05/21 **Press release** NTT DATA and MapmyIndia to Develop First 3D Map Datasets for India

2018/02/18 **News** AW3D at Mobile World Congress Barcelona

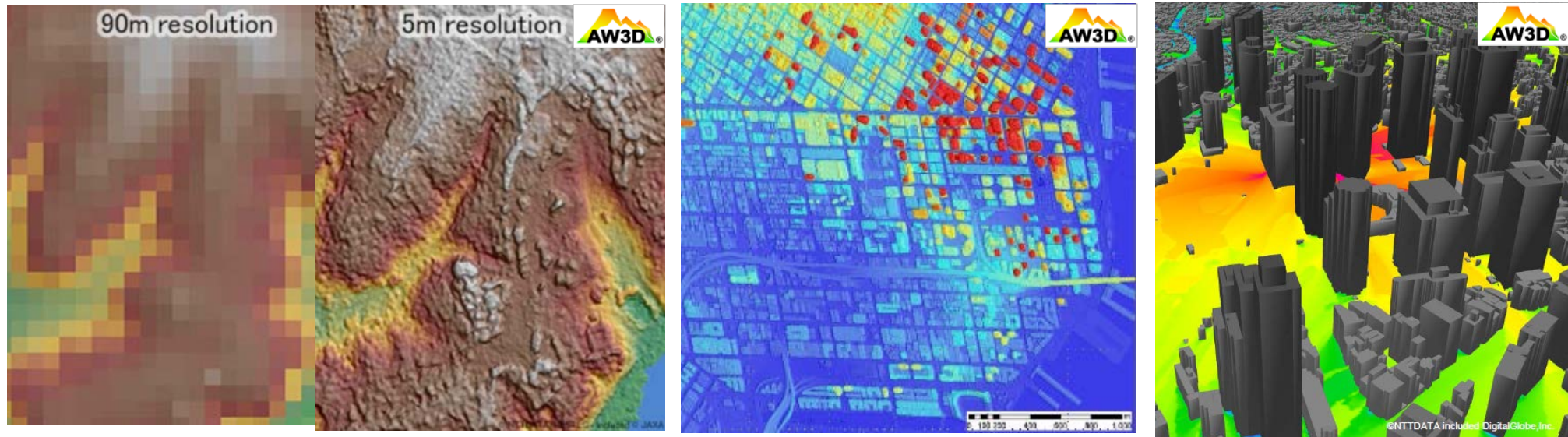
2018/02/02 **News** Asian cities have been added as off-the-shelf product!

Products

Please access to <http://www.aw3d.jp/en/>

Examples of Useful Data for Land Use Planning and Monitoring

Contribution of products/data for your interest area and scale.



SRTM*/AW3D30**
Open data

AW3D Standard
DSM***/DTM**** 5m

AW3D Enhanced
DSM/DTM 0.5-2m

AW3D Building
Polygon(Shape/Height)

Topography
Country/Province level

Topography and building etc.
City/town/village level

Landscape simulation
Urban planning etc.

Country scale



Micro-Scale


- * SRTM: Shuttle Radar Topography Mission
- ** AW3D: Advanced World 3D Map – 30m
- *** DSM: Digital Surface Model
- **** DTM: Digital Terrain Model

Please access to <http://www.aw3d.jp/en/>

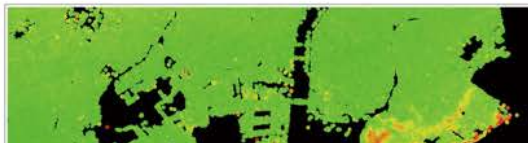
World 3D Topographic Data (AW3D)




Thank you for your attention.



Forest
Japan's Top Professionals Monitor Forests around the World from Space



Infrastructure
Detecting Dangerous Spots in Social Infrastructure in their early stages



Agriculture
Using Satel and Solve t

Please access to our web site.
<https://www.restec.or.jp/en/>

