GROUP ON EARTH OBSERVATIONS

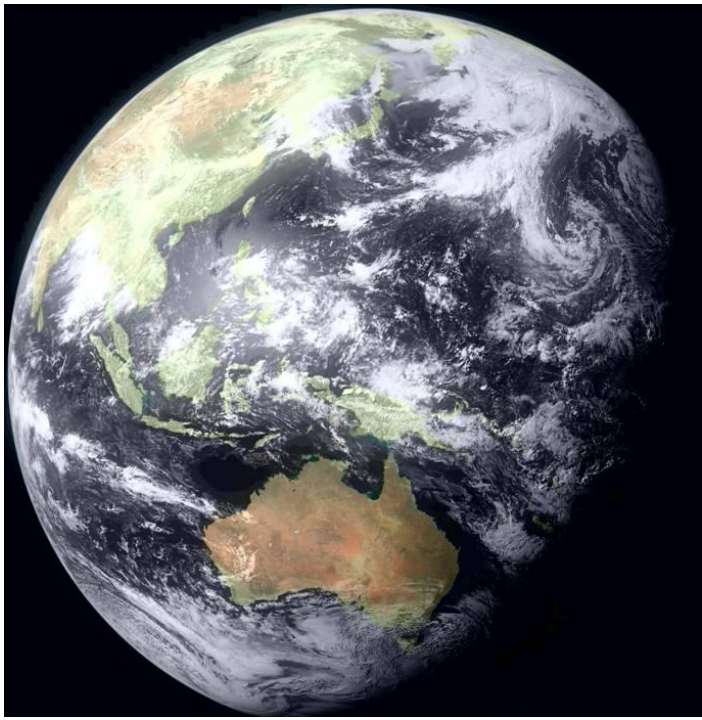
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Satellite Earth Observation: Powerful Tool for SDG monitoring

Chu Ishida
Japan Aerospace Exploration Agency

Features of Satellite Earth Observation

- Data is uniform, local to global, near real-time, archived
- Complements many in-situ and other data sources
- It is 'Big Data' – large volumes available
- Internationally coordinated constellations of satellites to improve observation frequency and to meet new user requirements
- With modeling, able to predict global to local phenomena of the Earth system



Applicability of Satellite EO for SDG Indicators

Indicator No.	Potential and indicative indicators	Potential Contribution of Satellite EO
Goal 1. End poverty in all its forms everywhere		
5	Losses from natural disasters, by climate changes and non-climate-related events, by urban/rural (in US$ and live lost)	**Rapid damage assessment**
Tier 2.	[Disaster Risk Reduction Index] to be developed	
Goal 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture		
10	Crop yield gap(actual yield as % of attainable yield)	**Rice production estimation**
15	Annual change in degraded or decertified arable land	**Rice planting area estimation**
Goal 3. Ensure healthy lives and promote well-being for all at all ages		
34	Mean urban air pollution of particulate matter(PM10 and PM2.5)	**Air pollution monitoring**

Applicability of Satellite EO for SDG Indicators (cont'd)

Indicator No.	Potential and indicative indicators	Potential Contribution of Satellite EO
Goal 6. Ensure availability and sustainable management of water and sanitation for all		
50	Percentage of population using basic drinking water, by urban/rural (modified MDG indicator)	**Precipitation**
54	[Reporting of international river and authorities on trans boundary river-shed management] – to be developed	**Basin precipitation**
Tier 2.	[Indicator on Integrated Water Resources Management (IWRM)] – to be developed	
Goal12. Ensure sustainable consumption and production patterns		
80	Aerosol optical depth (AOD) ※Satellite data	**Aerosol optical depth**
Goal13. Take urgent action to combat climate change and its impacts		
85	NET GHG emissions in the Agriculture, Forest and other Land use(AFOLU) sector (tCO2e)	**Global GHG concentration**
Tier 2.	GHG emissions intensity of areas under forest management(GtCO2e/ha)	**GHG flux**
Goal 15.		
89	Annual Change in forest area and land user cultivation	**Forest monitoring**

GROUP ON EARTH OBSERVATIONS

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Disaster Damage Assessment

ADB

Image from Open street map

Base maps
(Layers of houses, infrastructure, roads, etc.)

+

GIS Analysis

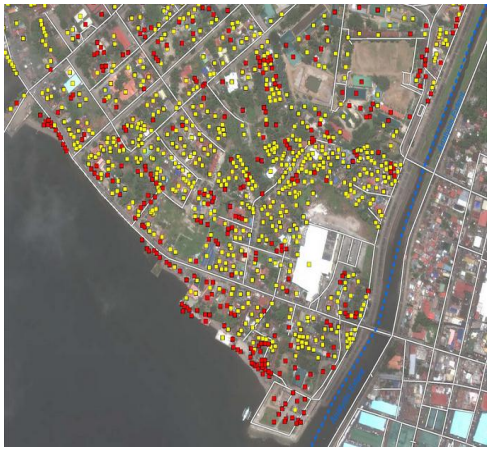
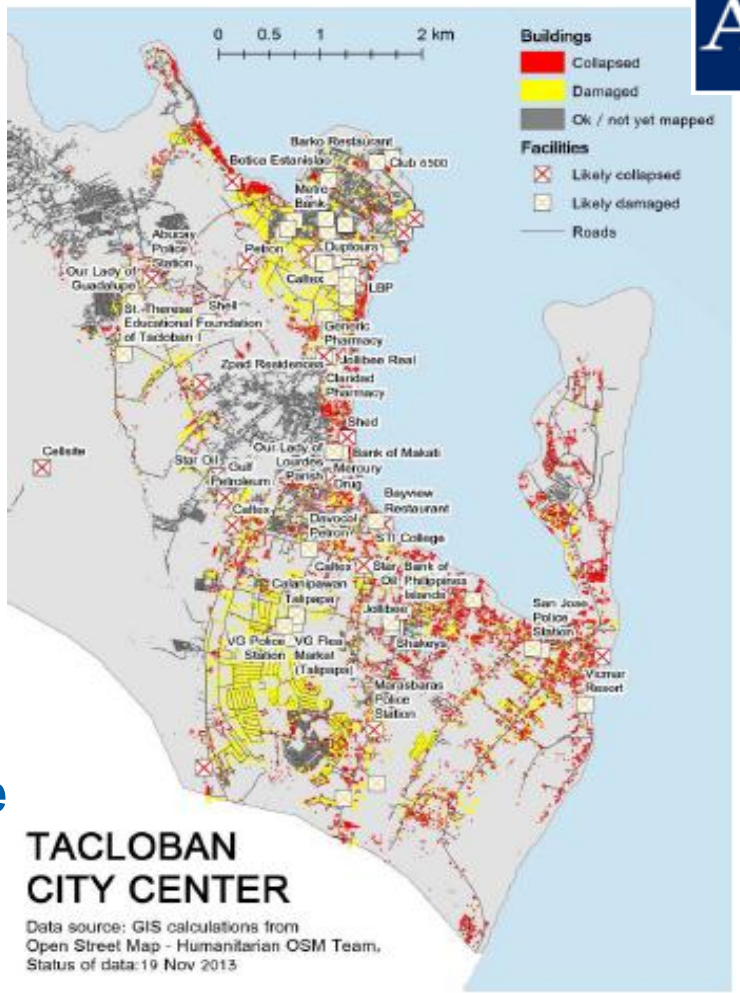


Image from International Charter

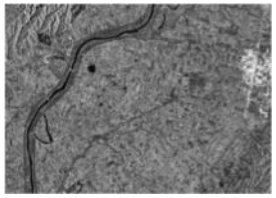
Damaged infrastructure by visual check of satellite imagery



1. Number of damaged infrastructure
2. Damaged infrastructure maps

Rice Production Estimation

Time series SAR

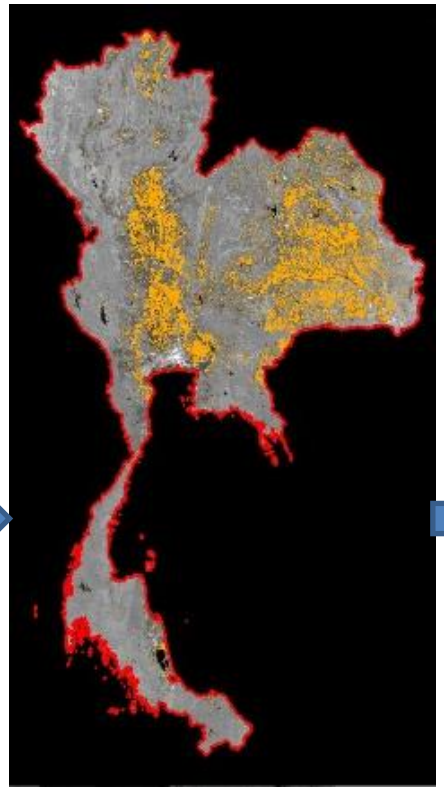


Dark (planting)

Bright (Harvesting)

Rice cultivated area

Rice Cultivated Area Mapping by SAR



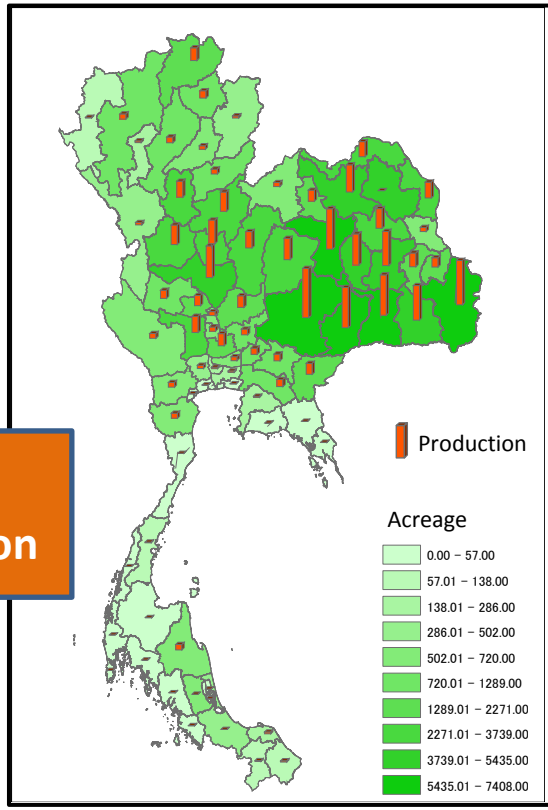
Model + met info

Statistical info.

Yield

Rice Production

Rice Production Estimation in Thailand

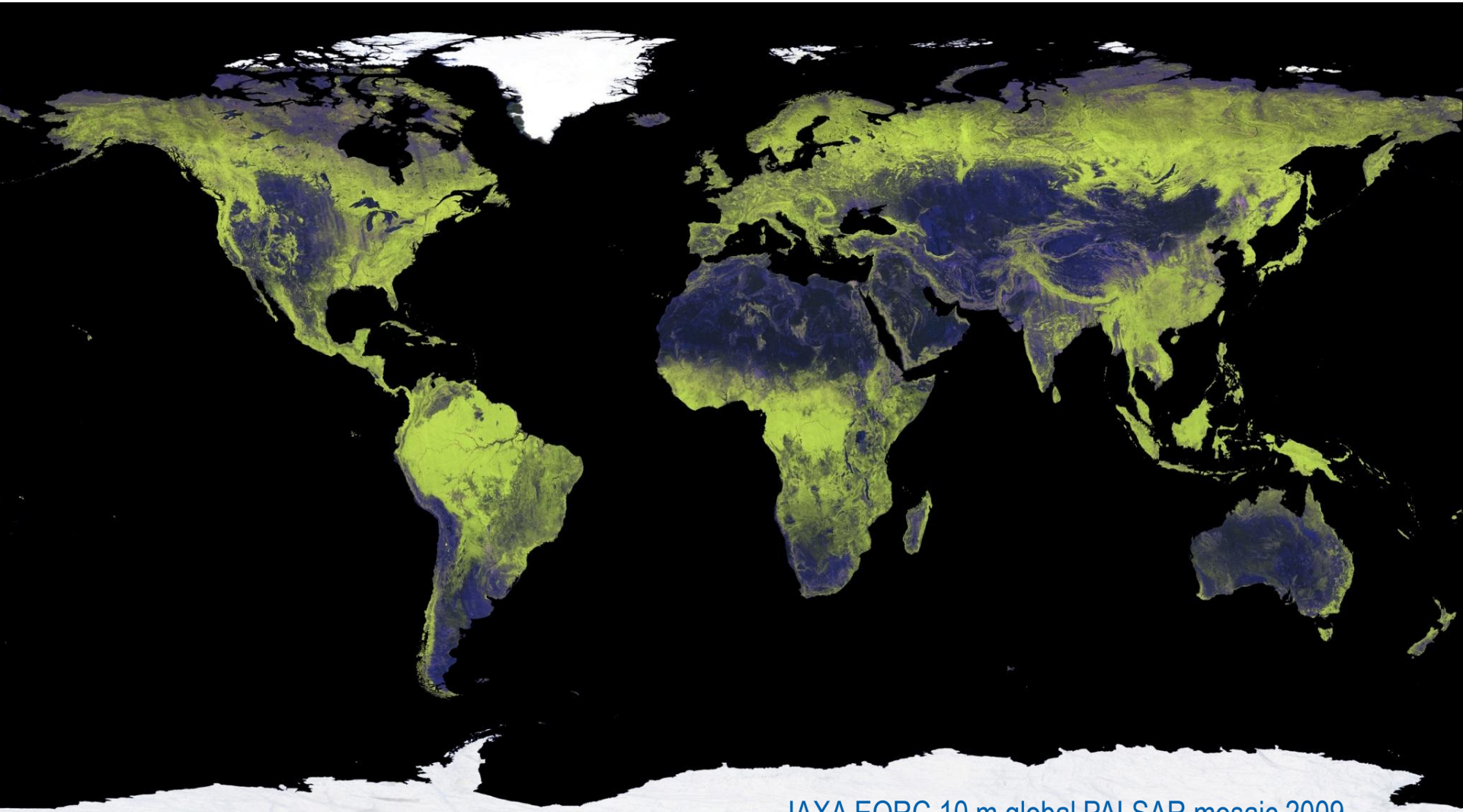


GROUP ON EARTH OBSERVATIONS

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Forest/Non-forest mapping

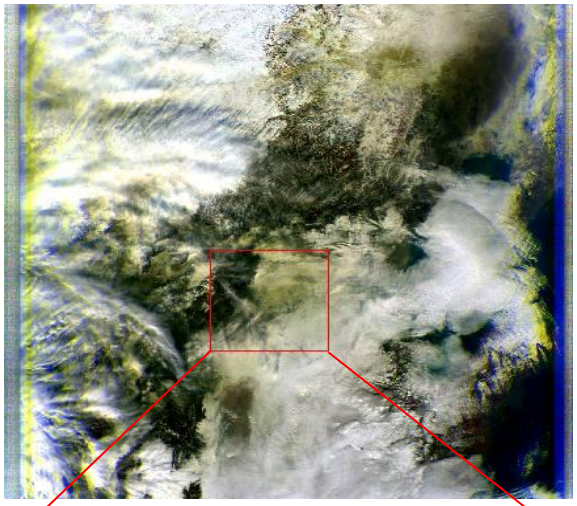
JAXA generates global forest map annually with ALOS-2 satellite.

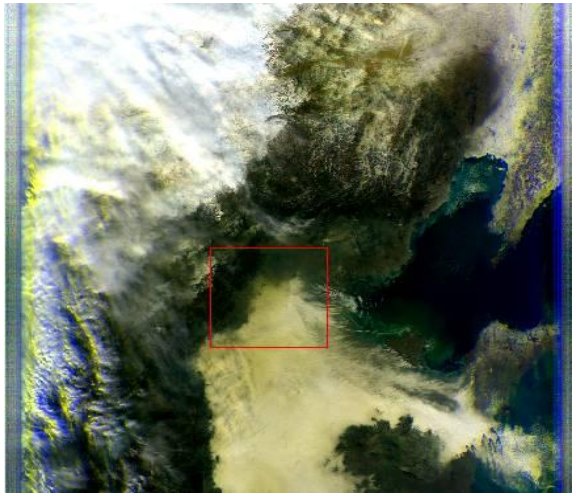


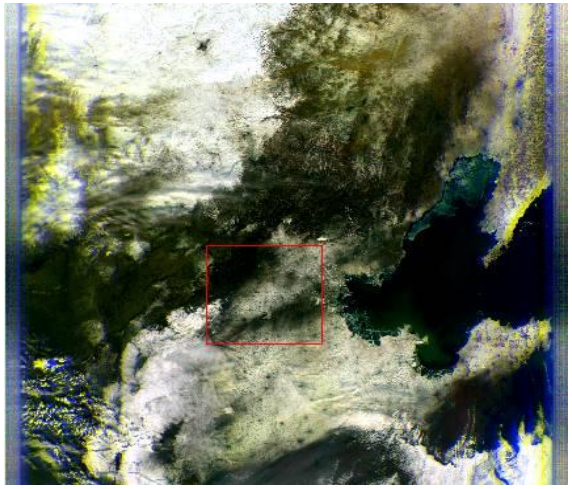
JAXA EORC 10 m global PALSAR mosaic 2009

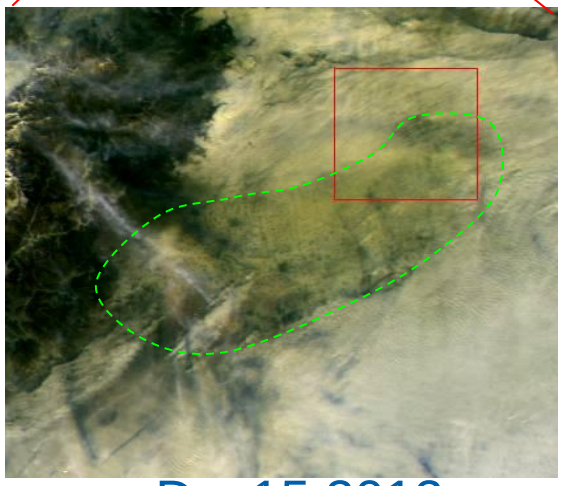
Air Pollution Monitoring

Air pollution in Beijing observed by GOSAT.

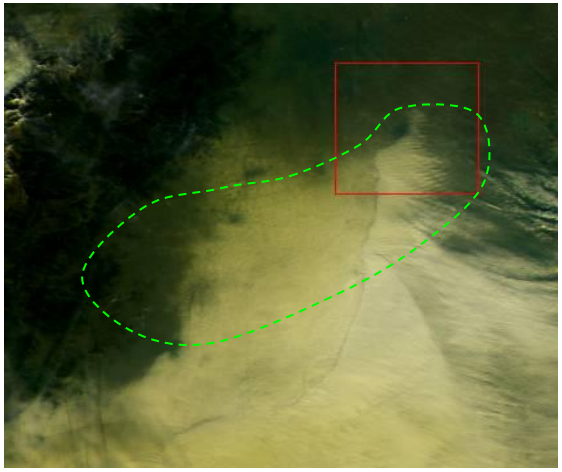




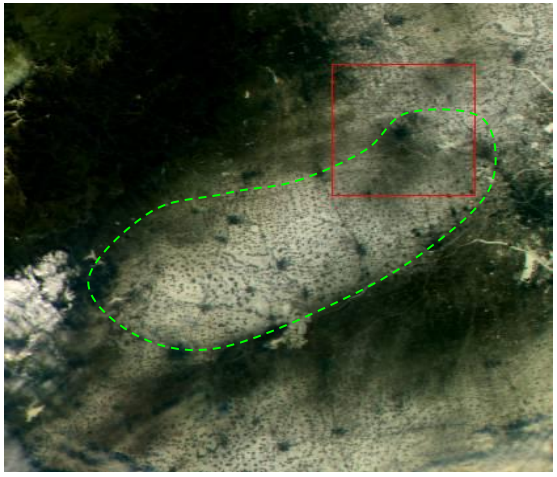




Dec15,2012



Jan 14,2013



Feb 04,2013

Summary

- Comprehensive, coordinated and sustained satellite Earth observation can improve SDG indicators monitoring, both directly and indirectly

- Space agencies, through international coordination bodies, GEO and CEOS, would welcome ongoing dialogue with the SDG community on how satellite data can help.

GROUP ON EARTH OBSERVATIONS

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Thank you