

Drafting Committee for the '*Asia-Pacific Plan of Action for Space Applications for Sustainable Development (2018-2030)*

China

Bangkok, Thailand
31 May - 1 June 2018

Priority themes

*Social
development*

*DRR and
Resilience*

*Climate
Change*

*Management
of Natural
Resources*

Connectivity

Energy

Targeted actions

Action Area 1

*Research and knowledge
sharing*

Action Area 2

*Capacity building and technical
support*

Action Area 3

*Regional norms and standards
/ intergovernmental platform*

Asia-Oceania Global Earth Observation System of Systems (AOGEOSS)

- Asia-Oceania GEOSS---a **regional** cooperation initiative with **broad involvement** to strengthen comprehensive ability of **Earth observation and applications for sustainable development**. As the member of ESCAP and co-leading country of AOGEOSS, China focuses on the regional collaboration in Asia-Pacific area, especially the **Priority Themes**;
- involve all 3 action area



Engage with and Coordinate all stakeholders, partners and sponsors working together on Earth observation activities in Asia Oceania region;



Provide a **platform** for regional countries to **advance data sharing and services**;



Investigate user needs and address gaps on implementation of GEOSS **and develop technological approaches**;



Establish **regional collaboration network** by **technology supporting and knowledge sharing**;



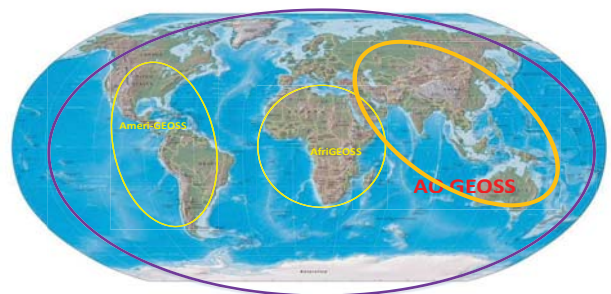
Utilize infrastructure, resources and capacity to **develop integrated and sustained observations**;



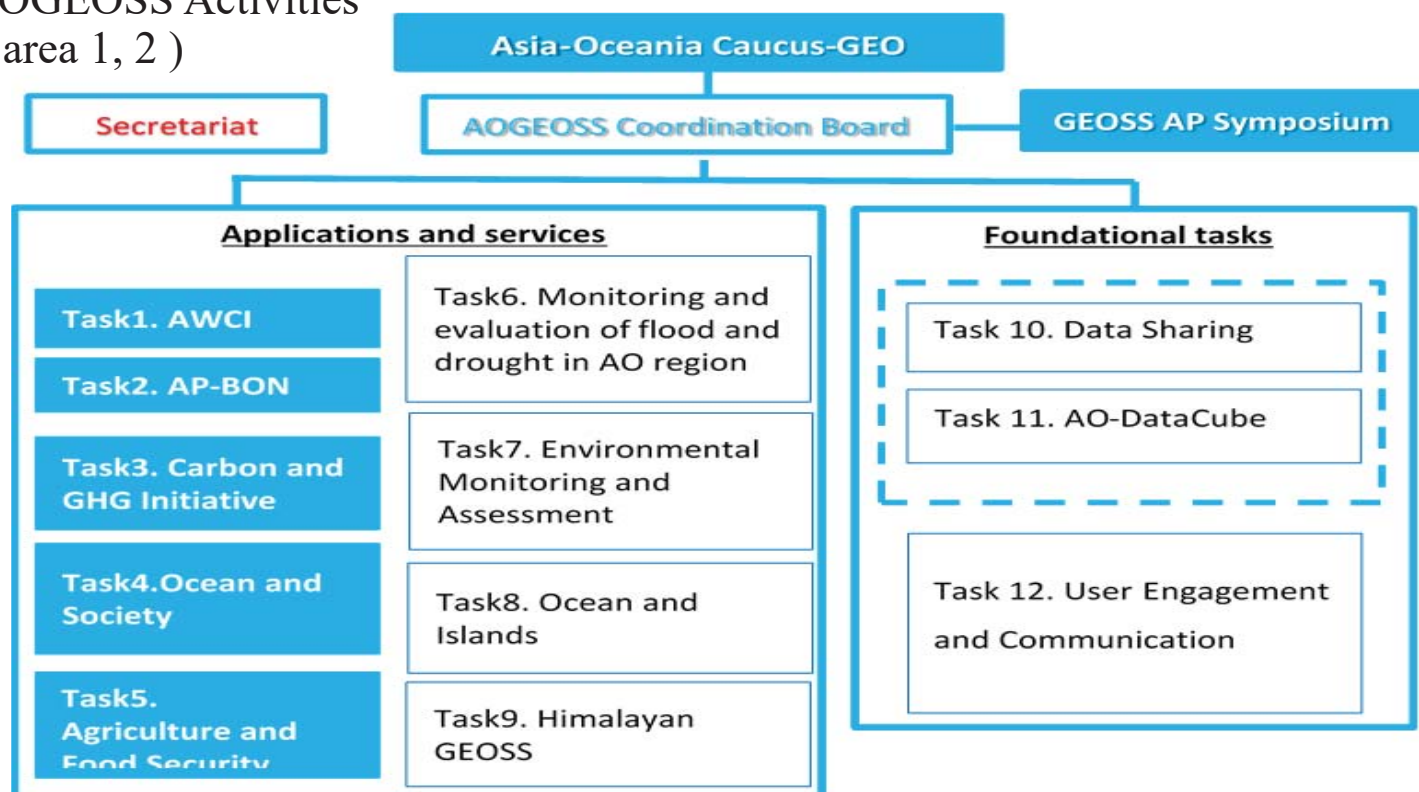
Support decision-making and regional sustainable development with Earth observation information.

AOGEOSS

- AOGEOSS initiative was launched in the GEO-XIII on November 2016 and included in GEO work plan 2017-2019.
- Participation:
GEO Members and countries in AO region(12):Australia, Bangladesh, China, India, Japan, Korea, Laos, Mongolia, Myanmar, Nepal, Pakistan, Vietnam.
POs and other societies(13): **UNESCAP**, UNEP-IEMP, UNESCO-HIST, WMO, CEOS, ICSU/Future Earth, ICSU/IRDR, ICIMOD, POGO, ISDE, ISPRS, GRSS, APSCO.
- **Technical training (Action area 1):**



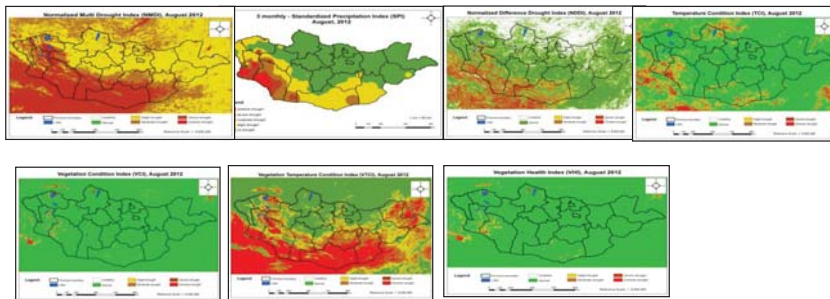
AOGEOSS Activities (area 1, 2)



task	theme	involve Priority Themes
1	Asian Water Cycle Initiative (AWCI)	2, 3, 4
2	Asia Pacific Biodiversity Observation Network (AP BON)	2, 3
3	Carbon and GHG Initiative	3
4	Ocean and society	1, 2
5	Agriculture and Food Security	2
6	Monitoring and evaluation of flood and drought	2
7	Environment Monitoring and Assessment	3
8	Ocean and island	1, 2, 3, 4
9	Himalayan GEOSS	1, 2, 3

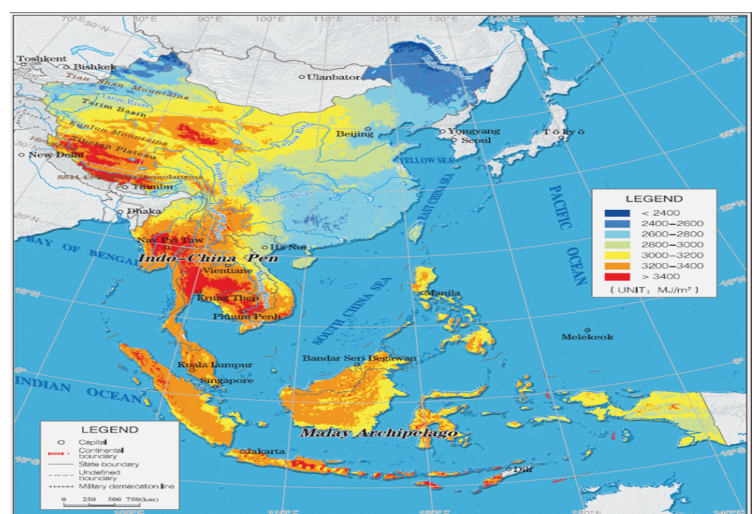
The framework of UNESCAP regional cooperative mechanism for drought monitoring and early warning

- China is one of the two regional service nodes
- Provided space-based data and capacity building assistance for effective drought monitoring and early warning to pilot countries such as Mongolia, Sri Lanka, Kingdom of Cambodia
- Technical training (Action area 1)



Global Ecosystems and Environment Observations: Annual Reports from China (GEOARC)

- Main Aims
 - Cope with global climate change and international cooperation
 - The 2030 Agenda for Sustainable Development
 - Develop and share global datasets
 - Focuses on regional and global scale
 - Analyze data and release report
 - Focuses on global ecological environment factors
 - Provide consultations and help decision making



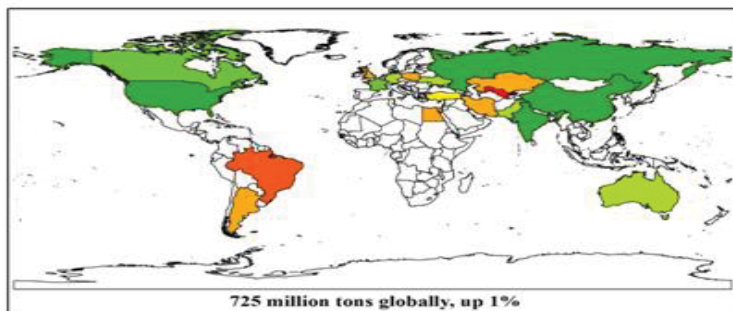
Distribution Pattern of Natural Elements of Ecological Environment in China-ASEAN

GEOARC

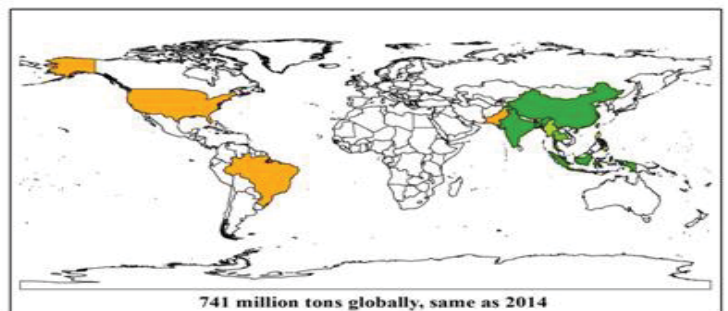


- Since 2012, including 8 subjects, 15 reports.
- Support global change studies and international cooperation via GEO.

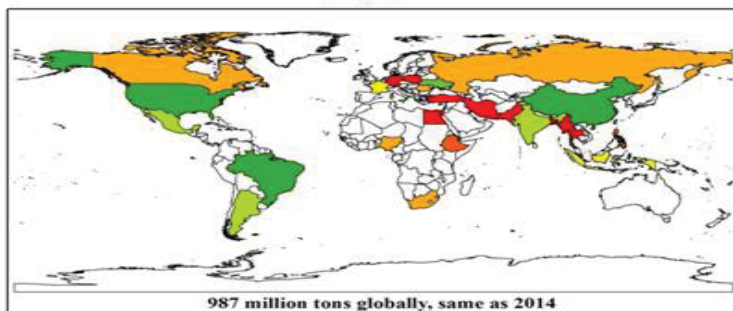
Reports list
Growth Conditions of Global Terrestrial Vegetation (2012, 2013)
Terrestrial Surface Water Areas (2012,2013)
Urban and Rural Resident Land Cover Distribution between 2000-2010 (2013)
Supply Situation of Maize, Rice, Wheat and Soybean (2013, 2014, 2015, 2016)
Large Area Wetlands of International Importance (2014)
Africa Land Cover (2014)
China-ASEAN Ecological and Environment Conditions(2014)
'The Belt and Road Initiative' Ecological and Environmental Conditions (2015)



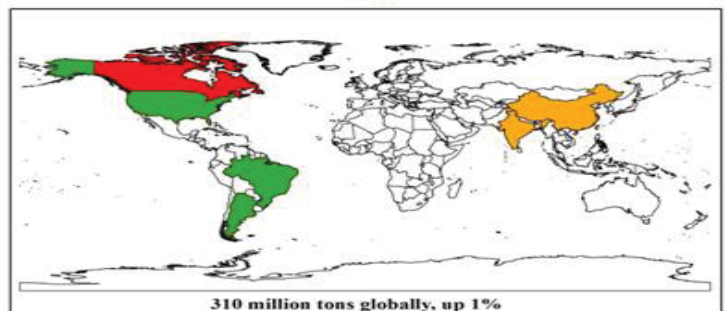
Wheat



Rice



Maize



Soybean



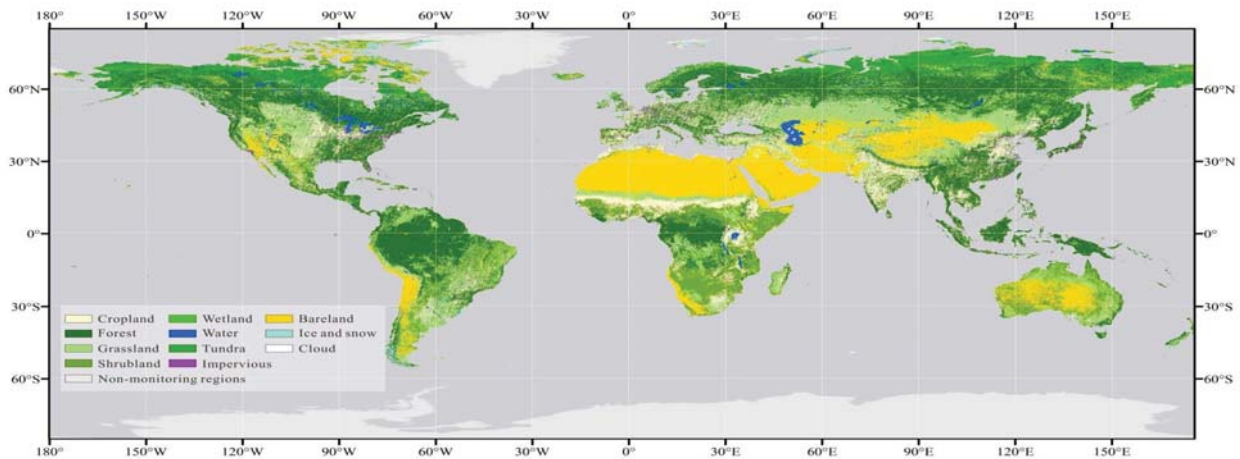
Legend (Units: 1000 tons)



Production Outlook of Wheat, Rice, Maize and Soybean in 2015 for 31 Countries

FROM-GLC 2015

Finer Resolution Observation and Monitoring - Global Land Cover (FROM-GLC) 2015



FROM-GLC 2015 product

GEOARC 2017

Two reports were released in GEOARC 2017

- The Belt and Road Initiative Ecological and Environmental Conditions
- The Impacts of Global Natural Disasters on Vegetation



GEOARC 2017

‘The Belt and Road Initiative’ Ecological and Environmental Conditions

- A comprehensive analysis was conducted in various respects, such as the conditions of terrestrial ecosystems, **ecological environment** and **development conditions** of critical urban areas, **road connectivity** conditions, status of terrestrial **solar energy resources**, **water budget** of land and **typical Marine disasters** in key ocean areas.



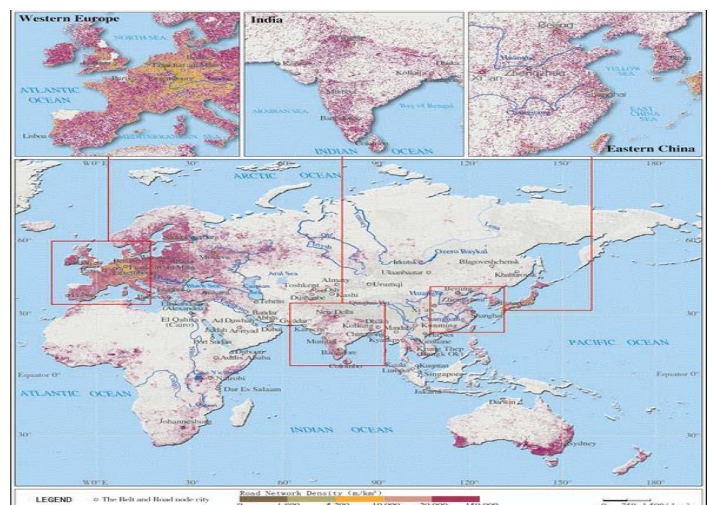
The remote sensing monitoring regions of the ecological environment over the 'Belt and Road'

GEOARC 2017

The Belt and Road Initiative Ecological and Environmental Conditions

Road connectivity conditions

- Road network density distribution and road capacity
- Road accessibility of economic corridors
- Impact of road on landscape pattern



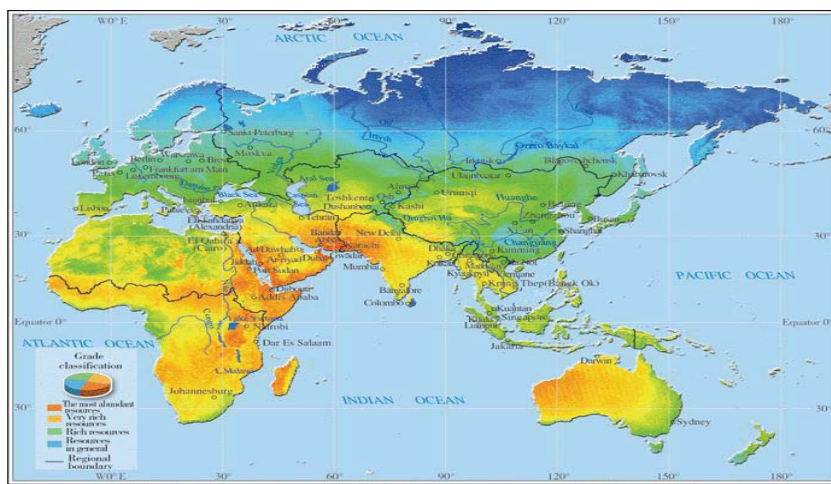
Distribution of road connectivity conditions in monitoring area

GEOARC 2017

The Belt and Road Initiative Ecological and Environmental Conditions

Status of terrestrial solar energy resources

- The spatio-temporal distribution of solar radiation
- Status of forest ecosystem
- Photovoltaic power potential and development status



Distribution of solar energy resources level of the 'Belt and Road' region in 2015


GEOARC 2017 data sharing list

Type of data set	No.	Name of data set
'The Belt and Road Initiative' Ecological and Environmental Conditions	1	Landsat based land cover product for 2015 in the Belt and Road Initiative area
	2	The potential of solar power generation in the Belt and Road Initiative area
	3	The plant potential productivity in the Belt and Road Initiative area
	4	Evapotranspiration product over the Belt and Road region by ETMonitor for 2015
	5	1 km Mean Leaf Area Index Product over the Silk Road Economic Belt and the 21st-Century Maritime Silk Road for 2015
	6	1 km Max Fractional Vegetation Cover Product over the Silk Road Economic Belt and the 21st-Century Maritime Silk Road for 2015
	7	1 km anomaly of PAR, TEM, VPD stress factor over the Silk Road Economic Belt and the 21st-Century Maritime Silk Road for 2015
	8	Forest Above-ground Biomass Map in the Belt and Road area, 2015 (1km)
	9	RoadDensity_B&R_2016
	10	B&R City island data
	11	The annual frequency of disastrous waves over the ocean on the Belt and Road region
The Impacts of Global Natural Disasters on Vegetation	12	The dataset of the typical drought disasters' impacts on terrestrial vegetation
	13	Datasets of earthquake disaster impacts on vegetation
	14	The terrestrial vegetation datasets affected by typical forest fire
	15	Typical major flood disaster impacts on terrestrial vegetation data sets
Data download URL: http://www.chinageoss.org/en/index.jsp		

CO₂ observation satellite of China

TanSat

Global CO₂ observation and monitoring






Payload: integrated design, including two scientific instruments

CO₂ Sounder
 3 bands: 0.758 – 0.778 μm 1.594 – 1.624 μm 2.042 – 2.082 μm
 Spectral resolution: $< 0.044 / 0.081 / 0.103 \text{ nm}$ @ 3 bands respectively
 SNR: $> 360 / 250 / 180$ @ 3 bands respectively
 Space resolution: $2\text{km} \times 1\text{km}$
 Swath: 20km

Cloud and Aerosol Polarimetry Imager:
 5 bands: 0.38/0.67/0.87/1.375/1.64 μm
 Polarization measurement: 0° & 60° & 120° @ 0.67/1.64 μm
 Space resolution: 500m
 Swath: 400km

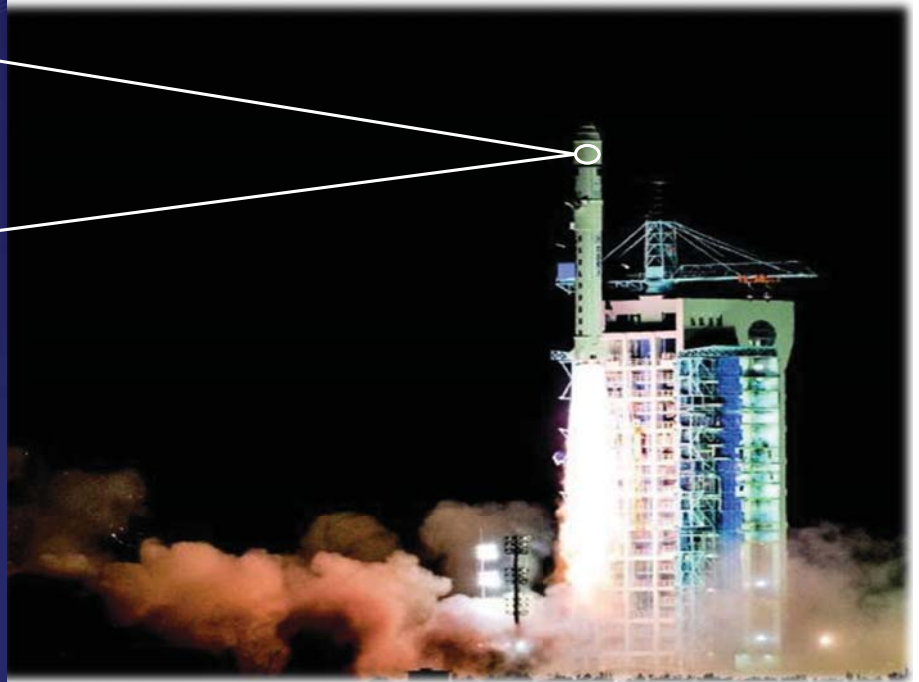
Observation mode:
 Nadir mode: High resolution observation over the land
 Sun-glint mode: High SNR observation over the sea
 Target mode: Observation to specific surface targets, such as ground-based validation sites

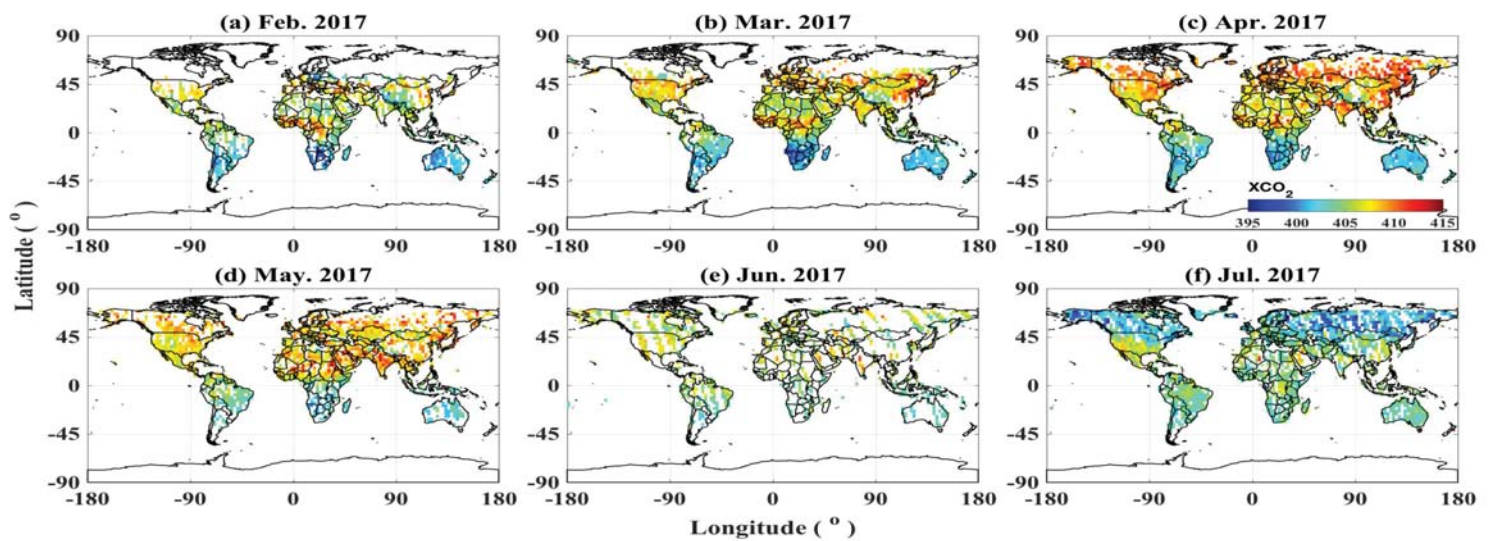
Nadir mode

Sun-glint mode

Target mode



The first 6 month TanSat XCO₂



Yi Liu et al., 2018

China National Earth Observation Data Sharing Platform

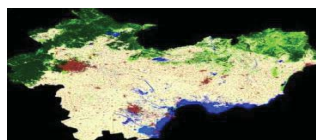
- More than 300TB remote sensing data and products, includes:
 - Metrological satellite data, such as FY2 and FY3; Land observing satellite data, such as ZY, HJ, CBERS, and BJ; Ocean observing satellite data, such as HY
 - 30m resolution global land cover datasets - GlobeLand30 dataset
 - And so on
- During the New Zealand earthquake in 2016, seven satellites with 219 view images (120GB in total) were organized to provide timely service for New Zealand, Australia and other countries.
- Data download URL: <http://www.chinageoss.org/en/index.jsp>



ZY-3 image



GF-1 image



GlobeLand30 dataset

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Satellite	Sensor	Resolution	Time	Region	MetaData Number	ImageData Number
FY3A	MERSI	250m, 1000m	2012-2014	Global	99305	10TB
FY3A	VIRR	1000m	2012-2013	Global		
FY3B	MERSI	250m, 1000m	2011-2014	Global	133883	12TB
FY3B	VIRR	1000m	2012-2013	Global		
FY3C	MERSI	250m, 1000m	2014	Global	34572	4TB
CBERS	CCD	20m	1999-2018	China	2682	1TB
HJ	CCD	30m	2009-2013	China	931	1TB
GF	WV	16m	2013	China	725	1TB

Product	Type	Resolution	Time	Region	MetaData Number	ImageData Number
Global LAnd Surface Satellite (GLASS) Products	Surface Broadband Albedo (ABD)	1000m	2000-2013	Global	855740	7TB
Global LAnd Surface Satellite (GLASS) Products	Fraction of Absorbed Photosynthetically Active Radiation (FAPAR)	1000m	2000-2013	Global		6TB
Global LAnd Surface Satellite (GLASS) Products	Leaf Area Index (LAI)	1000m	2000-2013	Global		7TB
Global LAnd Surface Satellite (GLASS) Products	Land Surface Temperature (LST)	1000m	2000-2013	Global		1TB

Thank you!

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