Introduction
Toward the next decade of APBON: Connect EO to SDGs

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Objectives of TG 7:

- **Establish a framework to integrate multiple EO data acquired by different Countries to monitoring AO Ecosystem and Environmental condition.**
- **Develop a comprehensive, inclusive and robust Synergized Multi-source Quantitative Remote Sensing Production System for operation.**
- **Create and maintain a cooperative mechanism to provide Quantitative Remote Sensing products for sharing and validation in AO region**
- **To Support SDGs: Generate policy-relevant advices to support governments to make evidence-based decisions on how to protect the Ecosystem and Environment.**
- **Release the Annual Report based on the cooperation networks;**

Most important Challenge Issues

- **Gap 1:the EO observation parameters to SDG indicators**
  - **How to connect the EO parameter to SDG indicators?**
- **Gap2: remote sensing experts to Ecological experts**
  - **How to Synergize Multi-source Remote Sensing data for Quantitative Production Generation?**
- **Gap3: multi Scale Observation and Validation:**
  - **How to integrate the Ground Observation, Airborne and Spaceborne Remote Sensing data?**
- **Gap4: Data sharing to information sharing**
  - **How to share the information and knowledge for the policy maker beside the data only?**

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Background

Goals, targets and indicators

June 2015, *"Transforming our world by 2030: A new agenda for global action".*

Three dimensions: economy, society, environment

17 total goals and 169 sub-goals

1)Ensure sustainable management of water and sanitation ;

2) Ensure the sustainable development of clean energy

3) Make cities inclusive, safe, resilient and sustainable

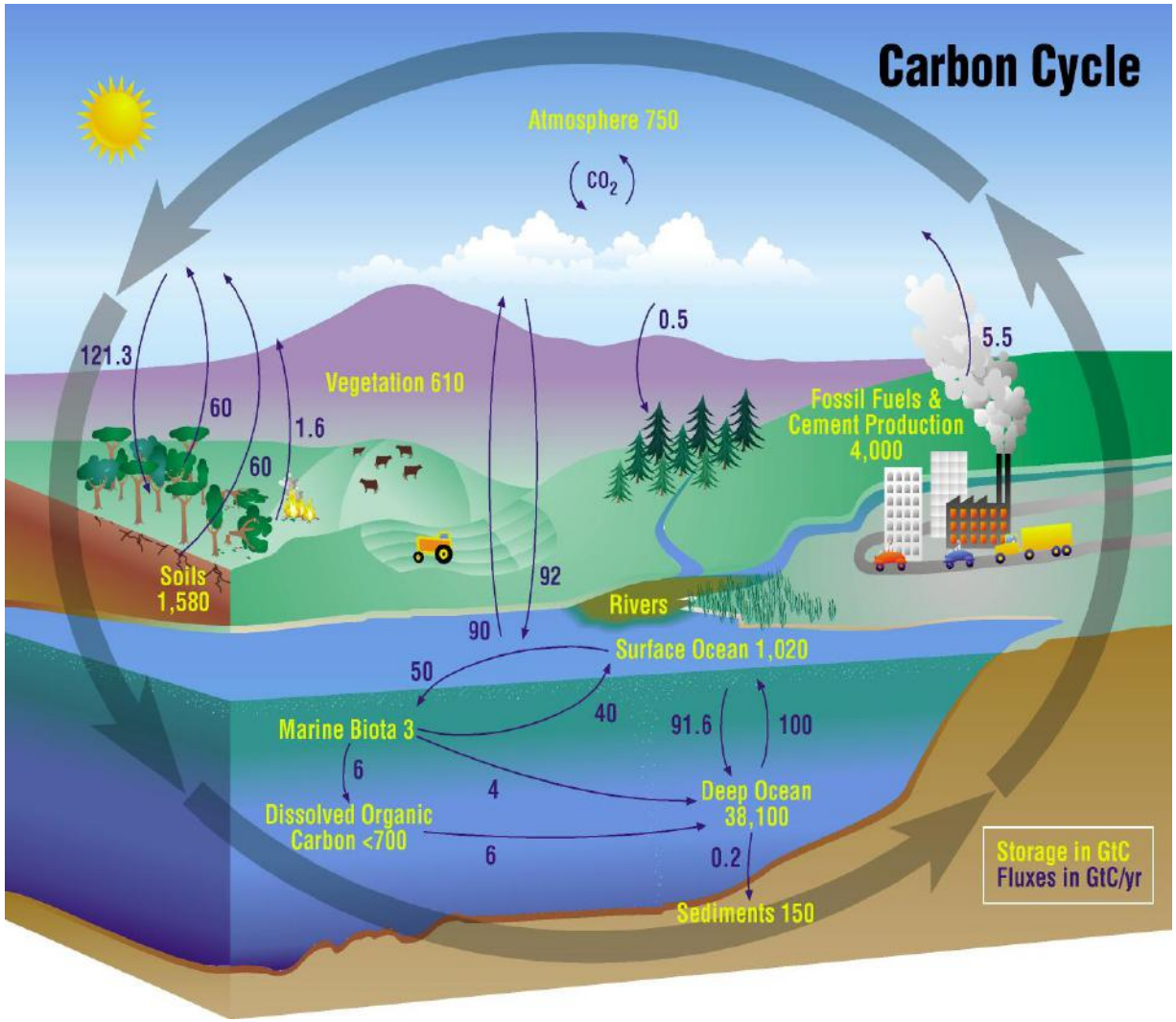
4) Take urgent action to combat climate change and its impacts

5) Conserve and sustainably use the marine resources

6) Protect terrestrial ecosystems, combat desertification and land degradation, and protect biodiversity

7) Strengthen cooperation on sustainable development and build a global partnership

Vegetation Ecosystem

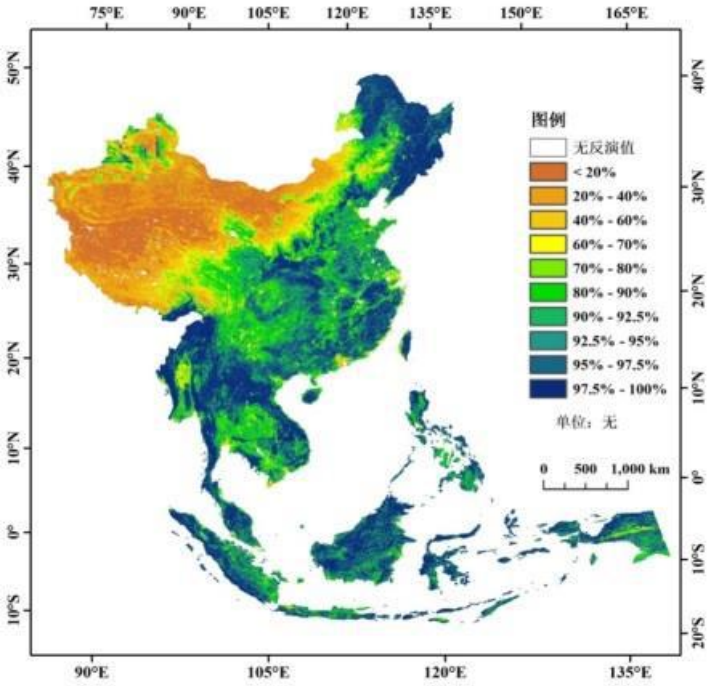


Key parameters:

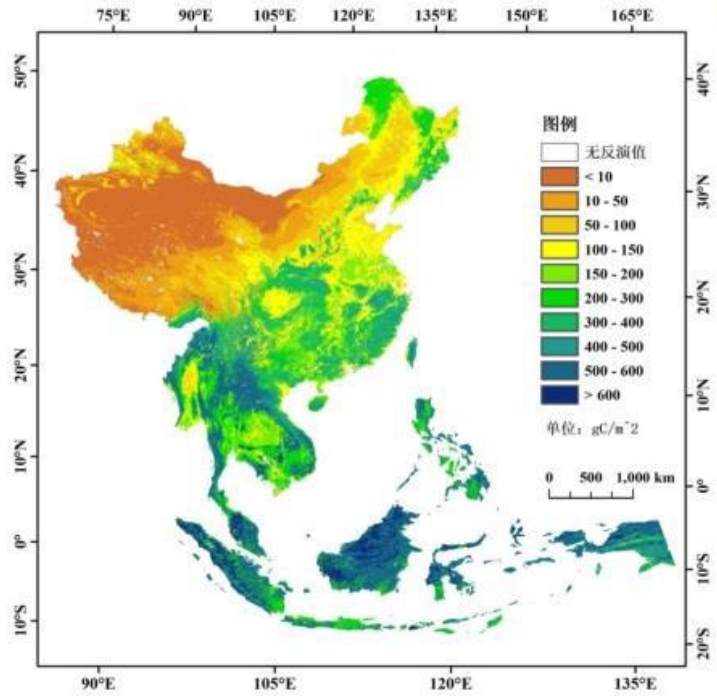
Vegetation Classes
Vegetation Index (VIs)
Vegetation Coverage(VC)
Leaf Area Index (LAI)
Biomass
Phenology
Chlorophyll
FPAR
NPP
……

Monitoring and evaluation of Ecosystem content

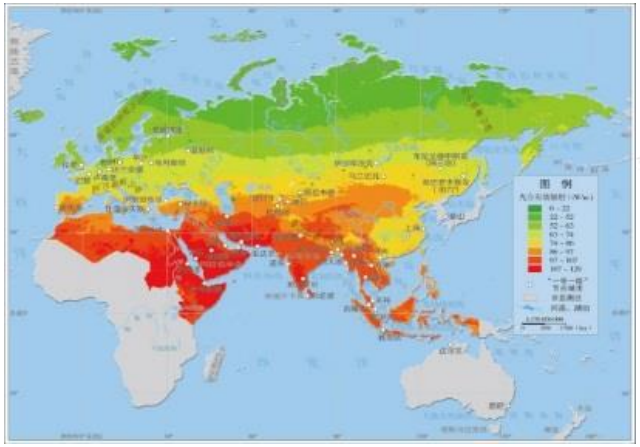
Monitoring and evaluation content	Monitoring indicators(24 indicators)
Macrostructure and condition of terrestrial ecosystem	ecological system type, annual mean LAI, MFVC, forest biomass on the ground, light-warm-water production potential, light-warm-water stress factor, anomaly value
Important urban development and ecological environment	Night light index, impervious surface, heat island intensity, heat island ratio
Land traffic conditions	density of road network, Road capacity index, Road accessibility index
Solar resource status	total solar radiation and Solar power potential
Water balance	Precipitation, ET, water budget, precipitation anomaly
The situation of marine disasters in key areas	Catastrophic waves, sea level anomalies, typhoons



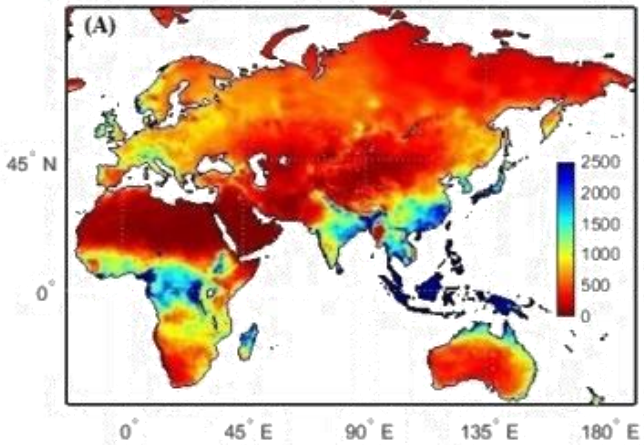
FVC

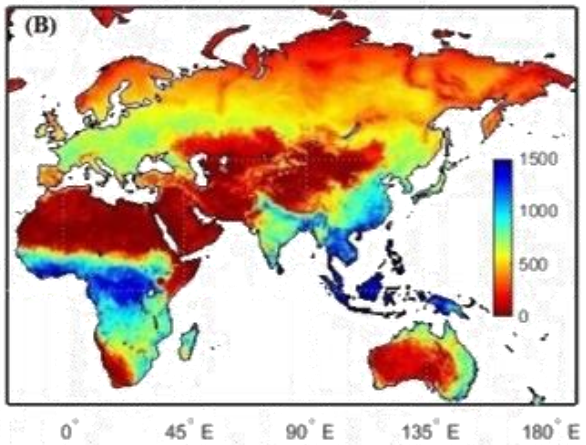


NPP



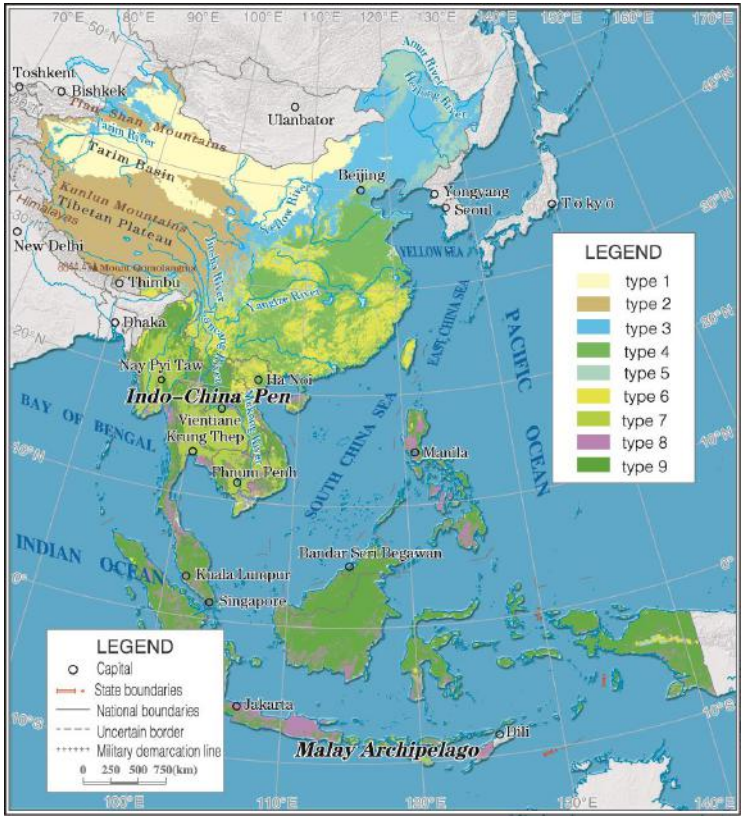
PAR

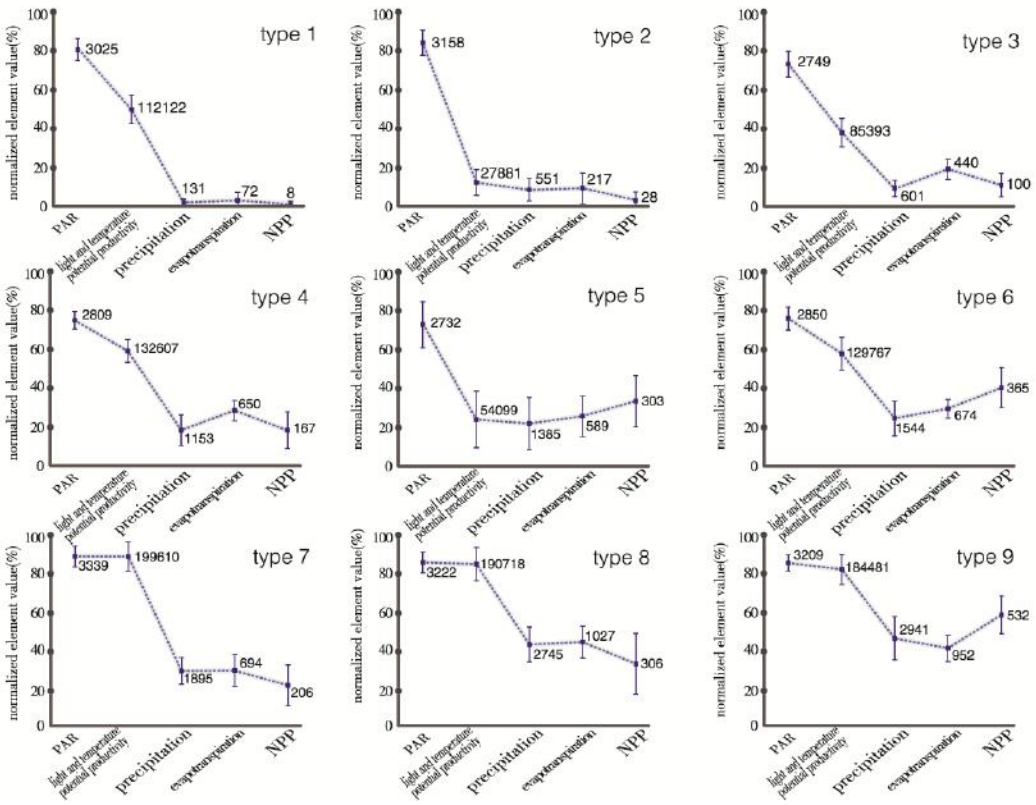




Precipitation

ET





Restricted by natural elements or human activities, there is distinct spatial variation in ecological environmental conditions in China-ASEAN.

The comprehensive analysis of natural elements affecting the ecological environment: light, temperature, water, vegetation, etc., China-ASEAN are clustered into 9 types.

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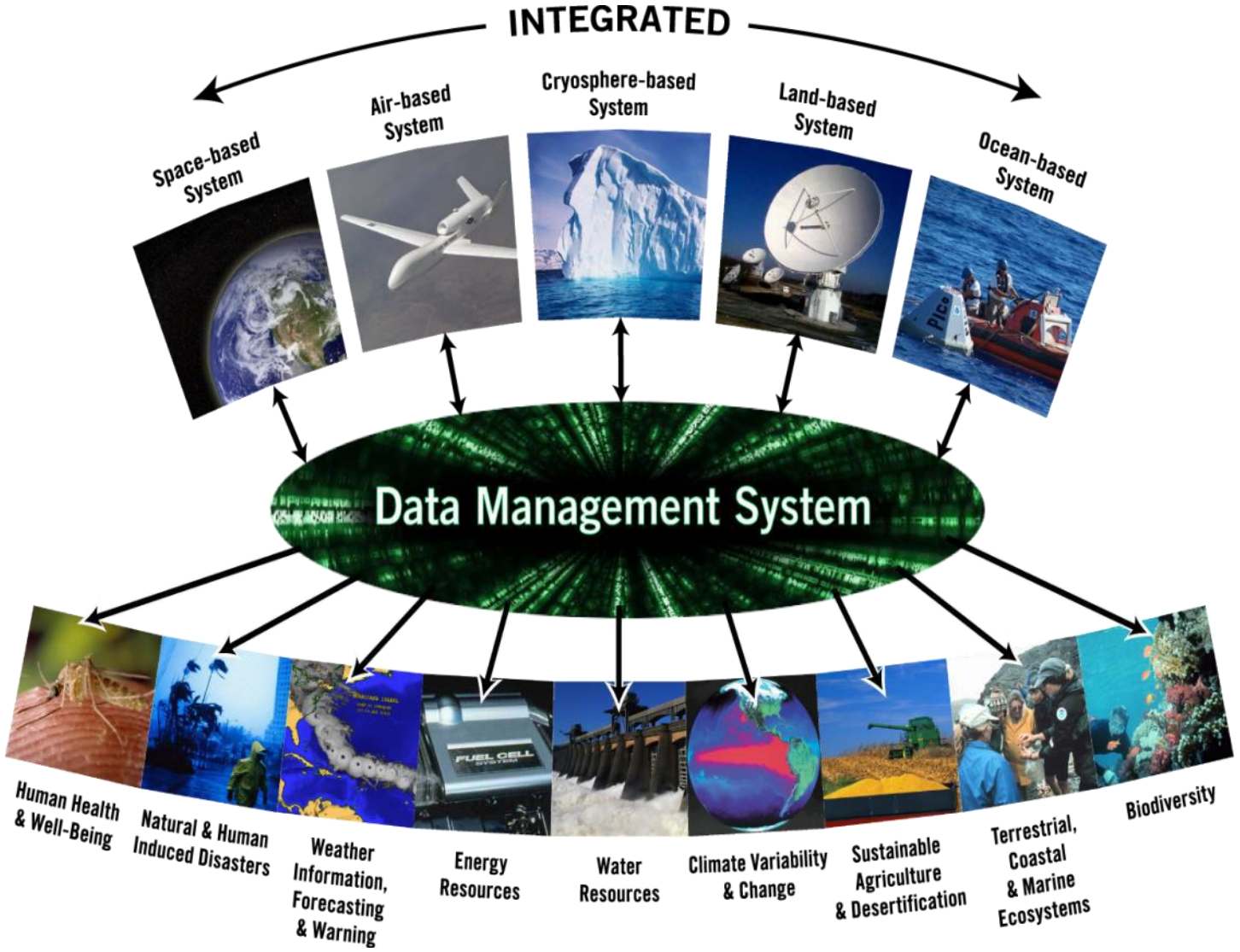
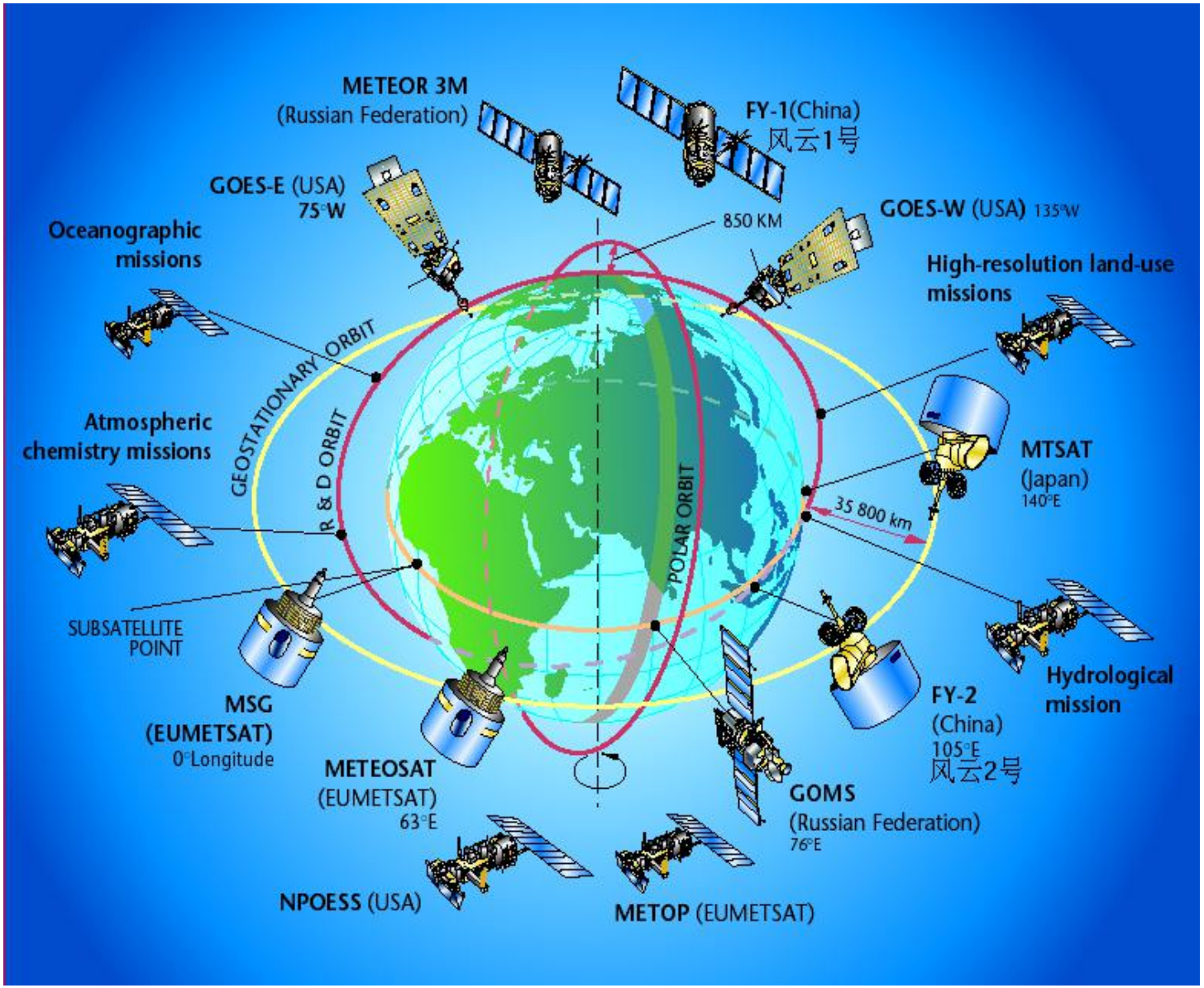
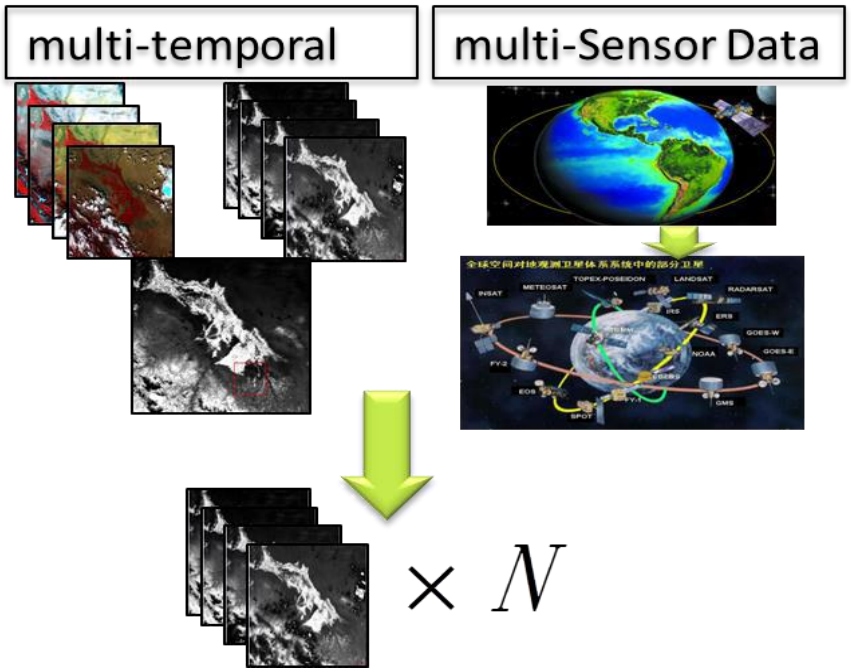
Structure of GEOSS

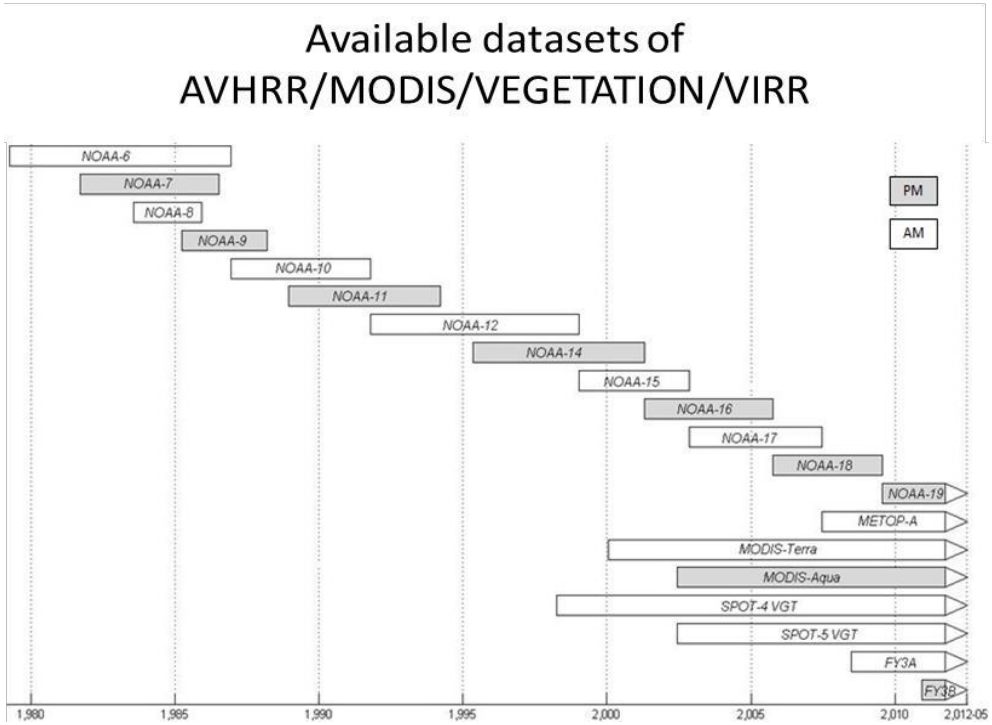


Global ecological and environmental monitoring based on Virtue Constellation Satellite

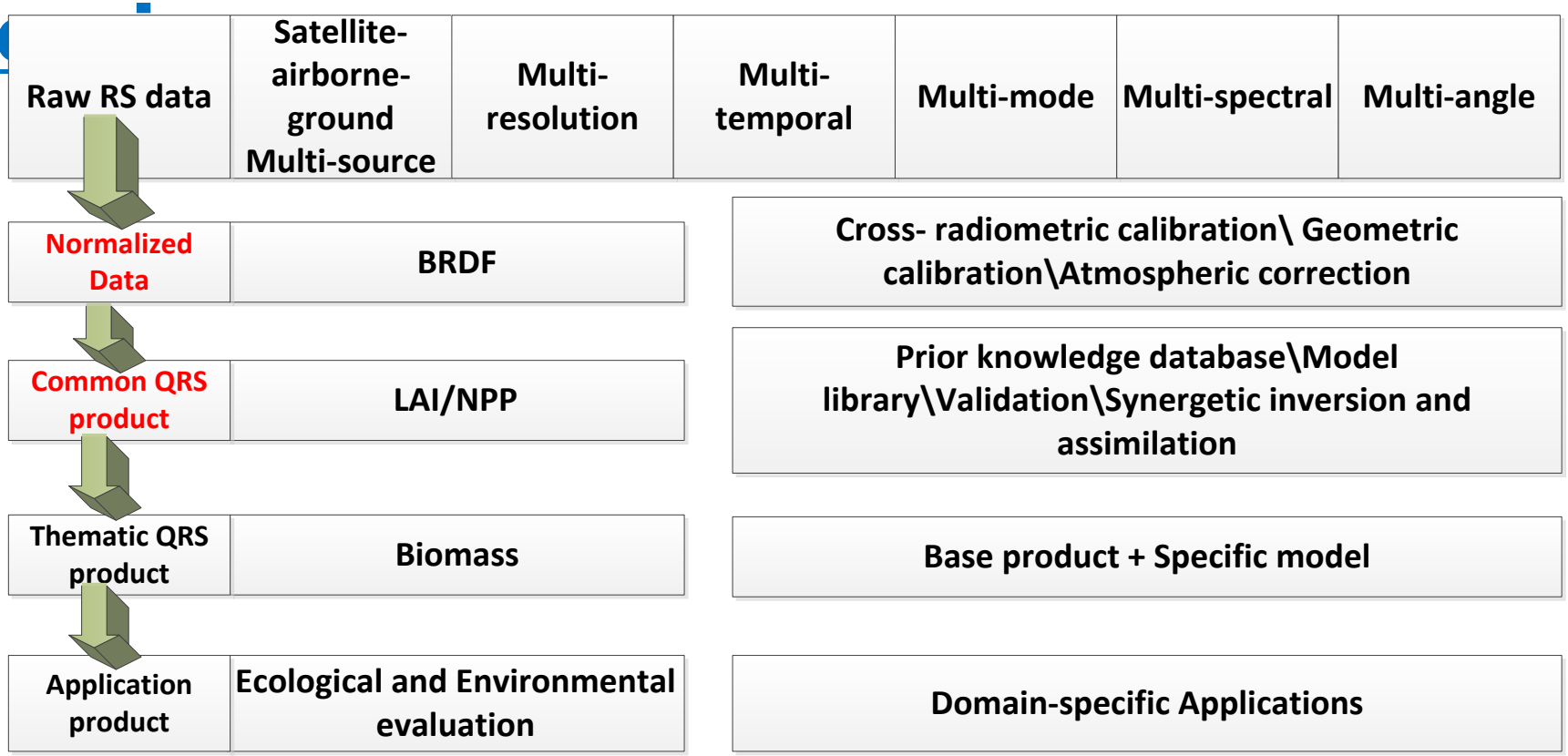


Multi-source remote sensing data from different sensors provide a chance to improve the temporal and spatial resolution of existing Ecosystem products.



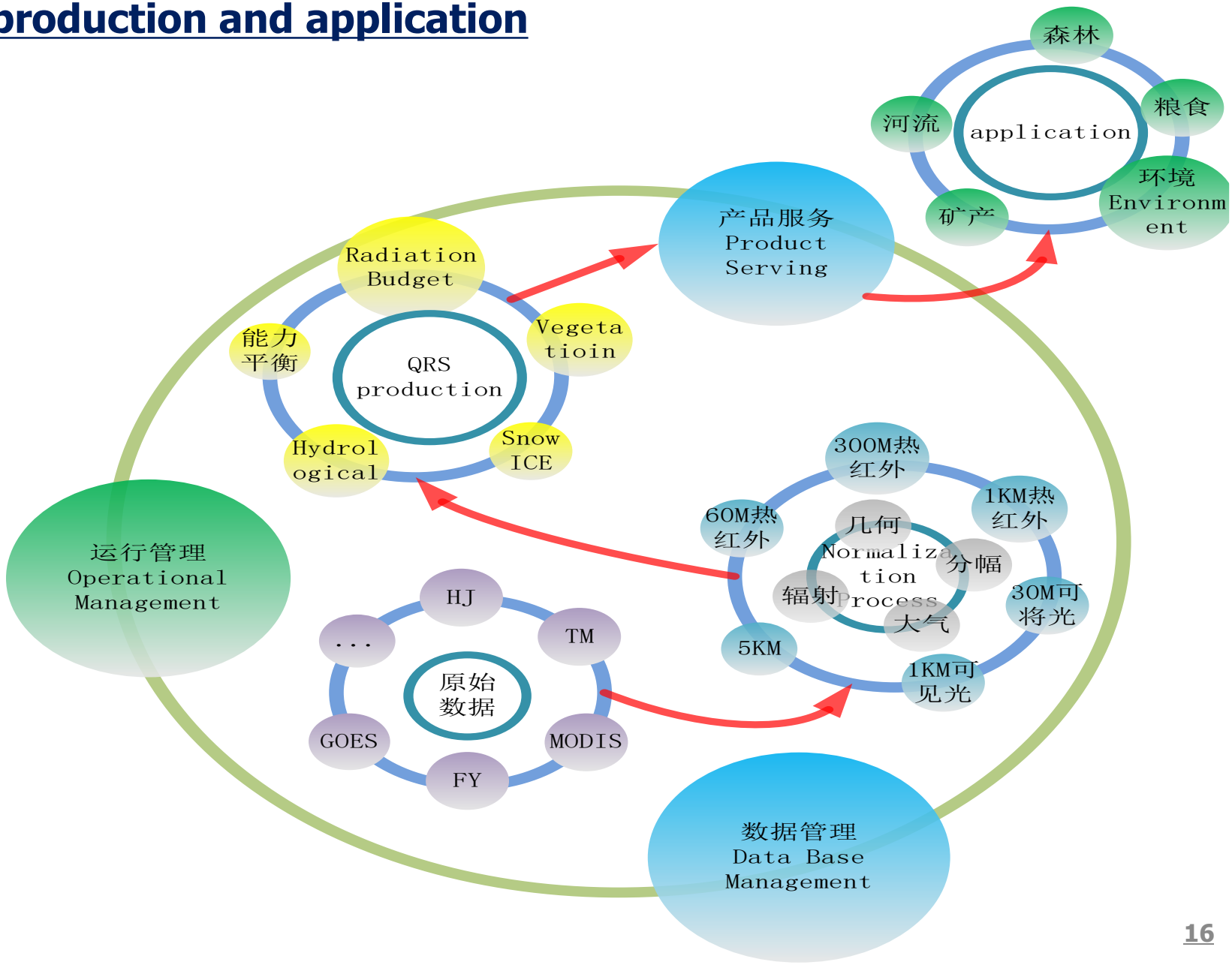


Architecture of Quantitative remote sc



- Raw multi-source remote sensing data
- Normalized multi-source remote sensing data
- Common Quantitative remote sensing product
- Thematic Quantitative remote sensing product
- Ecological and environmental evaluation Application

Multi-source data Synergized Quantitative remote sensing production and application



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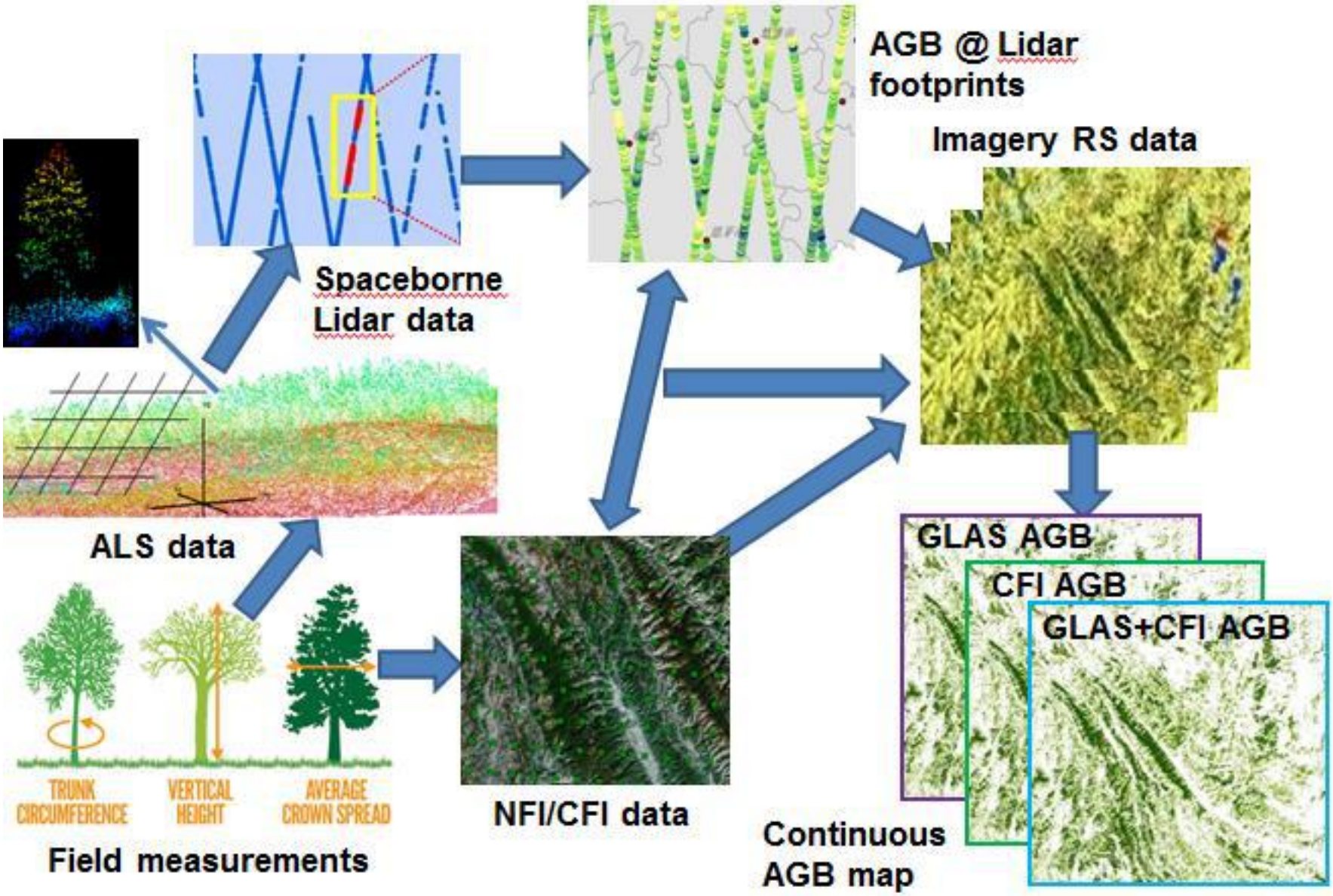
Global Forest Biomass Mapping



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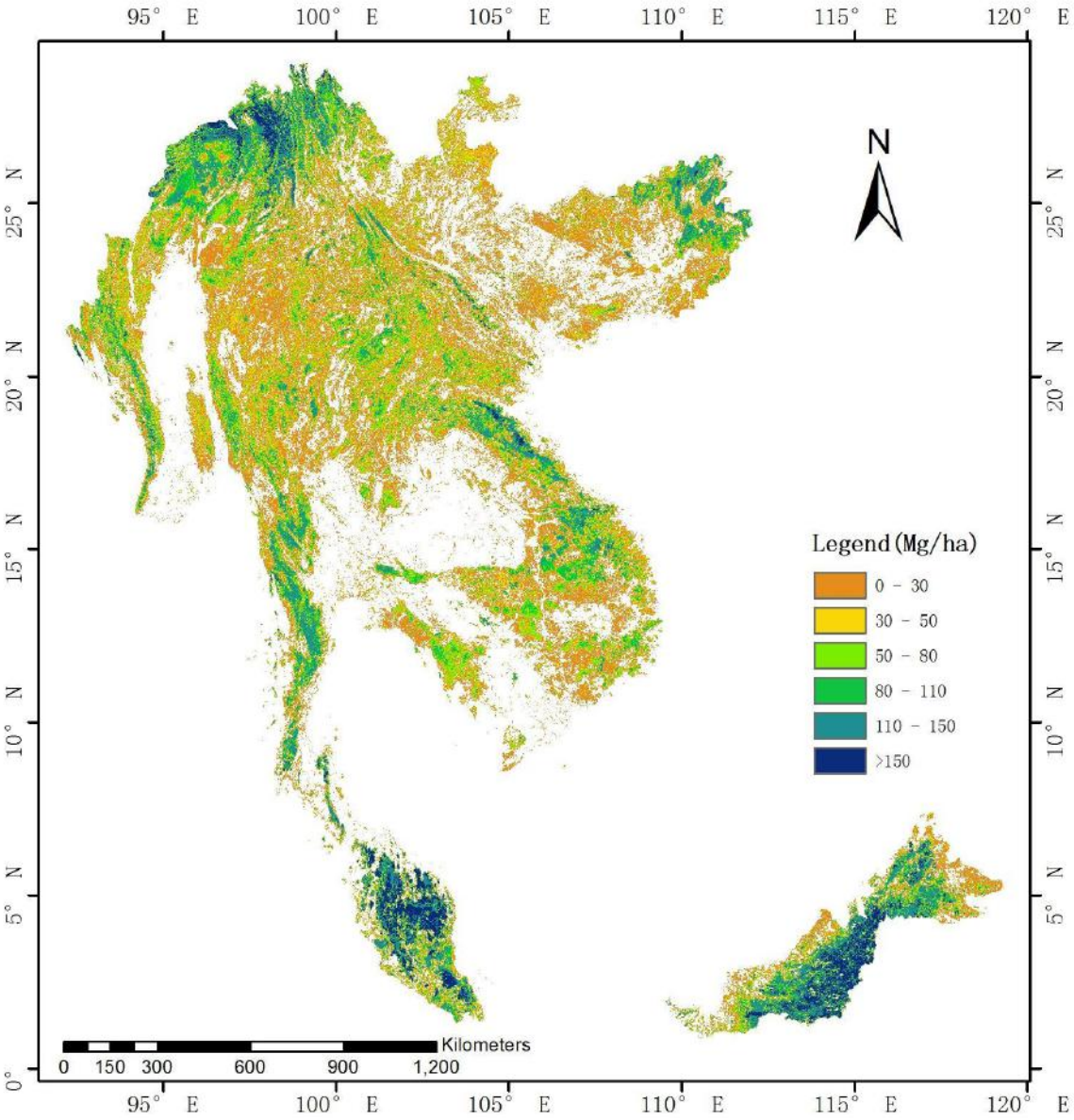
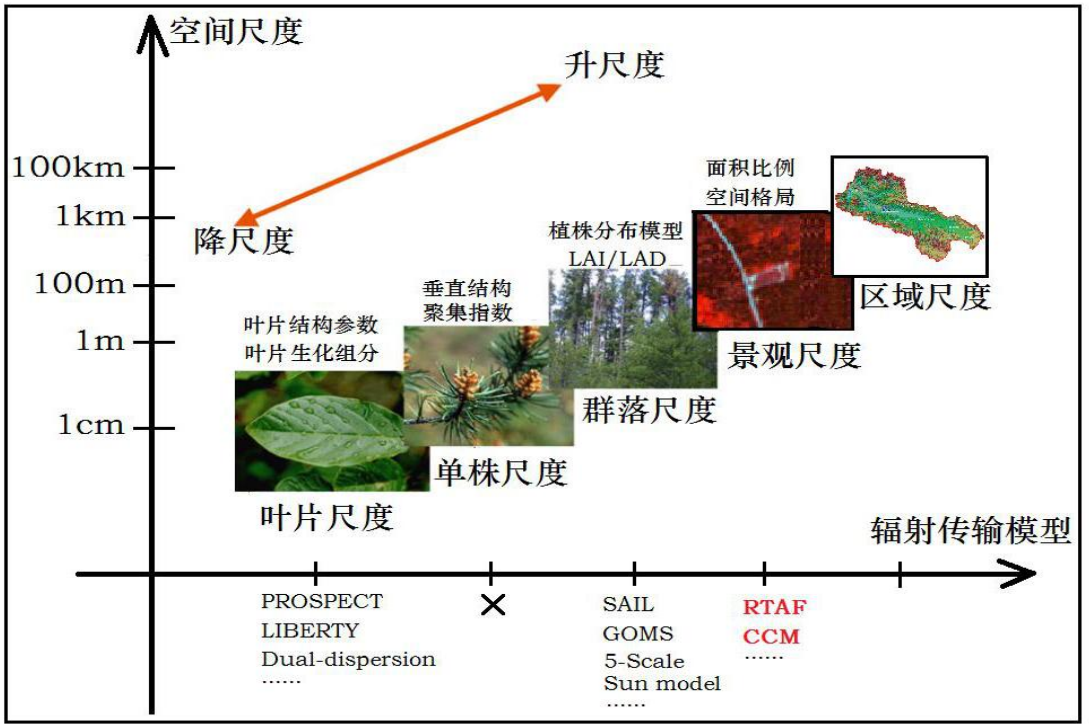
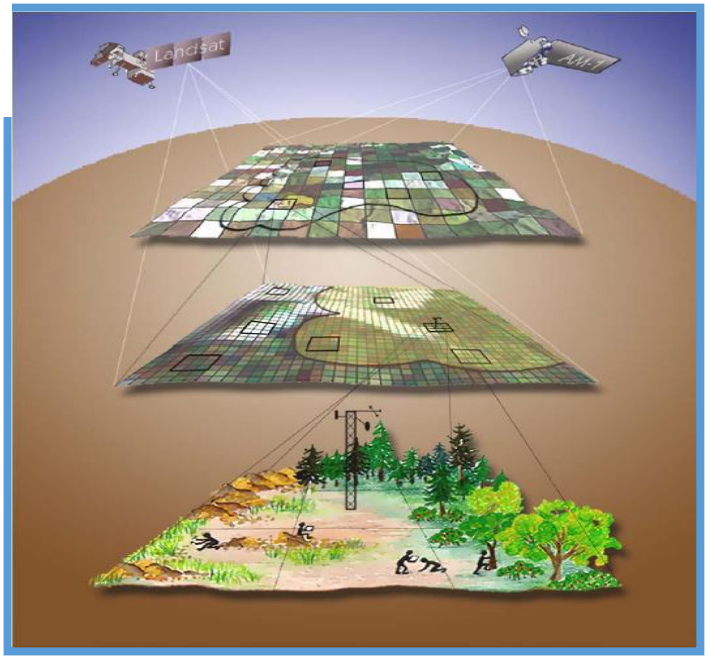




The same parameter at different scale have different value: scaling effect, causing difficults for RS product validation.

The Ecosystem need different parameter to describe at different scale: Leaf->Individual->Species->Landscale->Reginal->Glocal.



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Global Ecosystem and Environment Observation: Annual Report from China (GEOARC)

- To support global change studies in the framework of Earth Obse System of Systems (GEOSS)
- Released 13 reports since 2012
- Community Activity of GEO Work Programme 2017-2019
- Reports and data can download from China GEOSS Data Sharing Net (http://www.chinageoss.org/geoarc/).
- 2017 the 6th annual report will be released in October.

Report on 2012

Report on 2013

Report on 2014

Report on 2015

Report on 2016

- Data Sharing to national and global users

  Dataset Download: over 10000 times, 60TB.

  Report Download： 9000+ times

The **Global Ecosystems and Environment Observation: Annual Report from China（GEOARC 2017）and the related data set will be officially released in October, during the GEO 2017 annual conference in Washington DC.**

There are 3 sub group in WG7:

- WG7-1 Land Cover/Use
- WG7-2 Ecosystem Monitoring
- WG7-3 Atmospheric Environment Monitoring

AOGEOSS WG 7 welcome all participants in AO GEOSS.

Participants(till Dec. 2016)：

- **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):**

  UNEP-IEMP、UNESCO-HIST、WMO、UNESCAP、CEOS、ICSU/Future Earth、ICSU/IRDR、ICIMOD、POGO、ISDE、ISPRS、GRSS、APSCO.

AOGEOSS WG 7 will also welcome all countries in AO region.

Challenge Issues Existing

- Gap 1:the EO observation parameters to SDG indicators
  - How to connect the EO parameter to SDG indicators-> Generate director indicator for the policy makers for protect the Ecosystem and Environment.
- Gap2: remote sensing experts to Ecological experts
  - How to Synergize Multi-source Remote Sensing data for Quantitative Production Generation->Distributed and Operational System based on user's demands
- Gap3: multi Scale Observation and Validation:
  - How to integrate the Ground Observation, Airborne Remote Sensing, Spacebrone Remote Sensing->Efficient Observation Network and Scaling Effect Research
- Gap4: Data sharing to information sharing
  - How to share the information and knowledge for the policy

GROUP ON EARTH OBSERVATIONS

Thank you very much!