

# Introduction of the Asia-Oceania Global Earth Observation System of Systems

## (AOGEOSS)

GEO Initiative(GI-22)

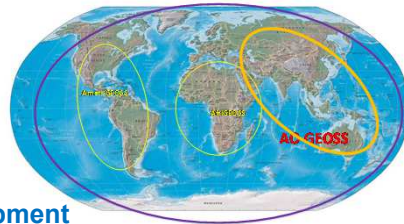
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**Institute of Remote Sensing and Digital Earth, CAS**  
**11 May 2017**  
**Kunming, China**

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## Overview

- **Asia-Oceania region**
  - Complex geographic
  - Large population (70% of world's)
  - Climate change drastically
  - Natural disasters occur frequently
  - Unbalanced socioeconomic development
  - Deteriorating ecological environment
- **Asia-Oceania GEOSS**---a regional cooperation program on Earth observation with broad involvement
- Strengthen comprehensive ability of Earth observation and applications for sustainable development at regional level.



## Objectives

- 

Engage with and Coordinate all stakeholders, partners and sponsors working together on Earth observation activities in Asia Oceania region;
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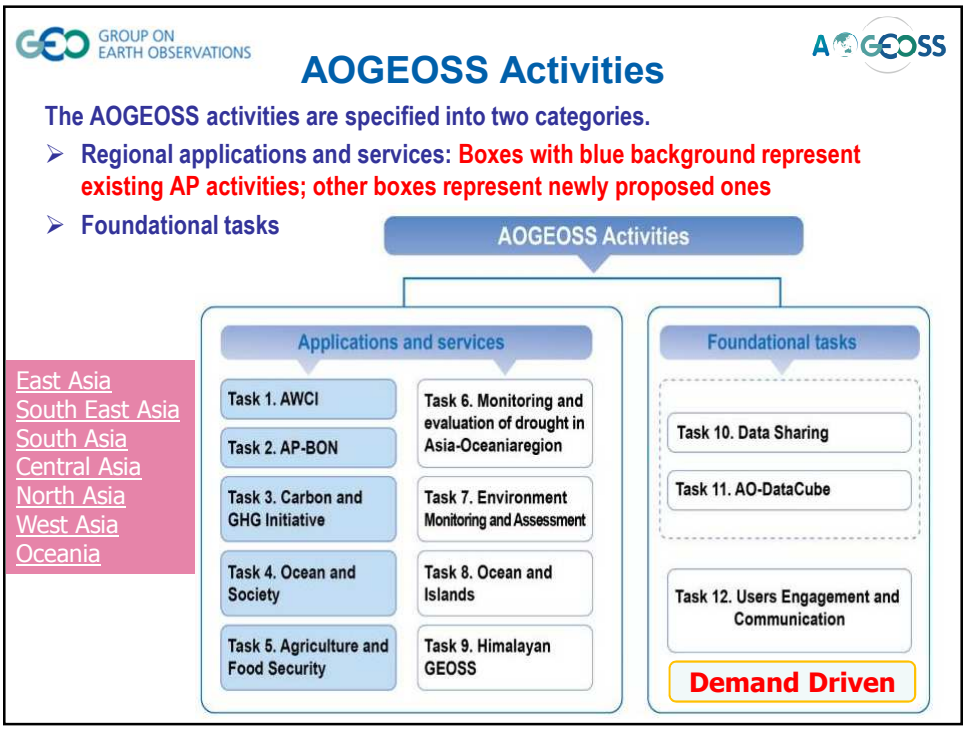
Investigate user needs and address gaps on implementation of GEOSS and develop technological approaches;
- 

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

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

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

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



# TG1: GEOSS Asian Water Cycle Initiative (AWCI)

- 2005 Nov. 1<sup>st</sup> Symp. in Tokyo
- 2006 Sept. TTM in Bangkok
- 2007 Jan. 2<sup>nd</sup> Symp. in Tokyo
- 2007 Sept. 1<sup>st</sup> ICG in Bali
- 2007 Dec. 3<sup>rd</sup> Symp. in Beppu
- 2008 Apr. 2<sup>nd</sup> ICG in Tokyo
- 2008 Nov. 3<sup>rd</sup> ICG in Beijing
- 2009 Feb. 4<sup>th</sup> ICG in Kyoto
- 2009 Dec. 5<sup>th</sup> ICG in Tokyo
- 2010 Mar. 6<sup>th</sup> ICG in Bali
- 2010 Oct. 7<sup>th</sup> ICG in Tokyo
- 2011 Mar. 1<sup>st</sup> CCAAT in Tokyo
- 2011 Oct. 8<sup>th</sup> ICG in Tokyo
- 2012 Sept. 9<sup>th</sup> ICG in Tokyo
- 2013 Jun. 2<sup>nd</sup> CCAAT in Tokyo
- 2013 Nov. Asia-Africa Water Cycle Symposium in Tokyo
- 2014 May 10<sup>th</sup> ICG in Tokyo
- 2014 Sept. 3<sup>rd</sup> CCAAT in Islamabad
- 2015 Sept. AASymp in Beijing



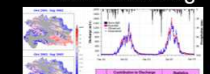
Coordination Design  
Data Sharing Policy  
Implementation Plan  
18 Demonstration  
River Basins

Observation Metadata Registration  
Document Metadata Registration  
Quality Assurance  
Data Linkage

Data Archive



Flood Monitoring



Snow & Glacier Melt



Climate Change Impact Assessment in Asia

Symp.: Symposium TTM: Task Team Meeting ICG International Coordination Group  
CCAAT: Climate Change Assessment and Adaptation Training

# TG2: Asia Pacific Biodiversity Observation Network (AP-BON)

## Proposed Activities for Developing Global Biodiversity Monitoring System

Targeting East Asia and Pacific Region

- Identification of existing researches on biodiversity
- Distribution of Monitoring sites
- Development of standardized data collection
- Data integration, storage and analysis
- Capacity building for data collection and data analysis
- Provision and dissemination of the information

Networking among Biodiversity Centers



- Data provision/sharing  
GEO-BON GBIF

Collaboration

ILTER  
NaGIS (CoML)  
Other programmes

Contribution

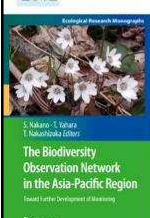
Decision Making in Biodiversity Conservation

- Data collection and its standardization
- Data integration and analysis
- Capacity building

## Forest loss in Cambodia



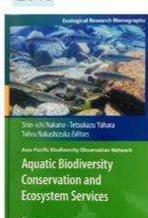
2012



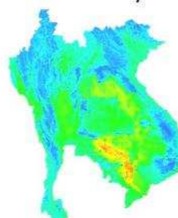
2014



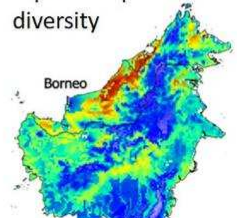
2016



## Fish diversity



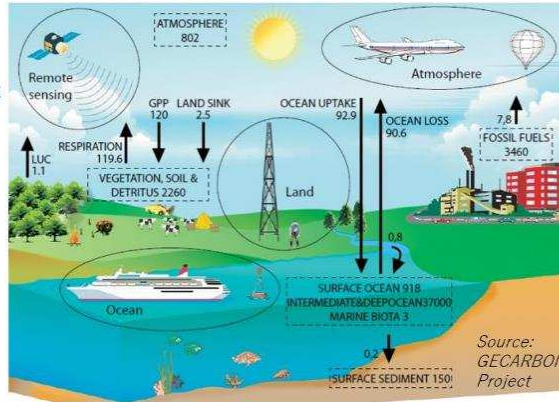
## Dipterocarpaceae diversity





## TG3: The GEO Carbon and GHG Initiative (GEO-C): Toward policy-relevant global carbon cycle observation and analysis

The Global Carbon Cycle: a complex interaction of different systems in different domains – directly linked to climate change



Original slide:  
Bombelli et al., 2015  
The 8th GEOSS AP  
Symposium, Beijing

Source:  
GECARBON  
Project

### UNFCCC Paris Agreement <Article 7.7>

c) Strengthening scientific knowledge on climate, including research, systematic observation of the climate system and early warning systems, in a manner that informs climate services and supports decision-making.

## TG4: Ocean and Society

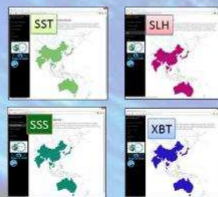
### GEOSS-AP Ocean Data Networking System

#### Data site of Asia Pacific countries:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li><b>Japan</b> <ul style="list-style-type: none"> <li>NEAR-GOOS Regional Real Time Data Base</li> <li>NEAR-GOOS Regional Delayed Mode Data Base</li> </ul> </li> <li><b>Australia</b> <ul style="list-style-type: none"> <li>Coastal Data Portal</li> <li>Coastal Research</li> </ul> </li> <li><b>China</b> <ul style="list-style-type: none"> <li>NEAR-GOOS Real Time Data Base</li> <li>China Delayed Mode Database for NEAR-GOOS</li> </ul> </li> <li><b>Korea</b> <ul style="list-style-type: none"> <li>Korea Real Time Database for NEAR-GOOS</li> <li>NEAR-GOOS Korea National Delayed Mode Data Base</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li><b>India</b> <ul style="list-style-type: none"> <li>Indian National Centre for Ocean Information Services</li> </ul> </li> <li><b>Thailand</b> <ul style="list-style-type: none"> <li>Central Database System and Data Standard for Marine and Coastal Resources</li> </ul> </li> <li><b>Vietnam</b> <ul style="list-style-type: none"> <li>Not yet have Data site. Inquire by E-mail.</li> <li>Vietnam's META-data is published in this web portal</li> </ul> </li> </ul> |
|---|---|

#### GEOSS-AP Ocean Data Networking System Web Portal:

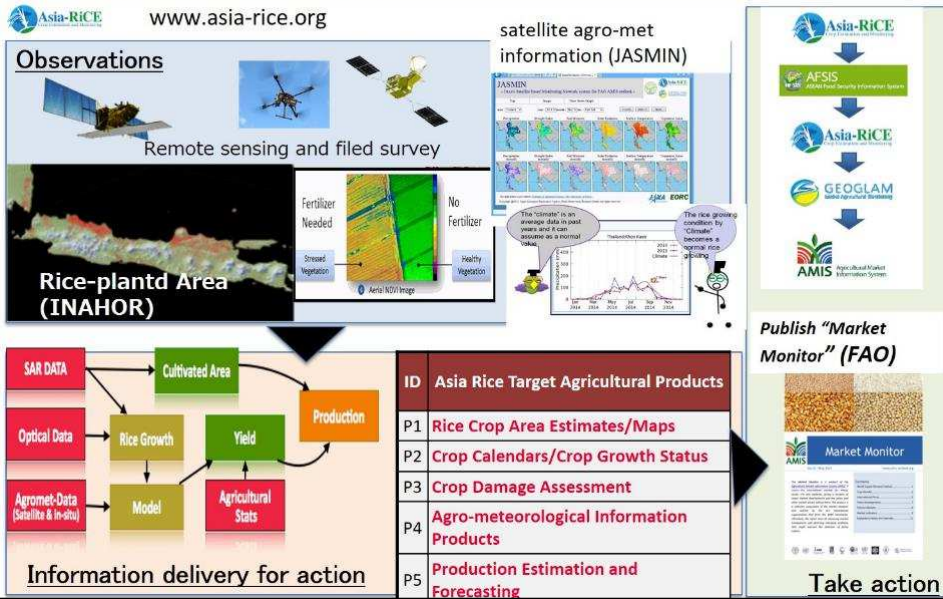
Web data portal build via core framework(GYRE-System).  
To encourage ocean research activities by searching the oceanographic data easily and speedily.  
To give opportunities the countries which don't have the public data base site to disclose their meta information about their oceanographic data.



Extension of the current Ocean Data Networking, which will ensure national security and help efforts of individual observation projects for data exchanges through collaborative works. In particular, we seek possible extension to biogeochemical and ecosystem observation (e.g. ocean acidification)

## TG5: Agriculture and Food Security

Task 5 is GEOGLAM Asia RiCE crop team activity and ground based observation / field survey network in Asia for Agriculture and Food Security.



## TG6: Drought Evaluation and Monitoring



**Objectives:** Applying Earth Observations and other Space-based technologies for drought monitoring, evaluation, and management

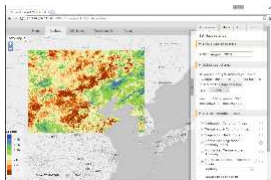
**TG Leaders:**  
UNESCAP, CAS

**Tasks**

1. **Create a drought monitoring cooperative mechanism** 2017
2. **Establish a framework** to monitor and evaluate drought 2018
3. **Develop a comprehensive decision support system** 2018
4. **Generate policy-relevant advices** for drought 2019

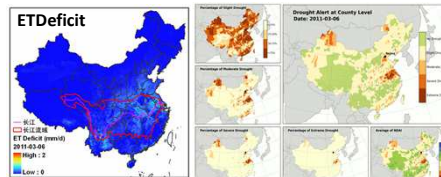
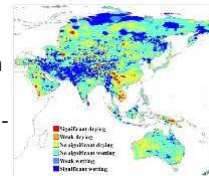
**Global Drought Monitor and Analysis Platform (GDMAP)**

<http://www.droughtmonitor.com.cn/>



- Earth Observation based
- Cloud spatial data management
- Support Online analysis
- Web based open source architecture

- Long term precipitation trends from CMORPH Satellite product (1998 - 2015)



- Drought in 2011 Yangtze River Basin and Inner-Mongolia

## TG7: Environmental Monitoring and Assessment



Co-Leaders: **CAS, NRSCC, UTS, ISPRS...**

Users: **National Government, Future Earth, UNEP-IEMP...**

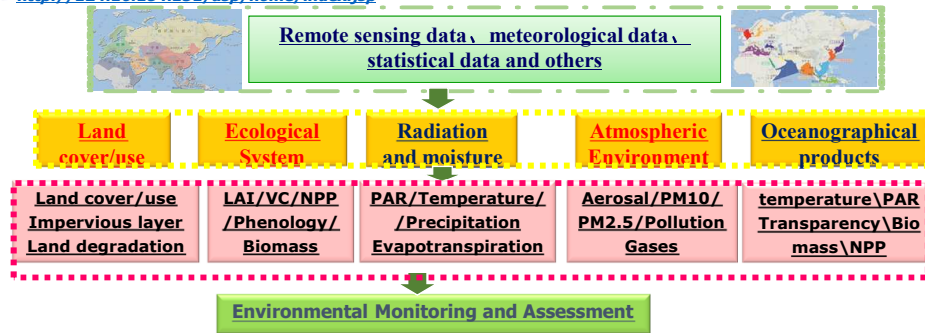
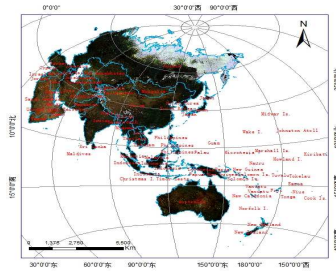
**NRSCC has continually carried out and released Annual Report on Remote Sensing Monitoring of Global Ecosystem and Environment (GEO ARC) from 2012.**

<http://www.nrsc.gov.cn>

**3 main sub-tasks include: Ecological System, Land use/cover; Atmospheric Environment**

<http://www.geodoi.ac.cn/WebCn/Default.aspx>

<http://124.16.184.151/dsp/home/index.jsp>



## TG8: Oceans and Islands



### Goal

- To advance and exploit synergies among the many observational programme devoted to island, coastal and ocean, to improve engagement with a variety of users for enhancing the timeliness, quality and range of services delivered;
- to raise awareness of the societal benefits of ocean observations at the public and policy levels
- Focus on coastal countries and small island states

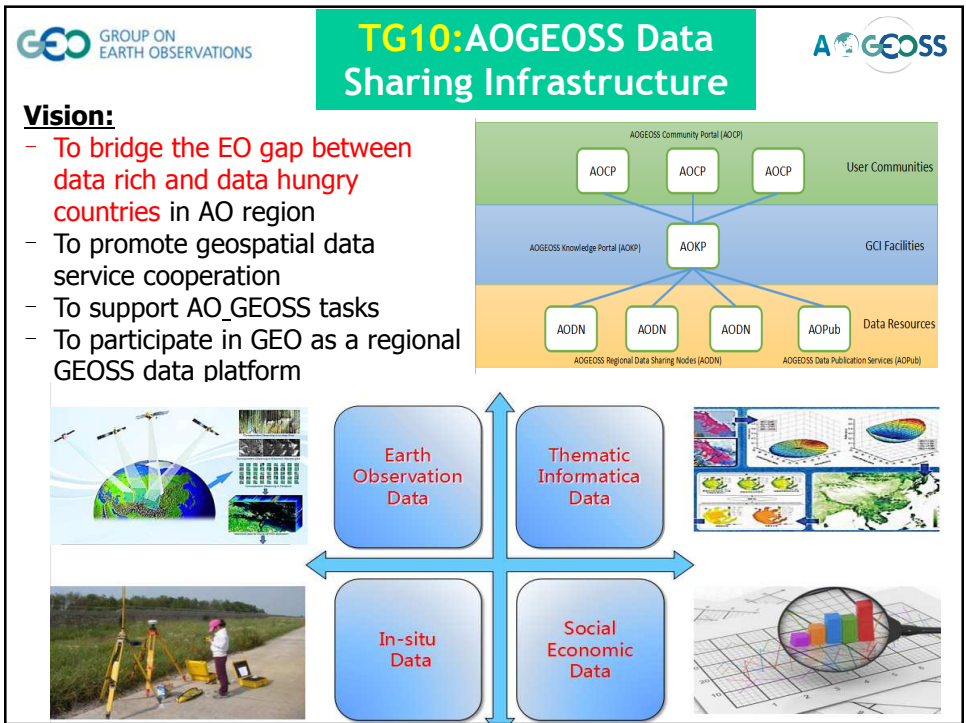
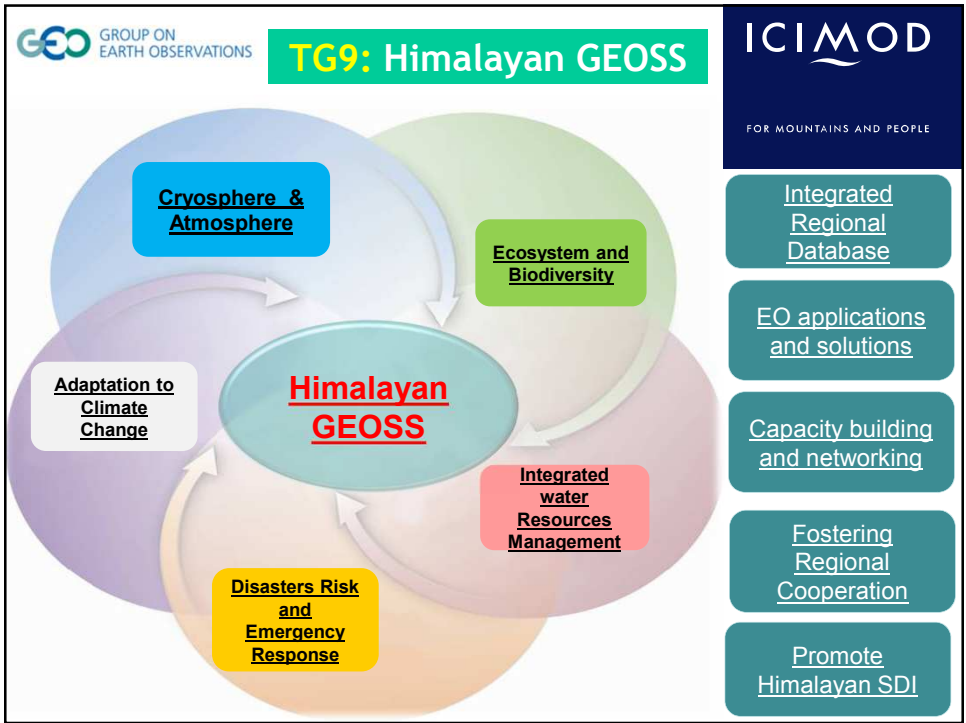


### Tasks

- Identify and articulate user needs.
- Produce new marine and coastal observation network by supporting and linking partners.
- Improve the Coastal Applications of the Data Cube and Modelling the Hydrodynamics and Biogeochemistry of the ocean environment.
- Evaluate the sea level rise risk for the developing states in the western and eastern Pacific.



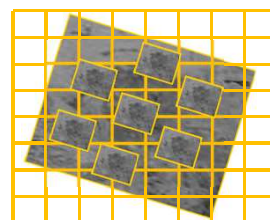
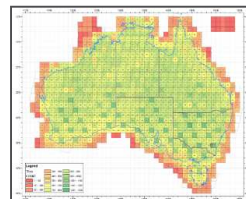






## TG11: Develop Regional GEOS Dataset

- Create dialogue to assess data format requirement among data-rich countries including Australia, China, Japan, Korea and Thailand. Datasets are encouraged to be developed based on GCI tools and DAB protocols.
- Consolidating operational users' needs and dynamic features of large volumes EO data to support development of AO Data Cube (AODC) data set format. eg. The Australia Geoscience Data Cube (AGDC) and Chinese Geoscience Data Tile DEM (CNGDT)
- Advocate and support incorporation of pilot researches using standardized AODC format, with the help of activities in task 1 to task 9.
- Advocate and support incorporation of data catalogues among member countries and POs.



## TG12: User Engagement and Communication

### GEOSS Asia-Pacific Symposium “Regional Convening Power”

Total over 1.600 participants (as of the 8<sup>th</sup> Symposium)

#### Purpose

To provide researchers, engineers and practitioners from the AP region a forum to exchange information and to discuss cooperation on specific initiatives and other activities in each thematic area, to promote the effort of GEOSS and to make further cooperation in the AP region.

#### History

- |                                   |                                    |
|-----------------------------------|------------------------------------|
| 1 <sup>st</sup> : Tokyo, Japan    | 6 <sup>th</sup> : Ahmedabad, India |
| 2 <sup>nd</sup> : Tokyo, Japan    | 7 <sup>th</sup> : Tokyo, Japan     |
| 3 <sup>rd</sup> : Kyoto, Japan    | 8 <sup>th</sup> : Beijing, China   |
| 4 <sup>th</sup> : Bali, Indonesia | 9 <sup>th</sup> : Tokyo, Japan     |
| 5 <sup>th</sup> : Tokyo, Japan    |                                    |



**AOGEOS Working Meeting**  
5<sup>th</sup> October 2016, Beijing (Co-leads)



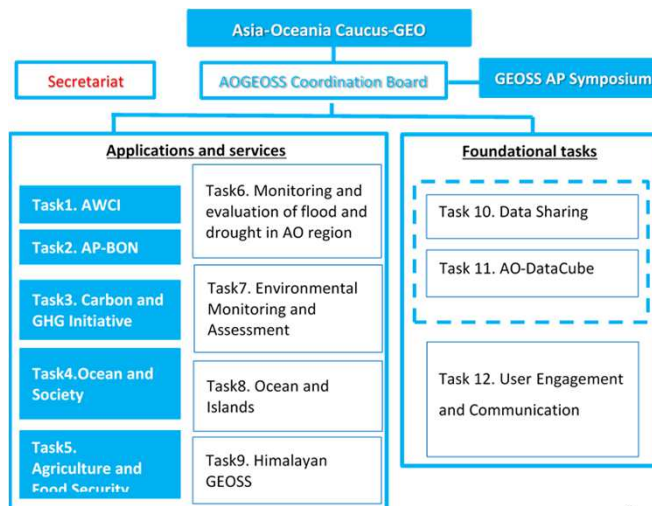
**AOGEOS Side Meeting**  
13<sup>th</sup> November 2016, St. Petersburg



**AUS-CHN Bilateral Meeting**  
7<sup>th</sup> April 2017, Sydney

## Governance Structure

- Caucus Principles
- Coordination Board
- AP Symposium
- Secretariat
- Task Groups
- Rules of Procedure for Decision-making Process
- Wide participation from Different countries and geographic balance



19

## Participation

AO GEOSS initiative was launched in the GEO PLENARY on November 2016 and included in GEO work plan 2017-2019.

Participants( till March. 2017) :

- **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.**



Kunming Forum on United Nations Global Geospatial  
Information Management  
*Cities of the Future: Smart, Resilient and Sustainable*  
10-12 May 2017, Kunming, China



**Thanks!**

**AOGEOSS**

*Better Observation for Better Future*

