

Sentinel Asia & SAFE

Space Applications for Environment



February 4 -6, 2009
The 3rd GEOSS Asia-Pacific Symposium
Kyoto Research Park
Dr. Takashi Moriyama, EORC JAXA



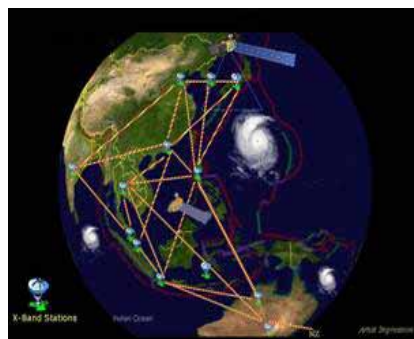
Established in 1993 after the Asia-Pacific International Space Year Conference (APIC) in 1992
Enhance the development of space programs in the Asia-Pacific region and promote regional cooperation in the field of space technology and its applications.

[Participation] Space agencies, related governments, regional and international organizations, institutions responsible for applying space technology.

[Organizers] MEXT, JAXA and co-host organizations

➤ **Past co-organizers:** Government entities of Mongolia, Malaysia, The Republic of Korea, Thailand, Australia, Vietnam

Working Groups



Sentinel Asia Project
 establishing Disaster Management
 Support System



**Earth
 Observation**



**Communication Satellite
 Applications**



ISS



**Space Education &
 Awareness**

Framework of Sentinel Asia

Voluntary and best-efforts-basis initiative by participating organizations

Space Community

APRSAF*

Content

Satellite Image

Promotion of Utilization

Capacity Building

* Asian-Pacific Regional
Space Agency Forum

International Community

**UN / ESCAP UN / OOSA
ASEAN AIT etc.**

International Cooperation

Digital Earth / Web-GIS Community

Digital Asia

Information Sharing Platform

Web-GIS

Data / Meta Data Management

Content

Digital Map

Social / Economic Data

Satellite Image

**Joint Project Team
(JPT)**

59 organizations

(51 agencies from 20 countries
and 8 int'l organizations)

Disaster Reduction Community

ADRC**

Member Countries

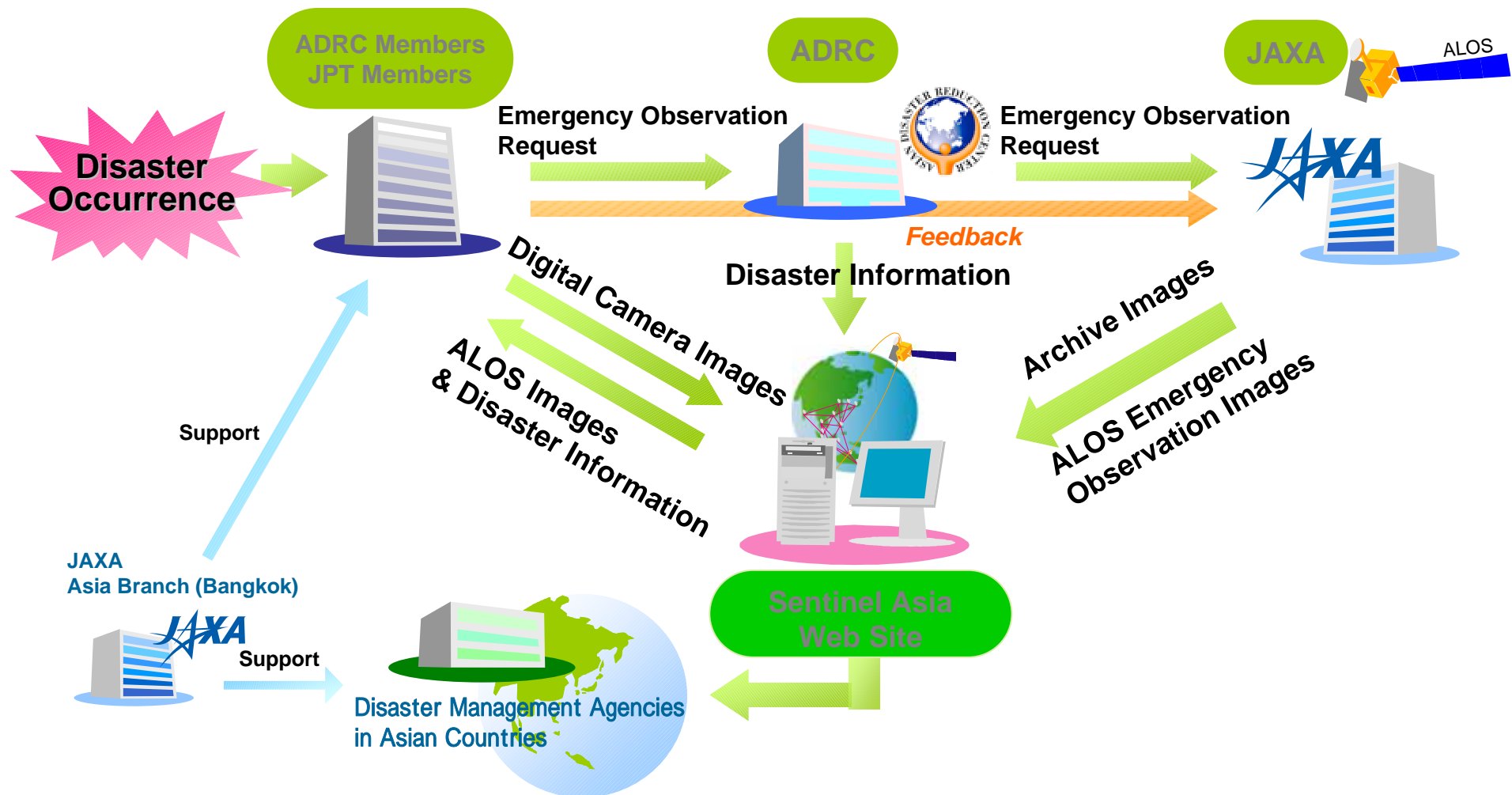
Content

Disaster Information

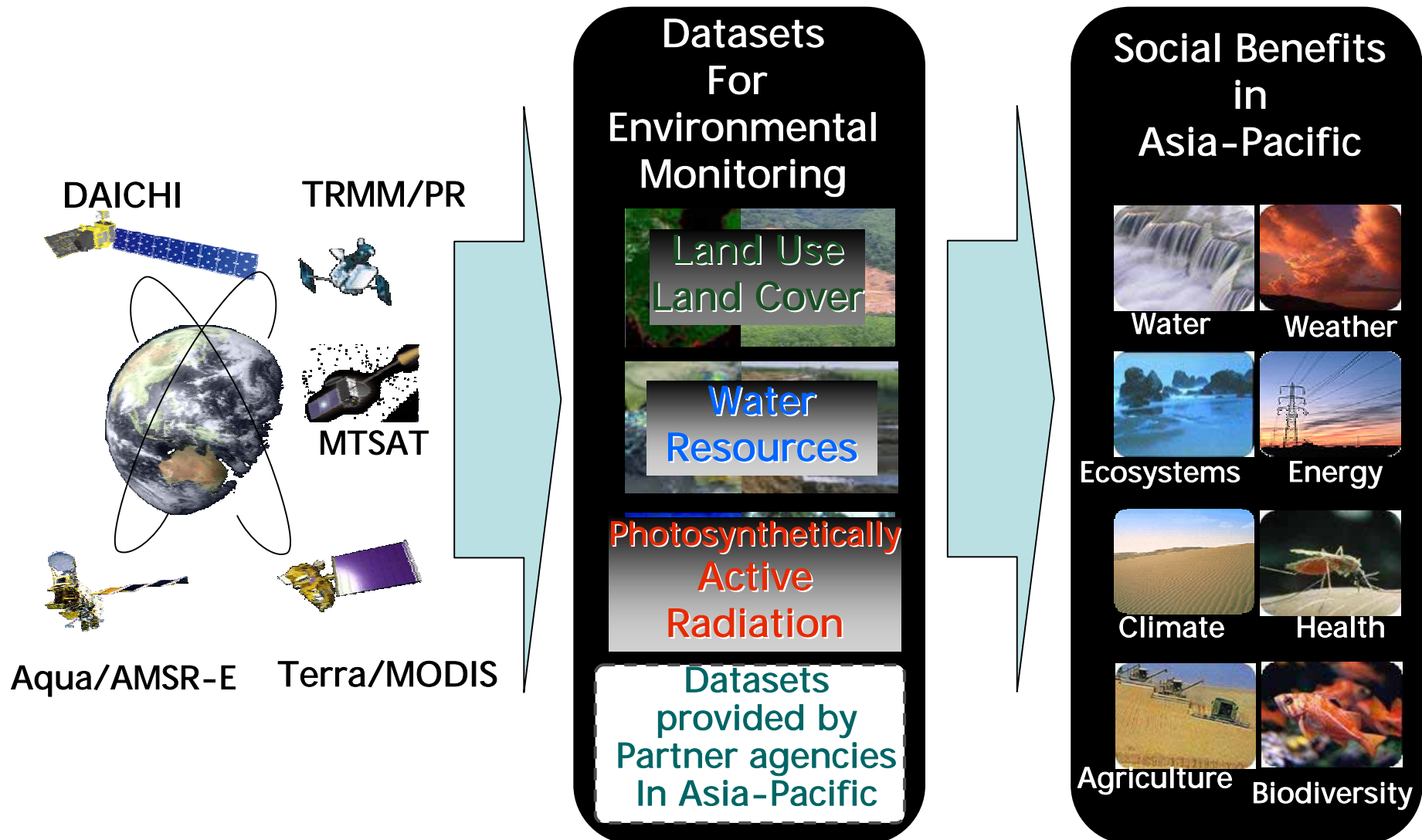
Utilization (User)

** Asian Disaster
Reduction Center

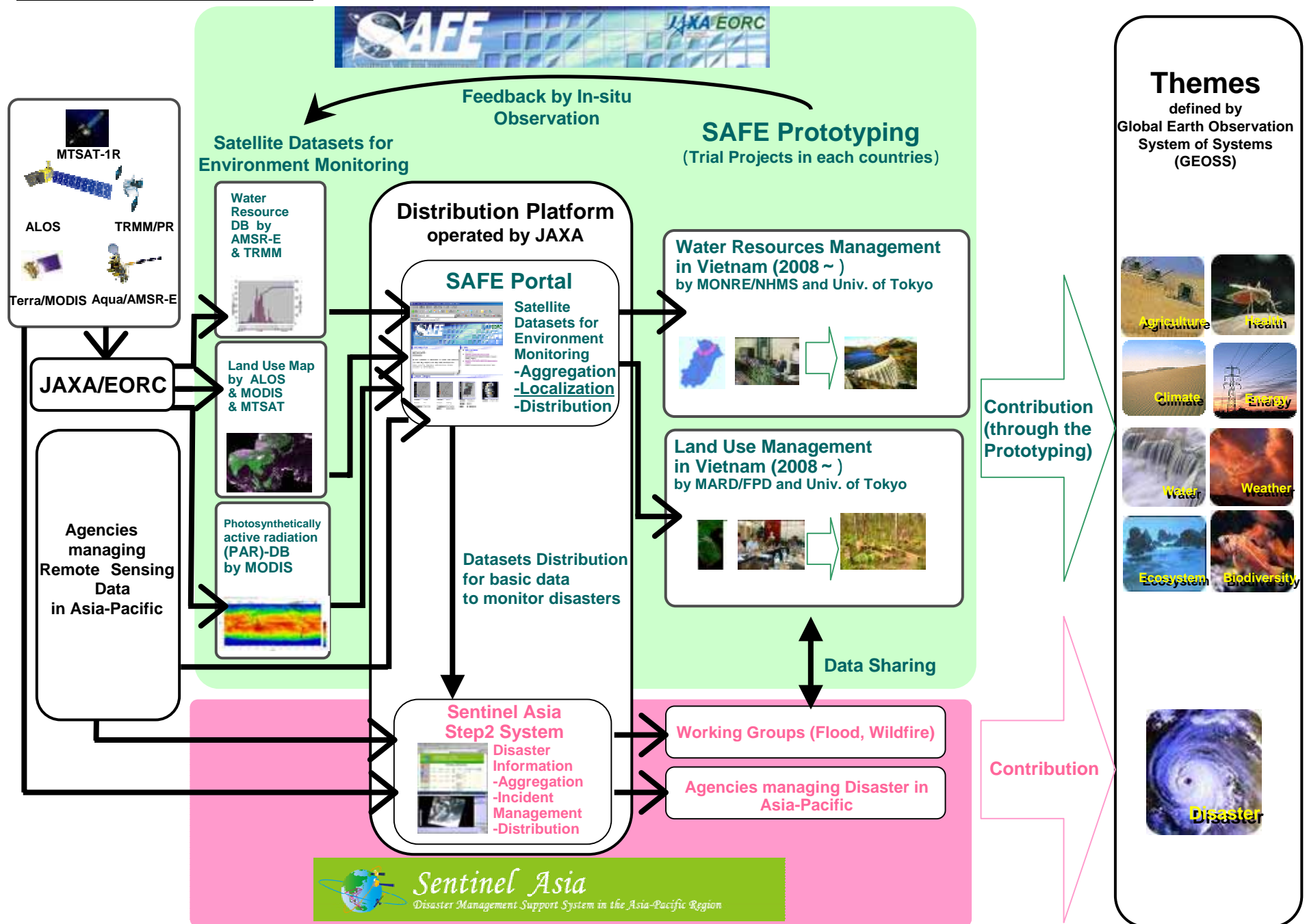
ALOS Emergency Observation Flow and Disaster Information in Sentinel Asia



SAFE (Space Applications For Environment)



The Overview of SAFE



Position of SAFE(1/3)

Background:

- Earth Global Warming is clearly on an escalation road, it is essential to implement proper behavior of accommodation to minimize potential hazards.
- This will require the Asia-Pacific region to start up practical EO satellite data use projects to understand impacts on global change on the environment, through the government data use for public services.

Position of SAFE(2/3)

Global warming hazards in Asia-Pacific:

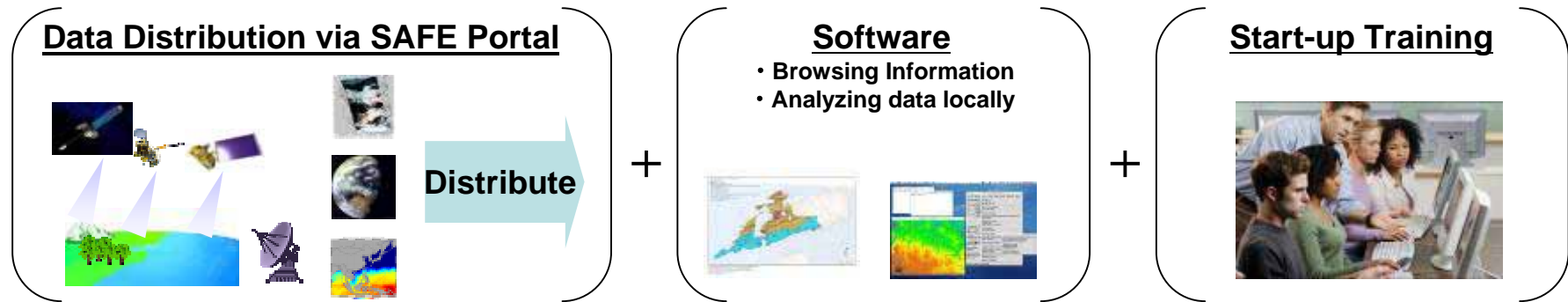
- Glacier lake outbreak will damage several thousand resident on the foot of the mountain.
- Record-breaking drought forced 30% production curtailment of cereal harvesting. This makes serious food shortage, daily life water shortage.
- Sea-level rise increasing the risk of water inundation disaster over coastal region and small islands.
- Expansion of communicable disease such as malaria.
- Forest fire risk enlargement. and it's quality problems

Position of SAFE(3/3)

How SAFE could contribute ?

- Early detection of changing environmental parameters such as water resources, river water level, land cover, deforestation, agricultural production, ecosystem so on. These environment change could be identified through the government public services as a part of SAFE prototype.
- Prototype can be carried out by small parties, the output should be shared and be accessible through SAFE Web.
- Common EO data sets can be generated and shared by SAFE community.

Point (1) “Common datasets”



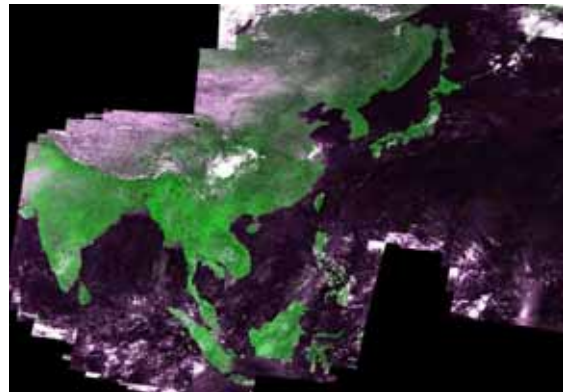
“End-to-End System”

SAFE will provide the following functions as a full package

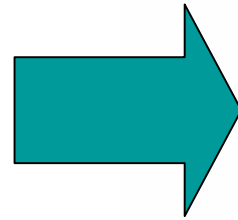
- ✓ **Near-real-time data distribution**
- ✓ **Software to manage data and information**
- ✓ **Training for operation in start-up phase**

Point (2) “Customize locally”

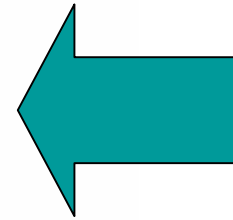
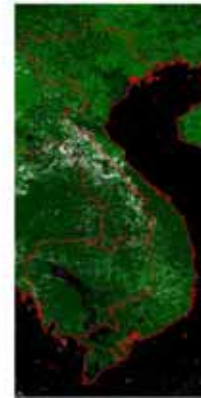
An example of customization



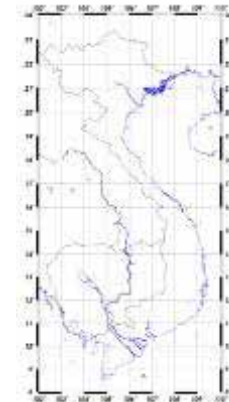
MODIS 10-days composite image



Subset image



Overlay border

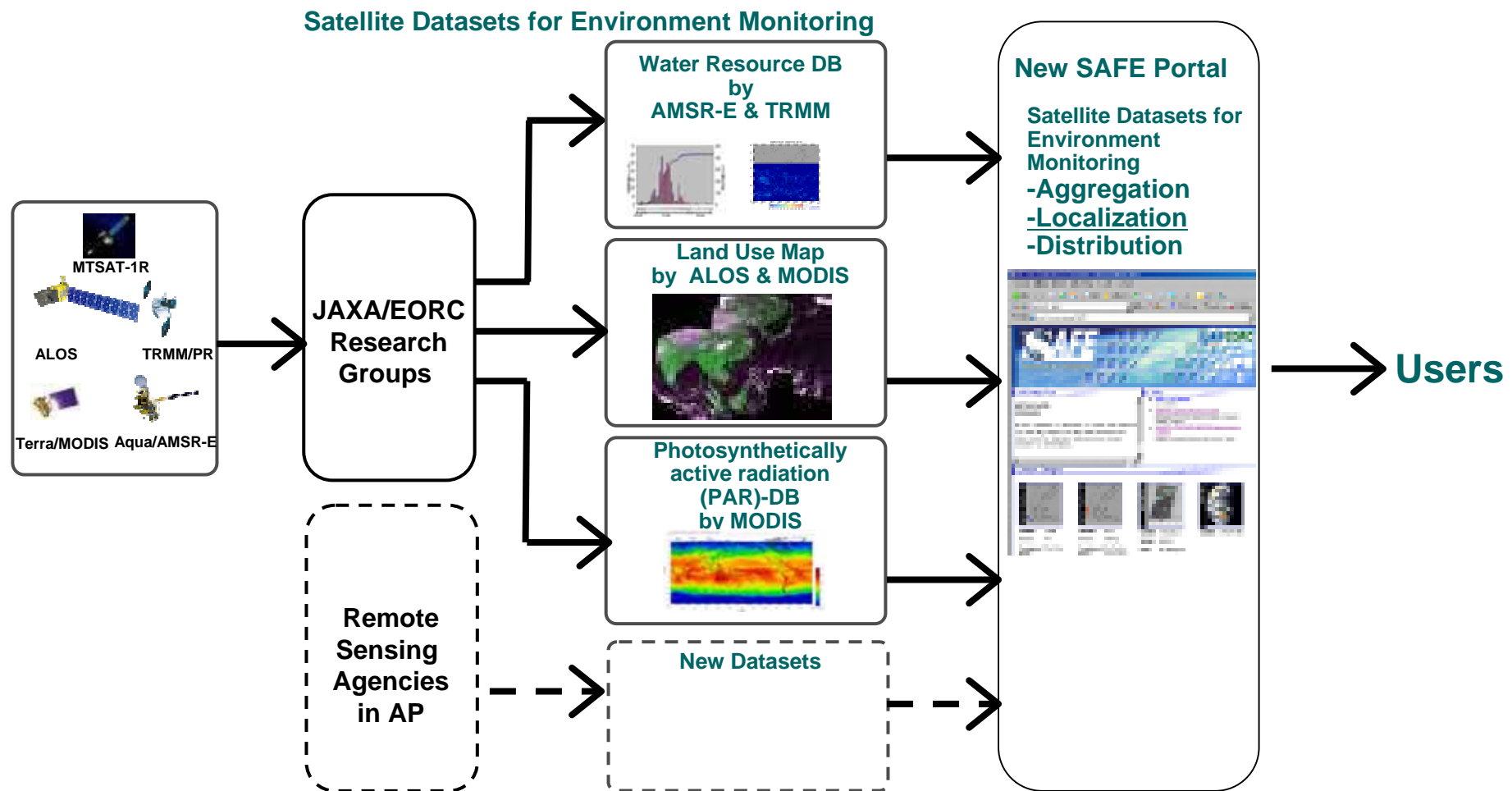


MAP Information

SAFE is created from user demands for operation such as;

- ✓ **Subset image by specifying latitude/longitude**
- ✓ **Set focus area (rivers, forests, basins etc.)**
- ✓ **Set up an information portal for local users**

Point (3) “SAFE Portal”



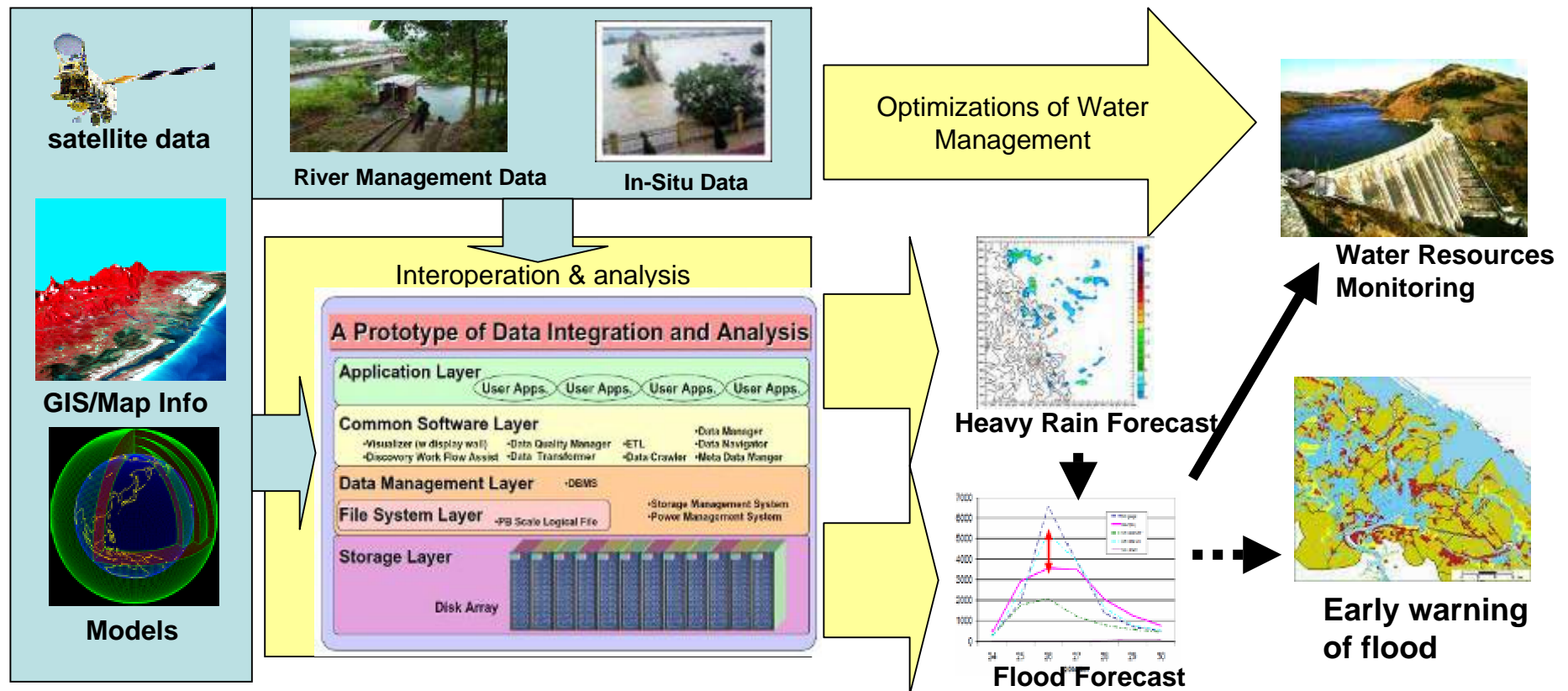
JAXA will set up new portal site for SAFE in next Japanese fiscal year. The role of new web will aggregate not only the near-real time satellite data, but also value-added datasets created by JAXA/EORC research groups for environmental monitoring.

In addition that, JAXA will encourage the partner agencies in Asia Pacific to provide their value-added satellite datasets for environmental monitoring to the site.

1st Prototypes: Water Resources Monitoring

For mitigation of flood damage and optimization of water resources management, JAXA and Univ. of Tokyo will set up a Water Resources Monitoring System using satellite data.

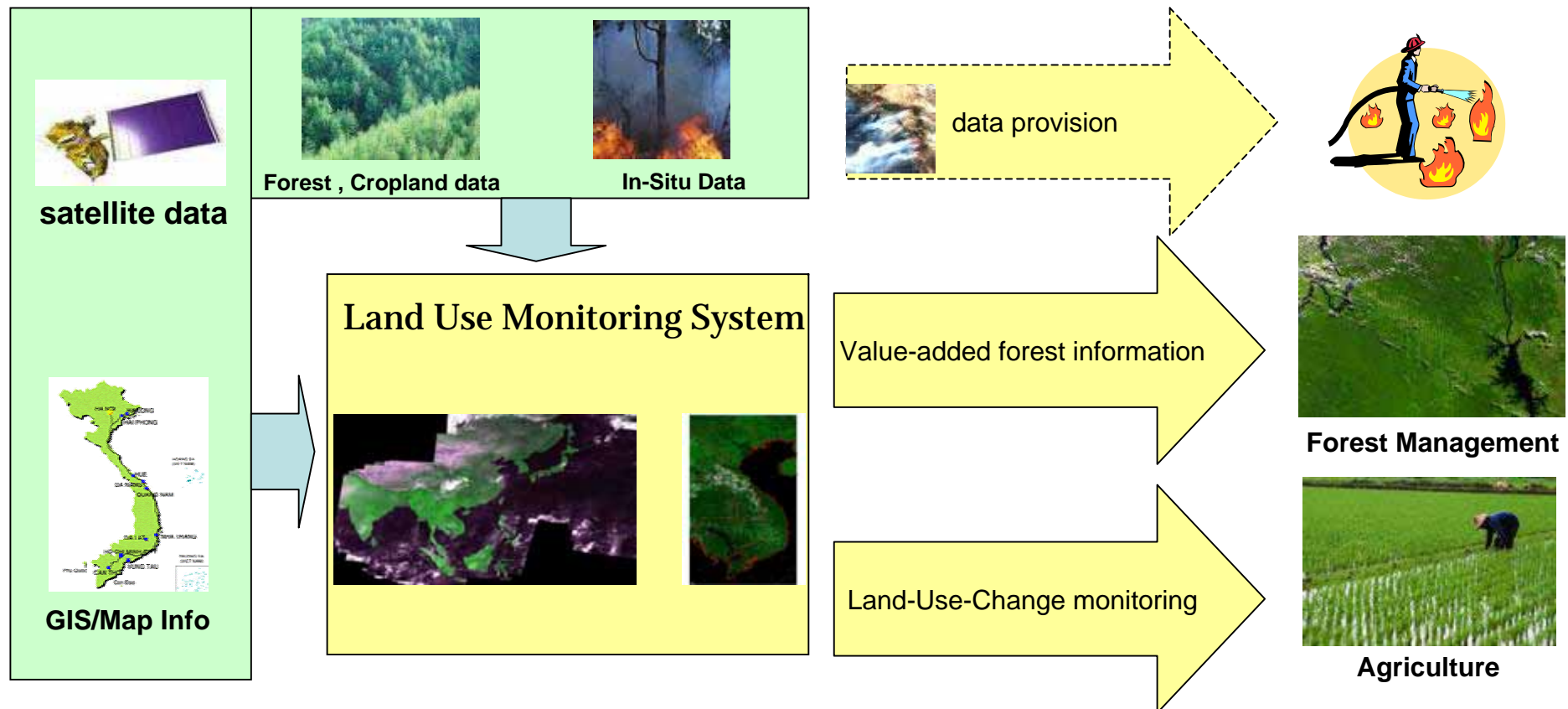
1. Develop methods to detect initial value of atmosphere for heavy rain forecast
2. Develop models to estimate river runoff for both normal situation and flood
3. Develop a dam manipulation system for optimized water resource management.



2nd Prototypes: Land Use Management

For sustainable land use, JAXA and Univ. of Tokyo will set up forest management system and value-added land use monitoring system.

1. Develop Land-Use-Change monitoring system.
2. Develop forest management system with value-added information.
3. Develop the Information Dashboard for optimized Land Use management.





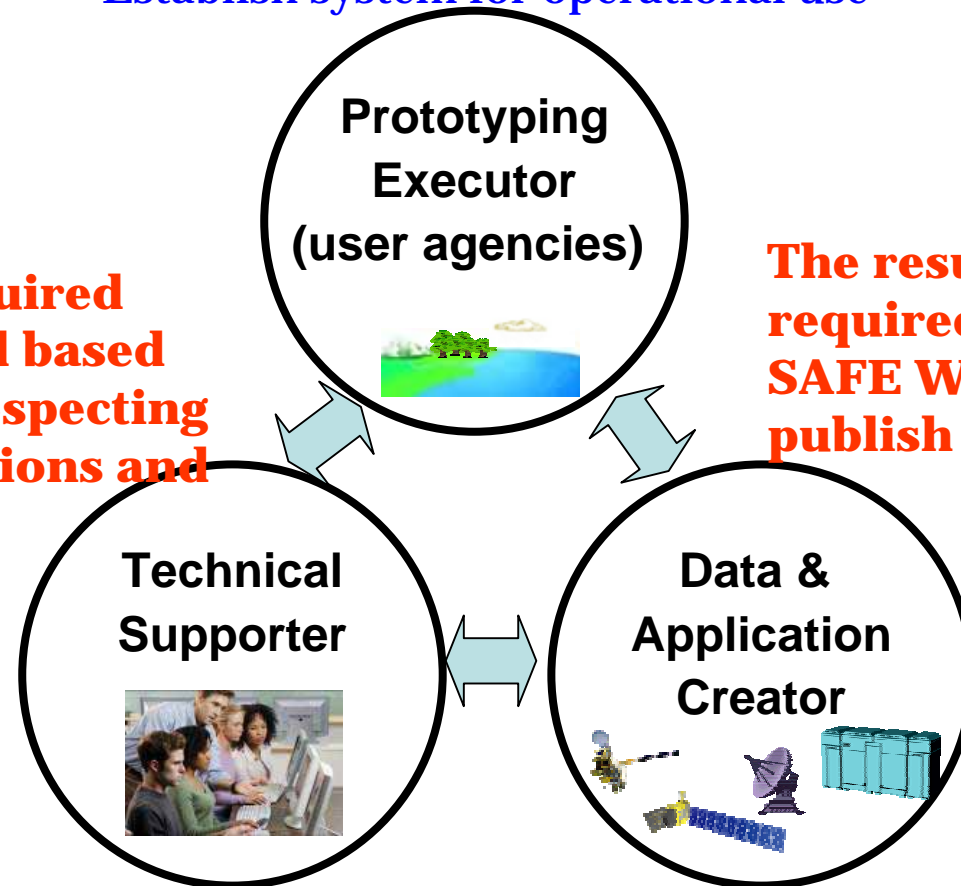
Candidate for prototypes

1. Integrated water resources management
2. Glacier shrinkage and glacier lake outburst
3. Agriculture and forestry
4. Ocean environment, coastal process and sea level rise

SAFE Prototype Scheme & Conditions

Submit proposal for approval
Establish system for operational use

**It should be required
open the ground based
data/datasets respecting
national regulations and
data policy**



**The results should be
required accessible via
SAFE Website, no restriction
publish research paper**

Review / evaluate proposal

Support users through hands on training accommodate with users environment. Install tools/ software for operational use.

Provide satellite data/datasets free of charge, advice application to be executed. Consider data continuity and active historical data archive



SAFE Resource Bank ½ (current and potential)

- Technical Supporter

Univ. of Tokyo

AIT/JAXA

GISTDA

CRISP

CSIRO

LAPAN

- Data provider,
application creator

JAXA/AIT

Univ. of Tokyo

GISTDA

CRISP

CSIRO

Mongolia/RSC



SAFE Resource Bank 2/2

Accessible data/ datasets

GSMaP (TRMM, AMSR-E)

Global Forest Cover Map (ALOS/PALSAR)

Asia Land use map (ALOS/AVNIR-II)

APAR (MODIS)

Land Cover Map (MODIS)

High Resolution DEM (PRISM,ASTER,)

AWCI River basin datasets (Univ. of Tokyo)

Globcover (ESA)

Landsat Archive (USGS)

Radarsat Global Archive (CSA)

Landsat Asia Archive (GISTDA)

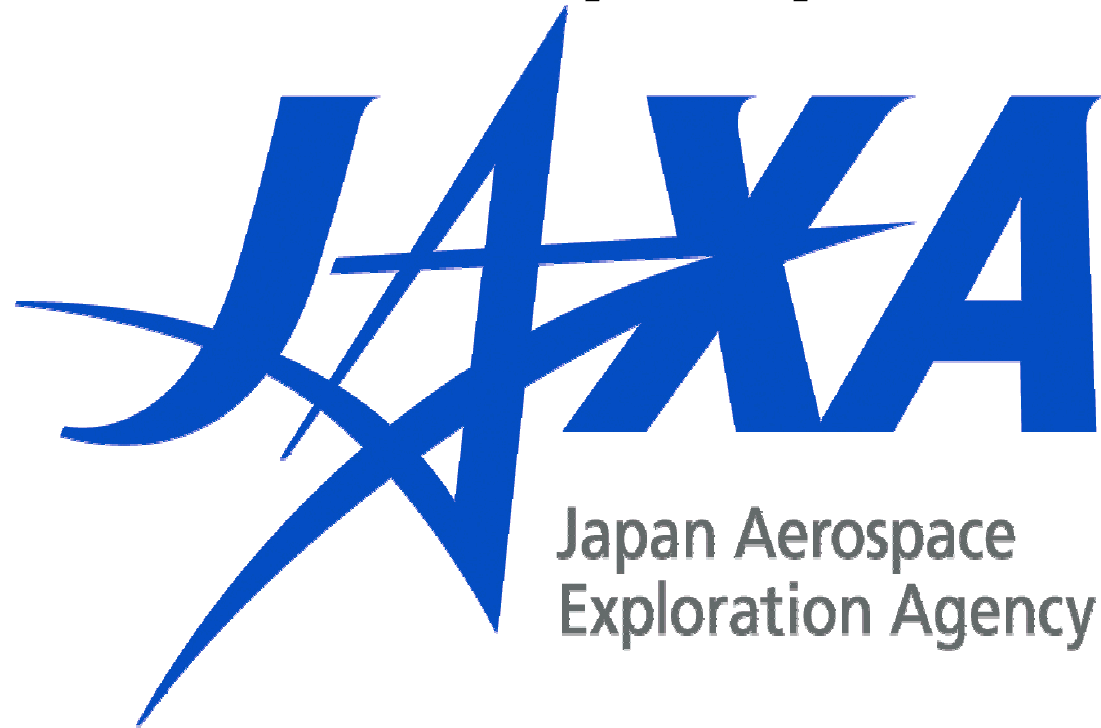
Global Climate Archive (CEOP)

Global SST (NOAA)

Global draught index (NOAA)

For more secure

and prosperous society



END OF PRESENTATION