

Sentinel Asia

contributing to
Disaster Management Support in the Asia-Pacific Region

44th Session of UNCOPUOS/STSC, 15 February 2007, Vienna

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Sentinel Asia Web Site



Disaster Management Support System in the Asia-Pacific Region

About Sentinel Asia

How to provide data

How to request ALOS observation

JPT Members

Library

FAQ

Web Forum

Links

Site Policy

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Recent Disasters and Emergency Observation

Wildfire Monitoring

Flood Monitoring

Capacity Building

Topics

Wildfire
Validation Activities
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[Participate >>](#)

add

Welcome to Sentinel Asia Web Site

Sentinel Asia is a "voluntary and best-efforts-basis initiatives" led by the [APRSAP](#) (Asia-Pacific Regional Space Agency Forum) to share disaster information in the Asia-Pacific region on the Digital Asia (Web-GIS) platform and to make the best use of earth observation satellites data for disaster management in the Asia-Pacific region.

Sentinel Asia is to initially be an internet-based, node-distributed, information distribution backbone, eventually distributing relevant satellite and in-situ spatial information on multiple hazards in the Asia-Pacific region. The system will draw on satellite derived products and imagery from all available earth observing geostationary, or low-earth orbiting satellites, including meteorological satellites that provide routine data to the region.

The system is also to be used by member countries of Sentinel Asia in the Asia-Pacific region to trigger dedicated satellite-data acquisitions through their participating and cooperating space agencies during major and minor disasters in their countries.

[\[Sentinel Asia Leaflet \]](#) 570KB





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<https://dmss.tksc.jaxa.jp/sentinel/>



Natural Disaster Damages in Asia

Total number during 1975- 2005
quoted from 'ADRC-Natural Disasters Data Book-2005'
originated in CRED-EMDAT, 2005

■ Asia

➤ Number of Disaster

■ 3107

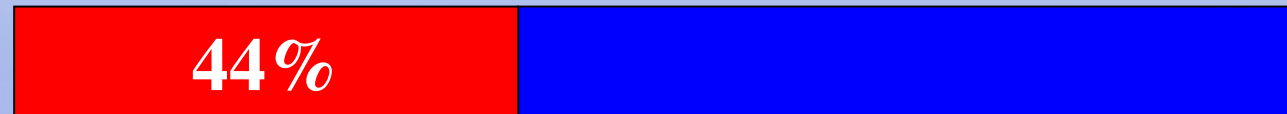
World : 8319



➤ Economical Damage

■ 55 Billion US\$

World :125 Billion US\$



➤ The Death Toll

■ 1251911

World : 2189116



➤ Victims

■ 47.5 Hundred Million

World : 53.4 Hundred Million



Sentinel Asia

- Contribution to the Asia-Pacific region for Disaster Management Support
- Contribution to Global Environment:
Prevention of global warming through Wildfire monitoring and mitigation
- Contribution to GEOSS and RESAP(UNESCAP)
- Collaboration with other initiatives:
Int'l Disaster Charter, SPIDER, GEO-Netcast, ASEAN Archive, etc.

Asia-Pacific Regional Space Agency Forum

APRSAF

<http://www.aprsaf.org/>

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.

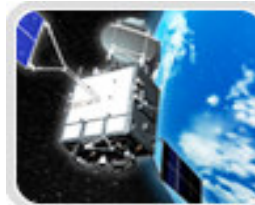
[Organizers] MEXT, JAXA and co-host organizations

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

Working Groups



Earth
Observation



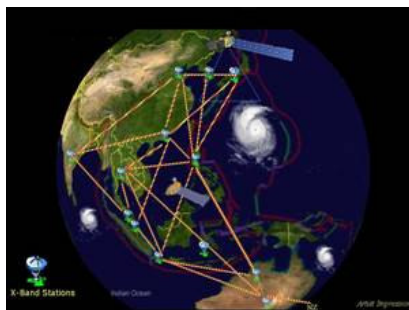
Communication Satellite
Applications



ISS



Space Education &
Awareness



Sentinel Asia Project
establishing Disaster Management
Support System

History

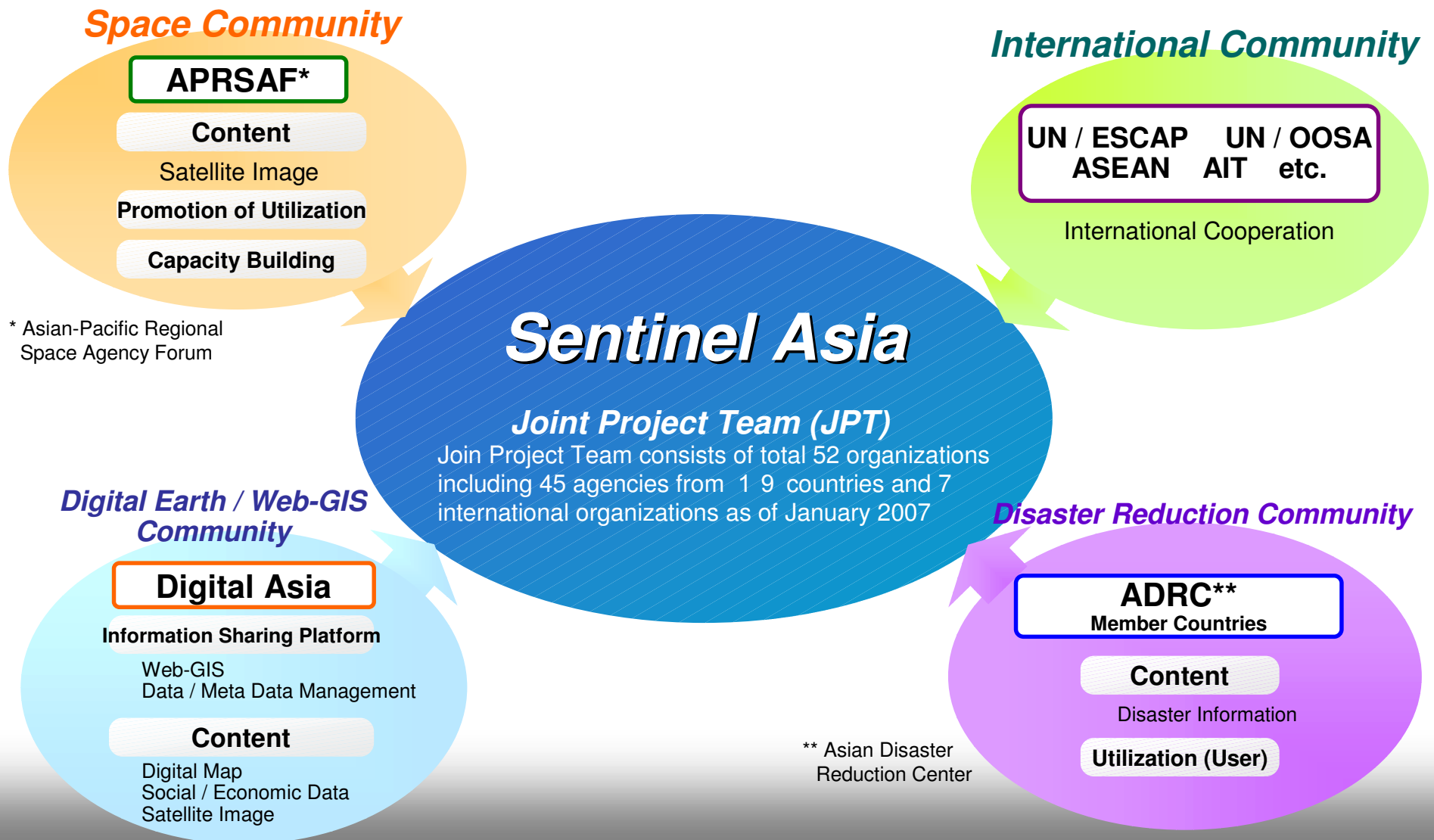
- APRSAF-12, Oct 2005, Kitakyushu, approved the plan to initiate the pilot project to contribute to disaster management support in the Asia-Pacific region.
- Joint Project Team (JPT) was organized and Sentinel Asia was initiated in the meeting in Feb 2006, Hanoi.
- Operations of Sentinel Asia have been started from Oct 2006.

(APRSAF: Asia-Pacific Regional Space Agency Forum)

Approach

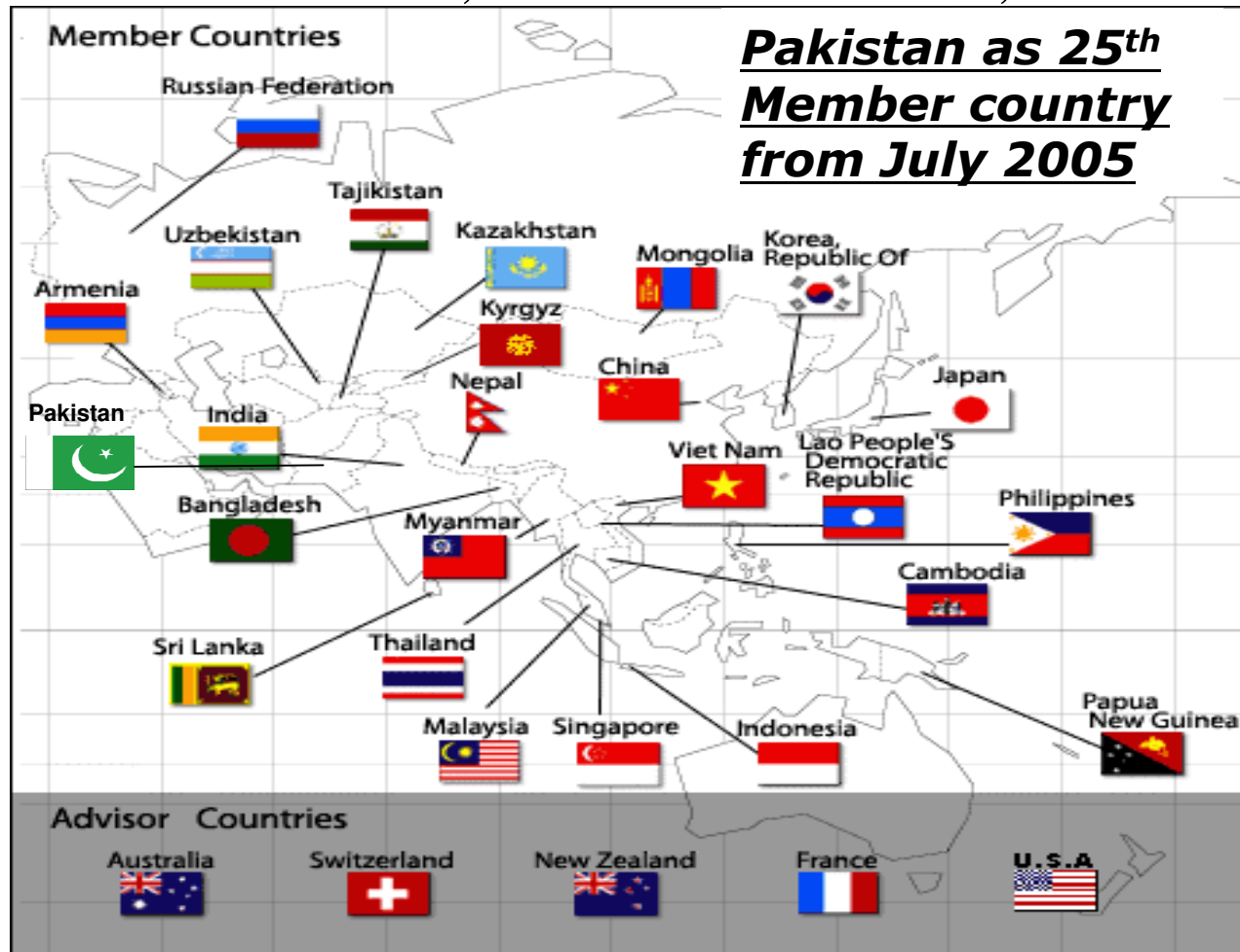
- Stepwise approach by Space community (APRSAF):
Sentinel Asia is the first step as a pilot project in 2006-2007
- Incorporating users (ADRC members, etc.)
- Collaboration with Digital Asia for information sharing platform
- Plan, Implementation and Operation through Joint Project Team (JPT)

Framework of Sentinel Asia



ADRC Member Countries

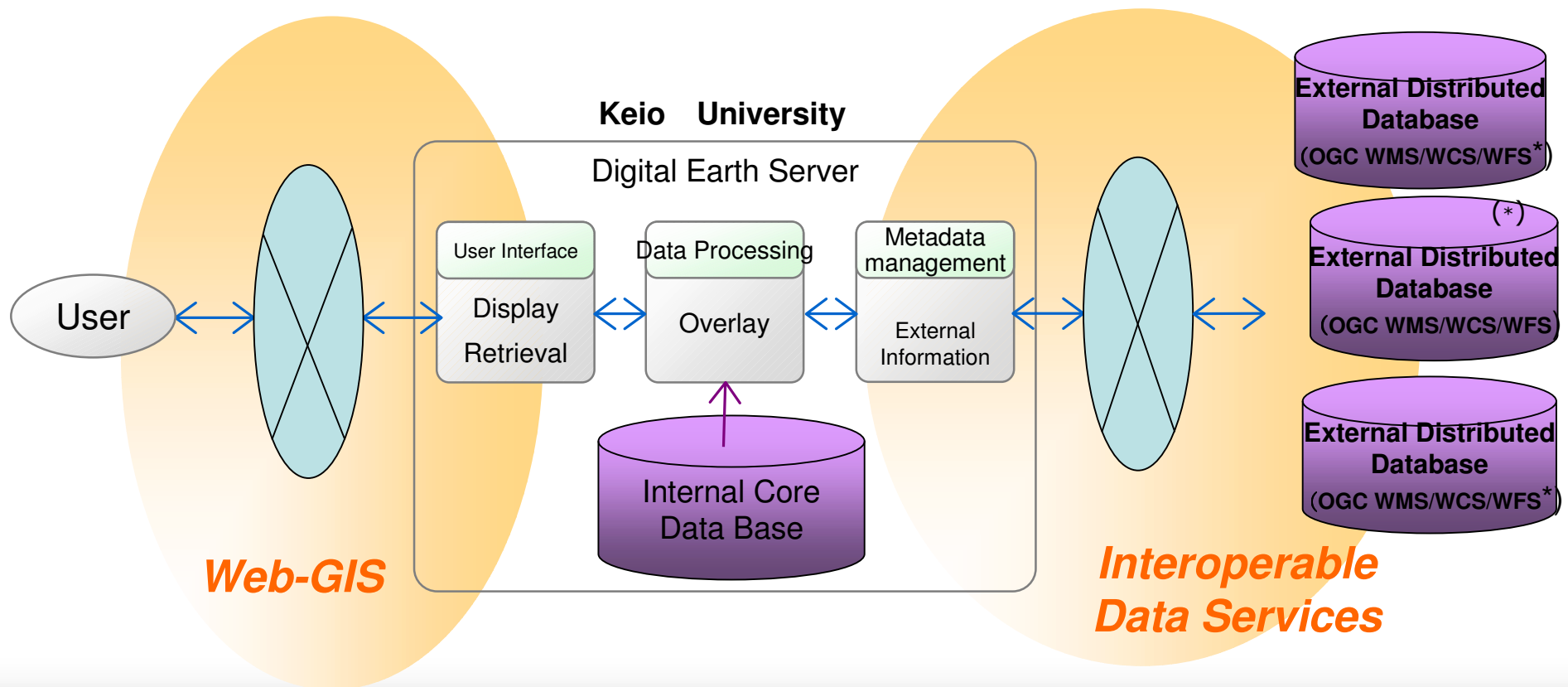
25 Member Countries, 5 Advisor Countries, 1 Observer



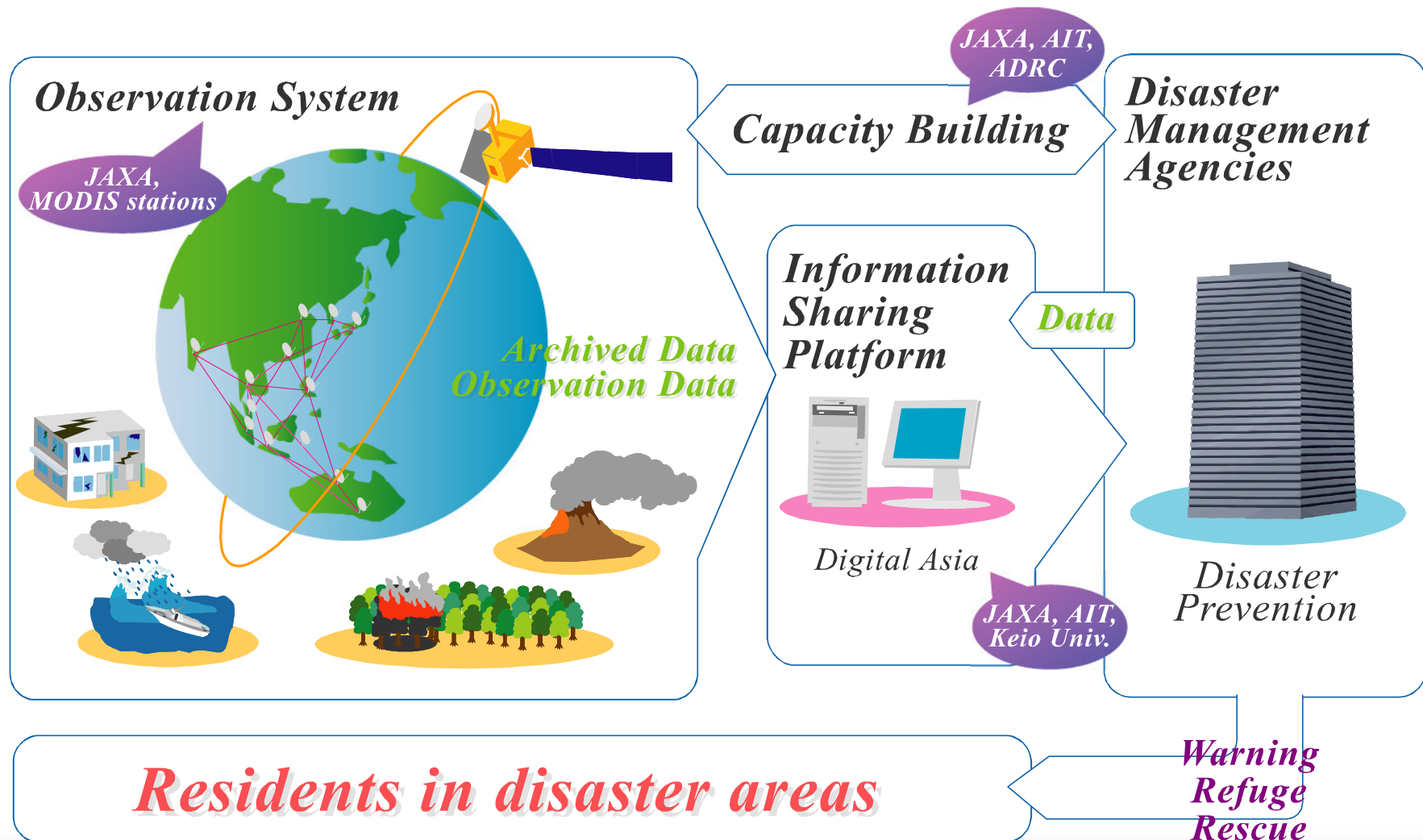
※Implement Various Projects in cooperation with UN/ISDR, UN/OCHA, UNESCO, UNU, WMO, UN/ESCAP, etc.

Digital Asia

Internet Web-GIS Dispersed Data Servers



Overall Flow of Sentinel Asia



Main Activities



Emergency observation in case of major disasters by ALOS and others
To accept observation requests from ADRC members and space-related JPT members



Wildfire monitoring by MODIS, ALOS, etc.



Flood monitoring by TRMM, AMSER-E, ALOS, etc.



Capacity building for utilization of satellite images for disaster management

Content (Sharing Data)

- Disaster information in the Asia-Pacific region provided by ADRC
- Digital maps data
 - A millionth digital map stored in Digital Earth server
 - Fine regional digital maps
- Satellite images of disaster area before and after disaster
- Satellite image products
- MODIS data for wildfire monitoring
- On-site digital camera images
- Regional social / economic data

List of Recent Disasters provided by ADRC

Sentinel-Asia Project - Disaster Management Support System - Microsoft Internet Explorer

ファイル(F) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

戻る 進む 検索 印刷 移動

アドレス http://ams.adrc.or.jp/adrc/MyMap/adrc/index.jsp

Sentinel-Asia Project
Disaster Management Support System

About DMSS Home Search Photo Search Satellite Images Help

Lang: English User/Pass: Login

The Latest Disaster Information

GLIDE Number:

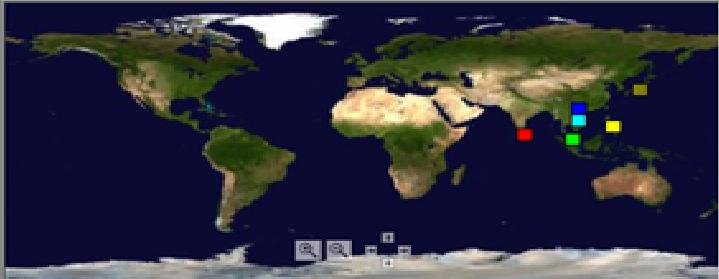
Event:

Duration: / ~ /

Region/Country: /

Comment Keywords:

Existence of satellite image and photo:

 [Map]

GLIDE Number	Event	Duration	Country	Comment	Provided by
FL-2006-000155-LKA	Flood and Landslide	2006/10/31	Sri Lanka	Due to torrential rains, Some parts of the country are experiencing Floods and Landslides. The most affected Districts are Gampaha, Puttalam, Kalutara and Colombo. Around 72,000 families have been affected and 25 deaths were reported by the District and divisional authorities in the affected areas.	ADRC
TC-2006-000153-PHL	Typhoon	2006/10/30	Philippines	Typhoon Gimaron battered the northern Philippines on Monday, killing at least 10 people in a barrage of landslides and flooding, officials said.	ADRC
FL-2006-000147-MMR	Flood	2006/10/11	Myanmar	On 11 October, the worst monsoon floods in more than a decade are sweeping through Myanmar and Thailand. At least 13 people have been killed over the last few days in army-ruled Myanmar.	ADRC
FL-2006-000147-THA	Flood	2006/10/09	Thailand	More than 32 dead in Thai floods since August 2006, reported on October 10.	ADRC
TC-2006-000144-VNM	Typhoon	2006/10/01	Viet Nam	At least 15 people in Vietnam are now known to have died as a result of Typhoon Xangsane, which buffeted central provinces over the weekend (by Oct.1,2006).	ADRC
TC-2006-000144-PHL	Typhoon	2006/09/27	Philippines	On September 28,2006, at least eight people have been killed and several are missing in the Philippines after Typhoon Xangsane brought fierce winds and rain.	ADRC
LS-2006-000143-PHL	Landslide	2006/09/22	Philippines	At least eight people were killed and 14 were injured when a landslide slammed into a narrow mountain road in the northern Philippines, local disaster officials said on Friday.	ADRC
TC-2006-000142-JPN	Typhoon	2006/09/17	Japan	The strong typhoon,Shanshan, to strike southwestern Japan has killed at least seven people caused tornade and flash floods.	ADRC

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インターネット

Photos of disaster

Sentinel-Asia Project - Disaster Management Support System - Microsoft Internet Explorer

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戻る 検索 お気に入り

アドレス(D) http://arrs.adrc.or.jp/adrc/MyMap/adrc/index.jsp


Sentinel-Asia Project
Disaster Management Support System

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Lang: English User/Pass: Login

Photo Details

GLIDE Number:	TC-2006-000144-VNM	At least 15 people in Vietnam are now known to have died as a result of Typhoon Xangsane, which buffeted central provinces over the weekend (by Oct.1,2006).
Event:	Typhoon	
Duration:	2006/10/01	
Country or District:	Viet Nam	This photo was shot at Da Nang city.
Posted Date:	2006/10/16 14:47:16	
Photo Date:	2006/10/01 00:00:01	
Provider:	Vietnam News Agency	
Title:	Cay bat goc	
Location:	Lat: 16d 3m 1.689s N, Lon: 108d 13m 20.329s E	

Photo


[\[Download this Original Photo \]](#) [\[Back \]](#)

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Satellite images before and after disaster

Sentinel-Asia Project - Disaster Management Support System - Microsoft Internet Explorer

ファイル(E) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

戻る 検索 お気に入り 移動

アドレス(D) http://arrs.adrc.or.jp/adrc/MyMap/adrc/index.jsp

Sentinel-Asia Project
Disaster Management Support System

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Satellite Image Details

Observation Date:	2006/10/12 16:03:24	Satellite:	PALSAR	Sensor:	PALSAR	Observation Mode:	FBS-HH
Flight Direction:	Ascending	Product:	L1.5	Pointing Angle:	41.5	Scene Center Lat. / Lon.:	15.6075/100.1778
Comments:	ALOS/PALSAR image (HH-ALPSRP038160290-H1.5GUA)						

Satellite Image

Legend:

User Layers:

- ☒ ALOS/PALSAR Thai Flood on O
- ☐ ALOS/PALSAR Thai Flood on O

Recommended Layers:

Base Map:

- ☐ DEM(GTOP030)
- ☐ DEM(ETOPO2)
- ☐ LAND COVER(GLCC)
- ☐ Population 1990(GPWv3)
- ☐ Population 1995(GPWv3)
- ☐ Population 2000(GPWv3)
- ☐ Population 2005(GPWfe)
- ☐ Population 2010(GPWfe)
- ☐ Population 2015(GPWfe)

DCW(Vmap0):

Reference

- ☒ Political Boundaries

Lat: 15d 36m 27s N, Lon: 100d 10m 40.091s E

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Satellite images and Land Cover Data

Sentinel-Asia Project - Disaster Management Support System - Microsoft Internet Explorer

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戻る 検索 お気に入り

アドレス(D) http://arrs.adrc.or.jp/adrc/MyMap/adrc/index.jsp 移動

Sentinel-Asia Project
Disaster Management Support System

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Lang: English User/Pass: Login

Satellite Image Details

Observation Date:	2006/10/12 16:03:24	Satellite:	PALSAR	Sensor:	PALSAR	Observation Mode:	FBS-HH
Flight Direction:	Ascending	Product:	L1.5	Pointing Angle:	41.5	Scene Center Lat. / Lon.:	15.6075/100.1778
Comments:	ALOS/PALSAR image (HH-ALPSRP038160290-H1.5GUA)						

Satellite Image

Legend:

User Layers:

- ☐ ALOS/PALSAR Thai Flood on O
- ☒ ALOS/PALSAR Thai Flood on O

Recommended Layers:

Base Map:

- ☐ DEM(GTOP030)
- ☐ DEM(ETOPO2)
- ☒ LAND COVER(GLCC)
- ☐ Population 1990(GPWv3)
- ☐ Population 1995(GPWv3)
- ☐ Population 2000(GPWv3)
- ☐ Population 2005(GPWfe)
- ☐ Population 2010(GPWfe)
- ☐ Population 2015(GPWfe)

DCW(Vmap0):

Reference

- ☒ Political Boundaries

[Add Layers][Redraw]

Lat: 15d 36m 27s N, Lon: 100d 10m 40.091s E

Copyright(C) Ministry of Economy, Trade and Industry (METI), Japan Aerospace Exploration Agency (JAXA), USGS, NGA

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Satellite images before and after disaster

Sentinel-Asia Project - Disaster Management Support System - Microsoft Internet Explorer

ファイル(E) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

アドレス(D) http://arrs.adrc.or.jp/adrc/MyMap/adrc/index.jsp

Sentinel-Asia Project
Disaster Management Support System

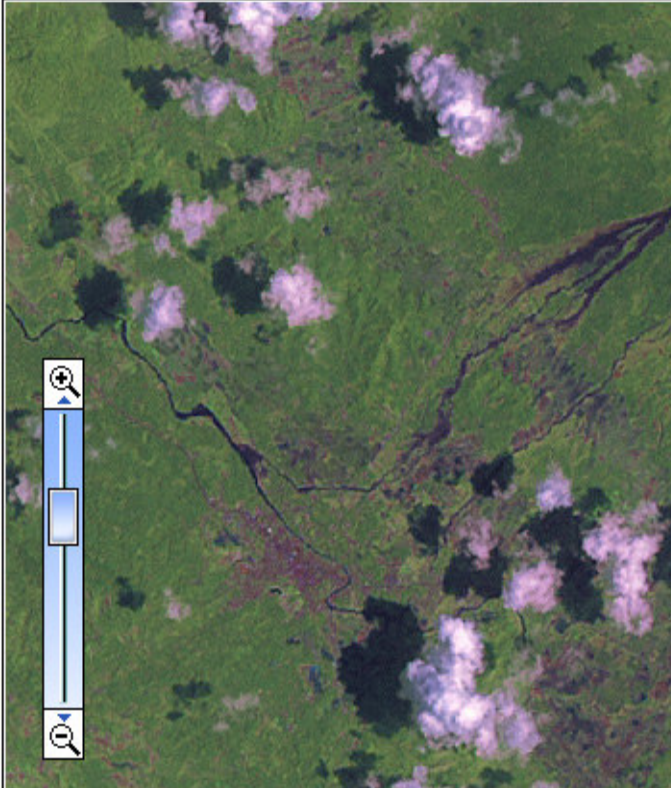
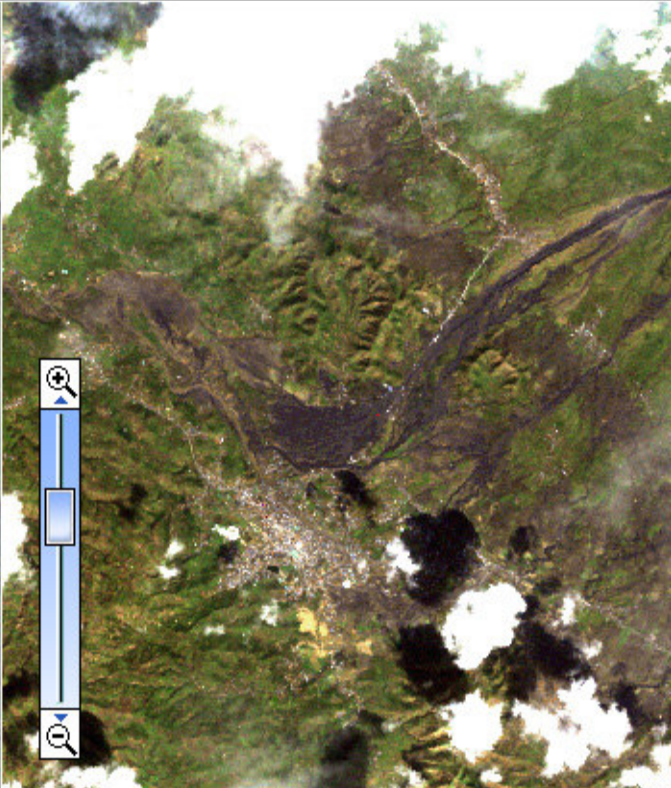
Home | Search Photo | Search Satellite Images | Help

Lang: English User/Pass: Login

Satellite Image Details

Observation Date:	2006/12/05 02:27:00	Satellite:	ALOS	Sensor:	AVNIR-2	Observation Mode:	OBS
Flight Direction:	Descending	Product:	L1B2	Pointing Angle:	10.44	Scene Center Lat. / Lon.:	13.20375/123.700096
Comments:	Philippines, Typhoon and Mudslide						

satellite Image

Displayed and Overlaid Data

Map Data

[+] ☐ DCW(Vmap0):

Satellite Image (After Disaster)

☐ ALOS AVNIR-2(2006/12/03 02:44)

☒ ALOS AVNIR-2(2006/12/05 02:27)

Satellite Image (Before Disaster)

☐ LANDSAT(2003/01/01 00:00)

☒ LANDSAT(2005/01/01 00:00)

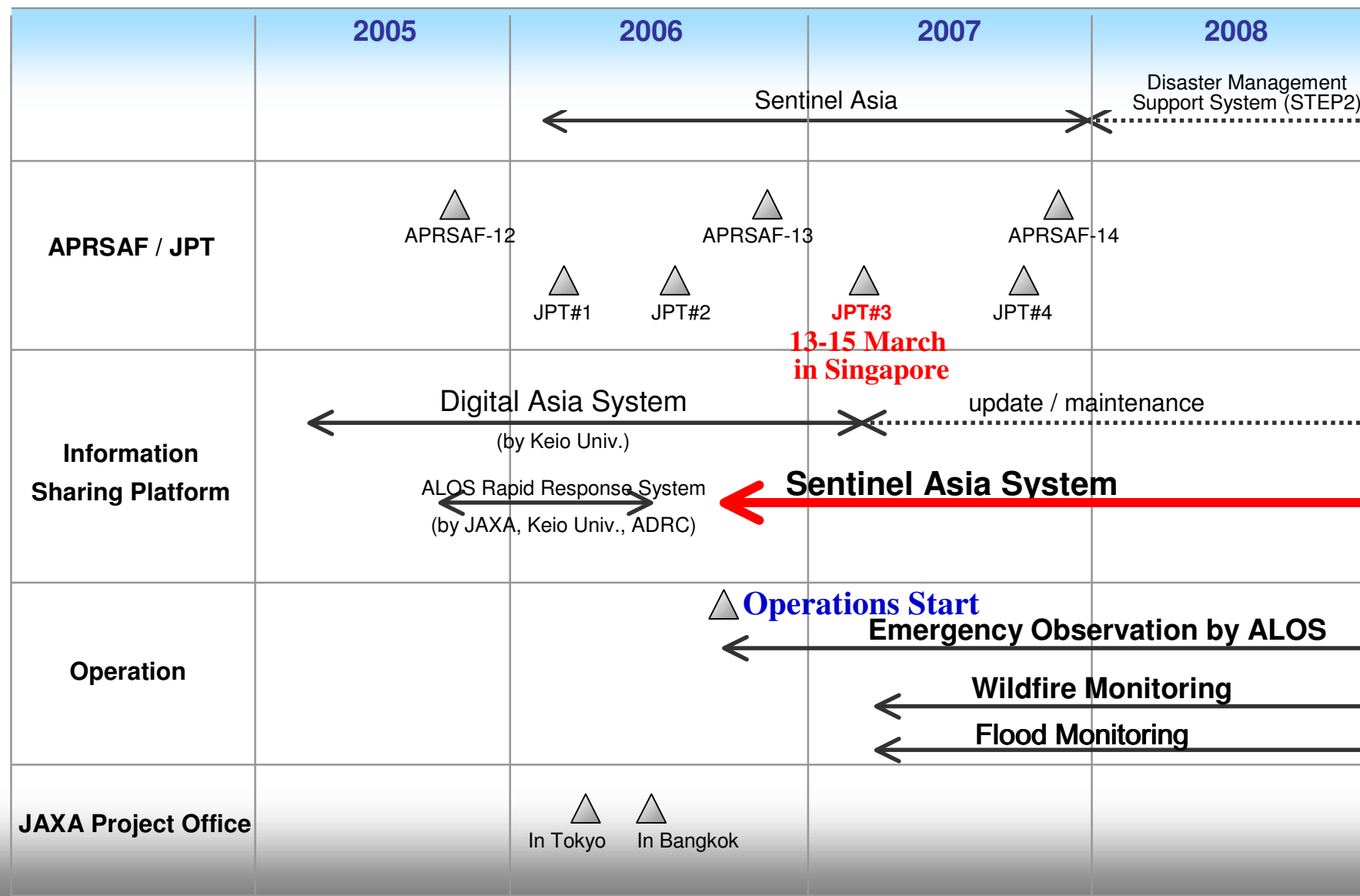
Other Information

[+] DEM

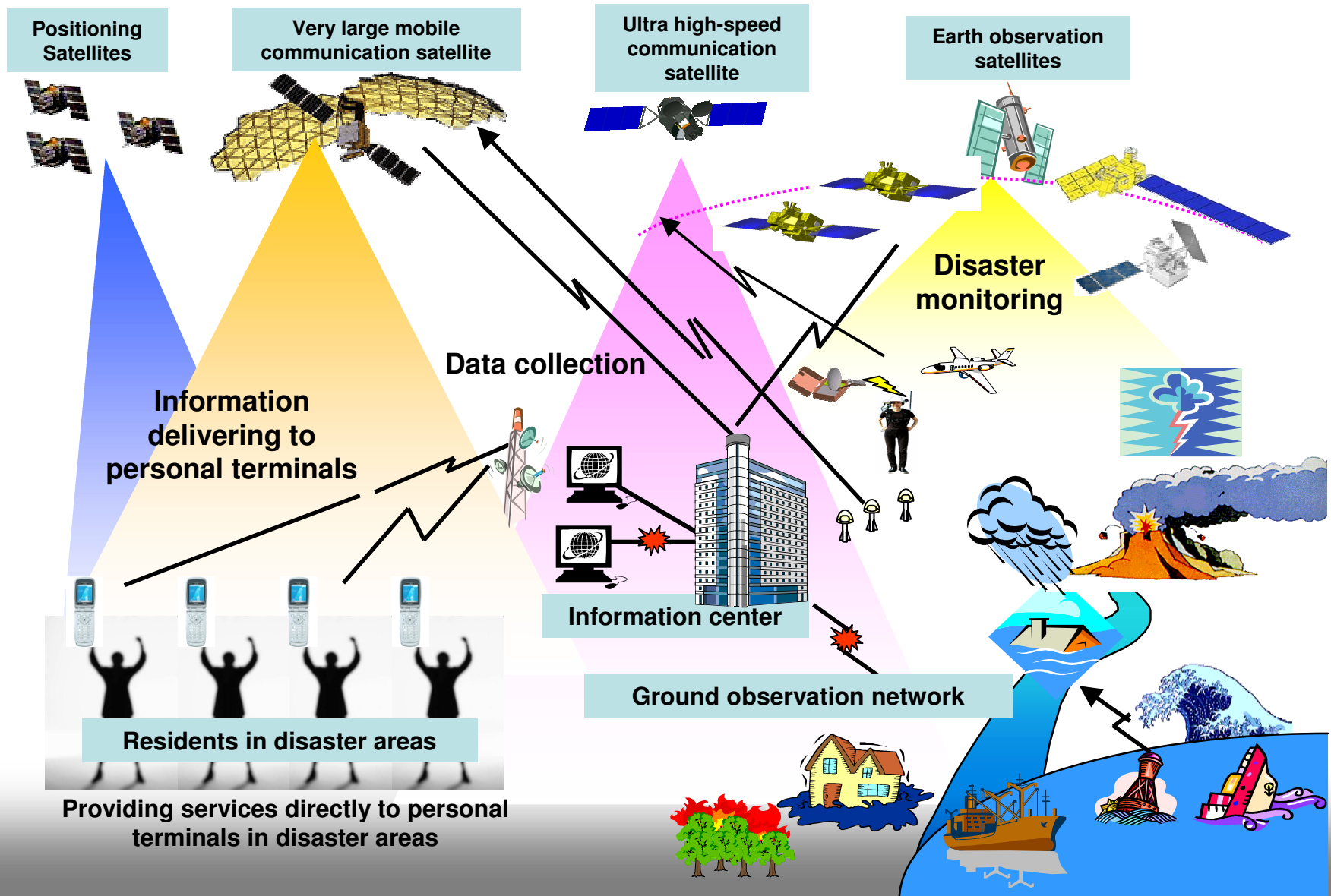
[+] LAND COVER

[+] Population

Sentinel Asia Milestones



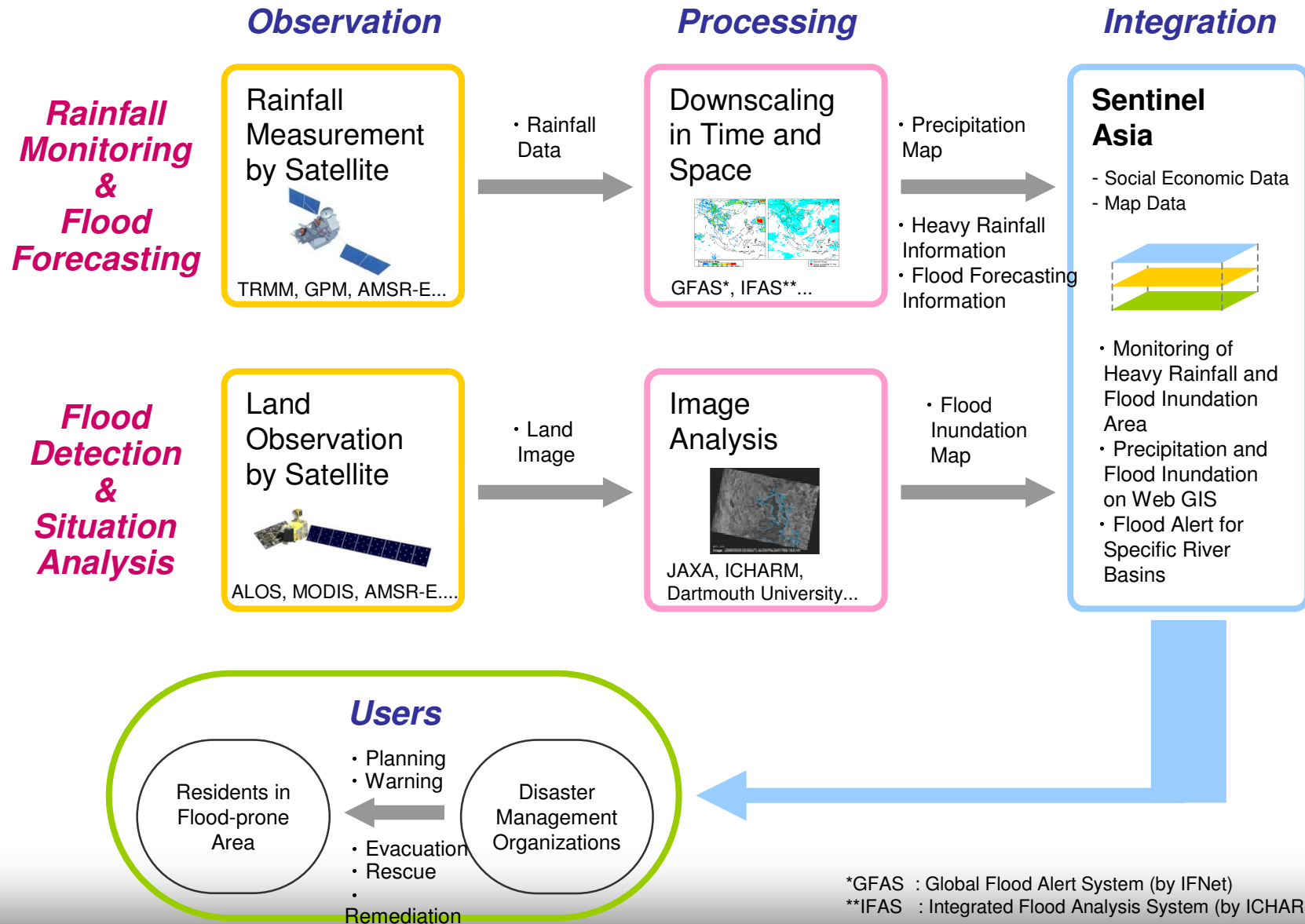
JAXA Vision of a Disaster Management Support System in the Asia-Pacific Region



Sentinel Asia Flood Working Group

- Flood Working Group has been organized:
Leader is Mr. K. Fukami of ICHARM
- Purpose
Contribution to flood disaster management in the Asia-Pacific
region by space, GIS and information technology
- Main Activities
 - Monitoring of Heavy Rainfall and Flood Inundation Area
 - Precipitation and Flood Inundation on Web GIS
 - Flood Alert for Specific River Basins

Sentinel Asia Flood Monitoring



*GFAS : Global Flood Alert System (by IFNet)

**IFAS : Integrated Flood Analysis System (by ICHARM)

Wild Fire Monitoring

Wildfire Working Group has been organized:
Leader is Prof. M. Fukuda of Hokkaido Univ.

Purpose

- Regional contribution to the Asia-Pacific region
- Global contribution to prevention of global warming

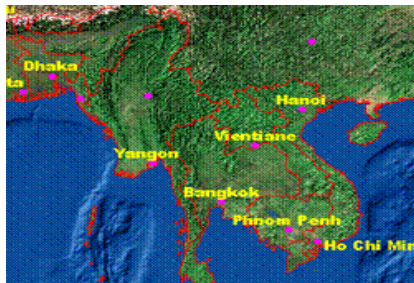
Main Activities

- Establishment and improvement of early Wildfire Detection based on MODIS data
- To provide hot spot information and satellite images on Web-GIS
- Development of Wildfire expansion forecasting
- Serving value-added information to Forest Fire Control Agency

Sentinel Asia (Satellite Observation for Disaster Monitoring)



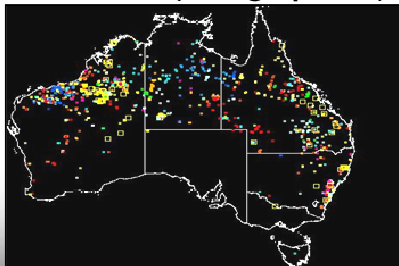
Hokkaido Univ. (Japan)



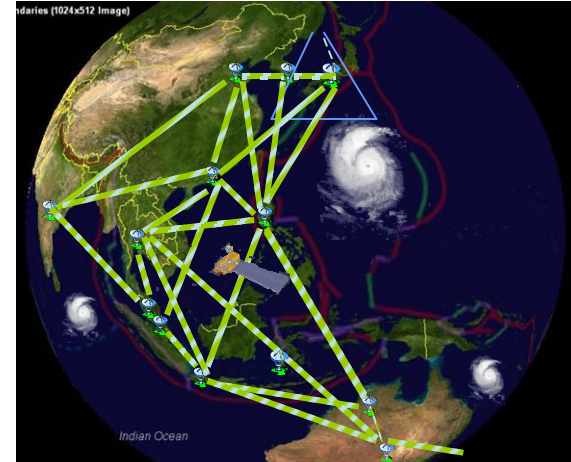
AIT/Tokyo Univ. (Thailand)



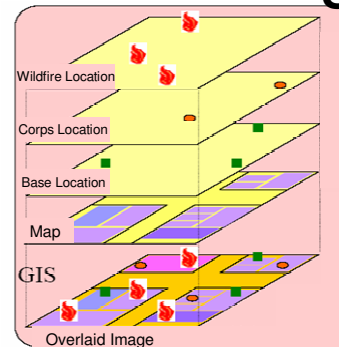
CRISP (Singapore)



CSIRO (Australia)



Satellite observation network



Integration by Digital Asia Web-GIS interface
(Keio Univ.)

Main Activities

- Establishment and Improvement of Early Wildfire Detection based on MODIS
- Development of Wildfire Expansion Forecasting
- Serving Value-Added Information to Forest Fire Control Agency



Wildfire map of Asia

Task of Wild Fire Working Group

Fire Warning (Fire Danger Warning)

Early Fire Detection

Forecasting Fire Expansion

Early Fire Control

Full Suppression

Restoration of damaged forest



**Satellite
Information**

Sentinel Asia Wild Fire Working Group

Hot Spot Detection Algorithm Validation

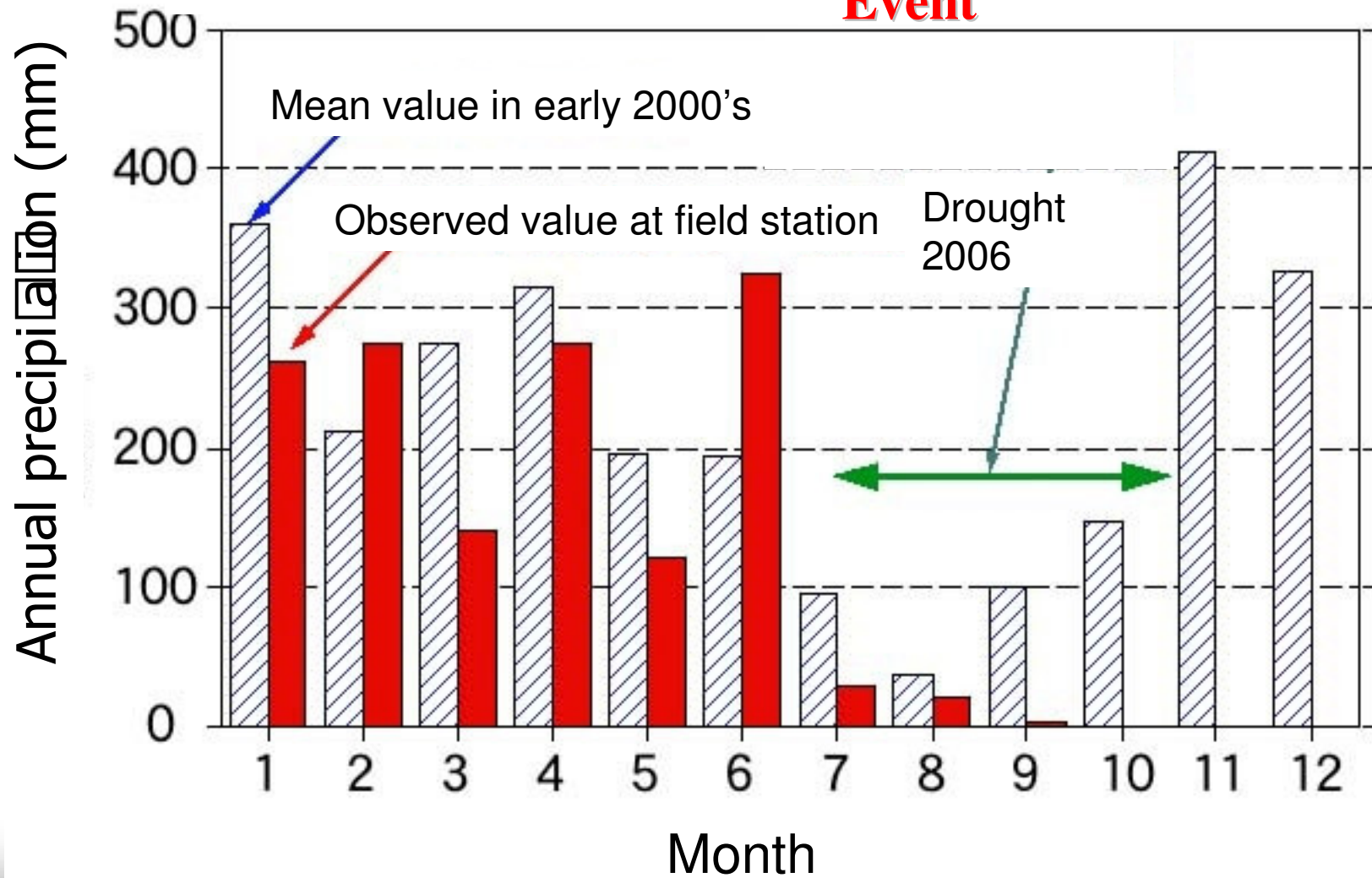
Campaign Oct.1-Oct.31

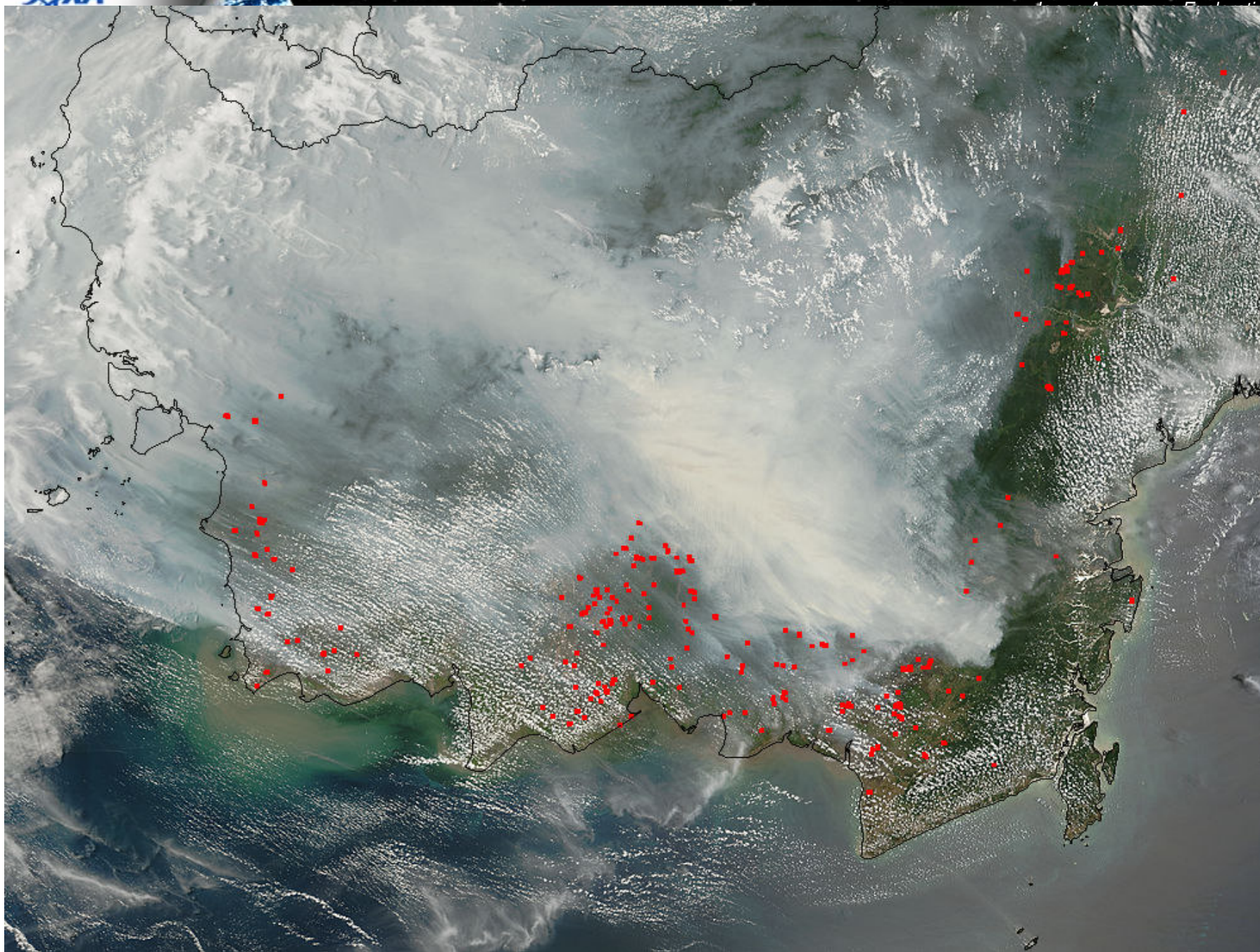
**Comparison between results of
detections by three MODIS Receiving
Stations**

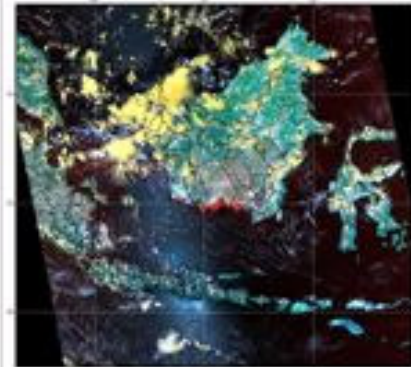
**Comparison between ground truth data
and hot spot data**

**Comparison between NASA Algorithm
and NEW Algorithm**

2006 El Nino Event







LAPAN Indonesia

AIT Thailand

CRISP Singapore

Fire Detection Data

Hokkaido University

Fire Detection on Ground

Palangka Raya University

Fire Patrol Team

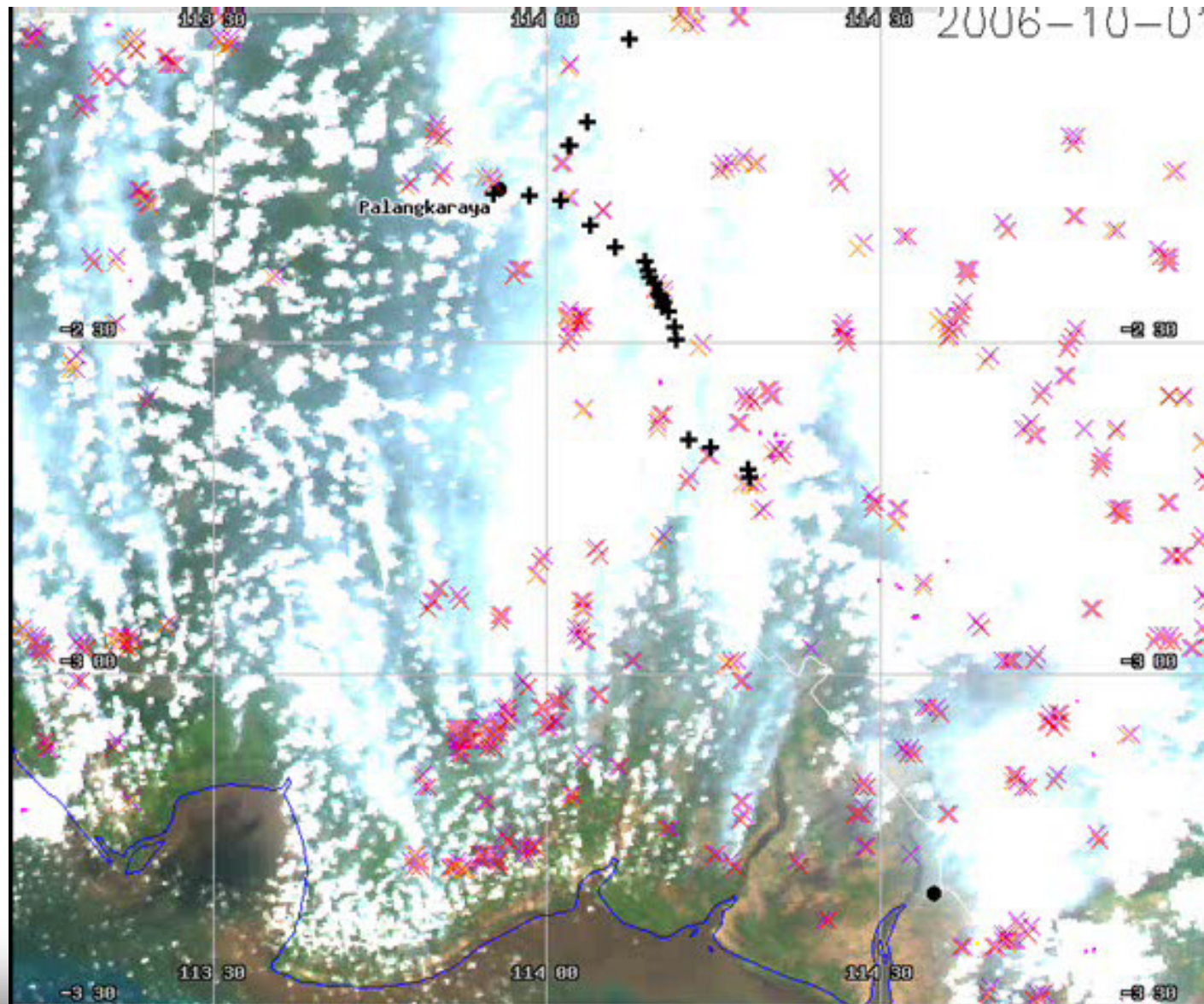


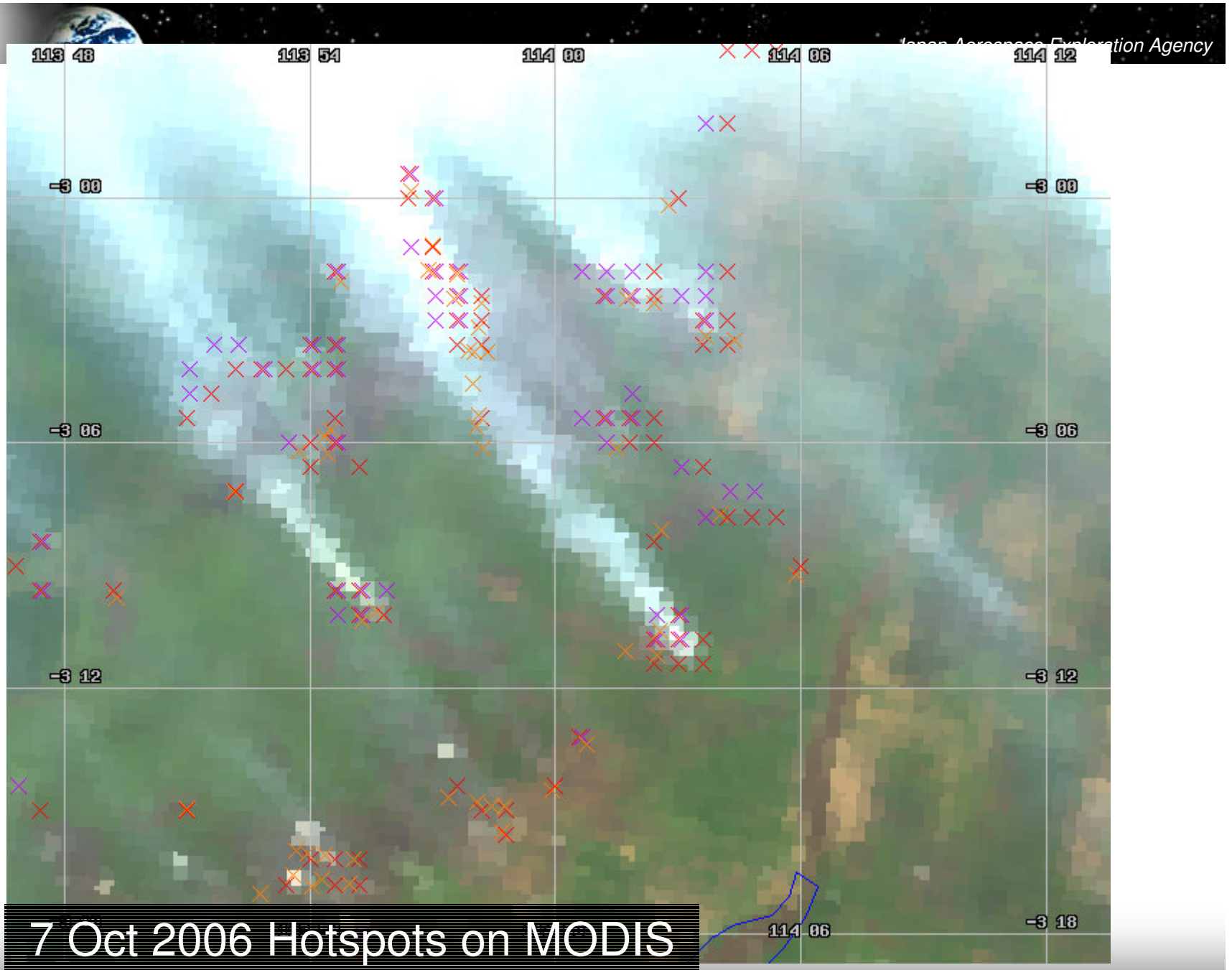
Received Hotspots

Institute	Total # of Pass	Pass incl. Hotspots	# of hotspots
AIT	172	46	3356
CRISP	221	46	3403
LAPAN	20(days)	20	1384
ACRES (NOAA)	363		



Time series of Hotspots









ERROR: stackunderflow
OFFENDING COMMAND: ~

STACK: