



APRSAF

Asia-Pacific Regional
Space Agency Forum

The Asia-Pacific Regional Space Agency Forum(APRSAF) and its Initiatives

November 2010

Shinichi Mizumoto

APRSAF Secretariat

(Japan Aerospace Exploration Agency (JAXA))



- **Establishment:** 1993, following International Space Year (1992).
- **Goal:** to promote regional cooperation in space development and applications.
- **Participating entities:** space agencies, government entities, user agencies, and international organizations (regional & global).
- **Characteristics:** open and flexible framework, voluntary contributions
- **Objectives**
 - to contribute to (i) the socio-economic development in the region, and (ii) the preservation of the global environment using space technology and its applications.
 - in order to increase benefits for all countries in the region, (i) to explore possibilities for future cooperation among developers and users of space technologies, and (ii) identify areas of common interest and assign priorities for action.

The above are to be pursued while cooperating with space agencies and other relevant entities outside the region that support APRSAF objectives.²

APRSAF: Framework

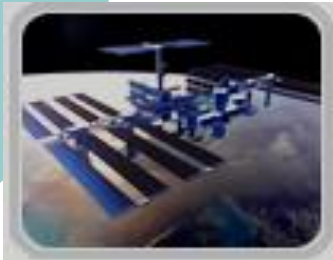


APRSAF

Asia-Pacific Regional
Space Agency Forum

Working Groups

Estab. 2001
(APRSAF-12)



Space
Environment
Utilization
WG



Earth
Observation
WG



Communication
Satellite Applications WG

**APRSAF
Plenary
Session**

Annual Mtg



Space Education
and Awareness WG

Initiatives



**"Sentinel Asia"
Disaster
Management
Support System**
Estab. 2005
(APRSAF-12)



**"SAFE"
Space Applications
for Environment**
Estab. 2008
(APRSAF-15)



**"STAR"
Satellite Technology
For the Asia-Pacific
Region**
Estab. 2007
(APRSAF-14)

APRSAF-16: Overview



APRSAF

Asia-Pacific Regional
Space Agency Forum

- **Date/Place:** 26-29 January 2010, Bangkok, Thailand.
- **Theme:** “Space Applications: Contributions towards Human Safety and Security”
- **Organized by:** MOST (Thailand), GISTDA (Thailand), MEXT and JAXA (Japan)
- **Participants:**
About 312 from 27 countries/regions and 10 int’l organizations
- **Side Events:** GNSS Workshop, Poster Contest, Water Rocket Event



APRSAF-16: Side Event

Poster Contest



APRSAF

Asia-Pacific Regional
Space Agency Forum

- Organized annually since 2006
- For students 8 - 11 years old
- Theme for 4th Poster contest: "Our Universe – Great Discoveries"
- 28 posters submitted from 10 countries



1st prize winner



2nd prize winner



3rd prize winner

APRSAF-16: Side Event



APRSAF

Asia-Pacific Regional
Space Agency Forum

5th APRSAF Water Rocket Event, 23-24 Jan. 2010

- Organized annually since 2005
- For students 12 - 16 years old
- Hosted by the National Science Museum, Thailand
- Teachers & Leaders Seminar on 1/23
- Launch Competition on 1/24
- Participants: 53 students and 23 teachers from 15 countries, incl. Colombia and Ecuador.
- 6th Water Rocket Event and 5th Poster Contest (theme "Space Technology to Help the Earth") will be held in conjunction with APRSAF-17



APRSAF-17



APRSAF

Asia-Pacific Regional
Space Agency Forum

- **Date/Place:** 23-26 November 2010, Melbourne, Australia
- **Theme:** “The role of space technology and industry in addressing climate change”
- **Venue:** Crown Conference Centre, Melbourne
8 Whiteman Street, Southbank 3006, Melbourne Australia
- **Organized by:** DIISR (Australia), MEXT and JAXA (Japan)



17TH
APRSAF

ASIA-PACIFIC REGIONAL
SPACE AGENCY FORUM



Initiatives of APRSAF



APRSAF

Asia-Pacific Regional
Space Agency Forum

■ Sentinel Asia



■ Space Applications for Environment (SAFE)



■ STAR Program : Satellite Technology for the Asia-Pacific Region



Sentinel Asia



APRSAF

Asia-Pacific Regional
Space Agency Forum

Sentinel Asia is a voluntary initiative led by APRSAF to support disaster management activities in the Asia-Pacific region by applying remote sensing and Web-GIS technologies.

- **Oct 2005:** plan to initiate the pilot project was approved at APRSAF-12.
- **Feb 2006:** Joint Project Team (JPT) was organized. As of 2010/11, JPT consists of 60 agencies from 24 countries and 10 inn's organizations.
- **Step1 (2006-2007):** pilot project (completed).
- **Step2 (2008-2012):** in progress.



Website

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

Framework of Sentinel Asia



APRSAF

Asia-Pacific Regional
Space Agency Forum

Space Community

APRSAF*

Data Provision

Promotion of Utilization

Capacity Building

* Asian-Pacific
Regional
Space Agency
Forum

Disaster Management Community

ADRC**
Member Countries

Utilization (User)

** Asian Disaster
Reduction
Center

Sentinel Asia Joint Project Team (JPT)

Join Project Team consists of total 70 organizations including 60 organizations of 24 countries/region and 10 international organizations as of September 2010

International Community

UN / ESCAP UN / OOSA
ASEAN AIT etc.

International Cooperation

JPT meeting in Manila,
Philippines,
in July 2010



Major Activities of Sentinel Asia



APRSAF

Asia-Pacific Regional
Space Agency Forum

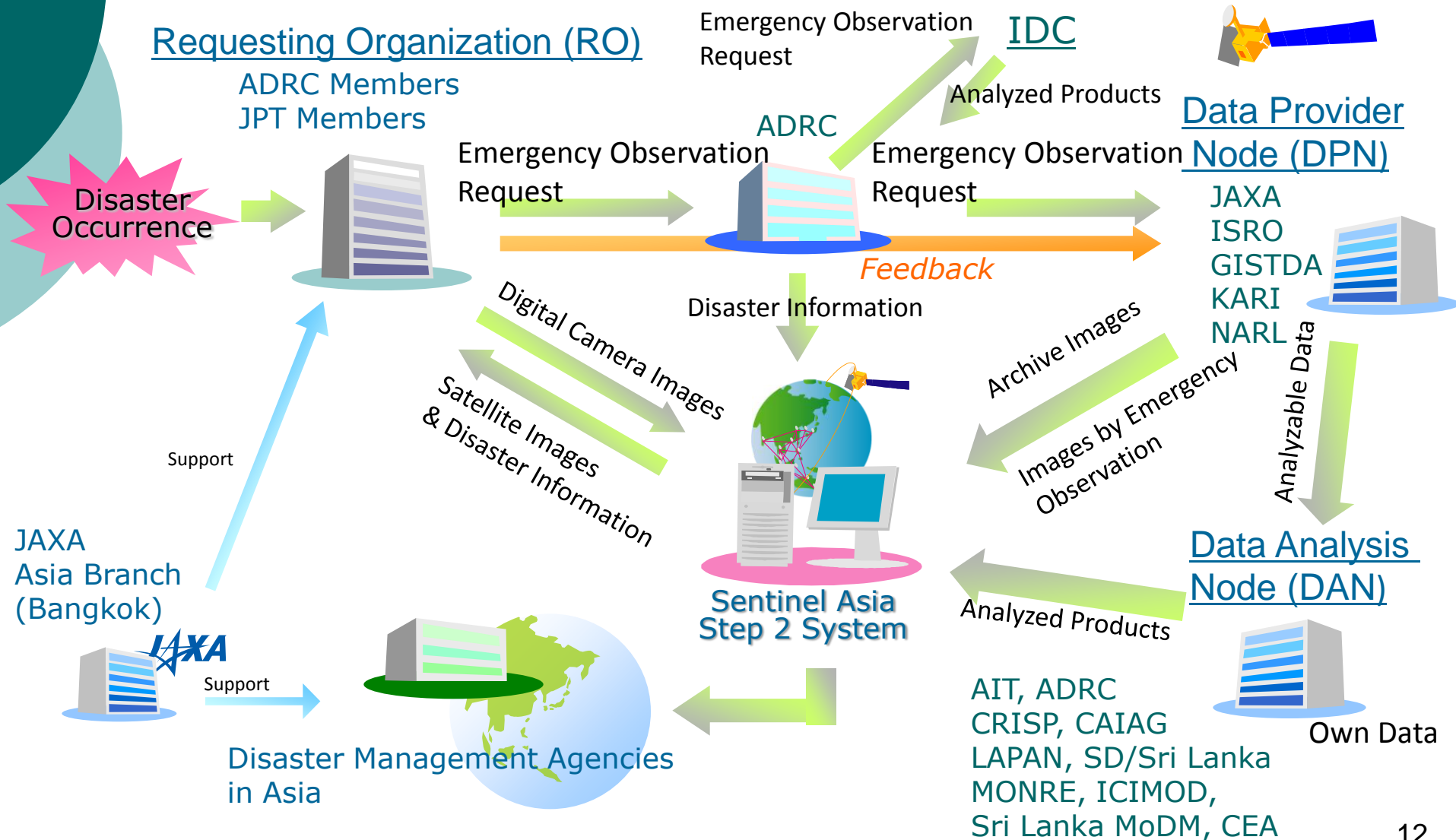
- **Emergency Observation**
accept emergency observation request from JPT and ADRC members
- **Wildfire Monitoring**
- **Flood Monitoring**
- **Glacier Lake Outburst Flood Monitoring**
- **Capacity Building and Human Networking**

Flow of Emergency Observation



APRSAF

Asia-Pacific Regional
Space Agency Forum



Satellites contributing to Emergency Observation



APRSAF

Asia-Pacific Regional
Space Agency Forum

JAXA/Japan



GISTDA/Thailand



International
Disaster Charter

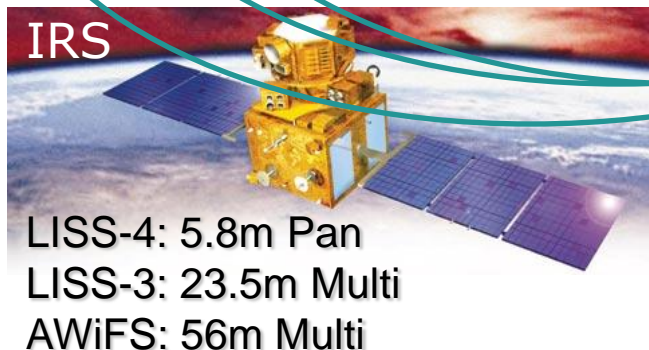


NARL/Taiwan
FORMOSAT



*Sentinel Asia
Constellation*

ISRO/India



KARI/Korea



Flood in Pakistan: ALOS Imagery in Aug. 2010



APRSAP

Asia-Pacific Regional
Space Agency Forum

WEB-GIS - Sentinel Asia Web Site - Mozilla Firefox

ファイル(E) 編集(E) 表示(V) 履歴(S) ブックマーク(B) ツール(T) ヘルプ(H)

http://sentinel.tksc.jaxa.jp/sentinel2/webGISControlAction?requestId=ERICIM000010&subsetName=Emerg

よく見るページ Firefox を使いこなそう 最新ニュース

Emergency Obs. Subset - Sentinel A... WEB-GIS - Sentinel Asia Web ... EmergencyObservation Thumbnail - ...

Sentinel Asia

Emergency Observation

Scale: 750000 Scale: 750000

☐ 100 ALOS AV2, P185 F2940
A-28.0, Aug 5, 2010

☐ 100 ALOS AV2, P185 F2930
A-28.0, Aug 5, 2010

☐ 100 ALOS AV2, P185 F2920
A-28.0, Aug 5, 2010

☐ 100 ALOS AV2, P185 F2910
A-28.0, Aug 5, 2010

☐ 100 ALOS AV2, P185 F2900
A-28.0, Aug 5, 2010

☐ 100 ALOS AV2, P185 F2890
A-28.0, Aug 5, 2010

☐ 100 ALOS AV2, P185 F2880
A-28.0, Aug 5, 2010

☐ 100 ALOS AV2, P185 F2870
A-28.0, Aug 5, 2010

☒ 100 ALOS PSR/WB1, P185
F2900-3000 A27.1, Aug 5, 2010

☐ 100 ALOS AV2, P193 F2940
A0.0, Aug 3, 2010

☐ 100 ALOS AV2, P193 F2870
A0.0, Aug 3, 2010

72.60025, 34.37527 72.09308, 33.66571

©Copyright 2009 Japan Aerospace Exploration Agency, All Rights Reserved.

完了

スタート 本田技研工業 - Yahoo!... WEB-GIS - Sentinel... デスクトップの検索

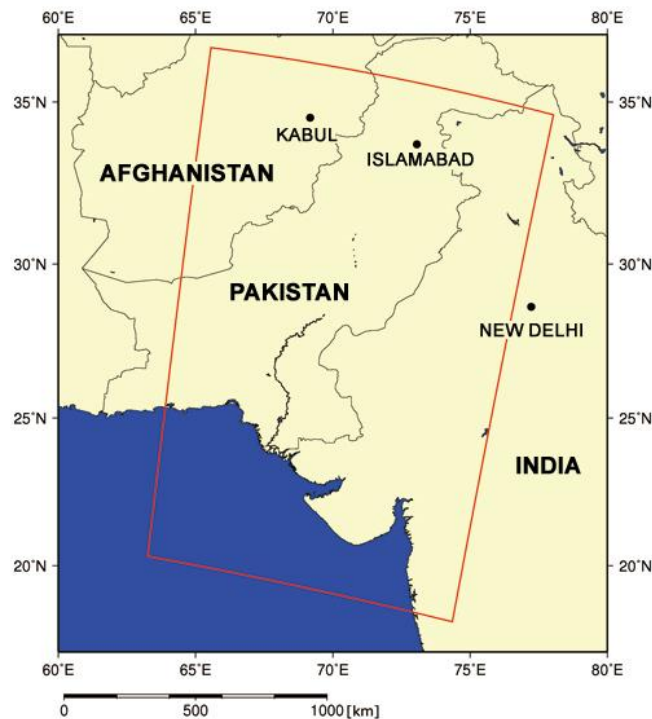
0:35

Flood in Pakistan: ALOS ScanSAR Imagery

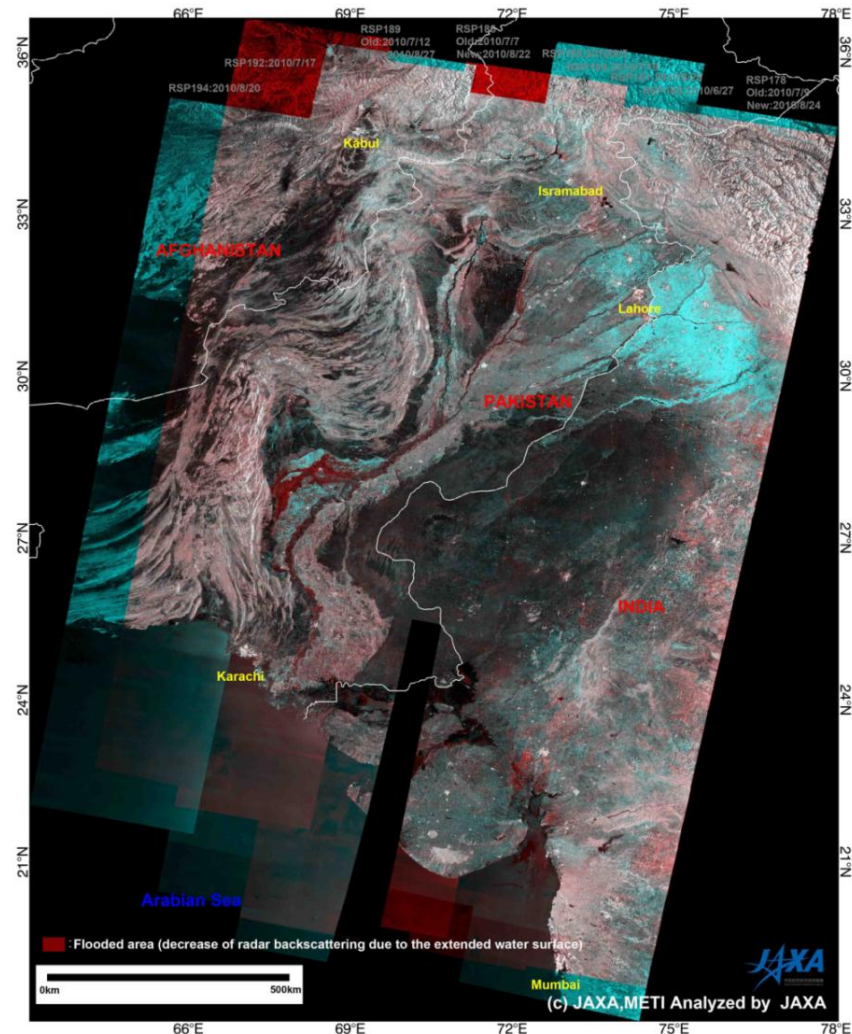


APRSAP

Asia-Pacific Regional
Space Agency Forum



ALOS/PALSAR
ScanSAR image mosaics over the Pakistan
and Detection of Flooded areas

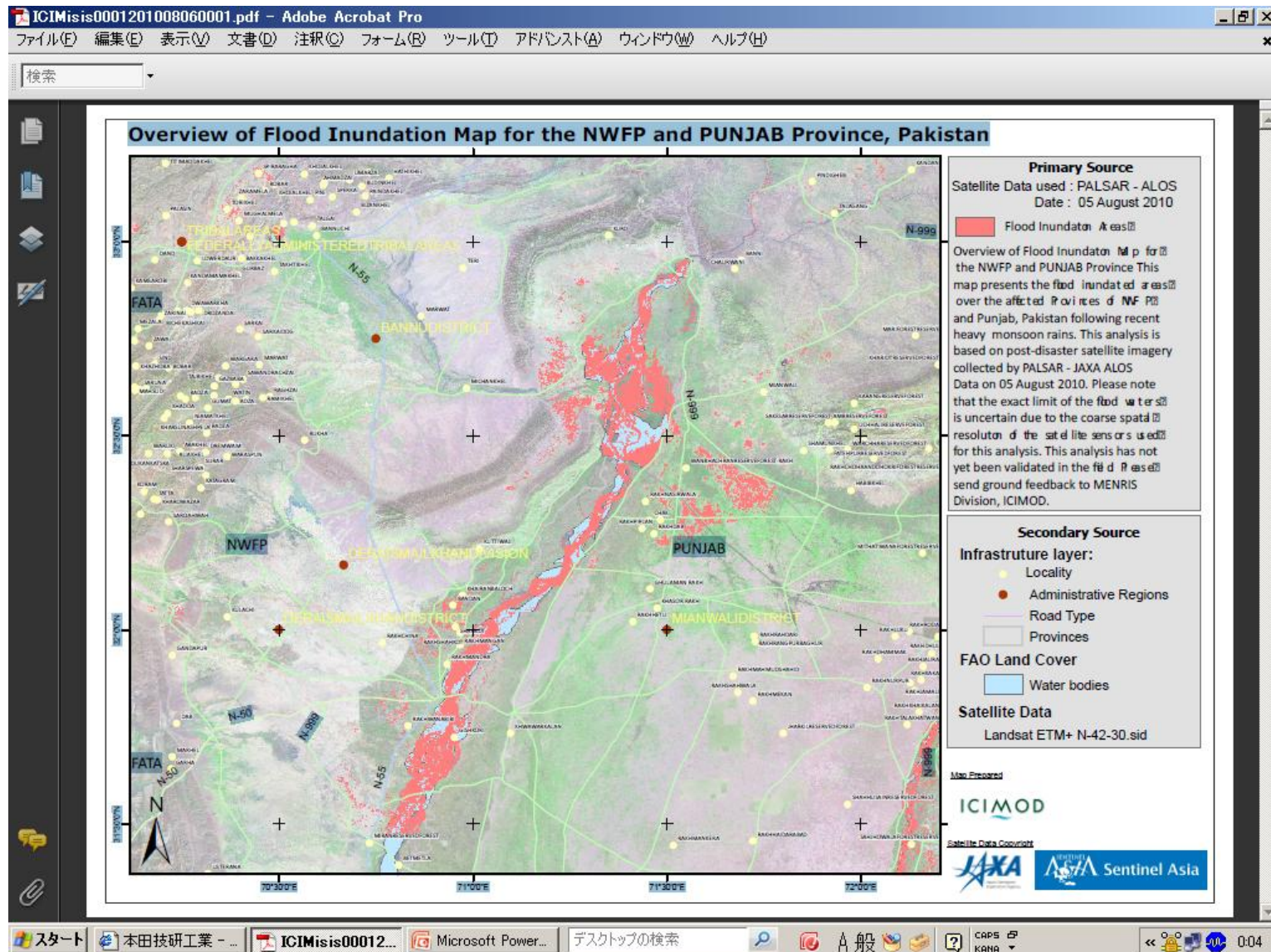


Flood Inundation Map by ICIMOD



APRSAF

Asia-Pacific Regional
Space Agency Forum

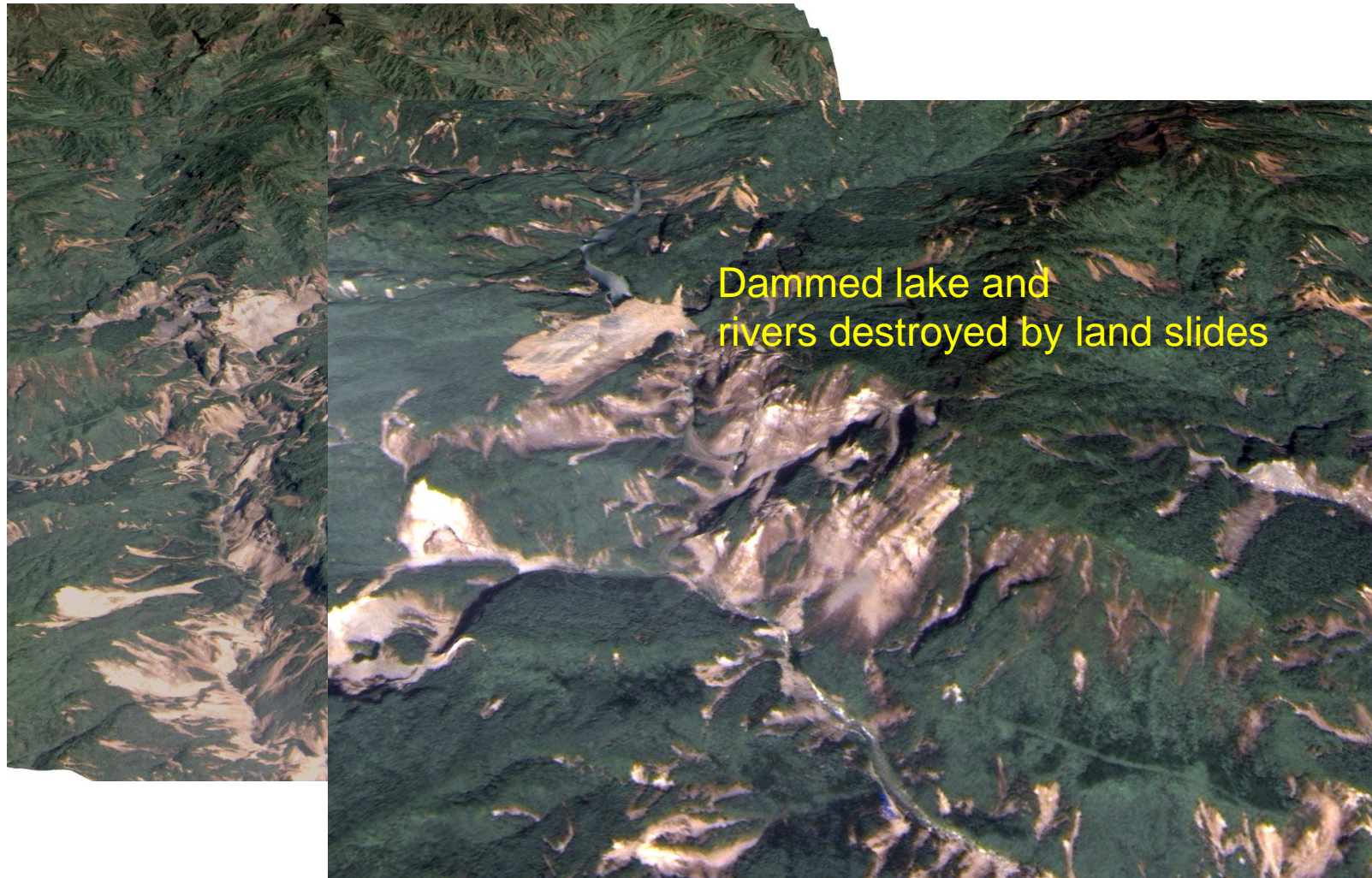


Earthquake in China in May 2008



APRSAF

Asia-Pacific Regional
Space Agency Forum



3D view in south-west China using PRISM/DSM and pan-sharpened image by PRISM and AVNIR-2 on June 4, 2008

Volcano Eruption in the Philippines in Dec. 2009



APRSAT

Asia-Pacific Regional
Space Agency Forum



Wildfire Monitoring by MODIS



APRSAF

Asia-Pacific Regional
Space Agency Forum



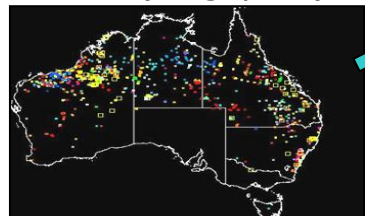
University of Tokyo (Japan)



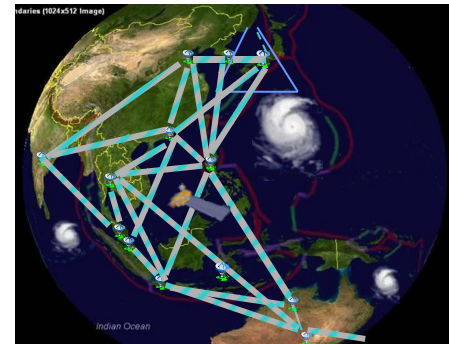
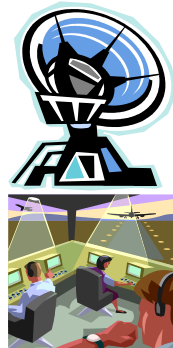
AIT/Univ. of Tokyo(Thailand)



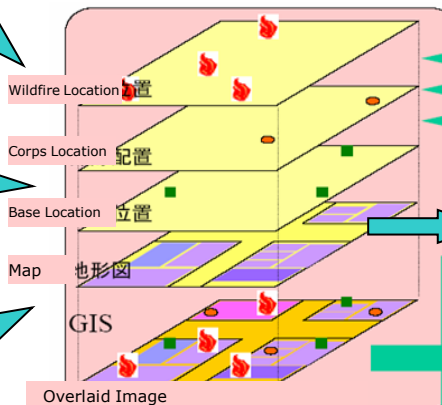
CRISP (Singapore)



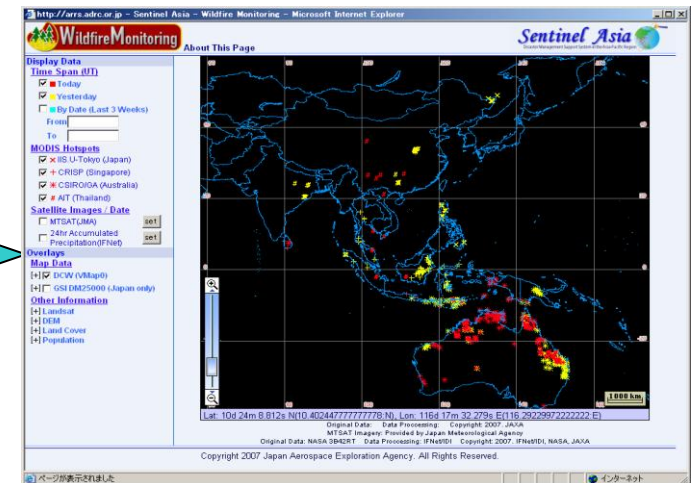
CSIRO (Australia)



Satellite observation network



Web-GIS
interface



Hotspot map of
Asia

Bushfires in Victoria, Australia in Feb. 2009

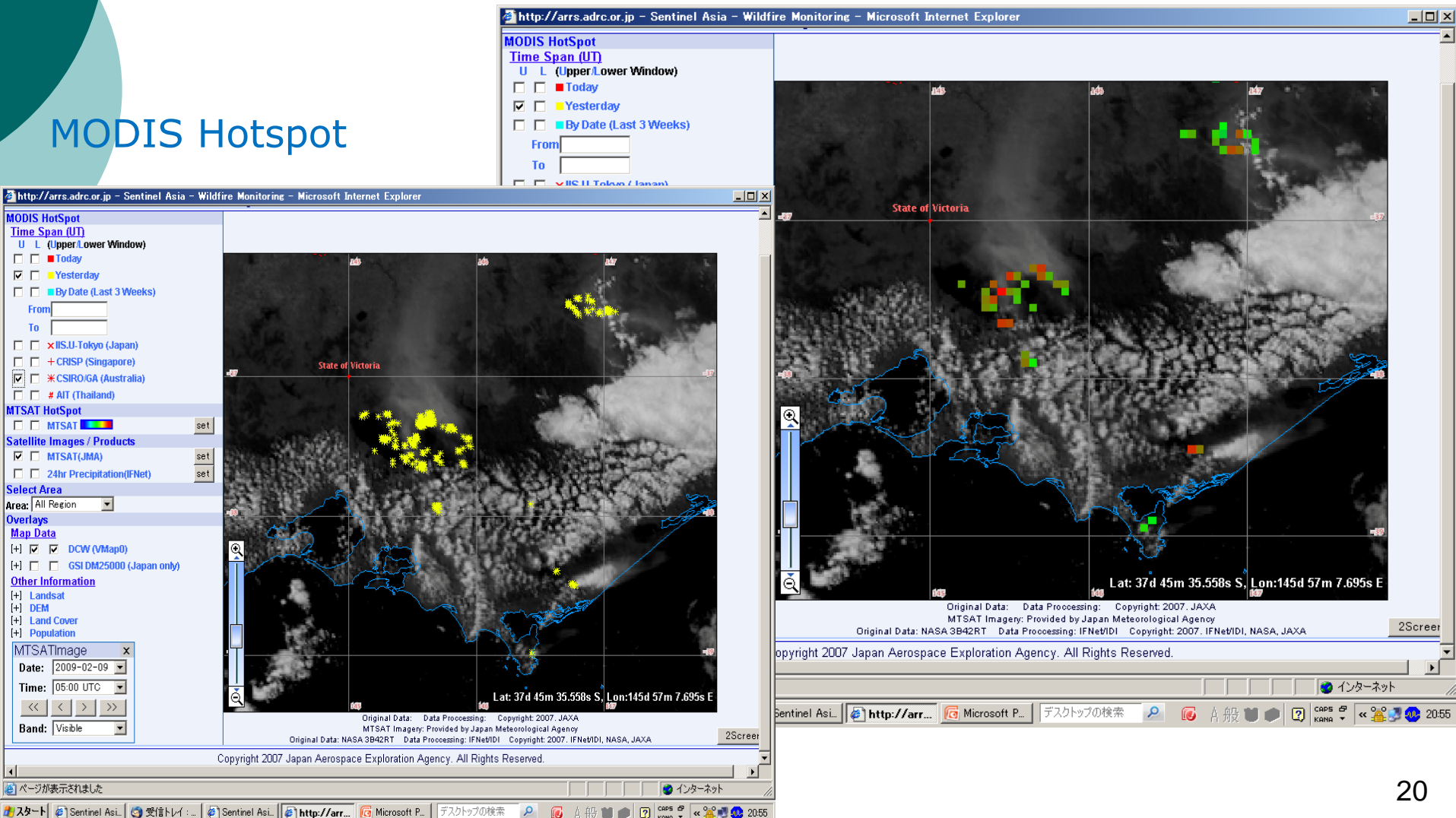


APRSAF

Asia-Pacific Regional
Space Agency Forum

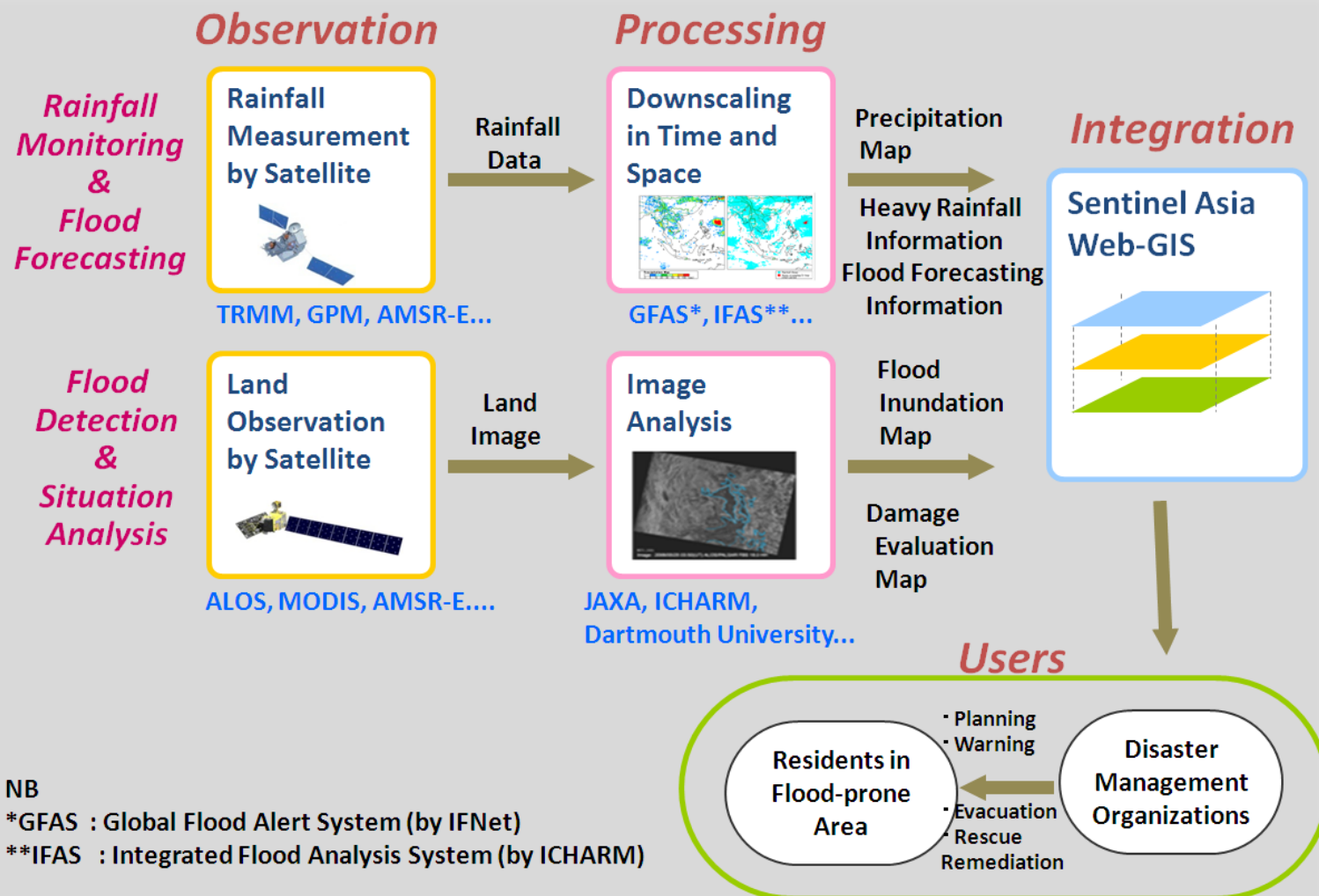
MTSAT Hotspots

MODIS Hotspot





Flood Monitoring

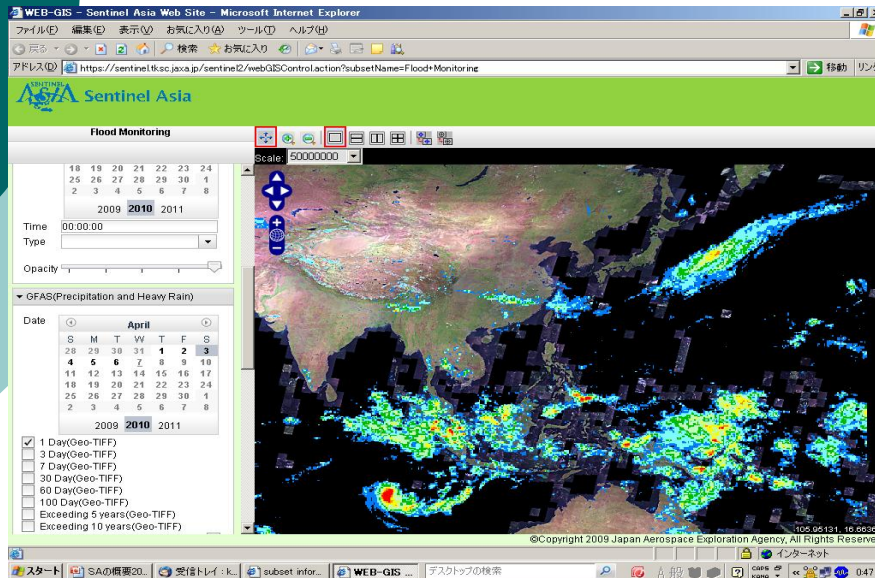


Precipitation Data : Flood Monitoring



APRSAF

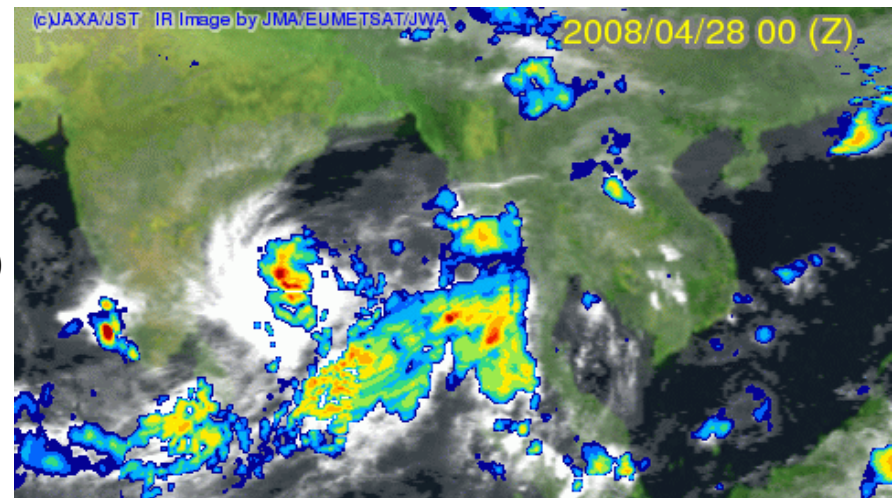
Asia-Pacific Regional
Space Agency Forum



GFAS (Global Flood Alert System)
Accumulated daily precipitation

GSMaP (Global Satellite Map of Precipitation)
Near real-time hourly precipitation

Cyclone 'NARGIS' attacked Myanmar in May
2008



MTSAT(Meteorological Satellite) Imagery on GIS



APRSAT

Asia-Pacific Regional
Space Agency Forum

Two screenshots of the Sentinel Asia - MTSAT Imagery web application interface.

Top Screenshot: Shows the main interface with a calendar for October 2007. The selected date is 2007-10-05 05:00(UTC). The main map displays a satellite image of a typhoon over the Pacific Ocean, labeled "Big Typhoon". The interface includes a "Display Data" section with "Observation Time (UTC)" and "Date" fields, and a "Map Data" section with "Band" (Infrared) and "Area" (Southeast Asia) options. The bottom status bar indicates "Copyright 2007 Japan Aerospace Exploration Agency. All Rights Reserved."

Bottom Screenshot: Shows a detailed view of the MTSAT imagery. The selected date is 2007-09-01 12:00(UTC). The main map displays a satellite image of Southeast Asia. The interface includes a "Display Data" section with "Observation Time (UTC)" and "Date" fields, and a "Map Data" section with "Band" (Infrared) and "Area" (Southeast Asia) options. The bottom status bar indicates "Copyright 2007 Japan Aerospace Exploration Agency. All Rights Reserved."

Glacial Lake Outburst Flood Monitoring



APRSAF

Asia-Pacific Regional
Space Agency Forum

Action Plan:

Collaboration of **ADRC Project for Bhutan** and **Keio University Project for Nepal**.

1. Satellite Image Utilization on Glacial Lake Inventory.
2. Identify Potential Outburst Glacial Lake.
3. Monitor and Establish Early Warning System in the Risk Areas.
4. Generate Hazard Risk Mapping for Glacial Outburst Flood.
5. Simulation and Modeling for the Flood Scenarios.
6. Information Sharing through Sentinel Asia Infrastructure.
7. Local Awareness and Knowledge Transfer through Capacity Building.

Capacity Building and Human Networking



APRSAF

Asia-Pacific Regional
Space Agency Forum

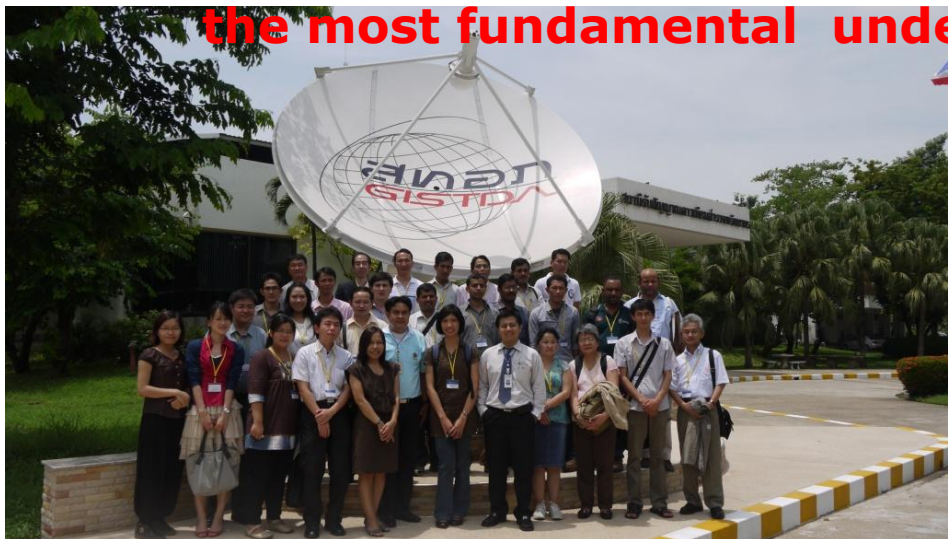


- **The 5th Training by JAXA, hosted by MoDM in Sri Lanka, in February 2010**



Human Network

the most fundamental underpinning of the project



- The 6th Training by JAXA, hosted by GISTDA in Thailand, in July 2010**



SAFE

Space Applications For Environment



APRSAP

Asia-Pacific Regional
Space Agency Forum

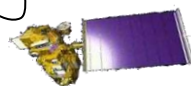
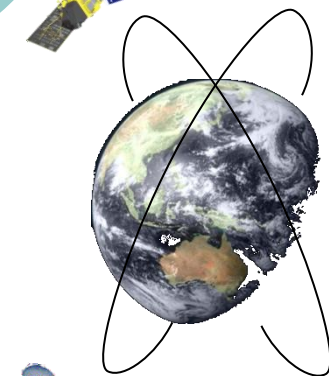
DAICHI



TRMM/PR



MTSAT



Aqua/AMSR-E Terra/MODIS

Prototyping

Vietnam:
Forest
Management

Vietnam:
Water Resource
Management

Lao PDR:
Forest
Management

Cambodia:
Water Resource
& Agriculture

Sri Lanka:
Risk of
Sea Level Rise

Indonesia:
Potential Drought

Social Benefits in Asia-Pacific



Water



Weather



Ecosystems



Energy



Climate



Health



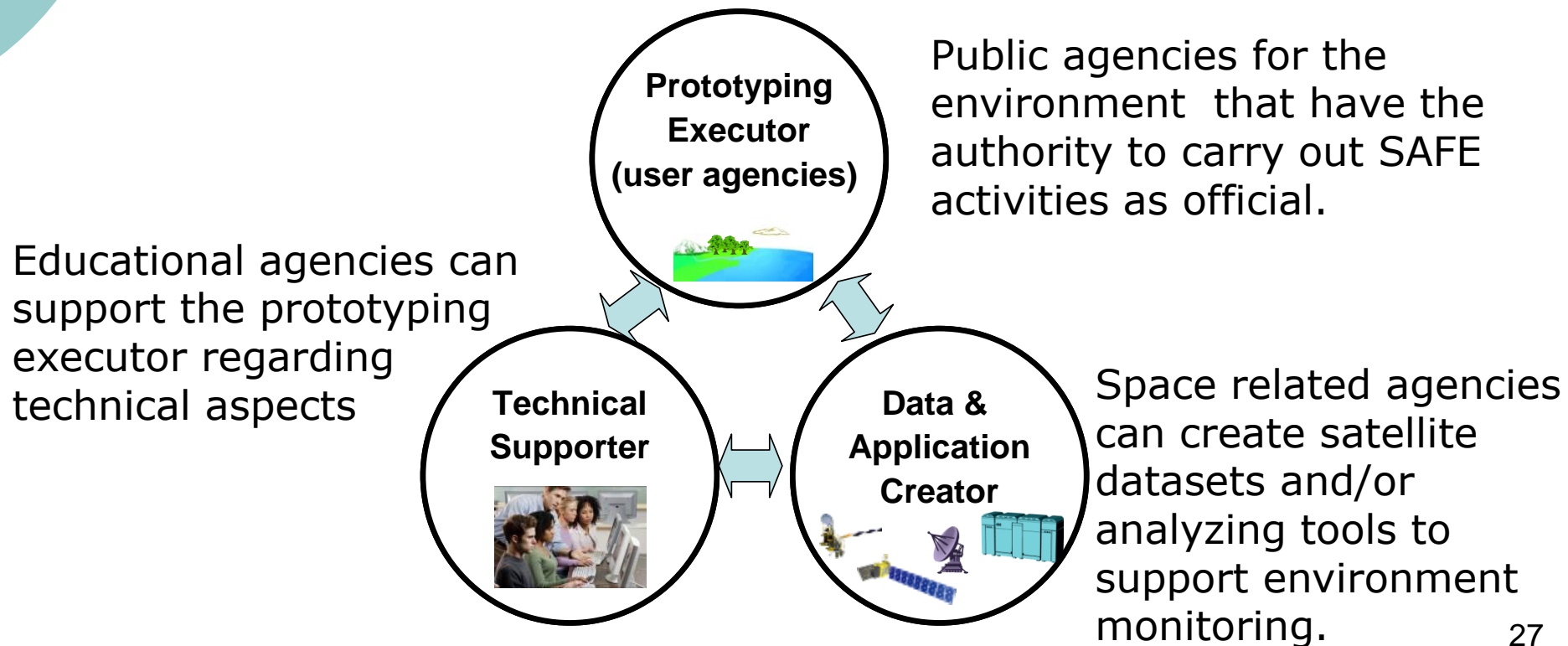
Agriculture





Framework of SAFE

- The SAFE activities are implemented by issue-based prototyping project teams consisting of end users, technical supporters, and data and application providers.





Technical Supporter

JAXA, Japan
AIT, Thailand
Univ. Tokyo,
Japan

GISTDA, Thailand
CRISP, Singapore
CSIRO, Australia
LAPAN, Indonesia

Data & Application Creator

JAXA, Japan
AIT, Thailand
Univ. Tokyo, Japan
GISTDA, Thailand
CRISP, Singapore
CSIRO, Australia
RSC, Mongolia

SAFE 2nd Workshop



APRSAF

Asia-Pacific Regional
Space Agency Forum



SAFE #2 WS

Held in Sri Lanka on Jun, 2010

As co-host; Coastal Conservation Department

50 participants

4 new proposals were submitted, and 2 out of them were approved as SAFE new prototyping.



SAFE Prototyping Status

Status	Country	Theme
Success Story	VIETNAM	Integrated water resource management
	VIETNAM	Forest monitoring
On Going	CAMBODIA	Water Cycle and Agricultural Activities
	LAO PDR	Forest monitoring and management
	INDONESIA	Potential Drought Monitoring
	SRI LANKA	Risk of Sea Level Rise on Coastal Zone
New Proposal	PAKISTAN	Monitoring Water Cycle Variations & Assessing Climate Change Impacts
	SRI LANKA	Modeling ocean frontal zones using high resolution satellite and float data to locate tuna fish aggregations

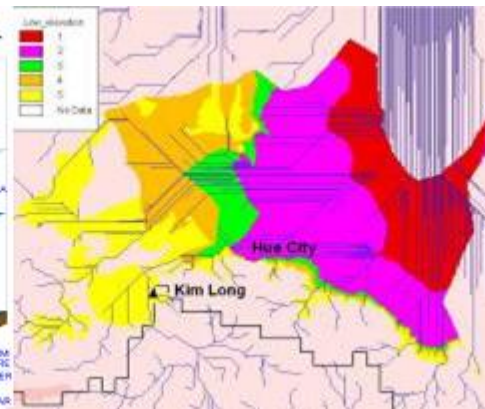
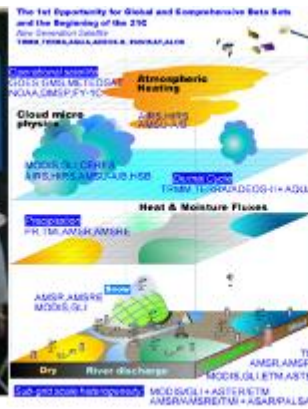
More details : <http://www.eorc.jaxa.jp/SAFE/index.html>

SAFE Prototyping: Integrated Water Resource Management in Vietnam

APRSAF

Asia-Pacific Regional
Space Agency Forum

- Vietnamese National HYDRO-METEOROLOGICAL Service , Ministry of Natural Resources and Environment (NHMS/MONRE) responsible for flood management and Metrological Service in Vietnam. NHMS is trying to strengthen the precipitation monitoring and reservoirs management under the Asian Water Cycle Initiative in cooperation with Univ. of Tokyo and JAXA.

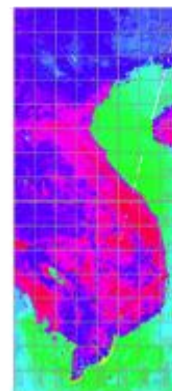


SAFE Prototyping: Forest Management in Vietnam

APRSAF

Asia-Pacific Regional
Space Agency Forum

- o Vietnamese Forest Protection Department of Ministry of Agriculture and Rural Development (FPD/MARD) responsible for Forest Management in Vietnam. FPD has MODIS receiving station and provides wild fire Hotspots information to its rural branches. The target of FPD is to strengthen the forest management by using of MODIS.





APRSAF

Asia-Pacific Regional
Space Agency Forum

STAR Program

Satellite Technology for Asia Pacific Region

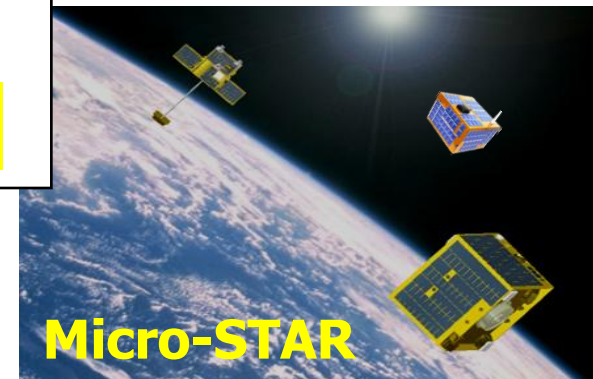
- **Establishment:** proposed at APRSAF-14 in 2007 as a new international cooperation scheme on small satellite development.
- **Objective:** to enhance the space technology of space-related agencies/ organizations in the region.
- **In Progress:** joint system study for EO-STAR satellite (300-500kg class), and development of Micro-STAR Technology Experiment satellite (50kg class).



System
Study



Satellite technology
capacity building



Micro-STAR

Development

STAR Program: International Project Office



APRSAF

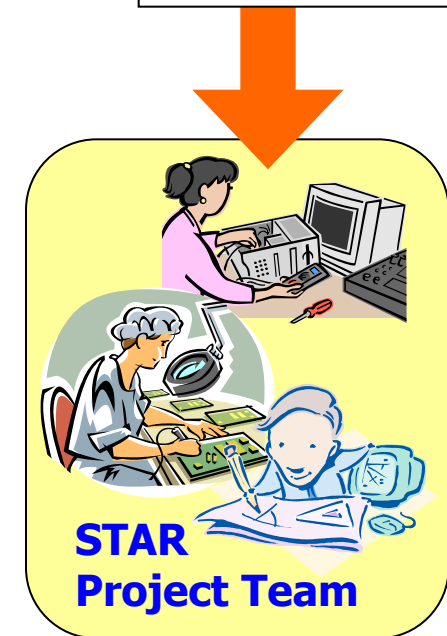
Asia-Pacific Regional
Space Agency Forum

- STAR's participating agencies are encouraged to:
 - send their staff on a continuous and long-term basis to JAXA.
 - carry out engineering work at the respective agencies.
- Relevant organizations are encouraged to provide launch opportunity, ground station operation resource, and necessary instruments for Micro-STAR satellite.

● **Engineers from:**
GISTDA, Thailand
LAPAN, Indonesia
KARI, Korea
ISRO, India
VAST, Vietnam
ANGKASA, Malaysia
JAXA, Japan



Project office at JAXA Sagami campus, Japan



Conclusions



APRSAF

Asia-Pacific Regional
Space Agency Forum

- APRSAF is the largest framework for space cooperation in Asia and the Pacific region.
- APRSAF is open to everyone in the region and takes a flexible approach. The activities of APRSAF are based on voluntary contributions.
- APRSAF also aims to strengthen partnerships between space agencies and user agencies.
- APRSAF does not only hold annual meetings, but also conducts concrete cooperative activities and initiatives.
- The initiatives (Sentinel Asia, SAFE and STAR Program) contribute to addressing regional issues, such as disaster risk reduction, environmental protection and natural resources management.



APRSAF

Asia-Pacific Regional
Space Agency Forum

**Thank you for your
attention.**

<http://www.aprsaf.org>