

Life First Society by Remote Sensing and Satellite Communications

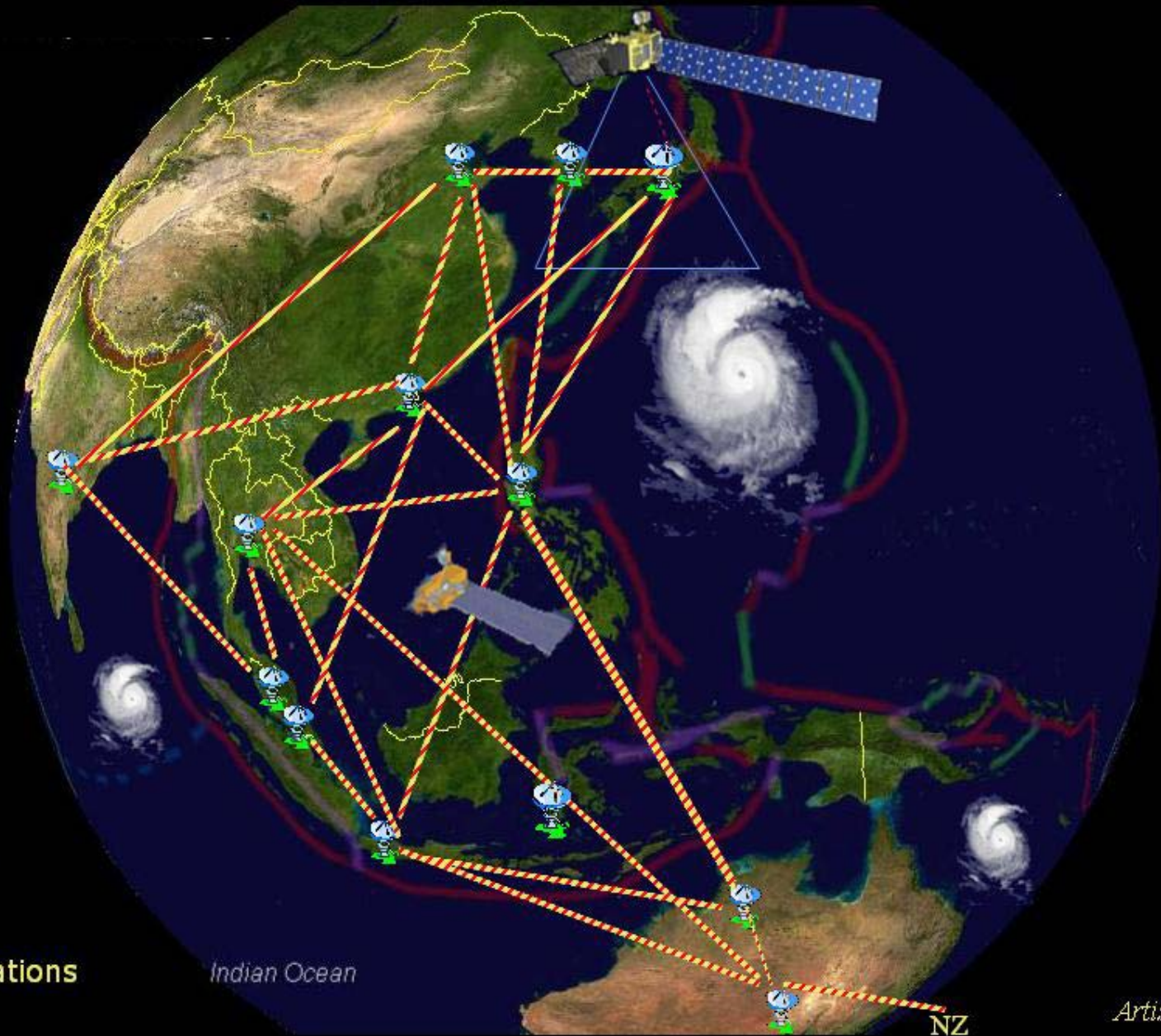
Sentinel Asia Project

May 25, 2006

Special Advisor to the Executive Director
Director, Disaster Management Support Systems Office
Japan Aerospace Exploration Agency (JAXA)

Takashi Moriyama, Ph.D

Disaster Information Sharing System in Asia and Pacific



X-Band Stations

Artist Impression



Hotel Okura, Tokyo, Japan
April 25, 2004

GROUP ON EARTH OBSERVATIONS



Framework document was adopted:

- This set out nine societal benefit topics to be derived through Global Earth Observation System of Systems, GEOSS.

Nine Societal Benefit Topics

1. Reduction and Prevention of Disasters
2. Human Health
3. Energy Management
4. Climate Change
5. Water Management
6. Weather Forecasting
7. Ecosystem
8. Agriculture
9. Biodiversity

The 2nd World Conference on Disaster Reduction (Kobe, Hyogo, Japan, 18 to 22 January 2005)

More than 4000 participants



APRSAF

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

Working Groups



Earth
Observation



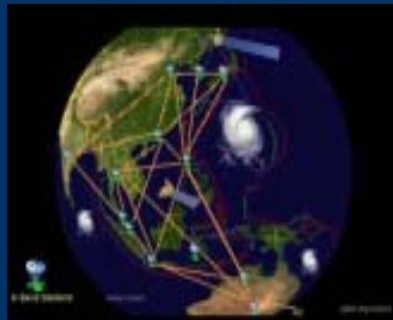
Communication Satellite
Applications



ISS



Space Education &
Awareness



Sentinel Asia Project
establishing Disaster Management
Support System

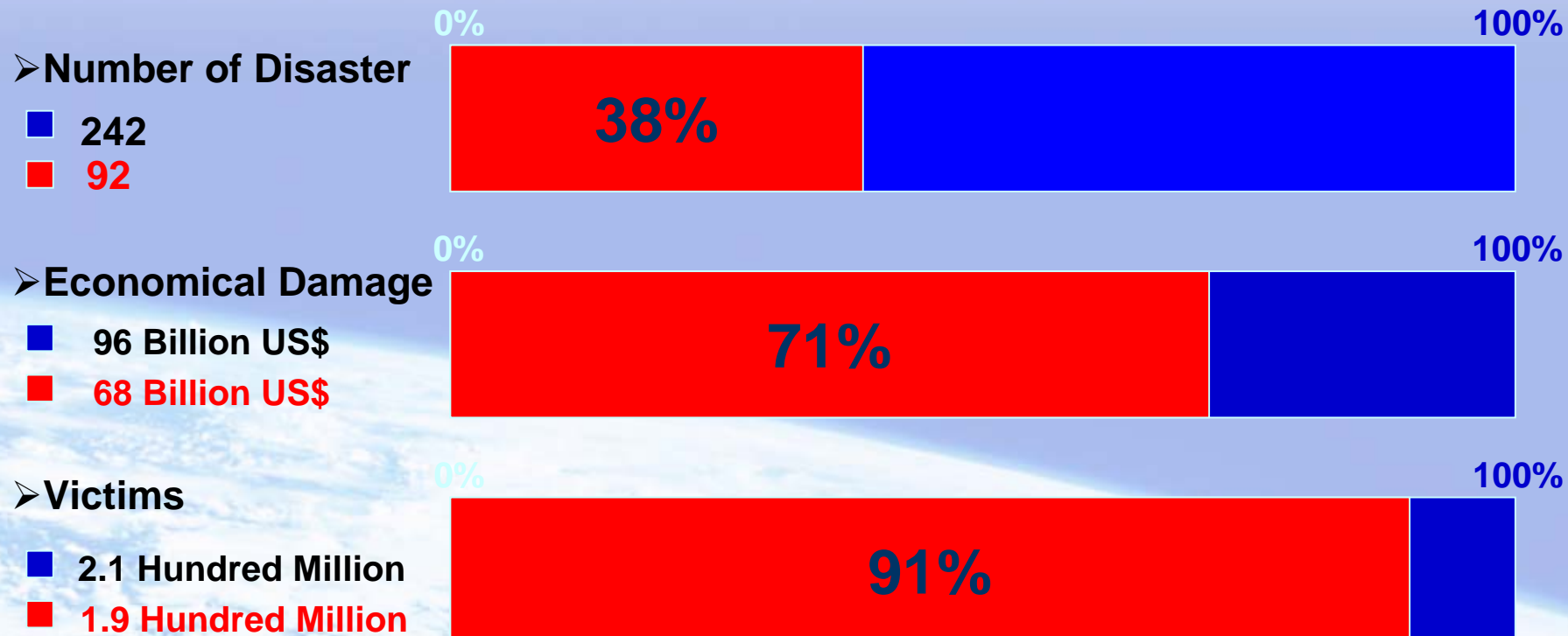
The 13th Session of APRSAF (APRSAF-13)

Serious Damages in Asia (attacked by Natural Disaster)

Sumatra Tsunami Victims *221,856 peoples*

Average of total loss during 1995 To 1999

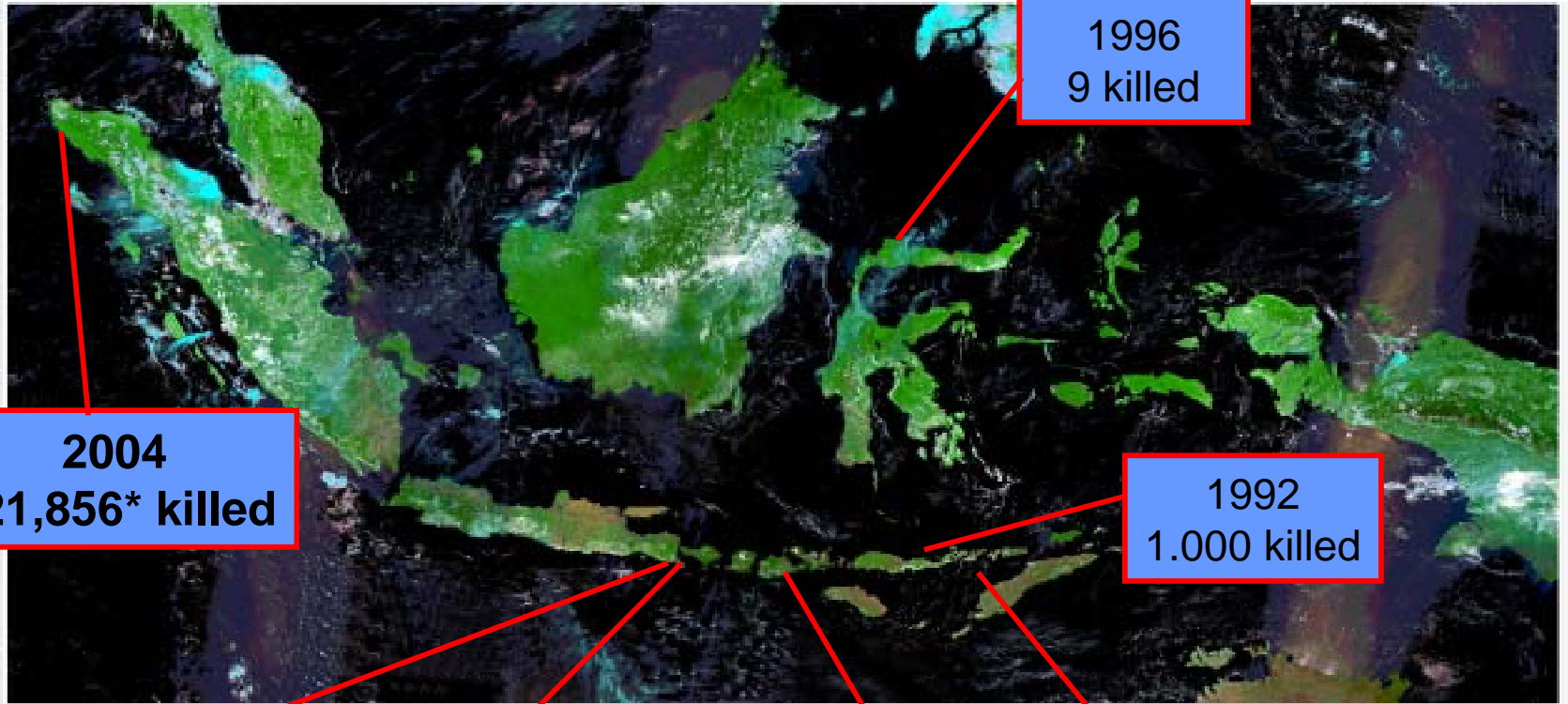
■ All Asia



Tsunami History in Indonesia

Almost big Tsunami has occurred at the trench line in Indian Ocean by the stress of plates motions

I N D O N E S I A



1996
9 killed

2004
221,856* killed

1992
1.000 killed

1994
238 killed

1917
15.000 killed

1815
10.000 killed

1883
36.000 killed

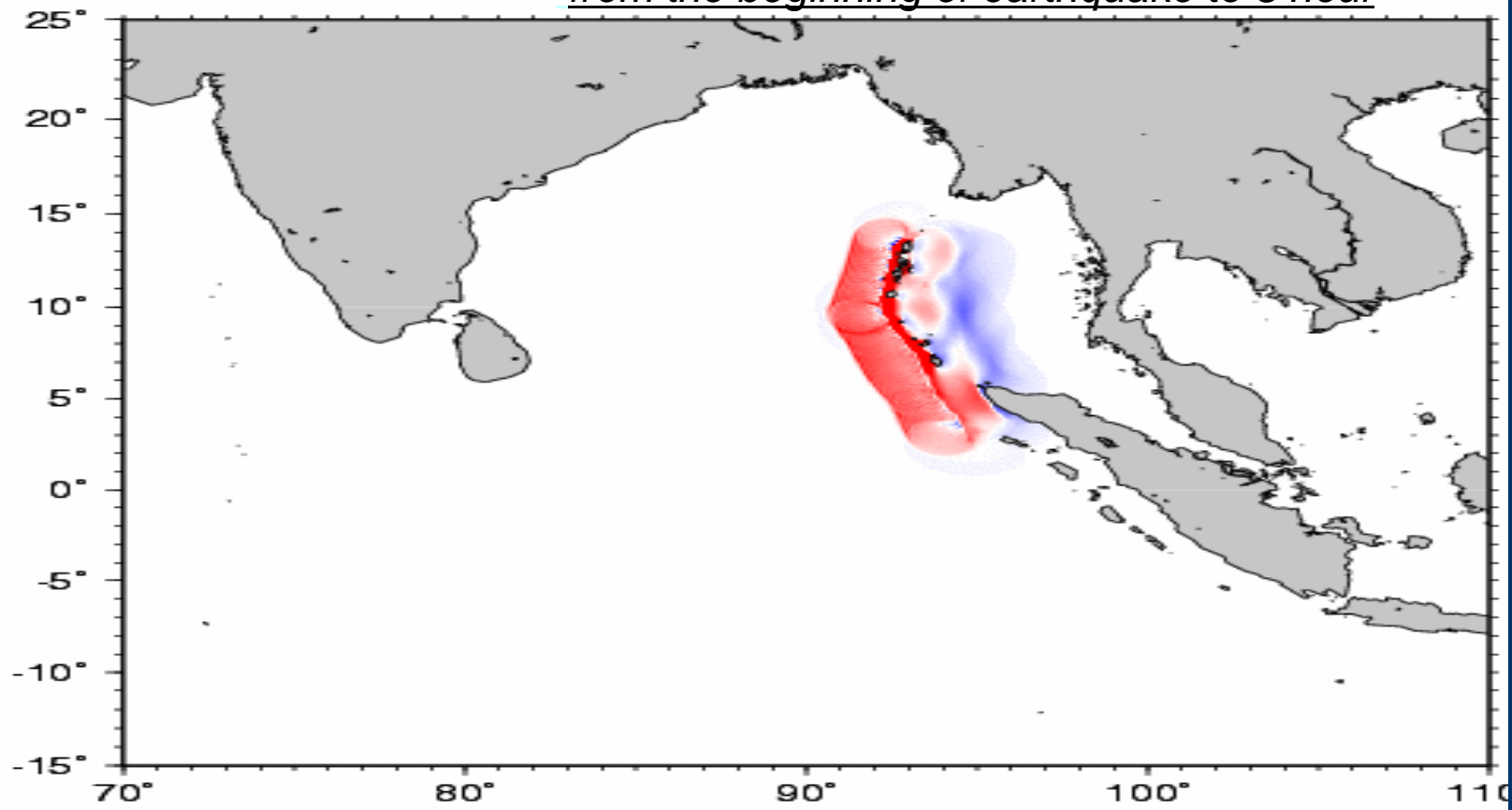
*165,869 Indonesian

Tsunami (CReSOS simulation)

Diffusion of Aceh Tsunami in Indian Ocean

2004 Sumatra Earthquake 010 min Time

from the beginning of earthquake to 3 hour



Banda Aceh from Space : 2004/6/23
(before the tsunami)



Banda Aceh from Space : 2004/12/26
(Just before the Tsunami attacked)



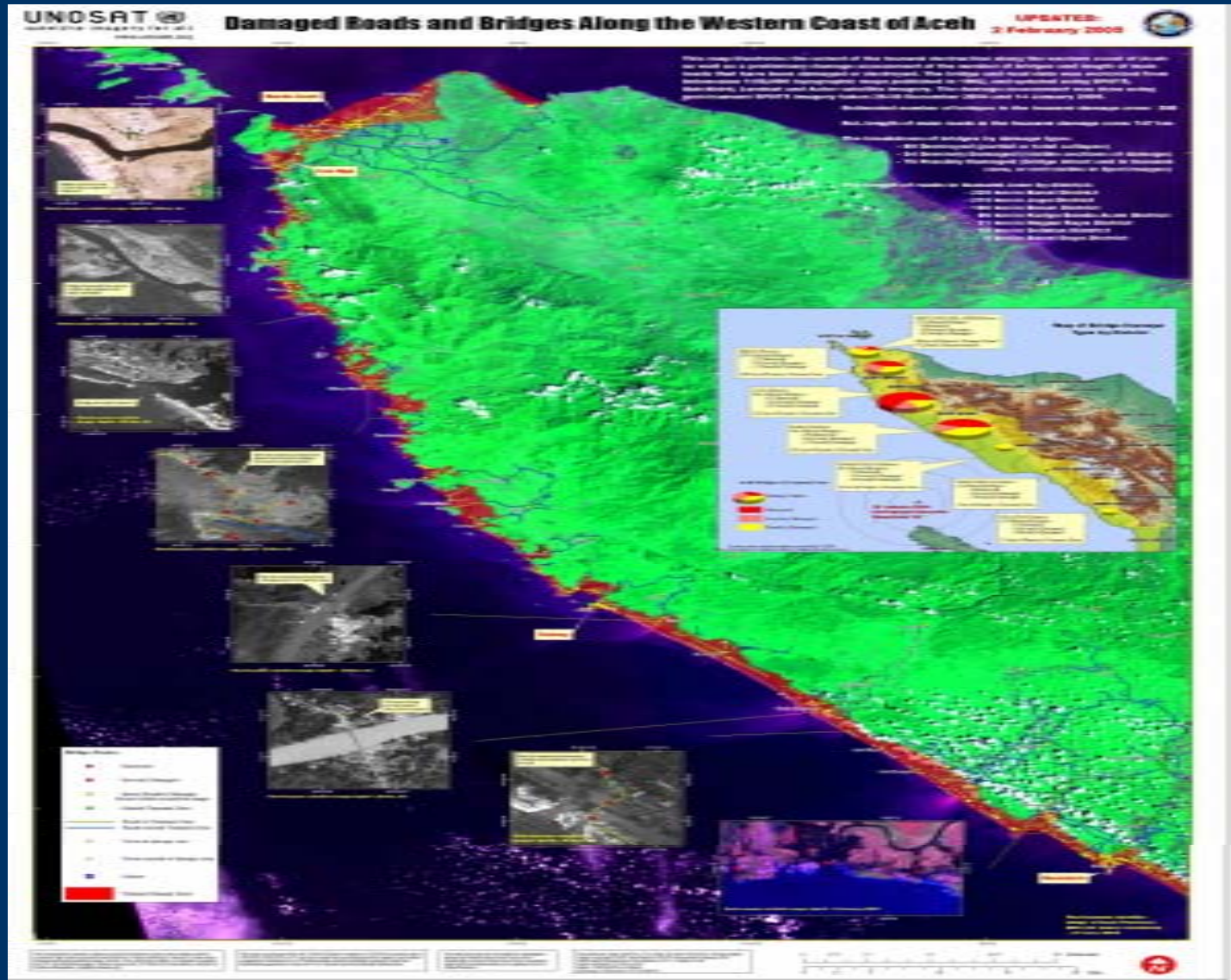
Banda Aceh from Space : 2004/6/23
(before the Tsunami)



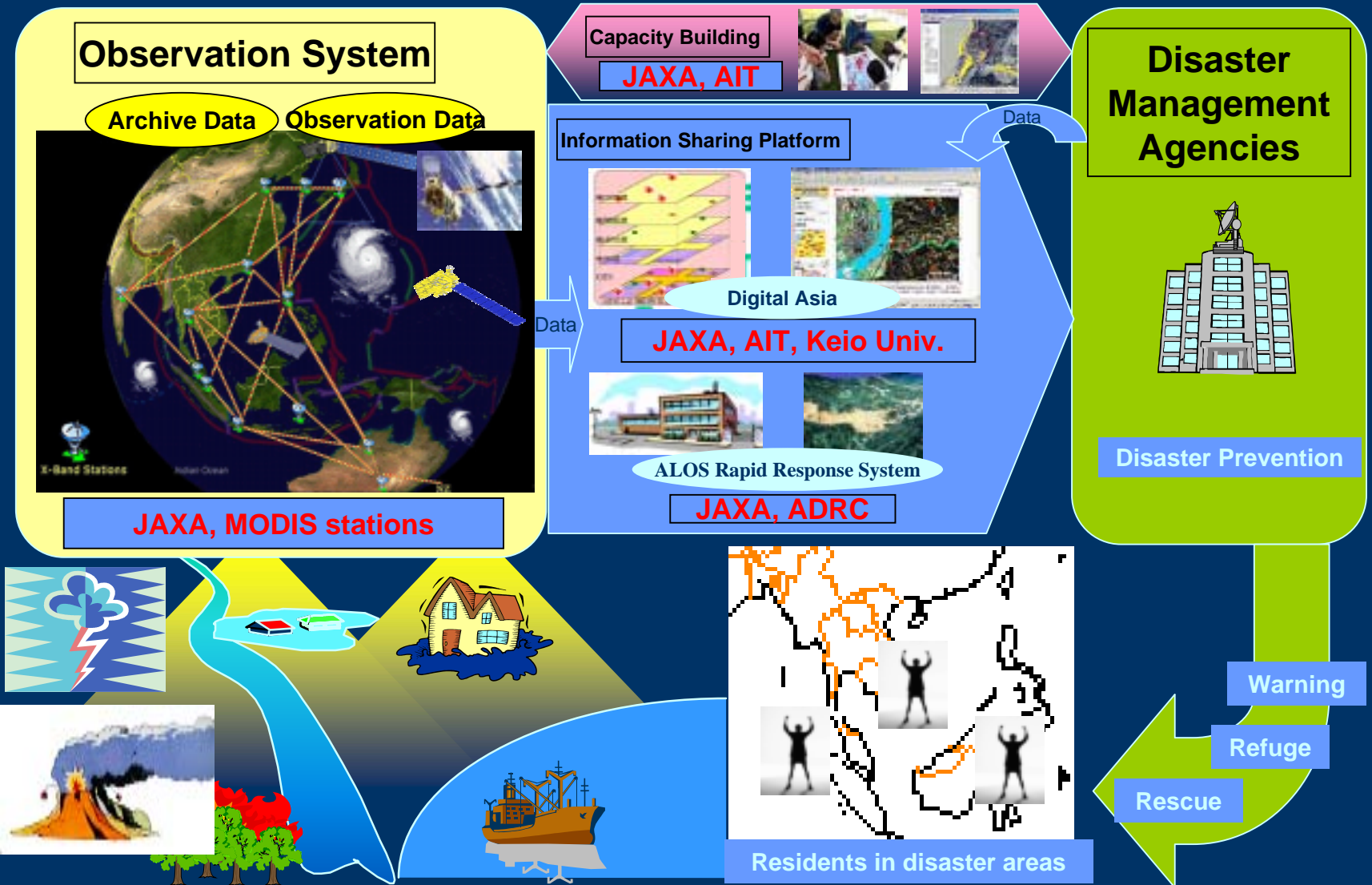
Banda Aceh from Space : 2004/12/28
(after the Tsunami)



Damage of Bridge and Road in Aceh Province : Combined picture by SPOT, QuickBird and LANDSAT (Red-colored shows destroyed area)



STEP 1: Establishment of Sentinel Asia (2006 - 2007)





Framework of Sentinel-Asia

Best-efforts, voluntary initiative by participating organizations

Project

Space Community

APRSAF*

- Content
 - Satellite Image
- Promotion of Utilization
- Capacity Building

International Community

UN / ESCAP UN / OOSA
ASEAN AIT

International Cooperation

Sentinel-Asia

Joint Project Team (JPT)
Join Project Team, consists of total 27 organizations including 23 agencies from 14 countries and 4 international organizations as of Feb. 2006.

Digital Earth / Web-GIS Community

Digital Asia

- Information Sharing Platform
 - Web-GIS
 - Data / Meta Data Management
- Content
 - Digital Map
 - Social / Economic Data
 - Satellite Image

Disaster Reduction Community

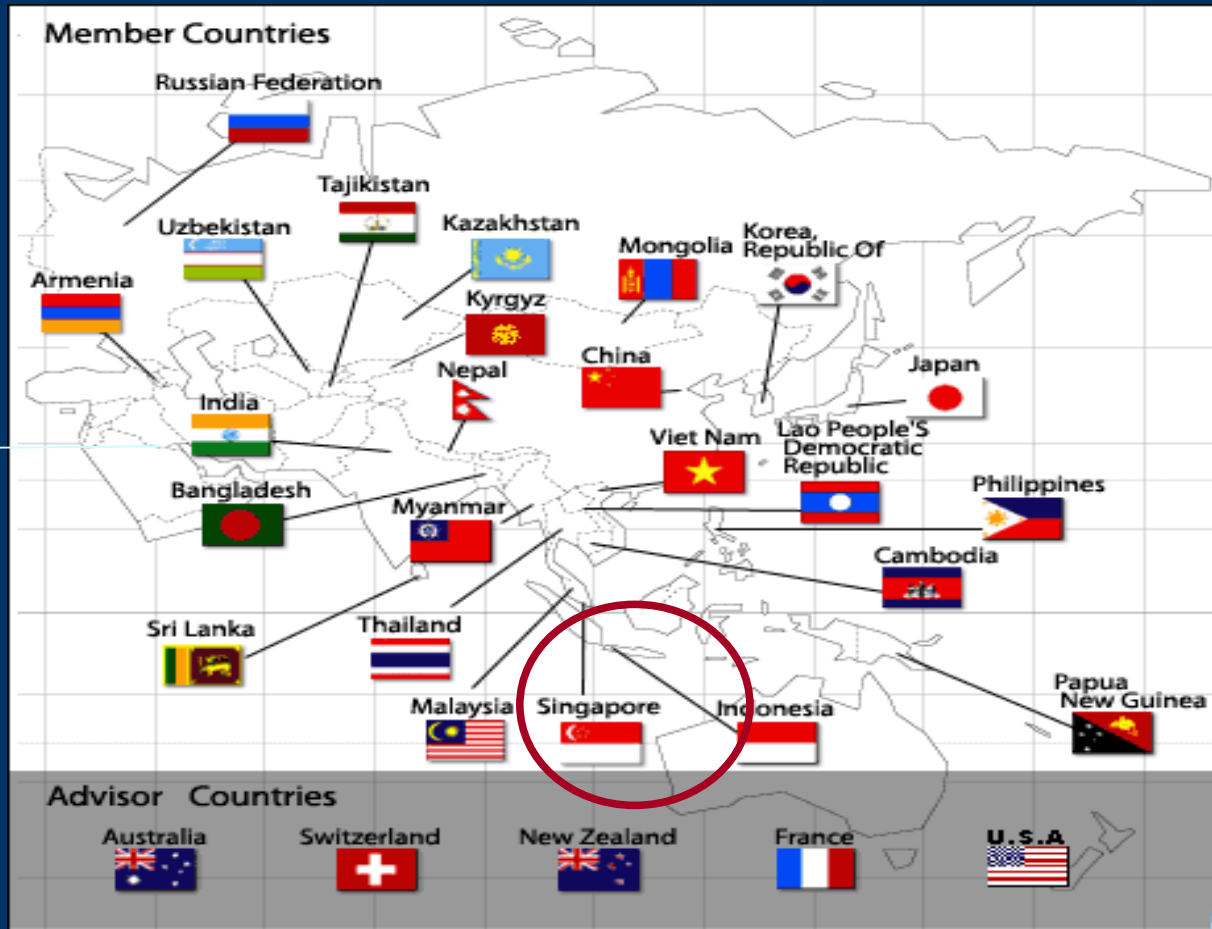
ADRC**
Member Countries

- Content
 - Disaster Information
- Utilization (User)

* Asian-Pacific Regional Space Agency Forum

AORC Member Countries

25 Member Countries, 5 Advisor Countries, 1 Observer



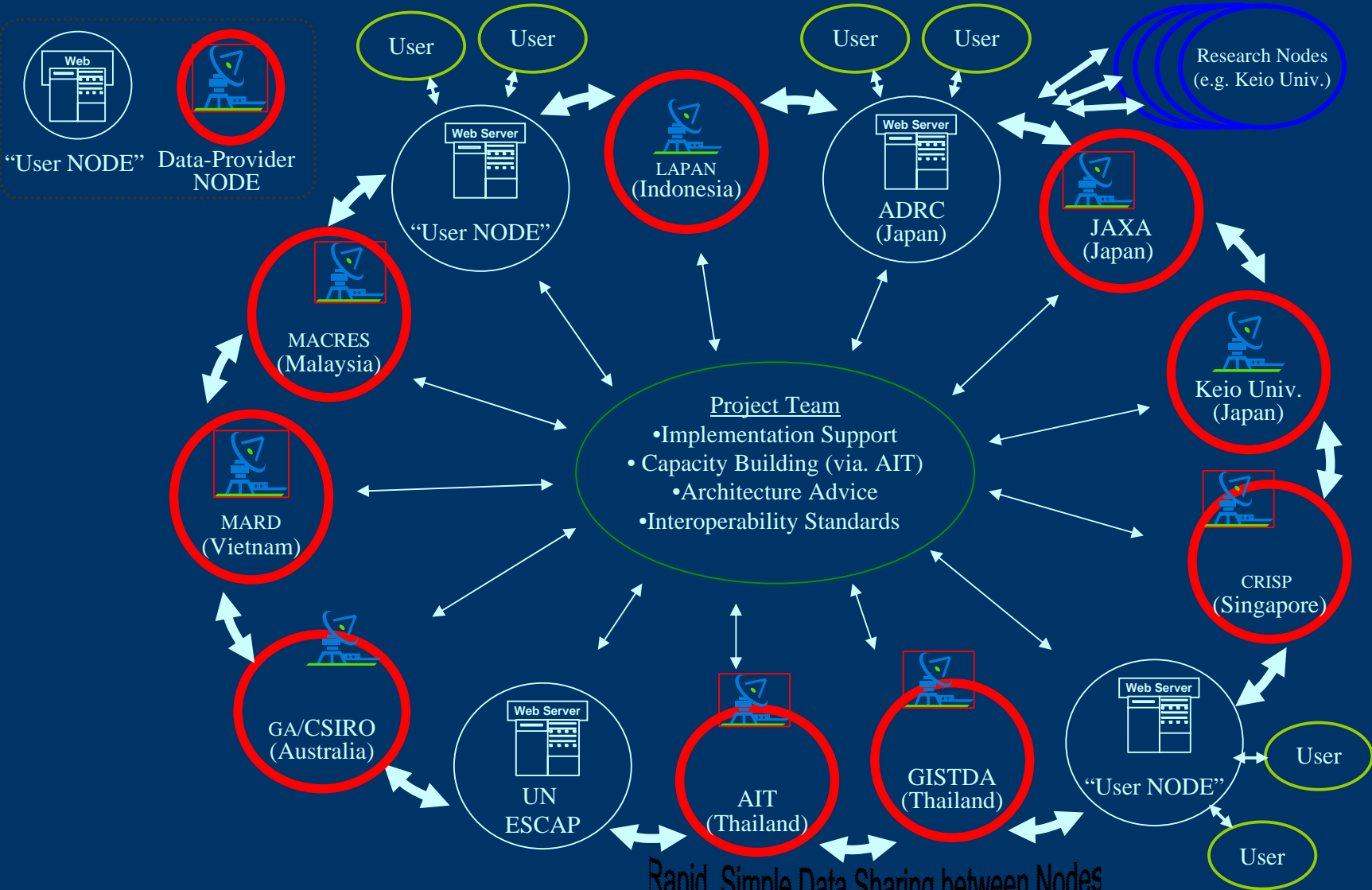
* Implement Various Projects in cooperation with UN/ISDR, UN/OCHA, UNESCO, UNU, WMO, UN/ESCAP, etc.



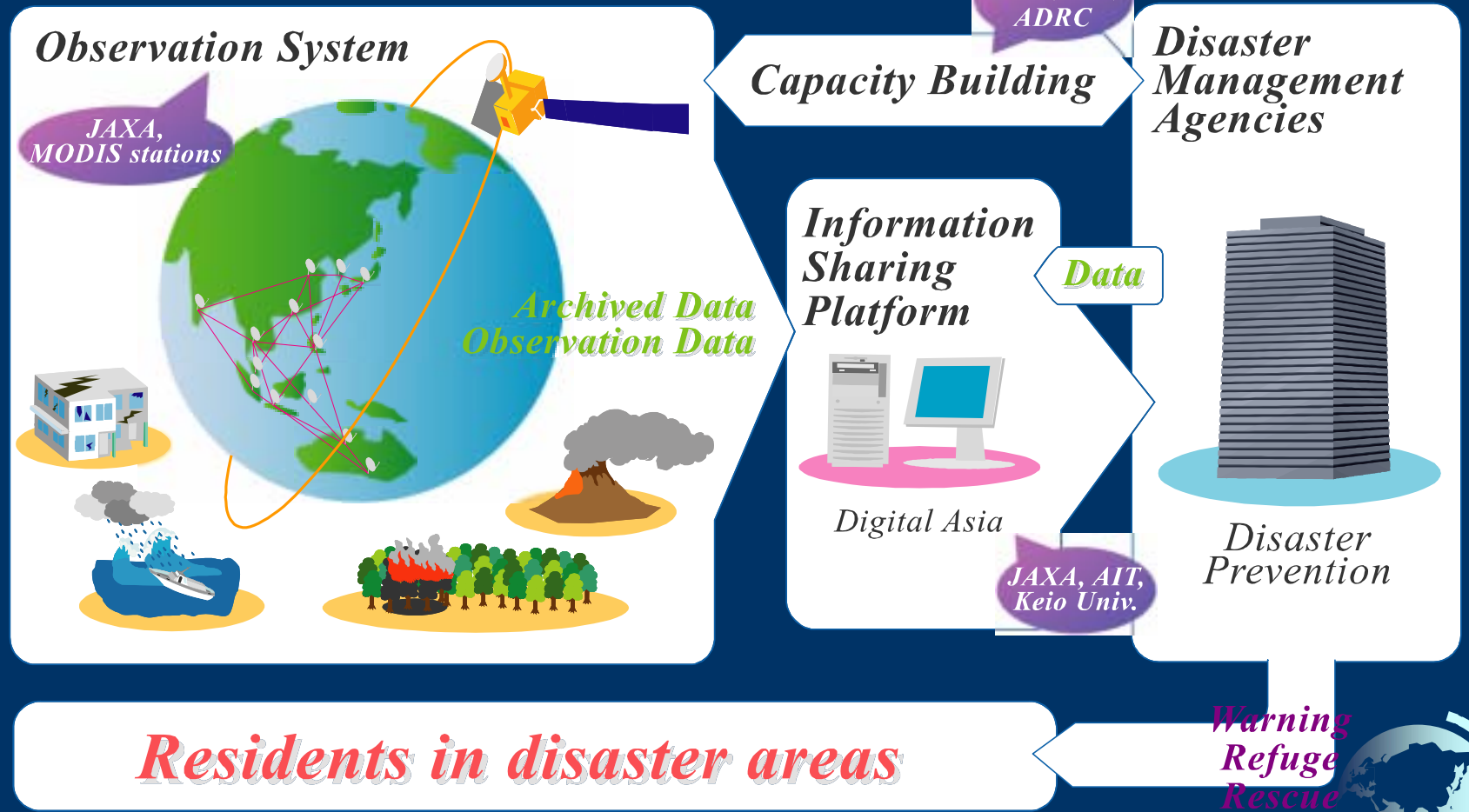
Structure of Sentinel-Asia Project



Sentinel Asia Concept of Operations



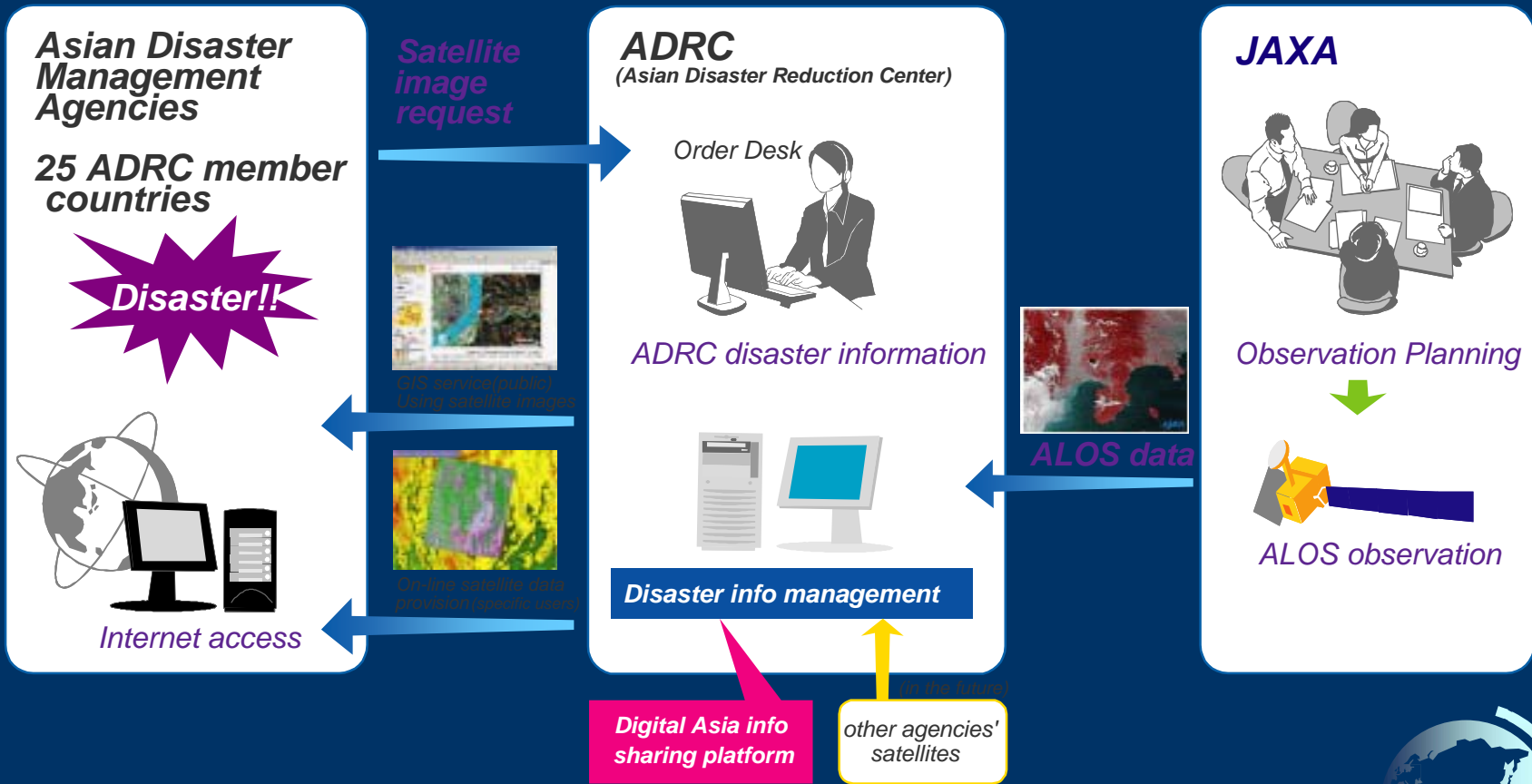
Overall Flow of Sentinel-Asia





Emergency Observation Request for Major Disasters

JAXA accepts ALOS observation request from ADRC member countries through ADRC



MODIS forest fire (hot spot) watch



CSIRO (Australia)



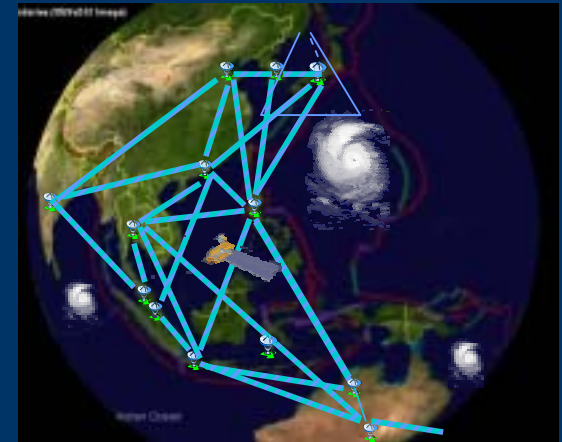
AIT/Tokyo Univ. (Thailand)



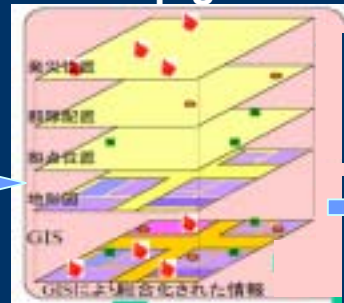
CRISP (Singapore)



MODIS data reception
Forest fire map generation



Observation network



WebGIS datasets
(Digital Asia)



Expand to whole Asia

>>Involve participating agencies
>>Expanding another disasters

IFNet : International Flood Network

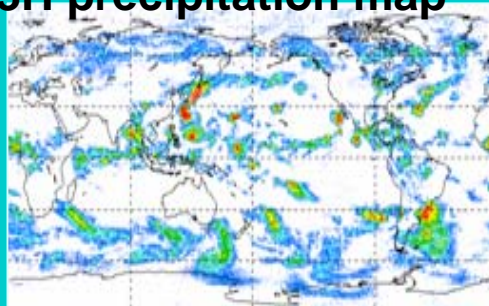
Satellite based flood alert system

GPM

(Global Precipitation Measurement)



**Satellite based
3H precipitation map**

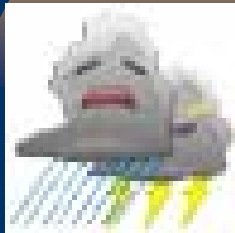


Now cast

forecast

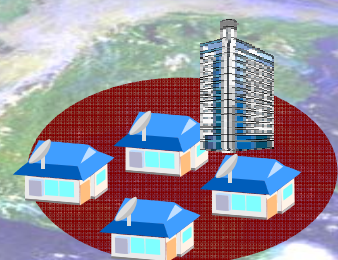
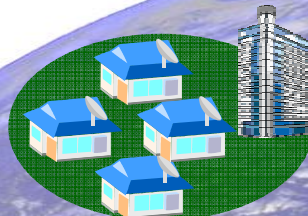
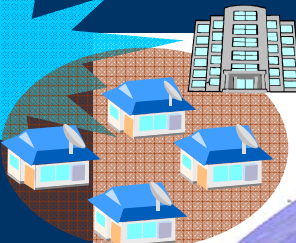
**Global Flood Alert System
(GFAS-1)**

**Data processing
(NASA, JAXA)**



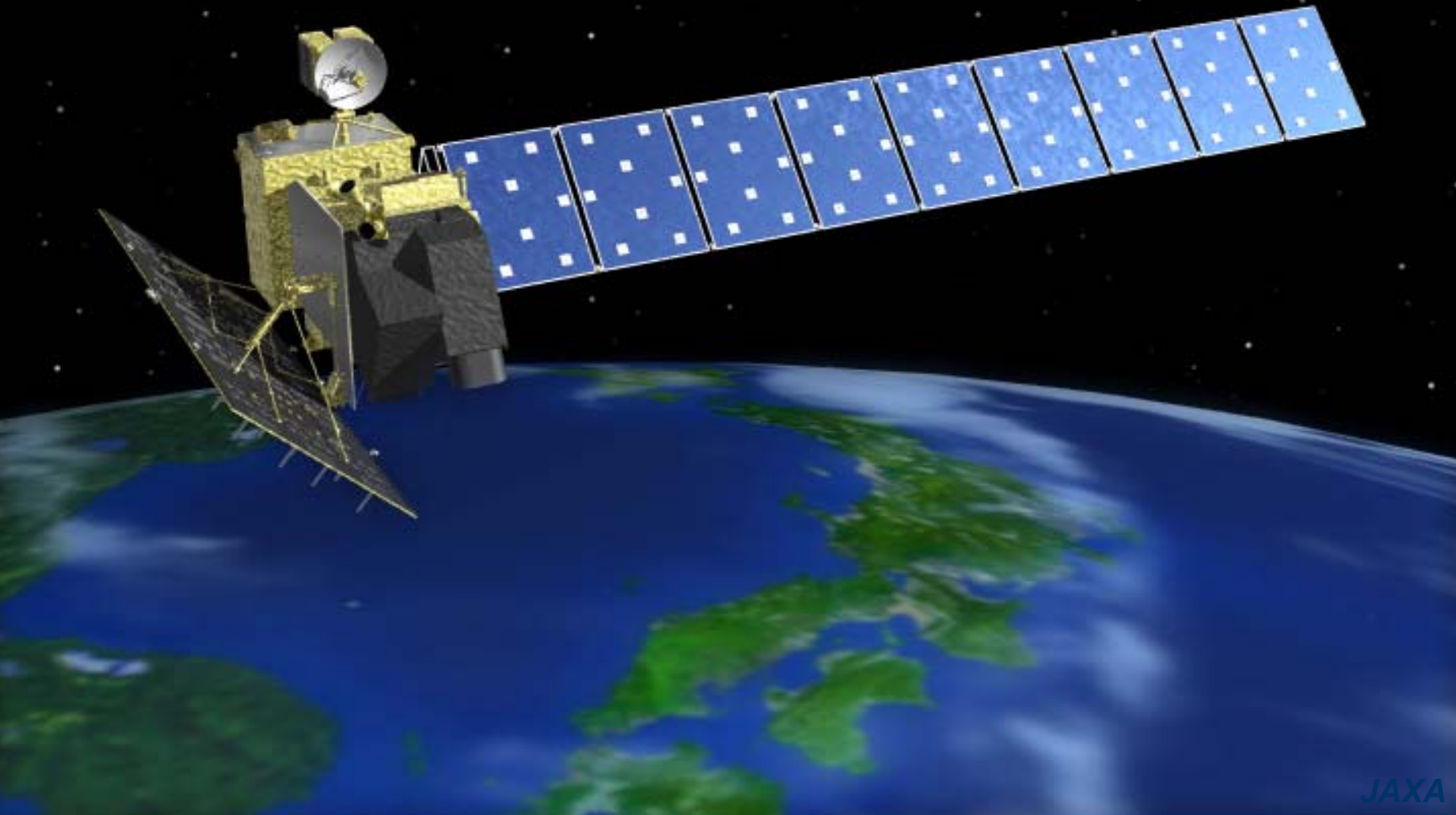
**Disaster
authorities**

Alert

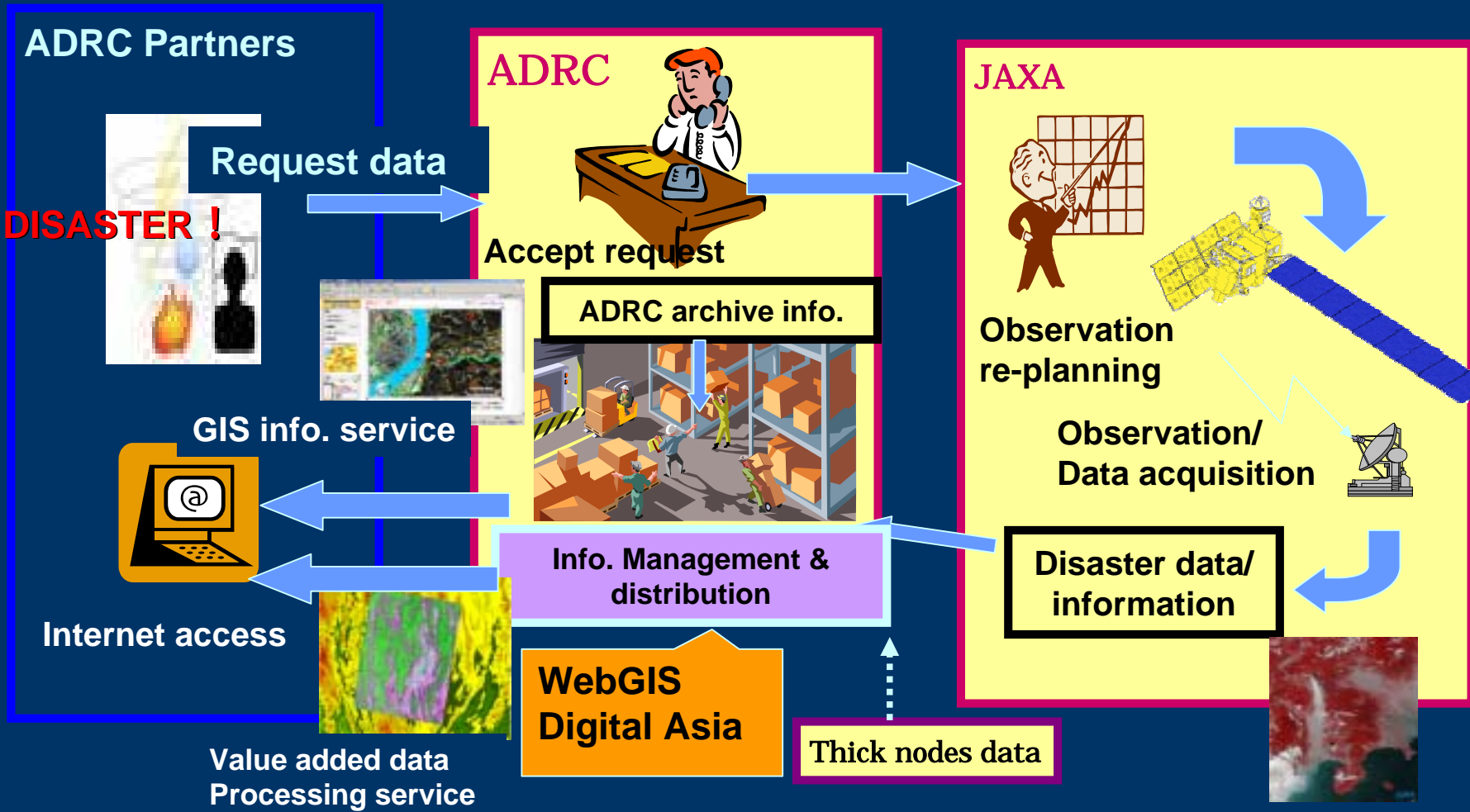


IFNet member agencies

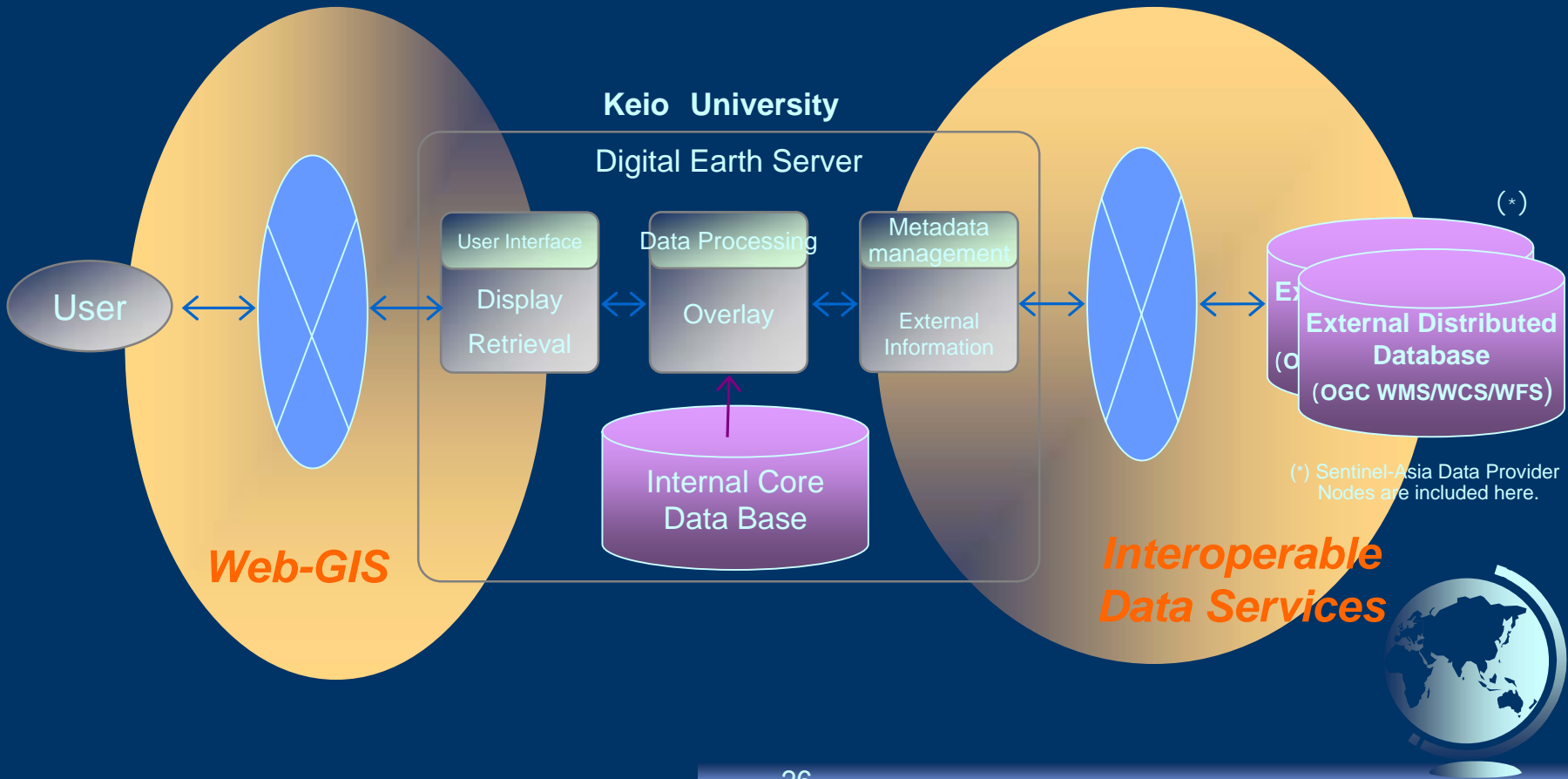
ALOS : High resolution Earth Observation Satellite



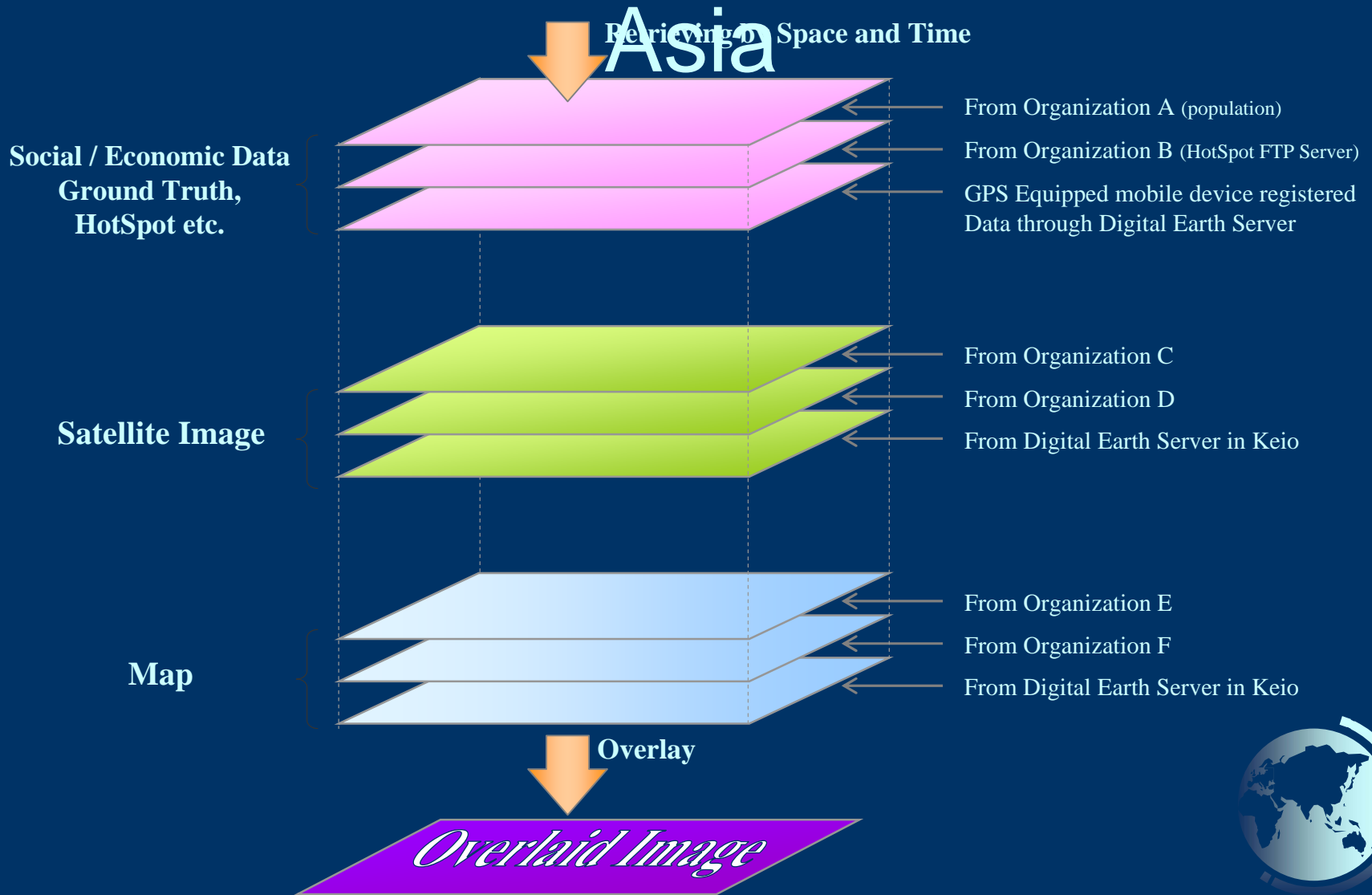
ALOS Disaster information service



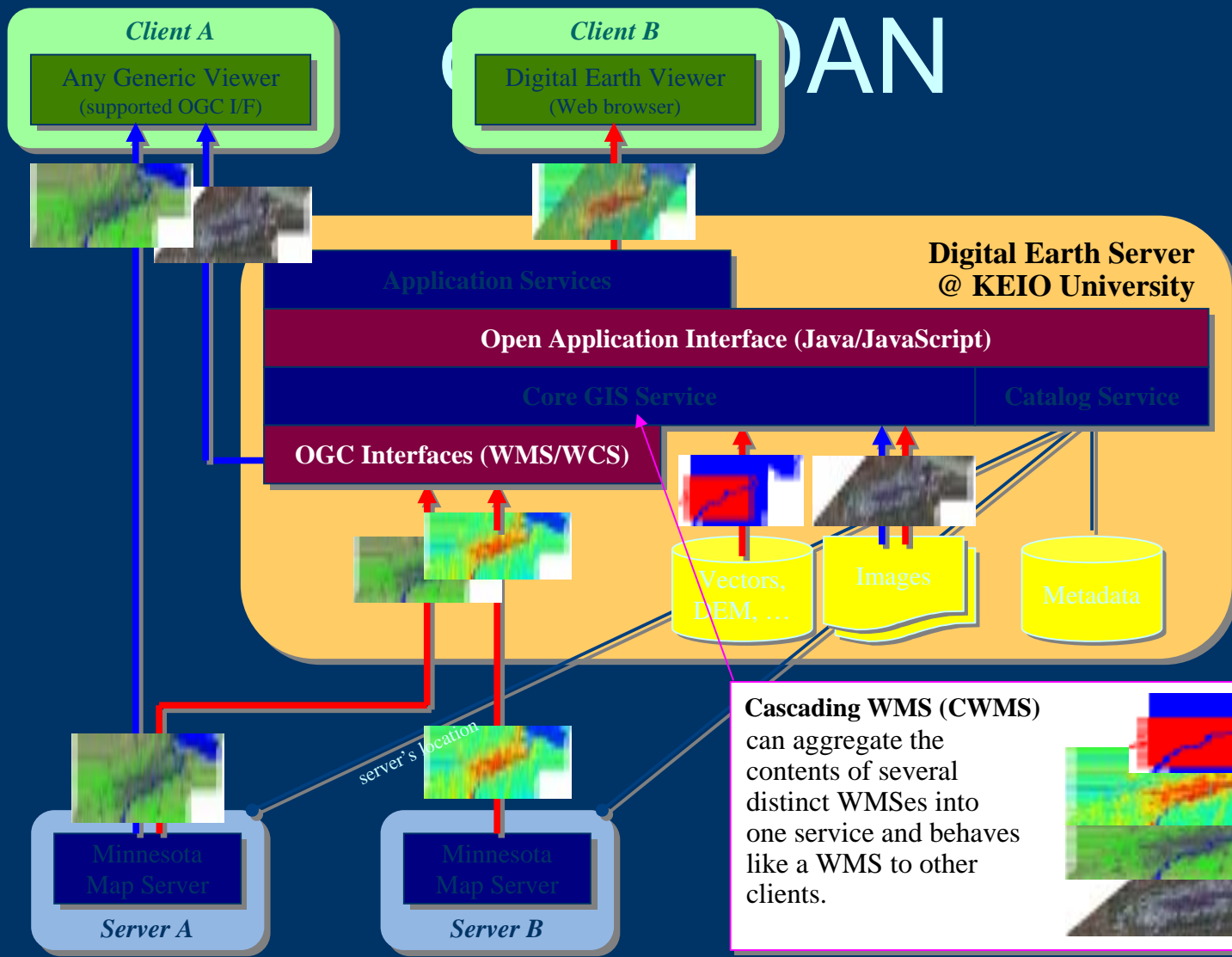
Interoperability in Digital Asia



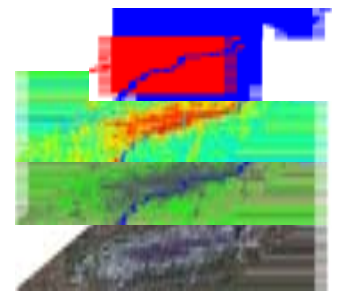
Overlay Processing of Digital



Interoperability Mechanism



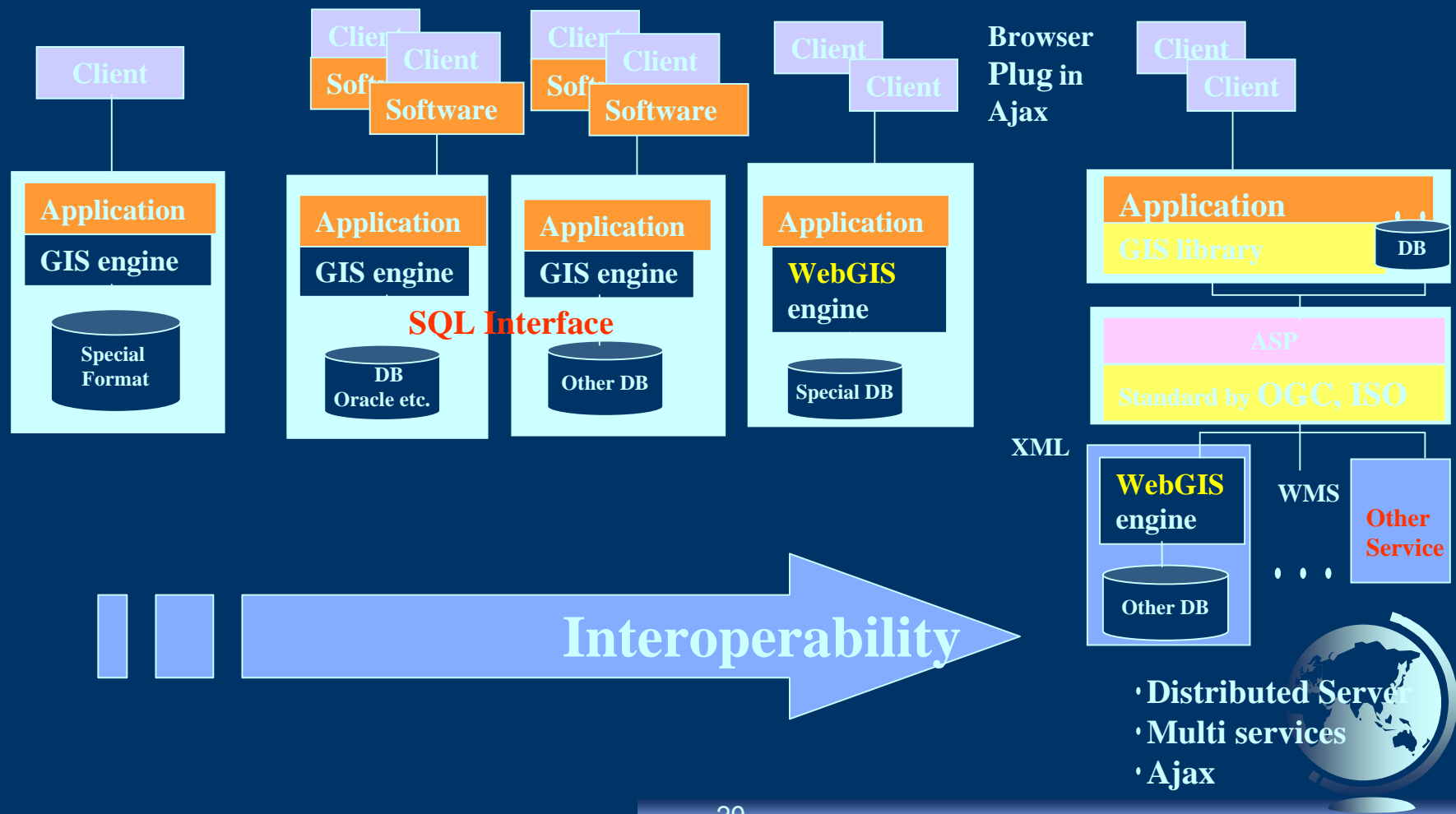
Cascading WMS (CWMS)
 can aggregate the contents of several distinct WMSes into one service and behaves like a WMS to other clients.



Evolution of GIS Software

WEB-Services

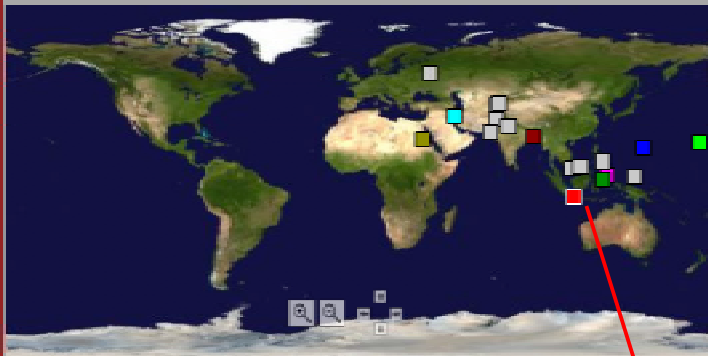
Standalone → Client Server → WW Web → Interoperable Web



Sentinel-Asia Project
Disaster Management Support System

The Latest Disaster Information

- Home
- Search Photo
- Search Satellite Images
- Search Observation Requests
- Request New Observation



GLIDE Number:

Event:

Duration: - - /

Region/Country:

Comment Keywords:

| GLIDE Number | Event | Duration | Country | Comment | Goto |
|------------------------------------|------------------|------------|--------------------------|---|------|
| EQ-2006-000064-IDN | Earthquake | 2006/05/27 | Indonesia | On 27 May 2006 at 5:54 AM Local time (5/26/2006 10:54:00 PM UTC) an M6.3 earthquake has struck the very highly populated region of Yogyakarta, 275 miles east of Jakarta, Indonesia. The death toll continues to climb and is currently estimated between 5,775 and 6,234 and the number of injured is between 46,000 and 53,000. | |
| VO-2006-000048-IDN | Volcano Eruption | 2006/05/11 | Indonesia | Indonesia's vice president has ordered the evacuation of some 17,000 people living near a volcano (Mt.Merapi) which has been threatening to erupt for weeks. Two people trapped and 4 people missed when Merapi erupted on 14 June. | |
| EQ-2006-000055-TON | Earthquake | 2006/05/04 | Tonga | A massive magnitude 7.8 earthquake rocked the South Pacific island | |
| EQ-2006-000043-IRN | Earthquake | 2006/03/31 | Iran (Islamic Republic O | devastating villages. | |
| TC-2006-000036-AUS | Tropical Cyclone | 2006/03/20 | Australia | Tropical Cyclone Larry has hit northeastern Australia on 20 March as a category four cyclone, packing wind gusts of up to 300 km/h. The cyclone forced thousands of people to flee and caused widespread damage to the region's banana crops and sugar cane. | |
| EQ-2006-000035-IDN | Earthquake | 2006/03/14 | Indonesia | A strong earthquake of Magnitude 6.7 on the Richter scale has struck eastern Indonesia on 14 March. The quake triggered 5 meter tidal wave which killed two persons and injured one. | |

Latest disasters are shown on the list and its positions are located on the map.

Username:

Password:

Language:

Disaster Management Support System

- Home
- Search Photo
- Search Satellite Images
- Search Observation Requests
- Request New Observation

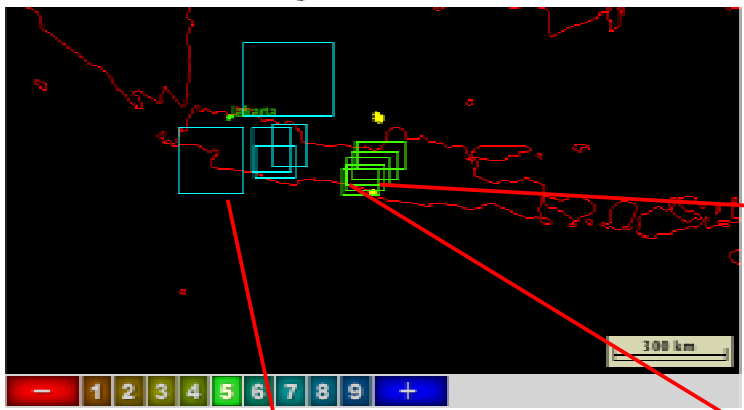
Disaster Details

| | |
|-----------------------------|--------------------|
| GLIDE Number: | VO-2006-000048-IDN |
| Event: | Volcano Eruption |
| Duration: | 2006/05/11 |
| Country or District: | Indonesia |

Indonesia's vice president has ordered the evacuation of some 17,000 people living near a volcano (Mt. Merapi), which has been threatening to erupt for weeks. Two people trapped and 4 people missed when Merapi erupted on 14 June.

The comments of this disaster.

Related Locations of Satellite Images and Photos



Related Recent Photos

| | Thumbnail | Date/Title | Comments |
|-----|-----------|-------------------------------|---|
| MAP | | 2006-06-02 users RIMG0244.jpg | A collapsed house of colony which located at the mouth of river near the earthquake center. |
| MAP | | 2006-06-02 users | A collapsed house (more than 90% collapse rate) of colony which is just |
| MAP | | | |

Photographs of a digital camera and its shot locations.

Username:

Password:

Language:

Related Satellite Images

| Thumbnail | Observation Date | Sensor | Product | Comments |
|-----------|-----------------------|--------|---------|----------|
| | 2006-05-11 00:00:00.0 | * | *** | comment |
| | 2006-05-11 00:00:00.0 | * | *** | comment |

Observed satellite images and its locations.

Related Observation Requests

| | Request ID | Requested Date | Observation Span | Event | Country | Organization | Status |
|--------------------------------------|------------|-----------------------|-------------------------|---------|---------|--------------|---------------------------|
| <input type="button" value="focus"/> | 15 | 2006-06-23 12:44:33.0 | 2006/05/11 - 2006/05/11 | Volcano | IDN | ADR/C | Waiting for Authorization |
| <input type="button" value="focus"/> | 17 | 2006-06-23 13:01:03.0 | 2006/05/11 - 2006/05/11 | Volcano | IDN | ADR/C | Waiting for Observation |
| <input type="button" value="focus"/> | 18 | 2006-06-23 13:48:01.0 | 2006/05/11 - 2006/05/11 | Volcano | IDN | ADR/C | Rejected or Canceled |

Requested observations of satellite images and its locations.

Disaster Management Support System

- Home
- Search Photo
- Search Satellite Images
- Search Observation Requests
- Request New Observation

Satellite Image Details

| | |
|-------------------|-----------------------|
| Observation Date: | 2006-05-11 00:00:00.0 |
| Sensor: | * |
| Product: | *** |
| Comments: | comment |

Satellite Image

The interface displays a satellite image of a coastal area. A zoomed-in inset shows a detailed view of a city area, with the text "2006-05-11 00:00:00.0" and "2006-05-11 00:00:00.0" overlaid. The legend on the right lists various layers: Reference (Political Boundary, Library Reference, Place Name), Boundaries (BarrierLine Feature, Coastlines, Depth Contours, Political Boundary), Hydrography (Aqueducts/Canals, Danger Point Feature, Inland Water Areas, Miscellaneous Line, Miscellaneous Point, Water Courses), Industry (Extraction Areas, Extraction Point Feature, Fish Hacheries/Fish, Miscellaneous Indu, Storage Point Feature), and Physiography. A zoom slider is located on the left side of the map.

Lat: 7d 29m 59.999s S, Lon: 110d 29m 59.999s E

[Redraw]

[Download this image from FTP site] [Back]

You can zoom up and down to desired scale using slider.

You can scroll this map to desired position with drag operation.

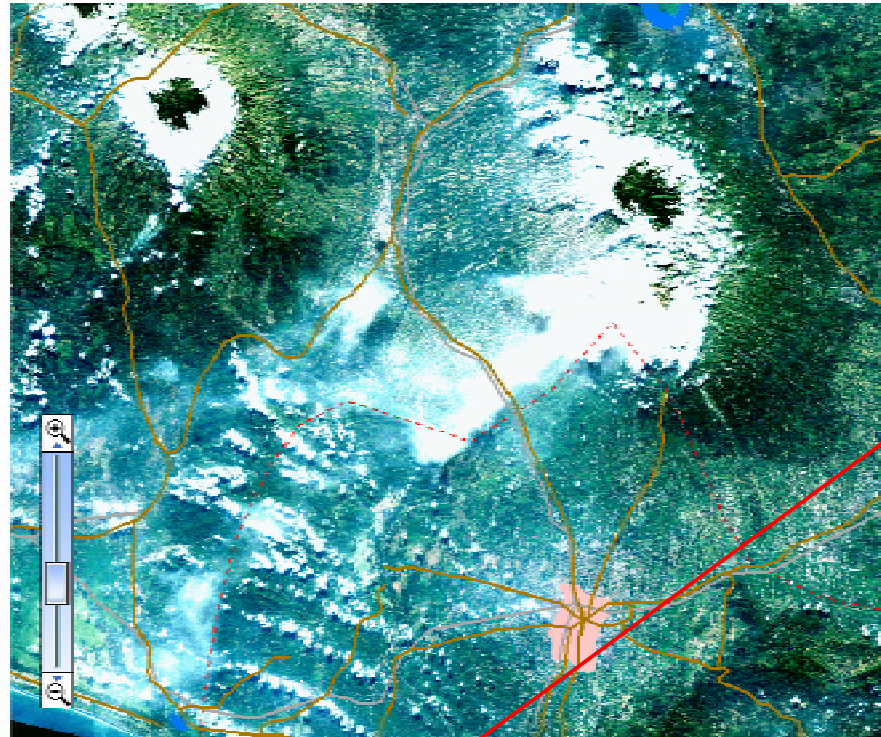
Disaster Management Support System

- Home
- Search Photo
- Search Satellite Images
- Search Observation Requests
- Request New Observation

Satellite Image Details

| | |
|-------------------|-----------------------|
| Observation Date: | 2006-05-11 00:00:00.0 |
| Sensor: | * |
| Product: | *** |
| Comments: | comment |

Satellite Image



Legend:

Pre-defined Layers:

Reference

- Political Boundary
- Library Reference
- Place Name

Boundaries

- BarrierLine Feature
- Coastlines
- Depth Contours
- Political Boundary

Hydrography

- Aqueducts/Canals/
- Danger Point Featu
- Inland Water Areas
- Miscellaneous Line
- Miscellaneous Poin
- Water Courses

Industry

- Extraction Areas
- Extraction Point Fe
- Fish Hacheries/Fish
- Miscellaneous Indu
- Storage Point Featu

Physiography

[Redraw]

Lat: 7d 29m 59.999s S, Lon: 110d 29m 59.999s E

Username:

Password:

Language:

[\[Download this image from FTP site\]](#) [\[Back\]](#)

You can overlay any layers on the satellite image.

You can get original satellite image from FTP server.

Disaster Management Support System

[Photo Details](#)

- [Home](#)
- [Search Photo](#)
- [Search Satellite Images](#)
- [Search Observation](#)
- [Requests](#)
- [Request New Observation](#)

| | |
|--------------|---|
| Posted Date: | null |
| Photo Date: | 2006-06-02 |
| Title: | RIMG0244.jpg |
| Comments: | A collapsed house of colony which located at the mouth of river near the earthquake center. |



Copyright© Arakida, ADRC

Username:

Password:

Language:

Google changes Everything ; Google Maps & Earth

