

PRACTICAL REMOTE SENSING DATA USE FOR DISASTER MANAGEMENT IN INDONESIA

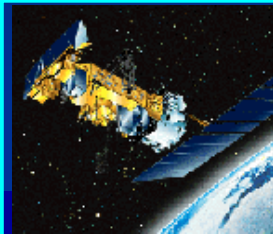
4th Sentinel-Asia Joint Project Team Meeting

Manila, 5-7 September, 2006

The Indonesian National Institute of Aeronautics and Space
(LAPAN)

ROLE OF REMOTE SENSING SATELLITE DATA FOR DISASTER ASSESSMENT IN INDONESIA

Indonesian National Institute of Aeronautics and Space (LAPAN)
Deputy of Remote Sensing Affairs
Remote Sensing Application and Technology Development Center
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Tel. (62 21) 8710786/8722733, Fax. (62 21) 8722733, <http://www.lapanrs.com>

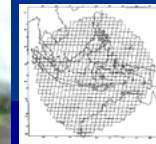


EARTH OBSERVATION SATELLITES

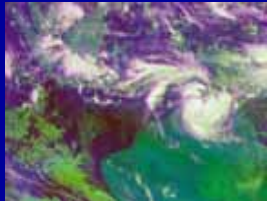
LANDSAT TM/ETM, GMS,
NOAA, MODIS, FENG YUN,
SPOT, IKONOS, JERS



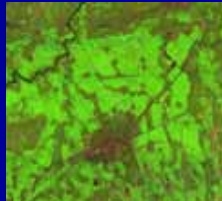
GROUND RECEIVING STATION JAKARTA, PARE-PARE, BIAK



NEAR-REAL TIME DATA PROCESSING AND ANALYSIS INTEGRATING USING GIS



Weather/Climate Prediction



Crop Assessment



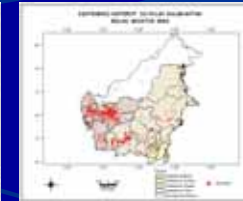
Irrigation Water Stock



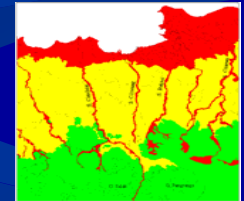
Volcanic Eruption



Greenness Vegetation



Forest/Land Fires



Flood Susceptibility

USERS

National Coordinating Board for Disaster Management
and IDP
Meteorology and Geophysical Agency
Ministry of Forestry
Ministry of Environment
Department of Agriculture
Statistical Bureau
Directorate Vulcanology and Geological Disaster
Department of Settlement and Regional Infrastructure
etc

Parepare South Sulawesi Remote Sensing Receiving Station



Previously, since 1993:

- Landsat-5
- SPOT-1,2,3
- JERS: OPS, SAR
- ERS-1 : SAR

Currently, since 2003:

- Landsat-7
- SPOT-4
- Terra and Aqua - MODIS

Early Warning and Community Preparedness on Disaster Management

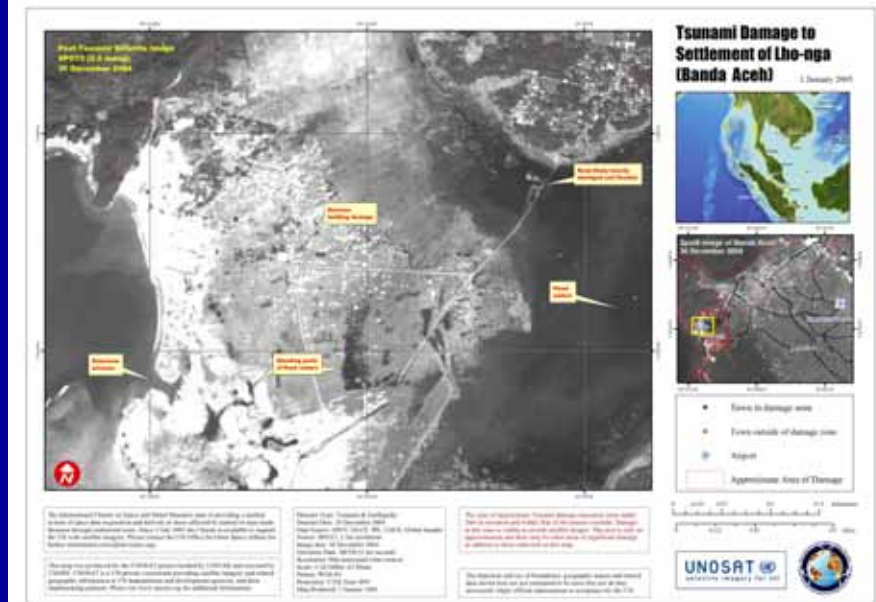
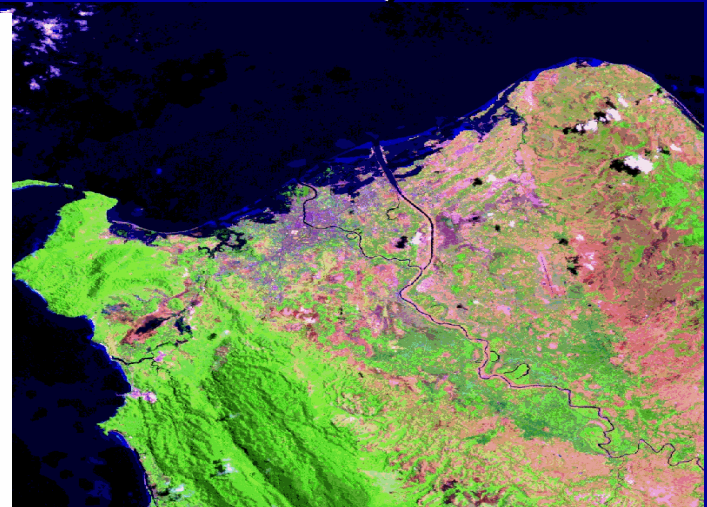
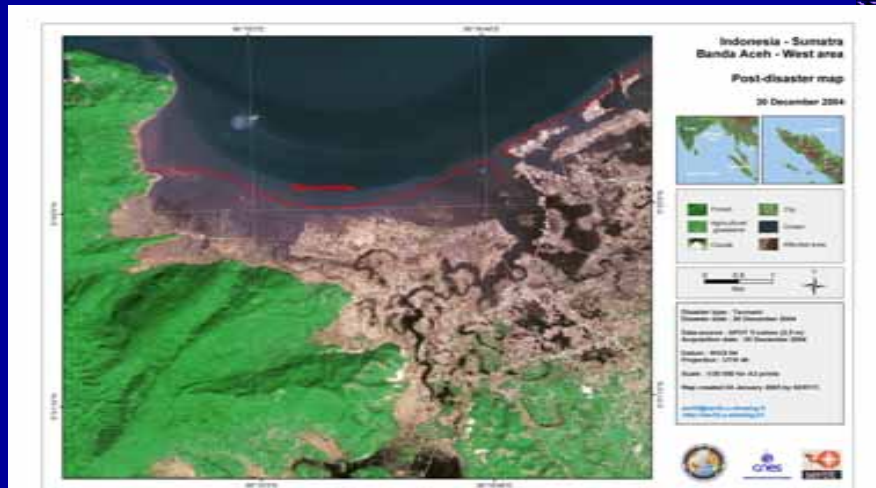
- Establishing Geospatial Data (Evacuation Map) for Tsunami along Ring of Fire Areas
- RS information on Monitoring of:
 - Weather/climate:
 - Cloud cover and rainfall estimation
 - Extreme weather
 - Potential flooded area
 - Climate prediction
 - Food security:
 - Vegetation index of paddy field
 - Paddy productivity and rice production
 - Fire management:
 - Forest/land vegetation index
 - Fire (*hotspot*) detection
 - Fire Danger Rating System

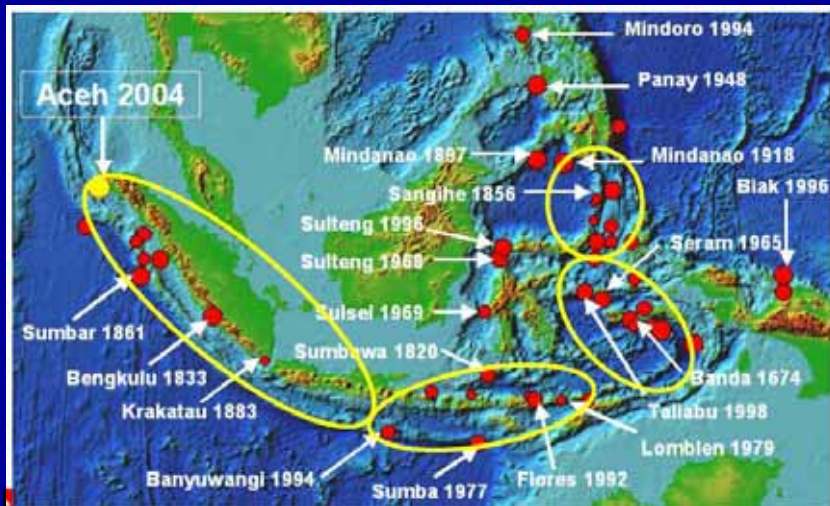
Quick Response

- Tsunami Aceh, 24 Des 2004
- Merapi Volcano Eruption, Central Java, April-June 2006
- Earthquake of Yogyakarta, 27 May 2006
- Tsunami Pangandaran, West Java, July 2006

Quick Response

Tsunami in Aceh (24 Dec 2004)





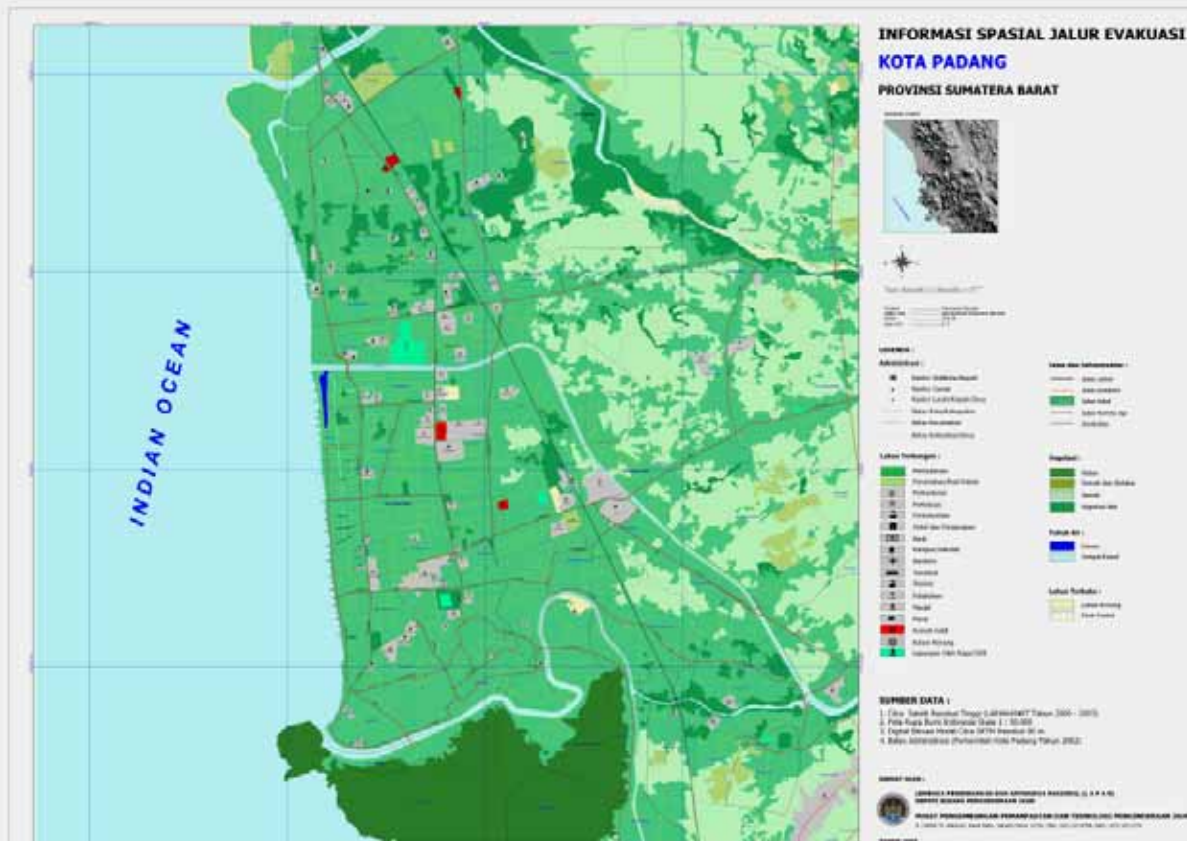
Establishing Geospatial Data for Tsunami along Ring of Fire Areas

Under National WG
Under Coordination of
RISTEK:

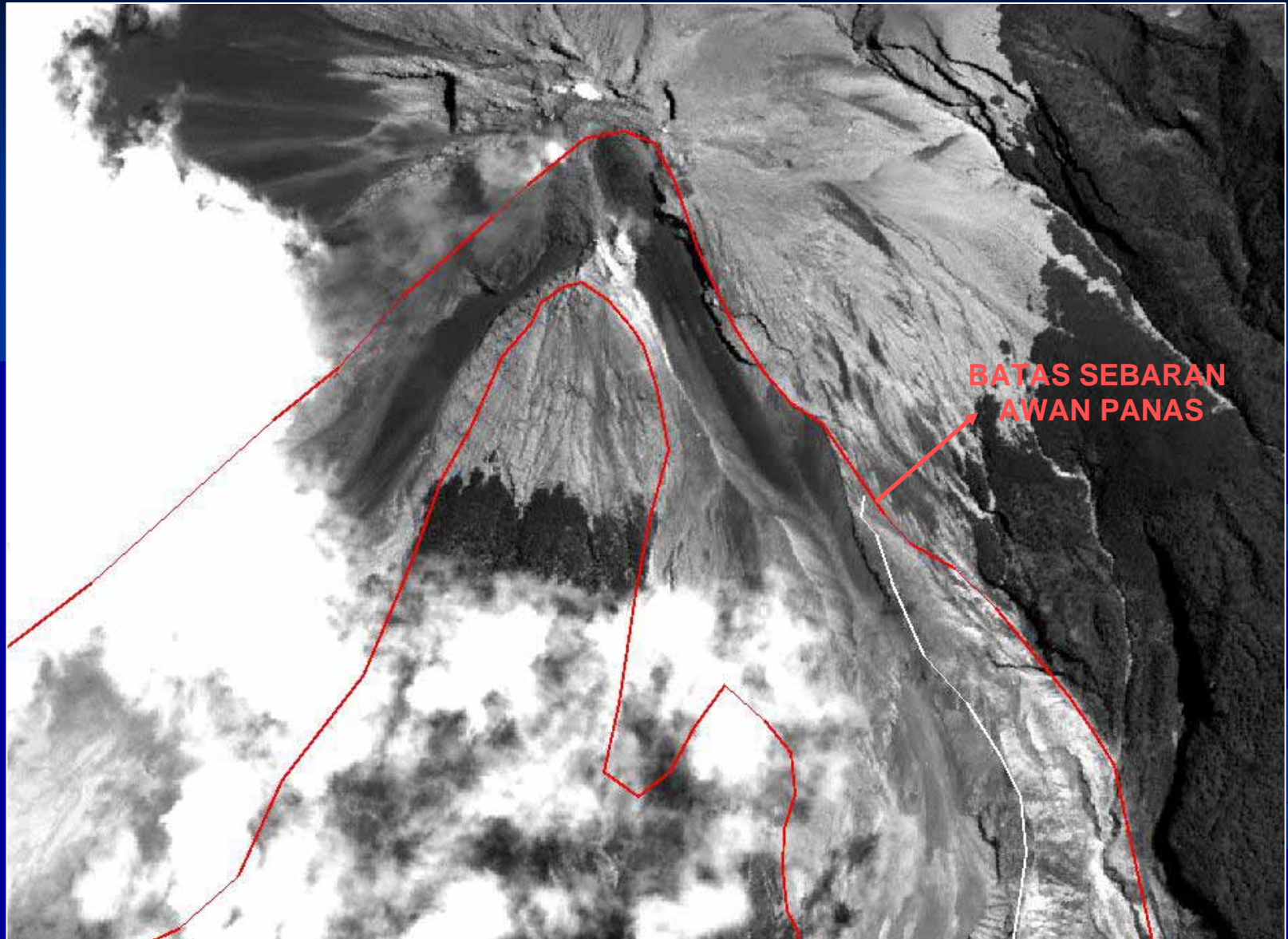
- Bakornas PBP
- BMG
- BPPT
- Bakosurtanal
- ESDM
- LIPI
- LAPAN
- Etc

In Int. Cooperation with:

- DLR
- JICA
- ASEAN
- IOC
- Etc.

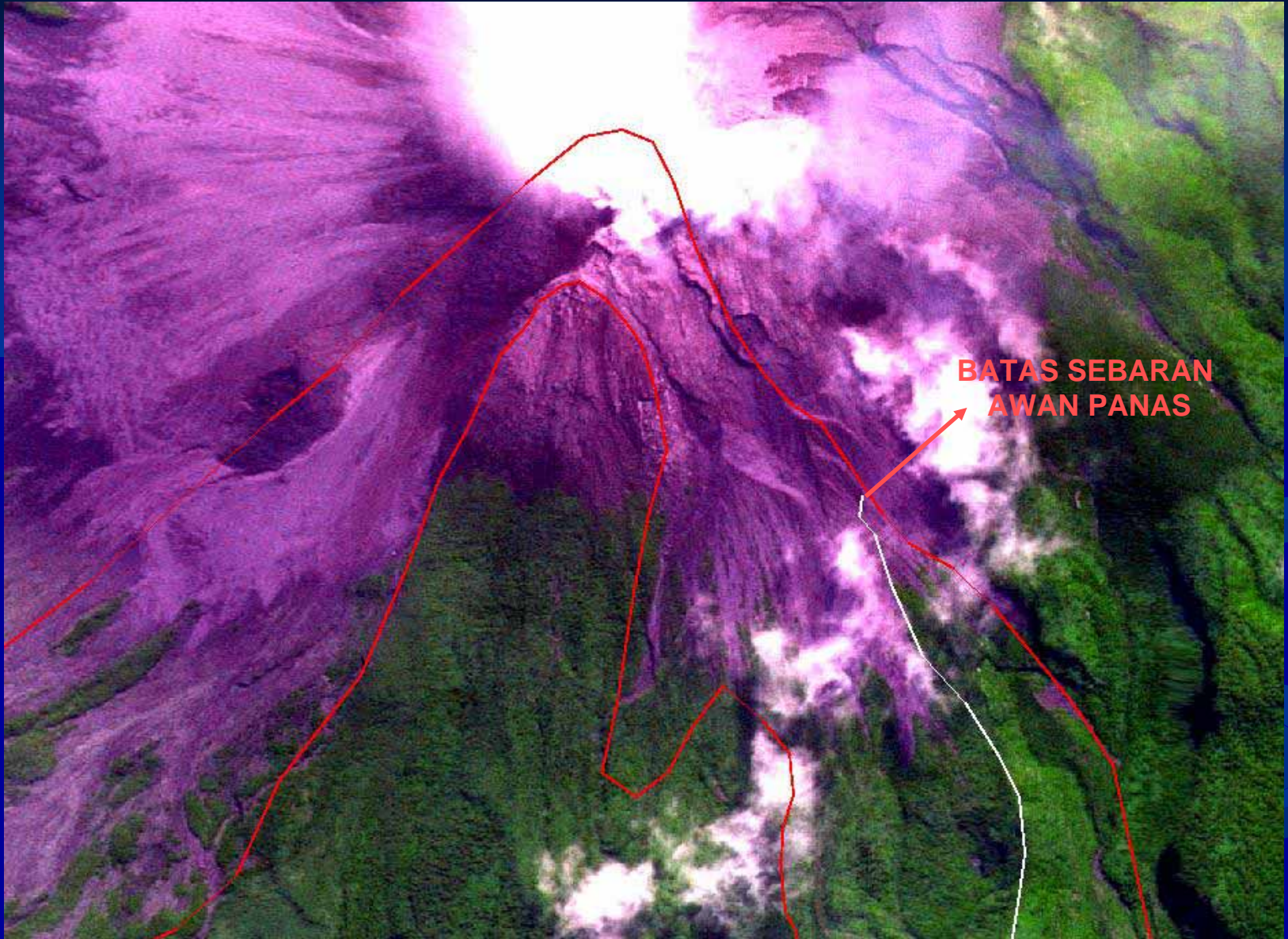


MERAPI VOLCANO POST ERUPTION OF 9,14 JUNE 2006



ALOS – PRISM-NADIR 2.5 m Sept 2006

MERAPI VOLCANO PRE ERUPTION OF 9,14 JUNE 2006

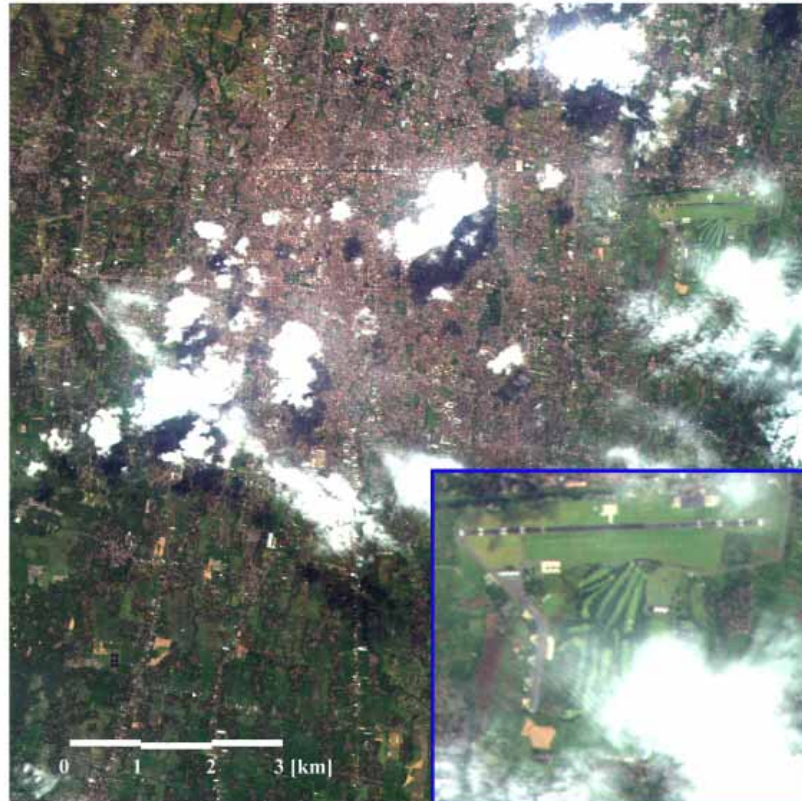


ALOS – PRISM-NADIR 2.5 m May-2006

Japan's - JAXA



「だいち」で観測した ジョクジャカルタ被災地



2006/5/28 RSP95, -36.9deg.



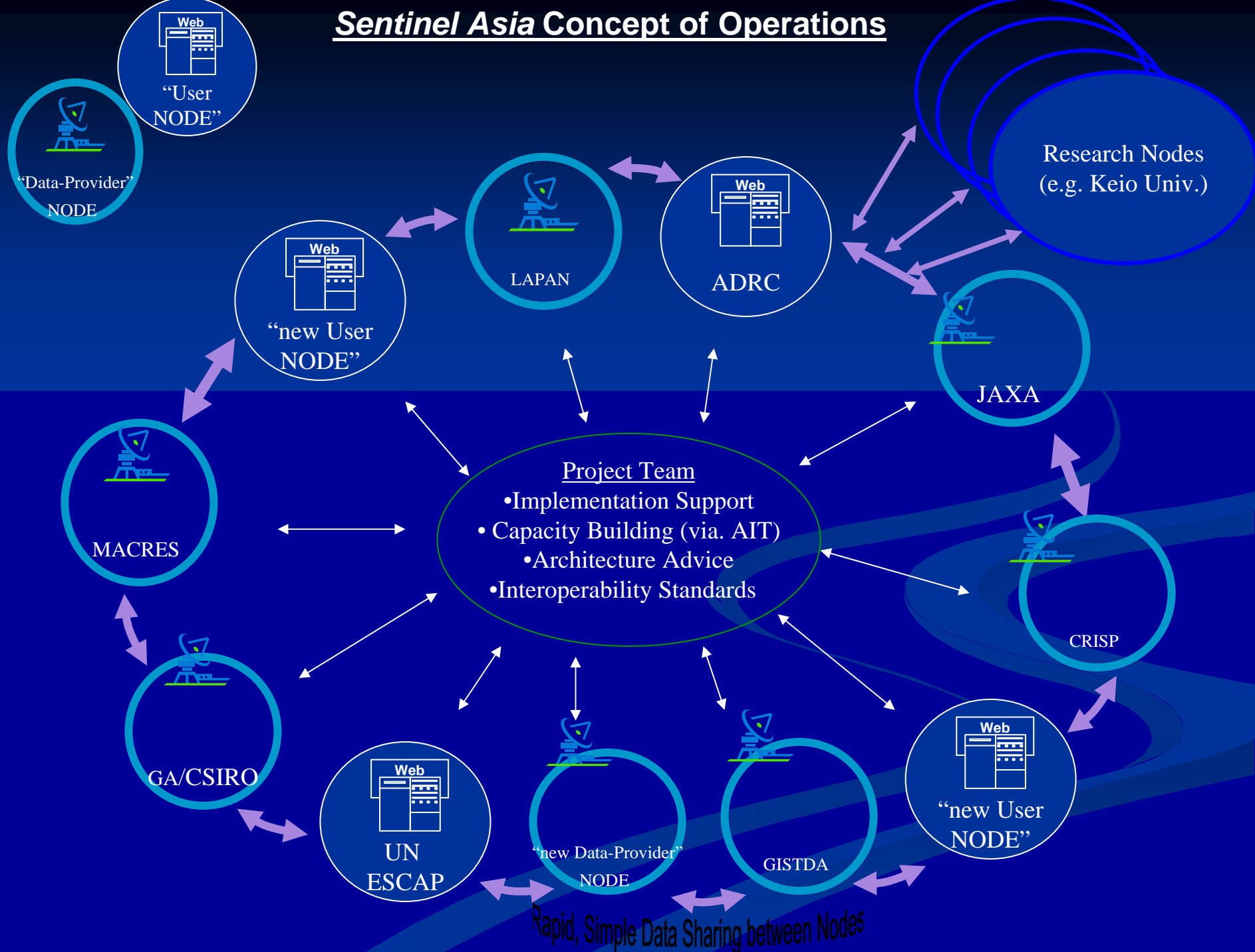
2006/5/16 RSP97, -30.8deg.

左図は2006年5月28日、右図は2006年5月16日にAVNIR-2によって観測されたジョクジャカルタの市街地です。拡大図はジョクジャカルタの空港で、懸濁水域（茶色）などが変化しています。

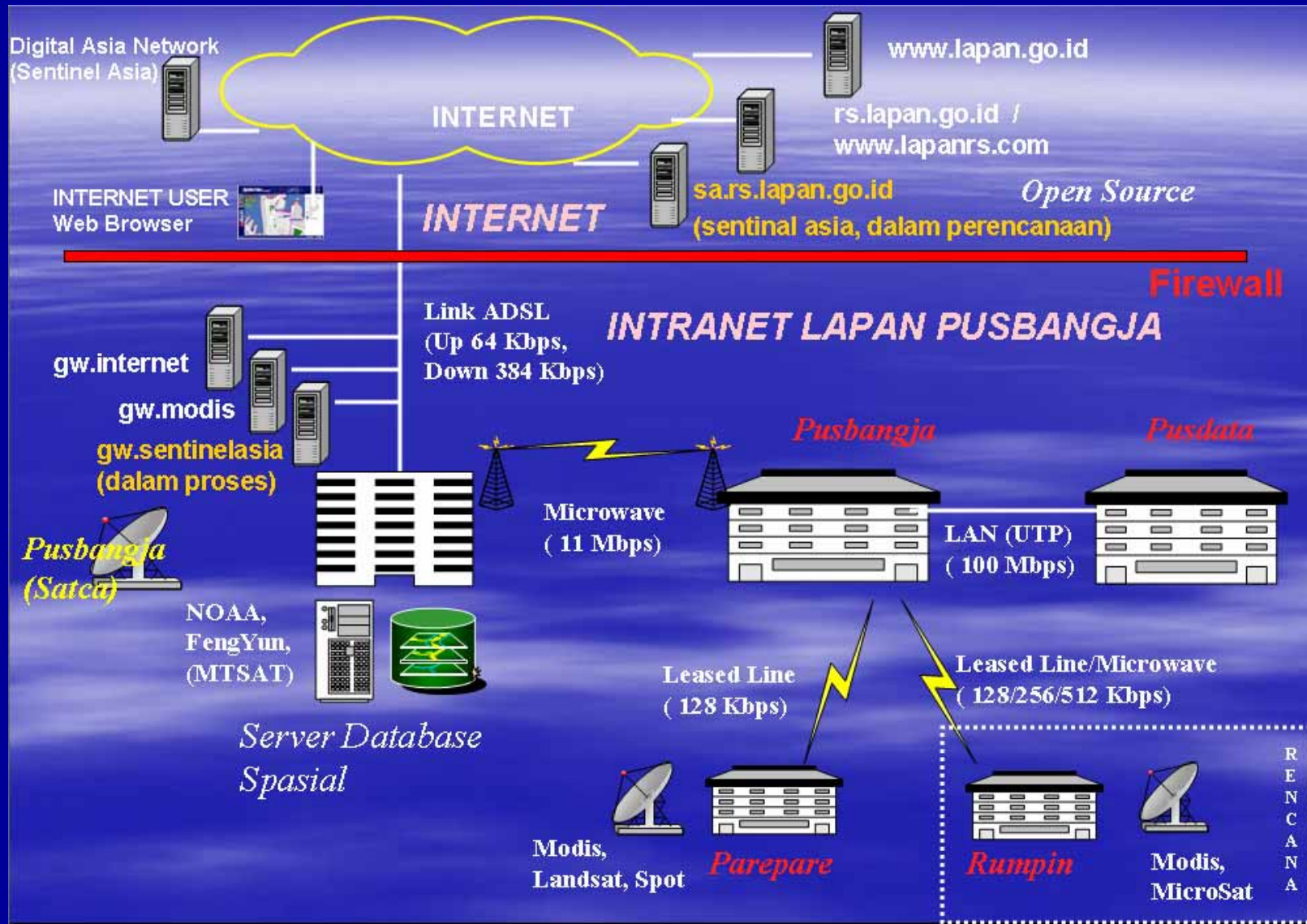


LAPAN-PUSBANGJA NETWORK INFRASTRUCTURE FOR SENTINEL ASIA CONNECTIVITY

Sentinel Asia Concept of Operations

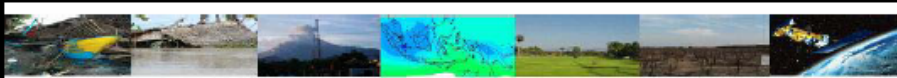


Infrastructure for Supporting Sentinel Asia



- Data transmission for MODIS di Pare-pare – Pekayon Jakarta (128 kbps) since 2004 to support nearly real time monitoring.
- Extranet Infrastructure for DAN, Sentinel Asia, etc.

Products



No. 06, Issue 30 October 2006

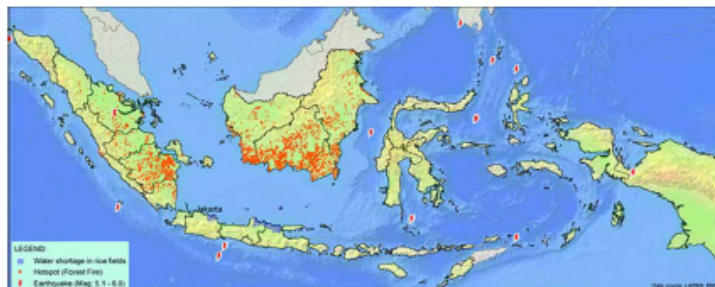


Early Warning Bulletin on Natural Hazards



Highlights:

- ❑ Peluang untuk terjadinya El Niño lemah sampai awal 2007 adalah 80%. Pergeseran awal musim hujan yang menjadi lebih lambat, khususnya di wilayah tenggara dan timur Indonesia serta penurunan curah hujan di berbagai tempat pada musim hujan 2006/2007, diperkirakan berhubungan dengan dampak El Niño.
- ❑ Pemantauan ketersediaan air di lahan persawahan di Jawa dan Bali masih menunjukkan kondisi kekurangan air di lahan persawahan sepanjang pantai utara Jawa. Titik rawan utama ditemukan di Indramayu (Jawa Barat), Rembang, Pati (Jawa Tengah), Lamongan, Gresik, Tuban (Jawa Timur).
- ❑ Titik api di Kalimantan dan Sumatra meningkat dengan tajam, khususnya di Sumatra Selatan (Kabupaten Ogan Komering Ilir), dan Kalimantan Tengah (Kabupaten Kotawaringin Timur).
- ❑ WFP-LAPAN telah melakukan survey lapangan di Timor Barat, NTT pada tanggal 18-23 September 2006. Survei ini bertujuan untuk memeriksa jenis penutupan/penggunaan lahan pertanian di lapangan dengan informasi yang diperoleh dari data penginderaan jauh. Informasi penutupan/penggunaan lahan pertanian akan digunakan dalam pemantauan tingkat kehijauan tanaman pangan dan pengembangan model untuk prediksi produksi tanaman pangan.
- ❑ A chance of weak El Niño is 80% until early 2007. Delay in the onset of rainy season, particularly for southeast and eastern parts of Indonesia, as well as rainfall reduction during the rainy season 2006/2007 in various places is projected with the El Niño effect.
- ❑ Monitoring on water availability in paddy fields of Java and Bali still reveal the water shortage along northern coast of Java. The main hotspots were found in Indramayu (West Java), Rembang, Pati (Central Java), Lamongan, Gresik, Tuban (East Java).
- ❑ Fire hotspots in Kalimantan and Sumatra islands increased sharply, particularly in South Sumatra (Ogan Komering Ilir district) and Central Kalimantan (East Kotawaringin district).
- ❑ WFP-LAPAN jointly undertook a ground check on agricultural land use in West Timor, NTT 18-23 September 2006. The mission was aimed at validating agricultural land cover information generated from remote sensing data. The information on agricultural land cover will be used to monitor the level of greenness of food crops and to develop a model for prediction of food crops production.




Gambar 1: Peta Peringatan Ancaman Bahaya Terkini di Indonesia
Figure 1: Map of Recent Hazards Alert in Indonesia

RS Info from MODIS Data for Early Warning:

- Daily Hotspot
- Daily FDRS
- Daily flood susceptibility
- Daily Cyclone track
- 6-day NDVI
- Monthly Rainfall Prediction
for 3 Months in advance
- Monthly El-Nino Prediction Analysis
- Quarterly Paddy Harvest Prediction

Information Dissemination

<http://www.rs.lapan.go.id/SIMBA>



KEDIRUTAN PENGINDERAAN JAUH - LAPAN
NATIONAL INSTITUTE OF AERONAUTICS AND SPACE - REMOTE SENSING AFFAIRS

HOME	PERKEMBANGAN TEKNOLOGI	PELAYANAN JASA	PEMANTAUAN BUMI DAN SIMBA
PROFIL	DUKUNGAN DUNIA USAHA	INVENTARISASI SDA	PERKEMBANGAN TEK PEMANFAATAN
LINK	TRAINING DAN KEGIATAN	DOWNLOAD	SITE MAP

Bahasa Indonesia

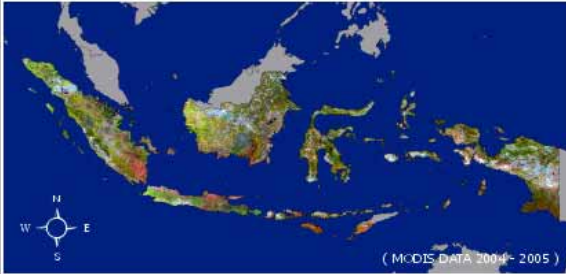
Cuaca & Iklim | Bencana Alam | Ketersediaan Pangan | Bencana Alam Lainnya | Basis Data 19:01:43

Sabtu, 06 Mei 2006

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 - [Daerah Potensi Banjir](#)
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 - [Titik Panas \(Hot Spot\)](#)
 - [Tingkat Kehijauan Vegetasi](#)
 - [Daerah Potensi Banjir](#)
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Sistem Informasi untuk Mitigasi Bencana Alam Menggunakan Data Penginderaan Jauh (SIMBA - LAPAN)

News Flash

(MODIS DATA 2004 - 2005)

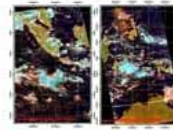
News

- Merapi, Citra Landsat dan SPOT selengkapnya [New](#)
- Gunungapi Merapi selengkapnya
- Banjir dan Longsor di Trenggalek selengkapnya
- Banjir di Jombang selengkapnya
- Banjir di Jember dan Banjarnegara selengkapnya
- Tsunami & Gempa Bumi di Aceh selengkapnya
- Sebaran Kabut Asap selengkapnya
- Tanah Longsor selengkapnya
- Gunung Api selengkapnya

Pencarian


[Pencarian Lebih Lanjut](#)

Citra Satelit Terbaru




Citra Satelit Terra/Aqua MODIS
(04 Mei 2006)

Cuaca & Iklim



Estimasi Curah Hujan
(05 Mei 2006)

Prediksi iklim
(Bulan : Juni 2006)



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Bidang Pemantauan Sumberdaya Alam dan Lingkungan (PSDAL) - LAPAN
Jl. LAPAN No. 70, Pekayon - Pasar Rebo, Jakarta 13710, Indonesia
Telp / Fax : (+62 - 21) 8710274 / 8722733

R & D on Utilization ALOS Data – ALOS PILOT PROJECT FOR INDONESIA

LAPAN has invited 7 counterparts to join ALOS Researches for several sectors.

1. **Topographic Map Production using ALOS Data – Benchmark test in urban area in Jakarta, rural area in Bogor, and forest area in East Kalimantan/Papua**, National Coordinating Agency for Surveying and Mapping (BAKOSURTANAL)
2. **Assessment of Land Degradation and Mass Movement Using ALOS Satellite Data**, Indonesian Soil Research Institute (ISORI), Soil and Agroclimate Research and Development, Ministry of Agriculture.
3. **Developing Algorithms for Coastal Zone Management and Vessels Monitoring Using ALOS Data**, Center for Remote Sensing and Ocean Sciences (CreSos)
4. **Natural Resources Mapping Models**, Geology Development and Research Centre, Ministry of Energy & Mineral Resources (DESDM)
5. **Land Use, Land Cover and Terrain Changing in Nanggroe Aceh Darussalam, Indonesia**, Universities : Syiah Kuala University, Banda Aceh; Regional Development Study Center , Bogor Agricultural University (IPB); Remote Sensing Center, Bandung Institute of Technology
6. **ALOS Satellite Imagery Application For Indonesia Forest Resources Monitoring**, Center for Forestry Mapping - Ministry of Forestry

Concluding Remarks

Advantages:

- International cooperation (G to G, International Charter, etc.) promotes the availability of useful information that are crucial for coordinated Disaster Management in Indonesia.
- Various remote sensing data types produce important information that support Disaster Management (prevention, mitigation, and rehabilitation)
- Knowledge and experience transfer (capacity building) to achieve the best suited and practical solutions for Indonesia in supporting the disaster management.

Concluding Remarks (*Cont.*)

Consideration:

- The availability of data, most importantly the very high-spatial resolution, before and after the disaster, helps very much the disaster management operation. Therefore, the data acquisition of the hazard prone areas especially for the very high-spatial resolution should be carried out.
- However the benefit of the space technology is depending on the type and the extent of the disaster.

Thank You