

Global Earth Observation System of Systems (GEOSS) Related Activities in Indonesia

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Introduction

Earth observation (EO) activities in Indonesia are conducted to get societal benefits in the areas of:

- the environmental and natural resources monitoring and management
- the disaster management
- the information accessibility for weather/climate variability and other environment factors
- the development and production renewable energy



Earth Observation System (EOS)

EOS utilized in Indonesia comprised of:

- Data Acquisition
- Model Development
- Information Dissemination
- Capacity Building
- Renewable Energy Resources



Data Acquisition

Receiving Ground Stations located at:

- Pare-Pare (South Sulawesi):
Landsat and SPOT
- Jakarta (West Java) and Biak (Papua):
NOAA, Terra/Aqua
MODIS, Feng Yun, GMS
- Rumpin (West Java):
TUBSAT, Microsat,
Terra/Aqua MODIS



MODIS - Pare-Pare



GMS - Jakarta



Feng Yun - Jakarta



NOAA - Jakarta





Data Acquisition



Equatorial Atmosphere Radar (EAR) in Kototabang, West Sumatra
(Cooperation between LAPAN and Research Institute for Sustainable Humanosphere (RISH),
Kyoto University, Japan)

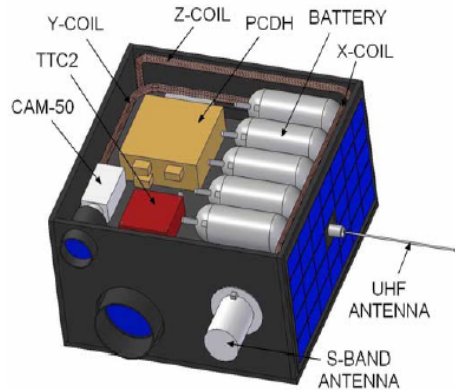
**Atmospheric component measurements
using the stratospheric balloon**





Data Acquisition

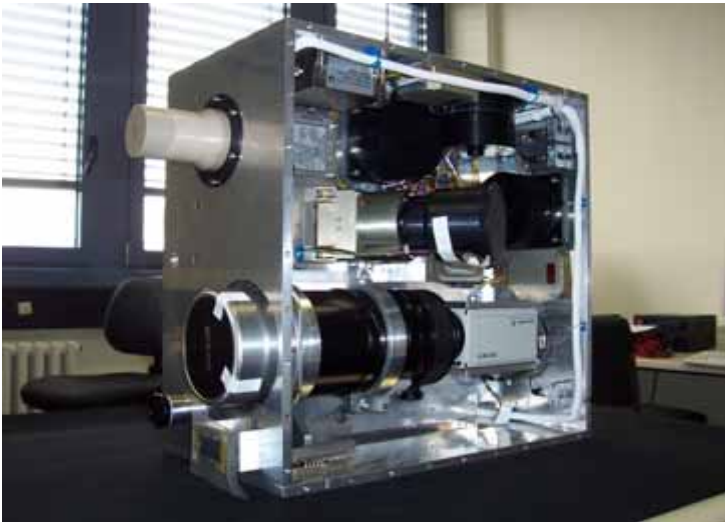
Micro-Satellite Development



LAPAN-TUBSAT micro-satellite was launched 10 January 2007 to polar low earth orbit at approx. 630 km altitude as auxiliary payload of the launch of Indian Cartosat-2 on Polar Satellite Launch Vehicle (PSLV) in middle of 2006.

Weight of satellite is 57 kg, with dimension of 44 x 44 x 25 cm.

LAPAN-TUBSAT micro-satellite payload comprise (1) color video camera with 1000mm objective, (2) color video camera with 50mm objective, (3) UHF store-and-forward communication, (4) S-band data communication, (5) UHF tracking and command and (6) CMOS star sensor attitude control reference. The satellite incorporate a 3-axis attitude control system utilizing gyroscopes and reaction wheels.

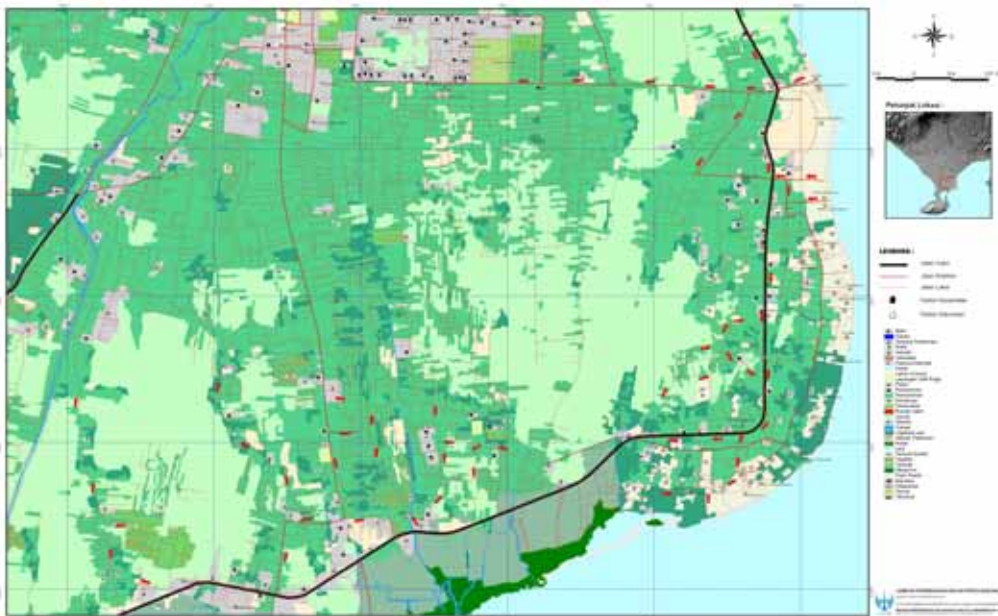




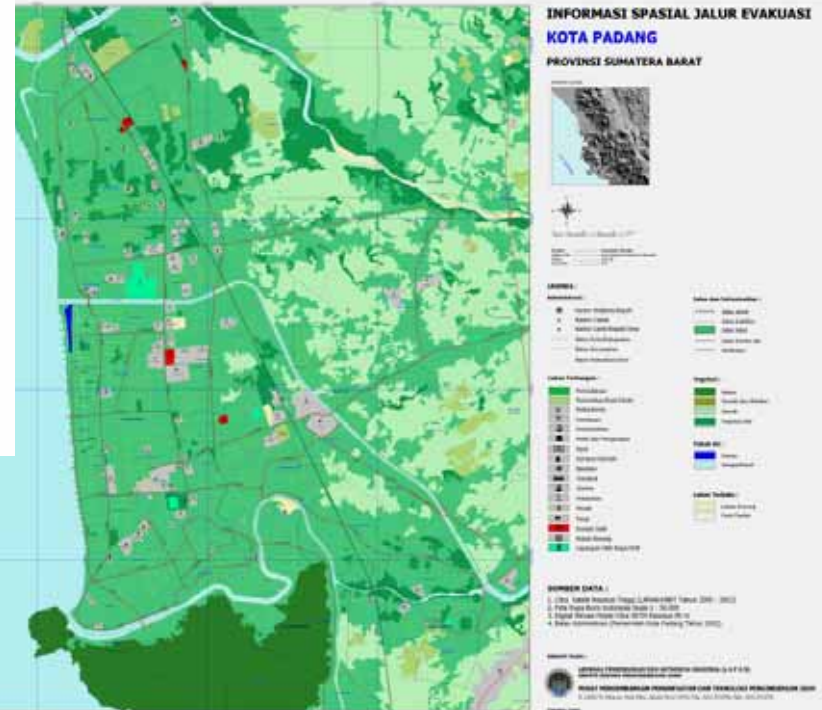
Model Development

Geospatial Data of Ring of Fire Areas: Evacuation map of Tsunami

INFORMASI SPASIAL JALUR EVAKUASI
DAERAH SANUR DAN SEKITAR



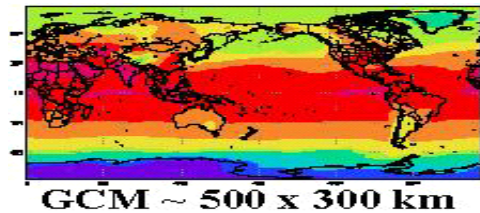
INFORMASI SPASIAL JALUR EVAKUASI
KOTA PADANG
PROVINSI SUMATERA BARAT



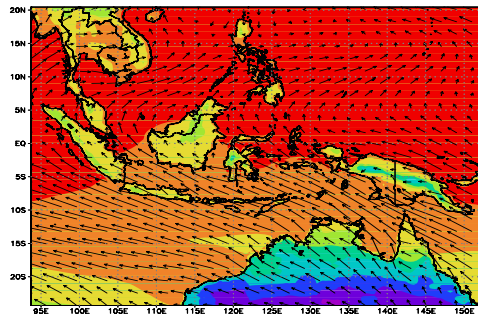


Model Development

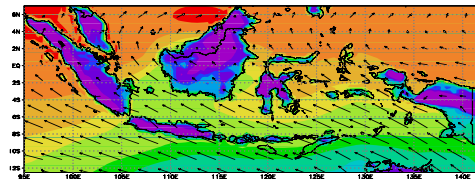
Weather forecasting/climate prediction



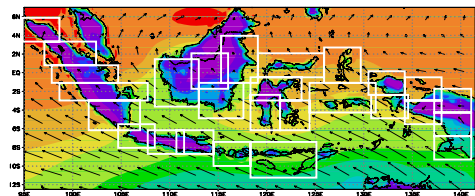
GCM ~ 500 x 300 km



Regional ~ 125 x 125 km

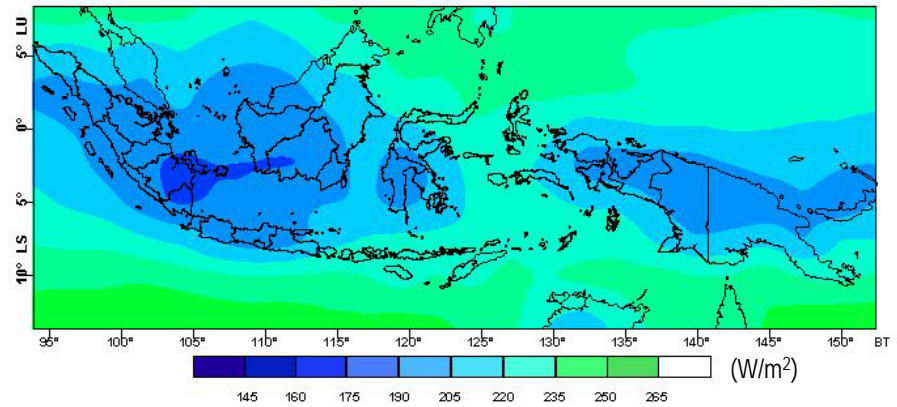


National ~ 50 x 50 km

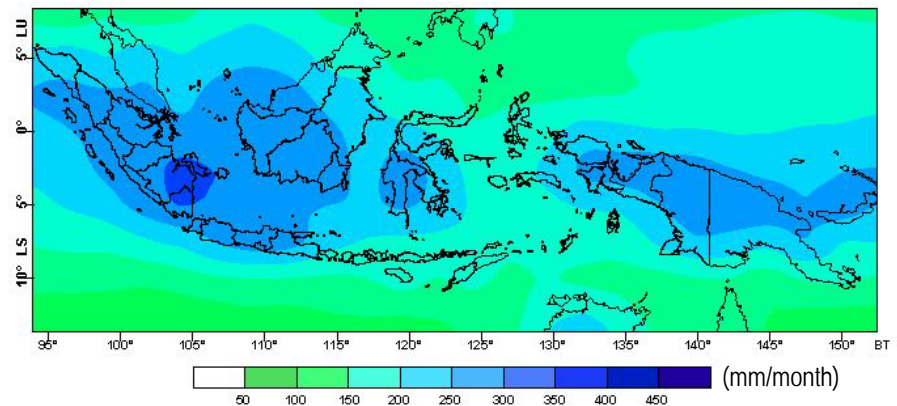


Local ~ 5 x 5 km

OLR PREDICTION – DECEMBER 2006



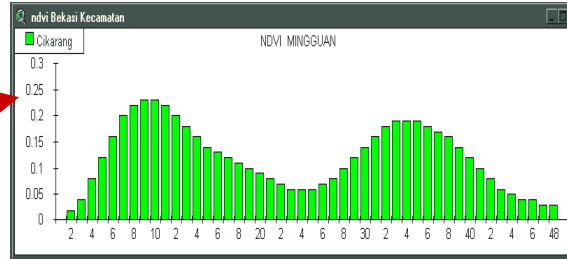
RAINFALL PREDICTION – DECEMBER 2006



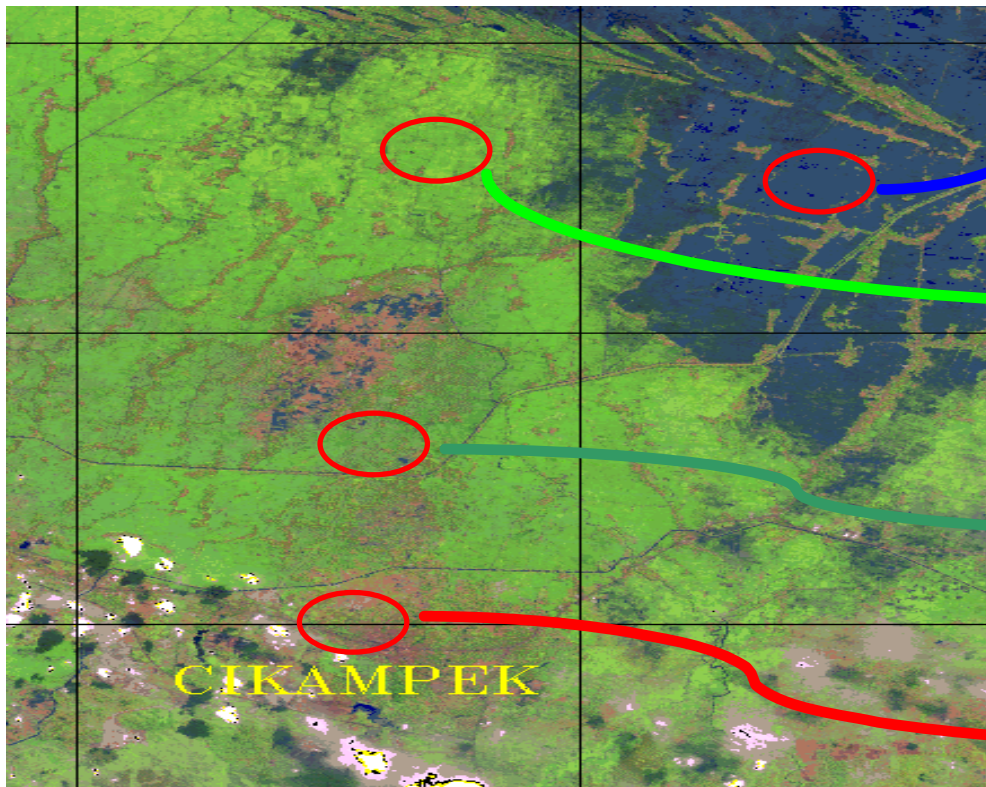


Model Development

Food security assessment



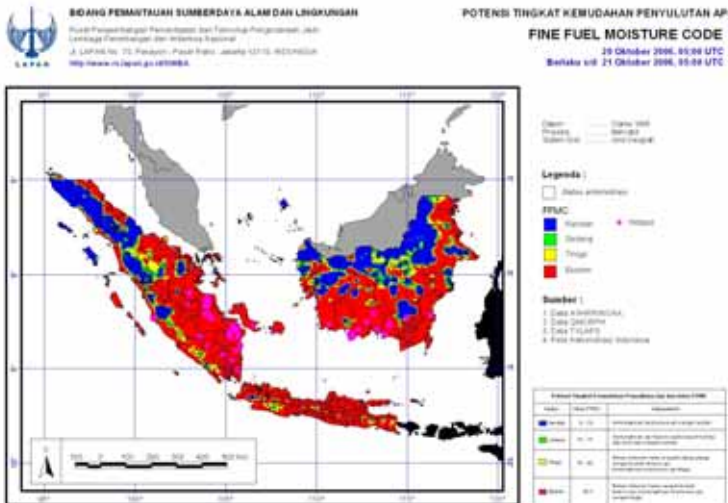
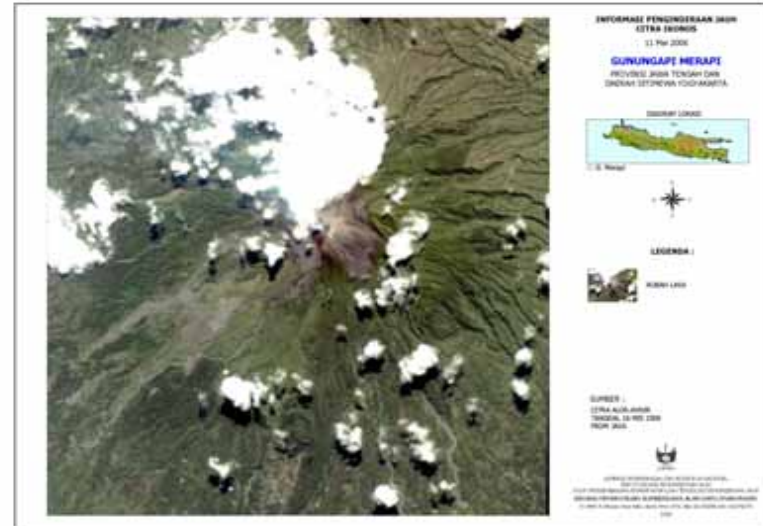
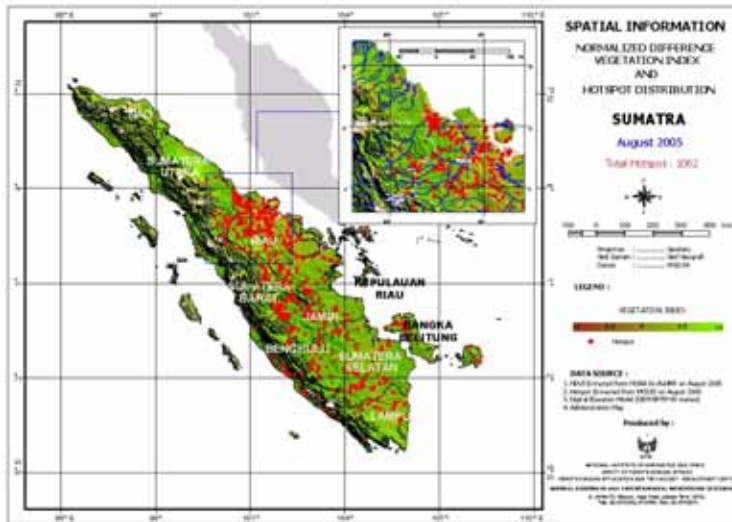
Vegetation index of paddy





Model Development

Disaster Management





Information Dissemination

- Website: www.rs.lapan.go.id/SIMBA
- Report, bulletin, etc.

Sistem Informasi untuk Mitigasi Bencana Alam Menggunakan Data Penginderaan Jauh (SIMBA - LAPAN)

News

- Banjir Lumpur di Bobakso (2006) selengkapnya
- Gempa Bumi & Tsunami di Pantai Selatan Jawa selengkapnya
- Gempa Bumi di Yogyakarta & Jawa Tengah selengkapnya
- Aktivitas Gunungapi Merapi selengkapnya
- Banjir dan Longsor di Sinal, Sulawesi selengkapnya
- Banjir dan Longsor di Kalimantan Tengah selengkapnya
- Banjir dan Longsor di Kalimantan Selatan selengkapnya
- Banjir dan Longsor di Gorontalo dan Sukoh selengkapnya
- Daerah Ombak Jawa & Sumatera 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

Early Warning Bulletin on Natural Hazards

LAPORAN PEMANTAUAN CUACA DAN IKLIM DI INDONESIA BULAN OKTOBER 2006

LAPORAN PEMANTAUAN CUACA DAN IKLIM DI INDONESIA BULAN OKTOBER 2006

PUSAT PENGEMBANGAN PEMANTAUAN DATA TEKNOLOGI PENGELOMPOKAN JAUH
LEMBAGA PENERBANGAN DAN ANTARAKSANA NASIONAL
JAKARTA



Capacity Building

- **Formal education**
- **Trainings**
- **Institutional arrangements**
- **International cooperation:**
 - **UN COPUOS**
 - **UN ESCAP**
 - **UN CSSTEAP**
 - **UN World Food Programme (UN WFP)**
 - **GEOSS**
 - **ESA**
 - **JAXA**
 - **DLR**
 - **ISRO**
 - **GOFC/GOLD**
 - **APRSAF**
 - **AP-MCSTA**
 - **APSCO**
 - **COST-SCOSA**
 - **USGS**
 - **Department of Land Information (DLI), Govt. of Western Australia**
 - **Technical University, Berlin, Germany**
 - **EU South Sumatra Forest Fire Management Project (EU SSFFMP)**



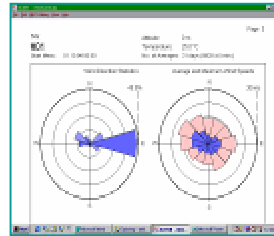
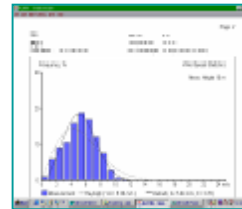
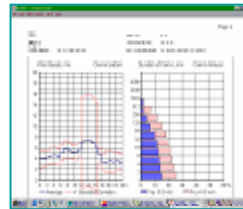
Renewable Energy Resources

Because of the economic development and population growth, Indonesia experiences increase energy demand. Therefore, Indonesia has formulated the energy mix policy to derive the benefit of other potential resources, such as wind energy, hydro power, solar voltage, nuclear energy.



Renewable Energy Resources

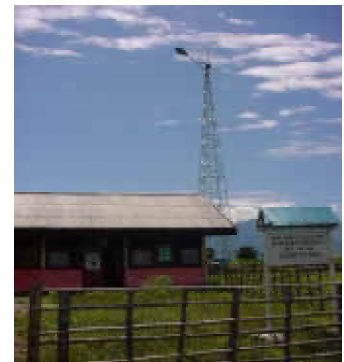
- **Potential Wind Mapping**
- **Wind Turbine Development: Small scale wind turbine of 50, 200, 1000, 3500, 5000 and 10000 Watt**





Renewable Energy Resources

- **Electricity and Water Pumps:**
 - Bulak Baru dan Kalianyar villages (Jepara) : 31 units of SKEA are installed with the capacity of 37.5 kW. It is utilized for 250 families
 - Nyamuk island (Jepara): 8 units of SKEA are installed with the capacity of 17 kW.
 - West Nusa Tenggara: 2 units in Oitui village, 5 units in Tongo village, and 1 unit in Piong village are installed with the total capacity of 6.5 kW. 7 units with 1 kW capacity each in Selayar village.





Conclusion Remarks

- **Because of its geographic nature and disaster prone characteristics, Indonesia is required to take activities related with Earth Observation (EO) especially to monitor and manage its environment and natural resources as well as disaster mitigation.**
- **In addition, Indonesia should also manage the energy resource consumption by making use the new and renewable energy resources.**
- **Therefore, the involvement with GEOSS is intended especially for building national capability and capacity.**



Thank You