REMOTE SENSING APPLICATION FOR DISASTER MANAGEMENT IN INDONESIA

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PRESENTATION OUTLINES

- Remote Sensing Facilities at LAPAN
  - LAPAN Ground Stations
  - Data Availability

- Remote Sensing Application for Disaster Mitigation
  - Hotspot, Burned Area Mapping, Drought Monitoring, Potential of Flood Monitoring, Hazard Mapping, and Disaster Emergency Response

- Development of SIMBA Center

- UAV Development

- National, Regional, and International Network
  - National Network, Sentinel Asia, ADRC, RSO UN SPIDER
Ground Station Facilities - Jakarta

- MODIS – Pare-Pare
- GMS - Jakarta
- Feng Yun - Jakarta
- NOAA - Jakarta
- Data:
  - MTSAT-1R
  - NOAA/AVHRR
  - Terra/Aqua MODIS
  - Feng Yun-1D
  - Landsat-7/ETM+
  - SPOT-4
  - ENVISAT (kerja sama dengan ESA)
  - SAR Imagery
  - etc
Data Availability

- NOAA
- MODIS
- LANDSAT
- SPOT
Data Availability

SPOT-5

EROS-1A

Ikonos

Quickbird
Remote Sensing Application for Disaster Mitigation
FIRE DANGER RATING SYSTEM (FDRS)
Hotspot Monitoring

Map service by Landgate
Hotspot (Google Kml)
Burned Area Mapping

Estimasi Luas Areal Terbakar di Provinsi Kalimantan Tengah untuk Kejadian Kebakaran Hutan/Lahan Tahun 2006

Kabupaten

Luas (Ha)
Burned Area Mapping

Sumber data: SPOT-4 dari stasiun bumi Pare-pare

LOKASI STUDI
BUKIT KAPUR - DUMAI

Sensitivitas kanal pada lahan bekas terbakar

Pemilihan Metode

Lahan bekas Terbakar
Example of Burned Areas
Drought Monitoring
Monitoring of Vegetation Greenness
Monitoring of Vegetation Greenness
Potential of Flood Monitoring

DATA:
1. Potensi hujan harian dari MTSAT (24 jam)
2. Daerah genangan dari PU Kimprawil yang sudah divalidasi dengan DEM SRTM 90 m dan data Landsat 7 ETM+ tahun 2003
Zonasi Daerah Potensi Bencana Gunung Api Merapi

Peluang aliran material vulkanik
- Rendah
- Sedang
- Tinggi

Zona PDC
- PDC 100 – 1300 m
- PDC 1400 – 2400 m
- PDC 2500 – 3700 m

Kerentanan penduduk (siang)

Batas administrasi
- Batas desa
- Batas kabupaten

Sumber data:
- DEM SRTM USGS
- SPOT-4 29-06-2009
- Data BPS Sleman 2009

Diolah oleh:
Pusfatja
DISASTER EMERGENCY RESPONSE

TSUNAMI 25th October 2010 - MENTAWAI ISLANDS, INDONESIA Central Pagai - Damage Extent Map

Interpretation:
On 25th October 2010, Indonesia’s Mentawai Islands were hit by a tsunami triggered by a 7.7 magnitude quake, which struck 200cm under the ocean floor near the Mentawai islands. This map shows the situation before and after the tsunami hit the Pagai Islands’ central part. Pre- and post-disaster images were ALOS AVNIR-2 images acquired on June 12, 2010 and October 28, 2010 respectively. Illumination area is shown using red line. Due to the cloud cover, only part of the island was analyzed. The damage extent map shows data from field observations.

Legend:
- Shaded area: Impact
- Unshaded area: Safe

Scale: 1:100,000
Reference coordinate System: UTM Zone 47S
Projection: WGS 84
Datum: WGS 84

Data Source:
- ALOS AVNIR-2
- JAXA

GIC
- 2010
Flash Flood (Wasior, Papua) 4 Oct 2010
(ALOS AVNIR, FORMOSAT – JAXA, SPOT4– LAPAN)
DISASTER EMERGENCY RESPONSE
DISASTER EMERGENCY RESPONSE
Development of SIMBA Center
UAV Development
UAV Technology Development
National, Regional, and International Network
National Network

1. Pre-disaster
2. Emergency Response
3. Recovery and Reconstruction
Regional Network (Sentinel Asia)
Sentinel Asia (WINDS Antenna)
Flood Mapping in Philippines

FLOOD – LUZON ISLAND, PHILIPPINES

Disaster Situation
Severe flooding in Metro Manila (Philippines) was occurred in August 7, 2012, due to typhoons.

Interpretation
This map shows parts of Luzon island in Pampanga, Nueva Ecija, Bulacan, and Tarlac Provinces, which were most affected by the flood. Optical satellite data were analyzed to highlight the flood impact for selected areas, displayed by in the red line zones.

Data Source
- Pre disaster image : ALOS AV2 (Feb 22, 2011). JAXA/METI/JIP

Scale
Projection: Grid Geographic Lat/Lon Datum : WGS84

Processing/Analysis
Image processing and map creation by LAPAN:
- Image Mosaic of ALOS AV2
- Image Enhancement of ResourceSat-2/IWIFS
- Visual Interpretation of ResourceSat-2/IWIFS

Damage Extent Map

Map created: August 16, 2012 by LAPAN

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Training with Asian Disaster Reduction Center (ADRC)
Internasional Network

- UN-SPIDER Team
- Network of Regional Support Offices (RSOs) (13 + 4)
- National Focal Points (45)
Personnel for RSO UN SPIDER

Steering Committee
Deputy Chairman for RS Affairs
Mr. Taufik Maulana
Director of Remote Sensing Application Center
Mr. Agus Hidayat

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Ms. Kusumaning Ayu
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Thank you