



LEMBAGA PENERBANGAN DAN  
ANTARIKSA NASIONAL



# REMOTE SENSING ACTIVITIES FOR DISASTER RAPID MAPPING (SUPPORTING THE J-RAPID PROJECT)

28 November 2019



**DR. M. ROKHIS KHOMARUDIN**



# Available Systems at LAPAN for Disaster Rapid Mapping



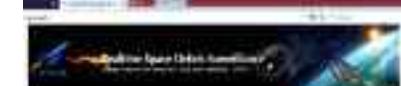
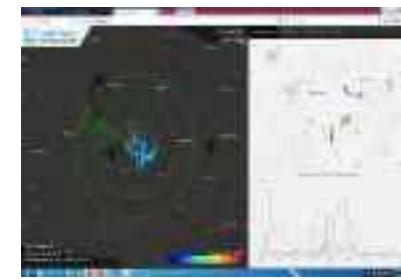
**Sistem Informasi untuk Mitigasi Bencana (SINBA)**

SINBA Sistem Informasi untuk Mitigasi Bencana merupakan sistem bantuan pengetahuan dan pengambilan keputusan untuk mitigasi bencana yang dilakukan oleh berbagai pihak dalam rangka menghadapi bencana. SINBA berfungsi sebagai sumber informasi dan analisis untuk mendukung keputusan dalam menghadapi bencana. Sistem ini mencakup berbagai modul yang mendukung pelaksanaan tugas-tugas mitigasi bencana, termasuk analisis risiko, perancangan strategi, dan evaluasi hasil.

**Tanggap Bencana**

**Publikasi Ilmiah Populer**

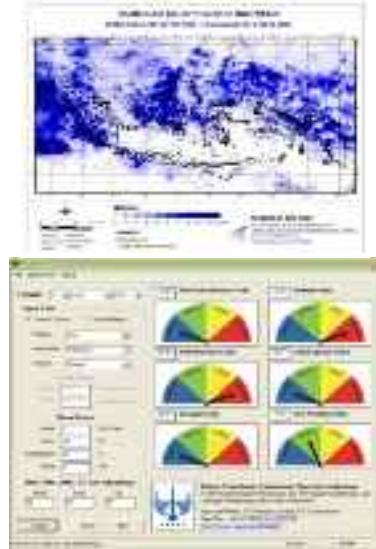
**Sistem Peringkat Bahaya Gempa**



# Remote Sensing for Disaster

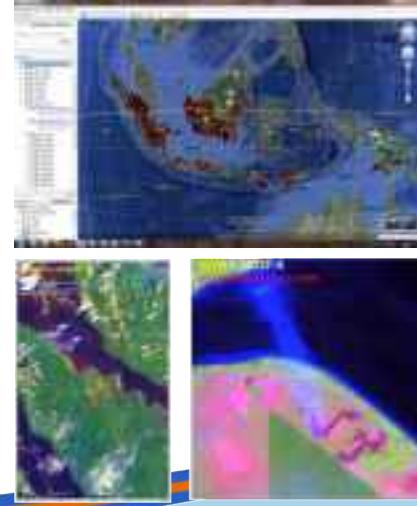
Before

Early Warning System



During

Disaster Monitoring



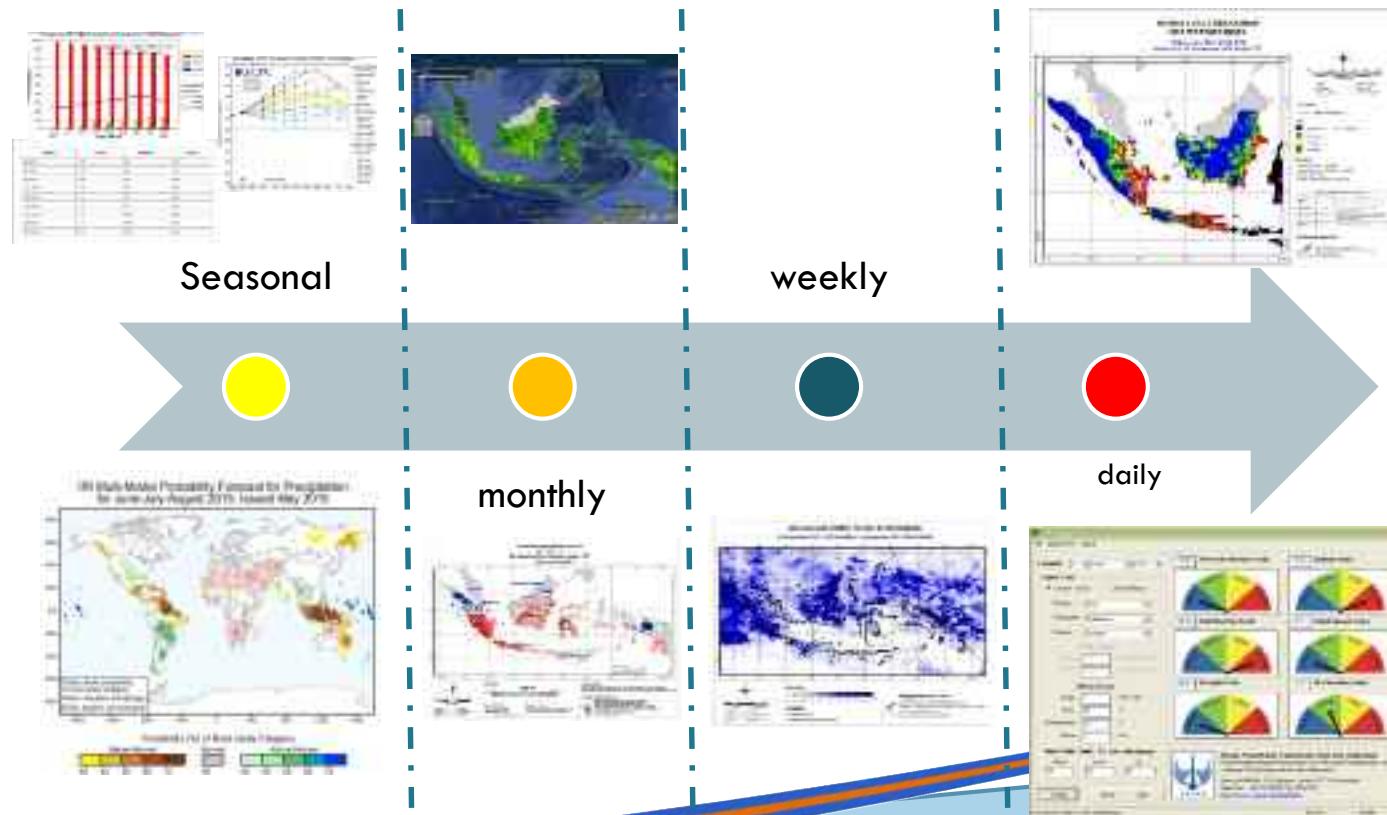
After

Damage area mapping





# Early Warning System for Hidrometeorological Disaster

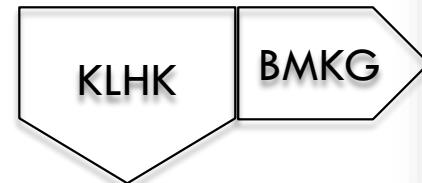




# Forest fire early warning system



# Fire hotspot data source for Indonesia from LAPAN



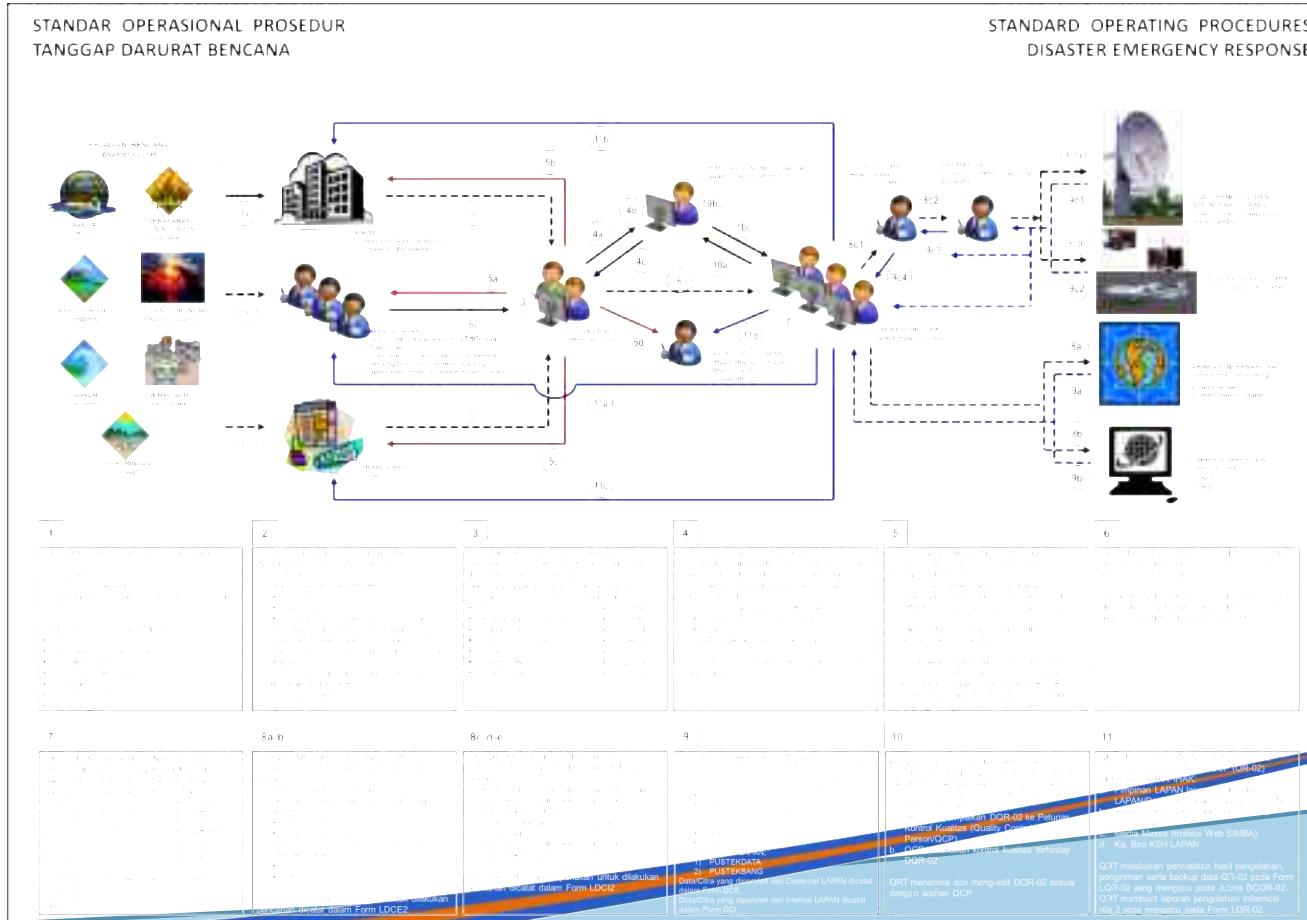
Surat Menteri KLHK tanggal 20 April 2016 yang menyepakati bahwa data hotspot akan diambil dari LAPAN.



# Hotspot Monitoring (1-18 Agustus 2018)

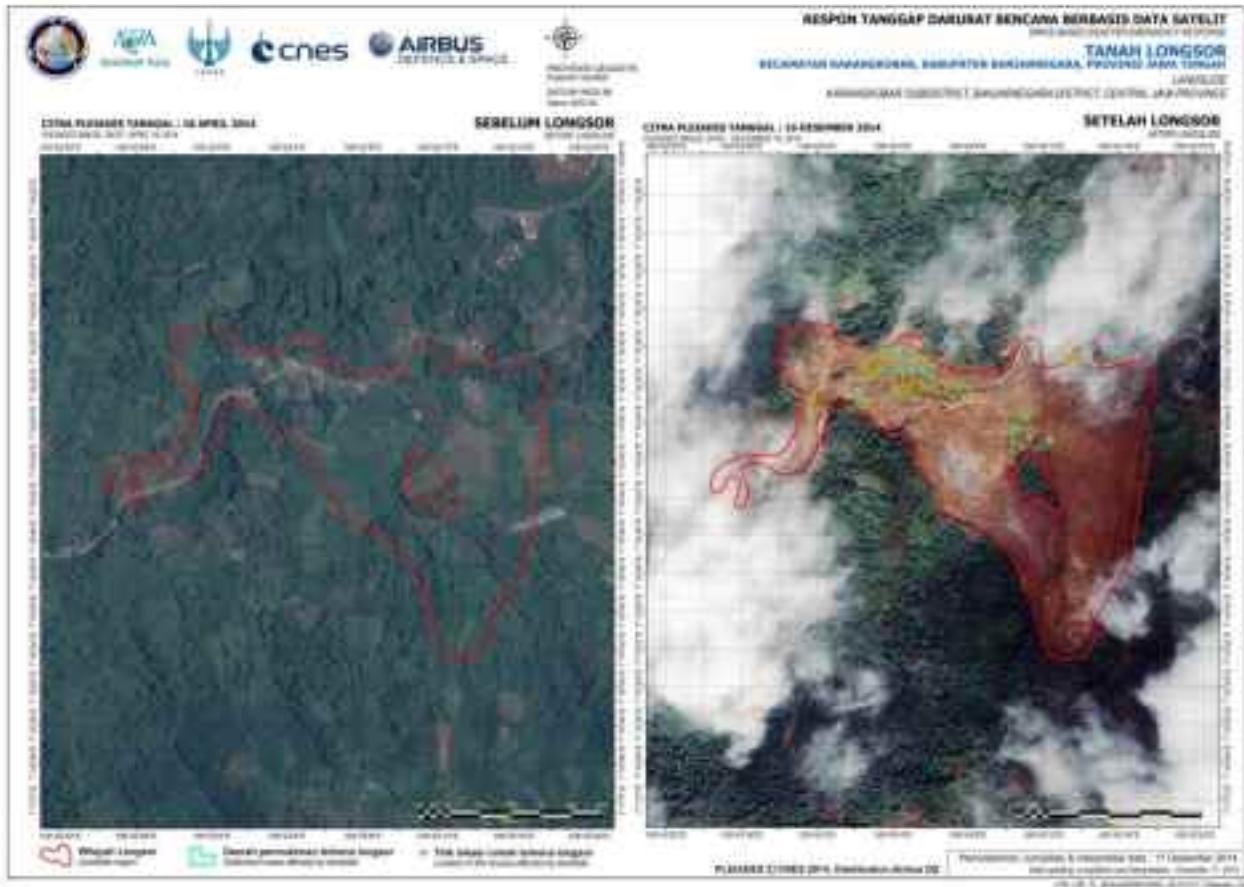


# LAPAN's SOP on Disaster Rapid Mapping



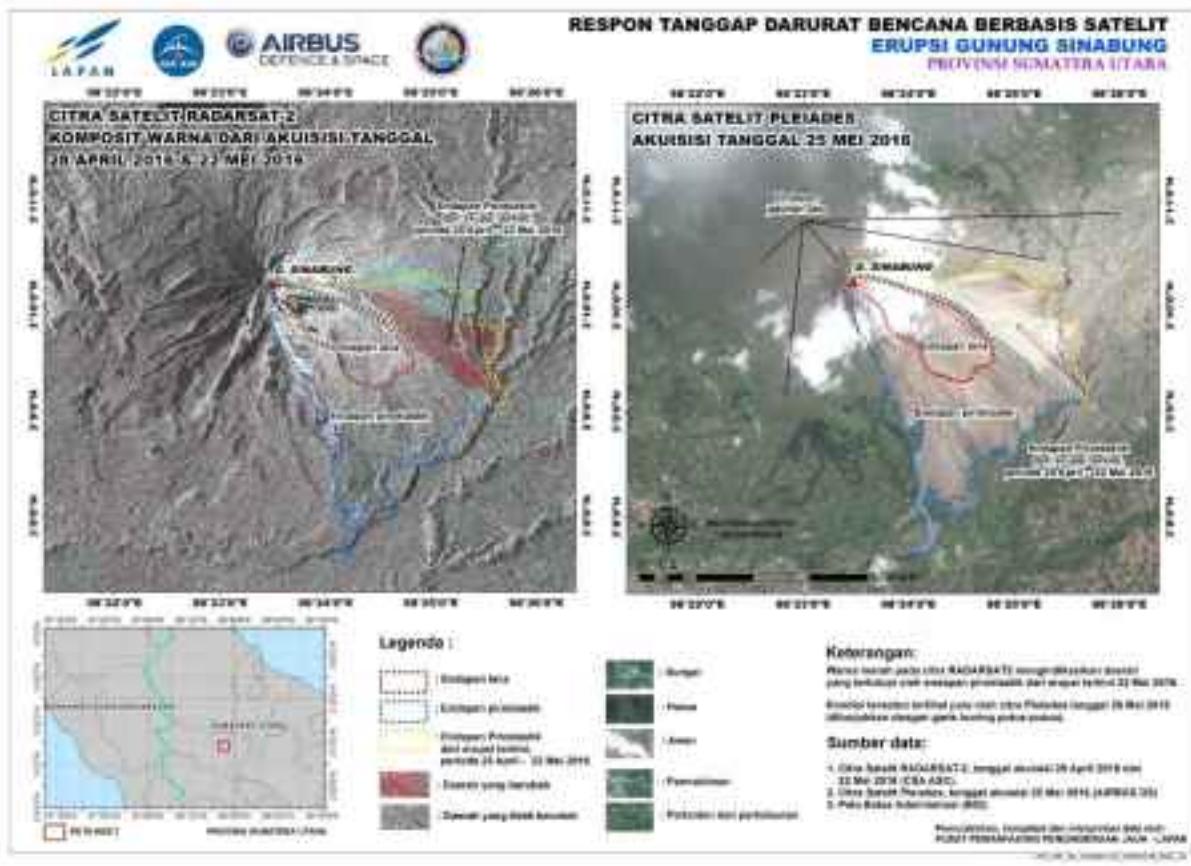
# Example of Disaster Rapid Mapping

<http://pusfatja.lapan.go.id/index.php/tanggapbencana>





# Example of Disaster Rapid Mapping Sinabung (21 May 2016, Karo, North Sumatra)



# Landslide (Desa Banaran, Kec. Pulung Kab. Ponorogo, Prov. Jawa Timur, 9 April 2017)

Citra SPOT-6 (17 Maret 2015)



Citra SPOT-6 (11 April 2017)





# Example of Disaster Rapid Mapping

## Fast Flood at Garut District

(20 Sep 2016, Garut, West Java )



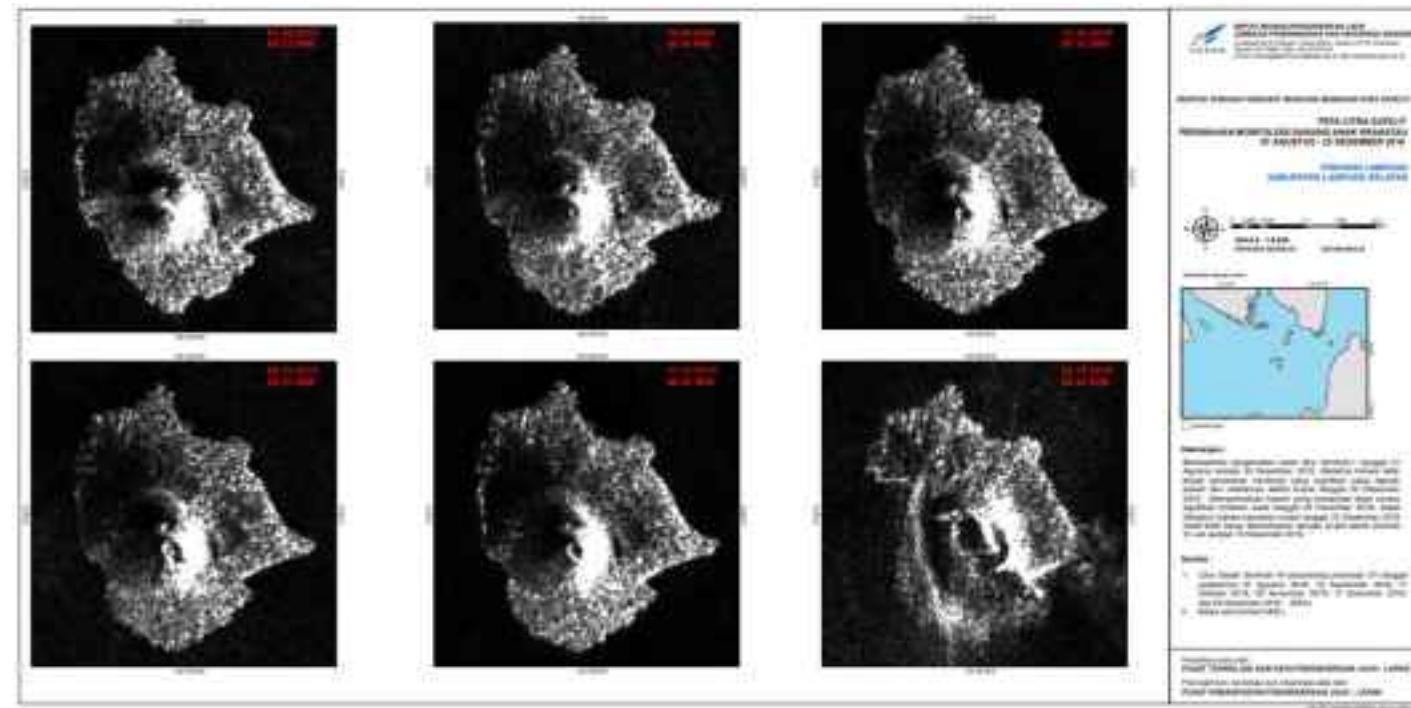
Pleiades (9 Jun 2014)

Pleiades (7 Oct 2016)

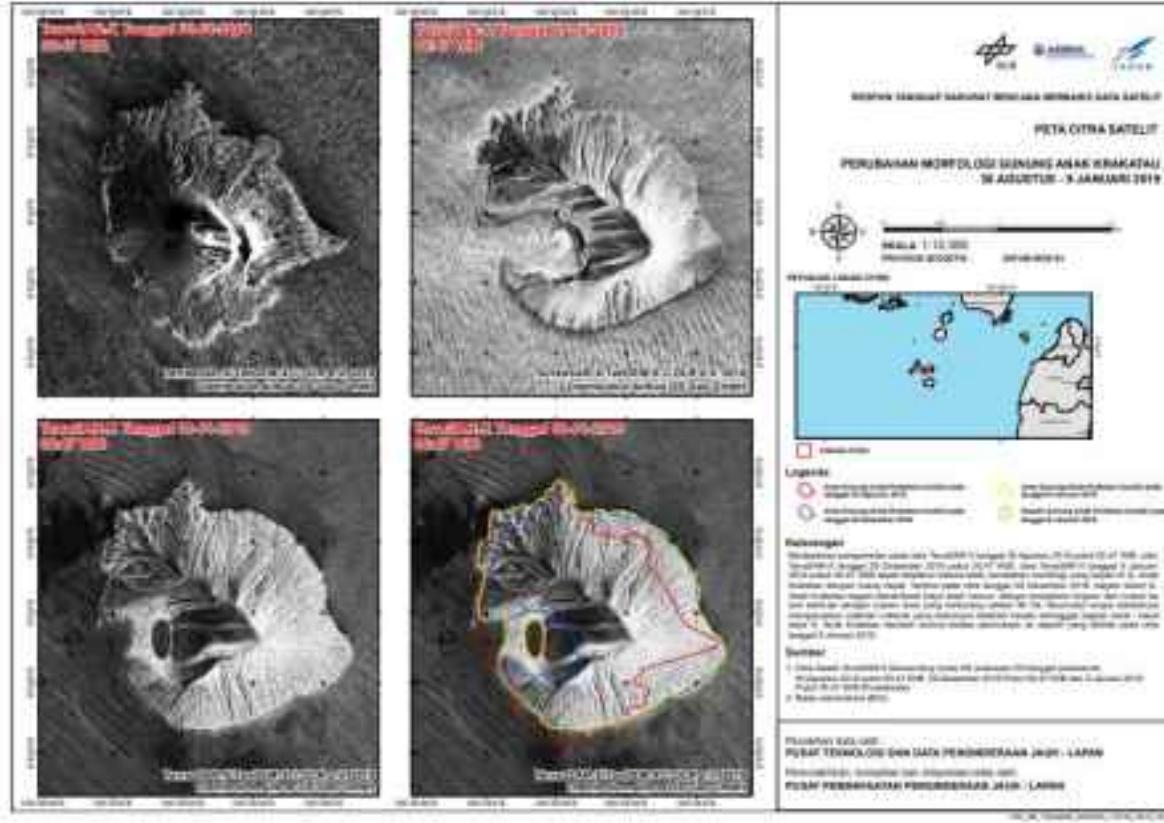


# Volcano Eruption

## Mt. Krakatau (from Sentinel 1A)

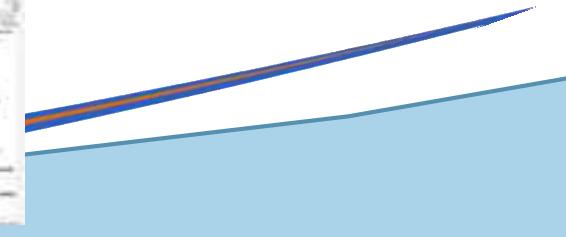


# Volcano Eruption Mt. Krakatau (from TerraSar X)



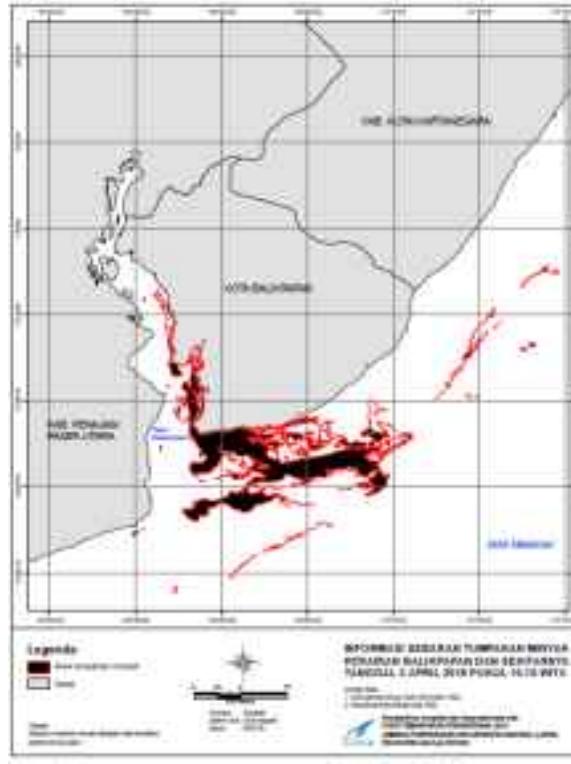
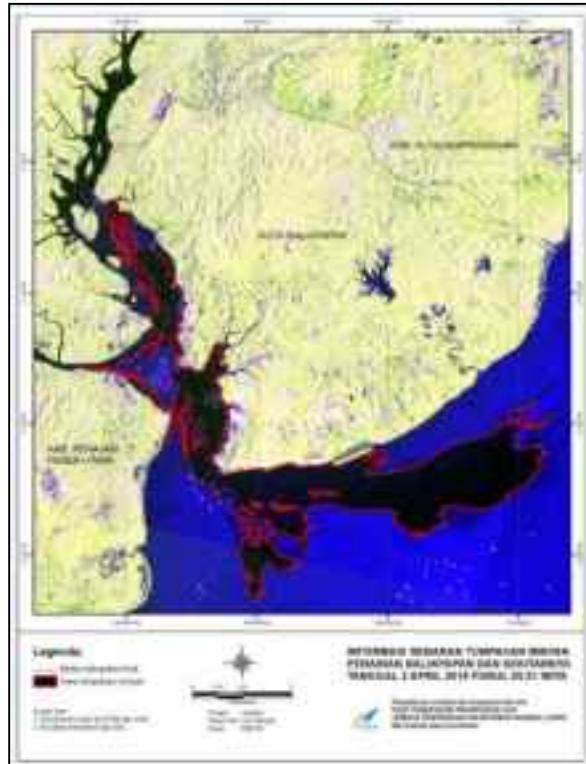
# Soil Liquefaction

## Soil Liquefaction in Palu, North Sulawesi



# Oil Spill

## Coastal zone of Balikpapan, Kalimantan (From Sentinel-1A)





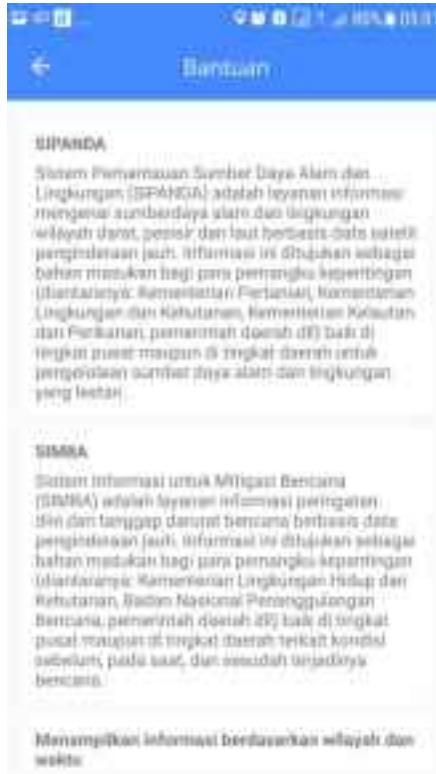
# Coordination with Disaster Management Body





Playstore : <https://play.google.com/store/apps/details?id=apan.go.id.sipandora>  
Link video: [https://www.youtube.com/watch?v=jC6fNeDG\\_SI](https://www.youtube.com/watch?v=jC6fNeDG_SI)

# SIPANDORA



## Content:

- 32 Information Type
- User feedback





# International Collaboration



**Type of Event:** Géologique

**Location of Event:** Montagne

**Date of Charité Activation:** 1 December 2011

**Date of Charité Activation:** 19/12/2011

**New zone of Charité activation:** 10/12/2011

**Charité Response:** 4000 m² burnt by LAMM

**Assistance ID:** 94

**Project Management:** LAMM

## Description of the event

An earthquake with a magnitude of 6.2 struck Indonesia's west coast on the southern coast of Sumatra island on 1 December. 102 people have been killed so far, with many more missing.

The area of the Palu Sea (Banda Neira Islands) has been severely affected with at least 170 buildings damaged or destroyed, a series of landslides, debris and debris fields.

The Indonesian Fire and Meteorology department account of losses, mountainous regions and rugged terrain are the reason why no rescue teams were able to reach those under heavy rubble. Thousands of people have been left homeless to this aftermath.

Through its disaster relief arm LAMM, hundreds of people have been treated and thousands of pieces of debris removed from the affected areas.

A spokesman for Indonesia's Disaster Agency said it is likely that 600,000 will become homeless due to the recent tremor with 100,000 confirmed.



**Aerial destroyed by earthquake in Aceh, Indonesia. December, 2004. Photo: AP**

**Sources: Photo:**  
Copyright: Photo by © CLMS (2010) - DisasterNet, ReliefWeb, and Space. All rights reserved.  
May be used freely by LAMM.

**8. Higher resolution version**

**more important to refugees in Banda Aceh, Indonesia**  
Date: 10/12/2011

**Sources: Photo:**  
Copyright: Photo by © CLMS (2010) - DisasterNet, ReliefWeb, and Space. All rights reserved.

**more important to refugees in Banda Aceh, Indonesia**  
Date: 10/12/2011

**Sources: Photo:**  
Copyright: Photo by © CLMS (2010) - DisasterNet, ReliefWeb, and Space. All rights reserved.

## Twitter

**Indonesia Charité**

Indonesia and government of Indonesia act to help survivors after the disaster. May 2011. Image acquired by CLMS on 10/12/2011.



CLMS 10/12/2011

**Indonesia Charité**

Indonesia and government of Indonesia act to help survivors after the disaster. May 2011. Image acquired by CLMS on 10/12/2011.



CLMS 10/12/2011

**Indonesia Charité**

A range of other activities planned in Indonesia for the aftermath. The Indonesian Red Cross Society continue to help all and the government has been by CLMS on 10/12/2011.

- Development a method for rapid mapping using remote sensing
  - Study on building vulnerability to disaster (lesson learnt from Palu Tsunami and Krakatoa Eruption)
  - Data used : Cosmo-Skymed Data, SPOT 6/7 and Pleiades

# Preliminary results



Blue/yellow = Damage area  
Black/white = no damage area



**KAN**  
Komite Akreditasi Nasional  
Lembaga Akreditasi Sistem Manajemen



**Terima kasih**

[www.pusfatja.lapan.go.id](http://www.pusfatja.lapan.go.id)