

# "Legal and Policy Aspects of Disaster Management Support from Space in Asia"

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Masami Onoda

Kyoto University Graduate School of Global  
Environmental Studies,

Research Fellow of the Japan Society for the  
Promotion of Science

JAPAN

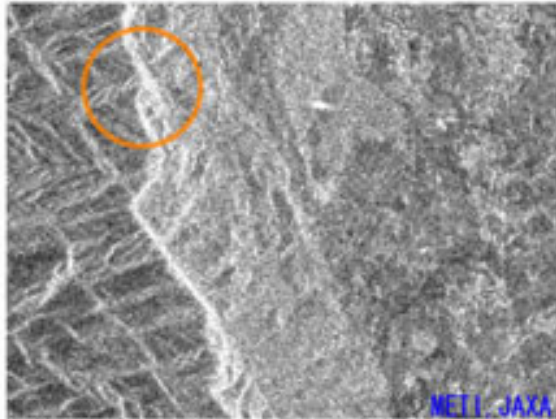
# Japan and the International Charter “Space and Major Disasters”

- ◆ The Japan Aerospace Exploration Agency (JAXA) joined the International Charter in February 2005. The Authorized User in Japan is the Cabinet Office.
- ◆ JAXA acquired images of Leyte Island in the Republic of the Philippines, where a huge landslide occurred on Feb. 17, by the Advanced Land Observing Satellite "Daichi." Images were provided to the Charter.

Source: [http://www.jaxa.jp/press/2006/02/20060225\\_daichi\\_e.html](http://www.jaxa.jp/press/2006/02/20060225_daichi_e.html)  
[http://www.jaxa.jp/press/2006/03/20060301\\_sac\\_daichi.pdf](http://www.jaxa.jp/press/2006/03/20060301_sac_daichi.pdf)

# Images of Leyte Island Observed by the PALSAR onboard the "Daichi"

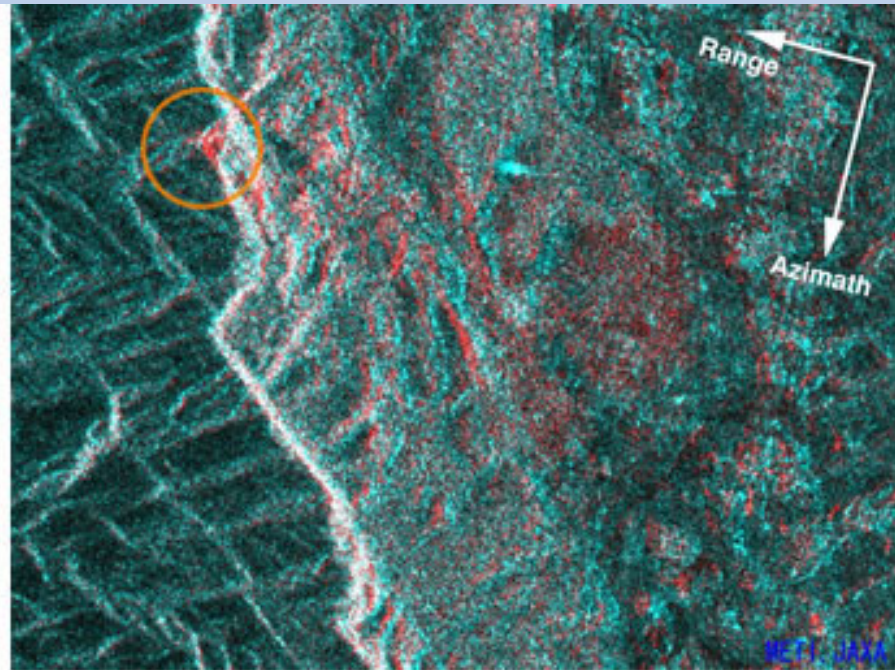
## Leyte Island Observation Images



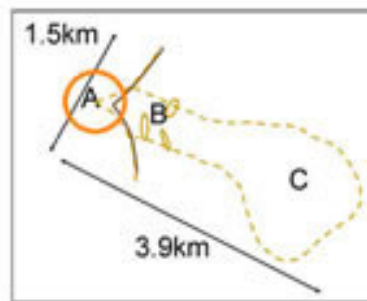
Prior to the landslide: observed by JERS-1/SAR around 11:12 a.m. on Feb. 2, 1996 (JST)



After the landslide: observed by ALOS/PALSAR around 10:53 a.m. on Feb. 24, 2006 (JST)



Color composite image (Red: PALSAR, Green and Blue: SAR)



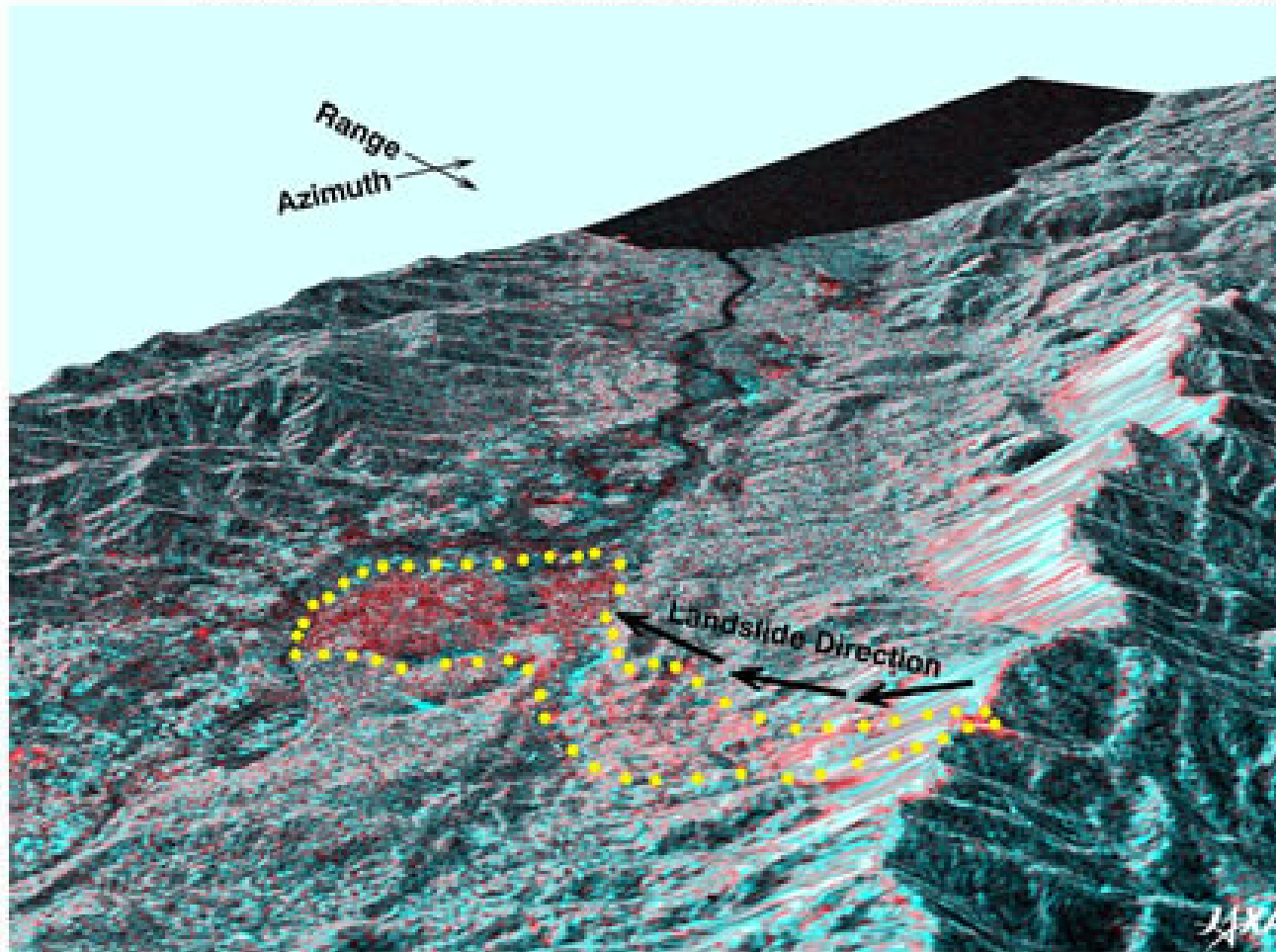
Longitude and latitude  
at the center of the image

Around 10° 20' N, 125° 5' E

5,000 x 3,750 m



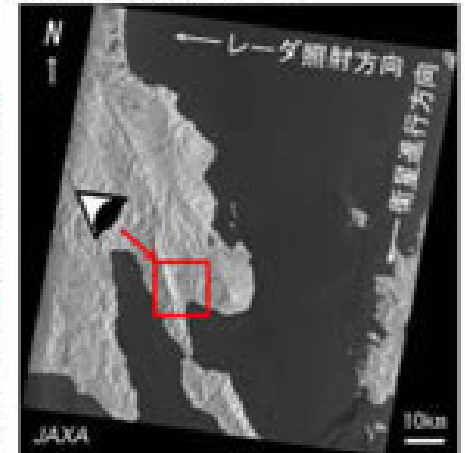
# North-west view of landslide area in Leyte Island, Philippines



Bird's eye view of the landslide stricken area

Color composite image with observation data by the PALSAR and JERS-1/SAR  
(R: PALSAR, G and B: SAR)

The area circled by yellow dots is estimated as a disaster stricken area based on the color composite image.



ALOS/PALSAR  
observation:  
Feb. 24, 2006 (JST)

JERS-1/SAR  
observation:  
Feb. 2, 1996 (JST)

Longitude and latitude  
around the landslide  
stricken area

Around 10° 20' N, 125° 5' E





# PHILIPPINES - Leyte Island - Village of Guinsaigon - Pre-Disaster Image

1:25.000



Center for Satellite Based  
Emergency Mapping & Disaster Response

German Remote Sensing Data  
German Aerospace Establishment

Map of the Philippines showing the location of Leyte Island.

Legend

- Settlement
- Road network
- Coastal area
- River

Interpretation

On Friday, February 17, 2006, a heavy rain buried the village of Guinsaigon, Southern Leyte Island (Philippines). This pre-disaster SPOT satellite image, acquired on February 17, 2006, displays the location of the landslide. The landslide extension from RADARSAT, acquired on February 24, 2006, data acquired on February 24, 2006, could partially be derived from the image on February 20, 2006, due to cloud cover.

Scale

0 500 1000 1500

Scale: 1:25 000 for DTM1 pre

Reference coordinate system: UTM Zone 51 N

Projection: UTM Zone 51 N

Spheroid: WGS 84

Datum: WGS 84

Data Sources

- SRTM C-band: © USGS 2005
- SRTM X-band: © DLR 2005
- SPOT: © CNES 2003
- ASTER: © NASA 2005
- ALOS AVNIR-2: © JAXA 2006
- ASAR: © ESA 2006
- RADARSAT-1: © CSA 1996 and 2006

Processing/Analysis

- image enhancement for SPOT
- atmospheric correction and the synthetic blue channel
- orthorectification
- contour lines from SRTM X-band
- road network and settlements from panchromatic data
- landslide extension from RADARSAT-1
- ALOS AVNIR-2

Map created February 22, 2006 by UNOSAT

Map updated March 3, 2006

Map disseminated by UNOSAT

Respond Job Manager: UNOSAT

For more information visit: <http://www.unosat.org>



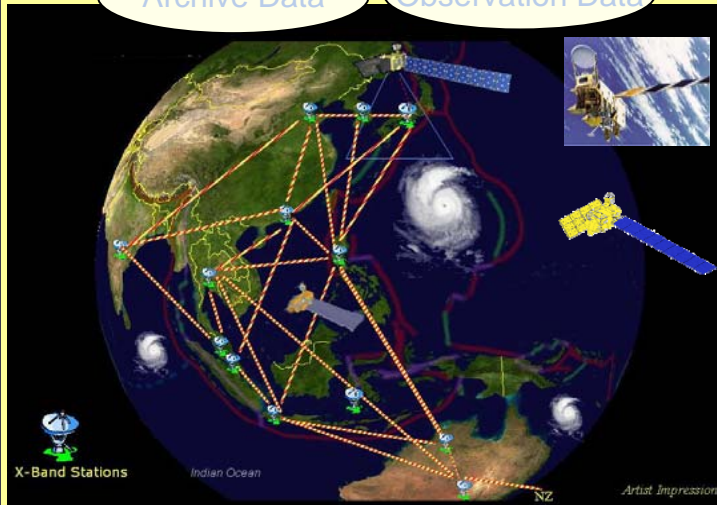
# Disaster Management System in Asia-Pacific

## Region: "Sentinel Asia"

### Observation System

Archive Data

Observation Data



X-Band Stations

Indian Ocean

Artist Impression

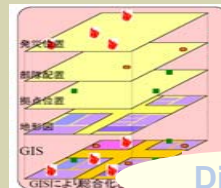
**JAXA, MODIS stations**

Capacity Building

**JAXA, AIT**



Information Sharing Platform



Digital Asia

**JAXA, AIT, Keio Univ.**

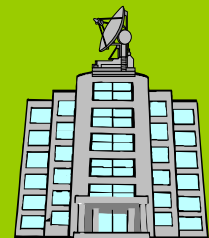


ALOS Rapid Response System

**JAXA, ADRC**



**Disaster Management Agencies**



Disaster Prevention

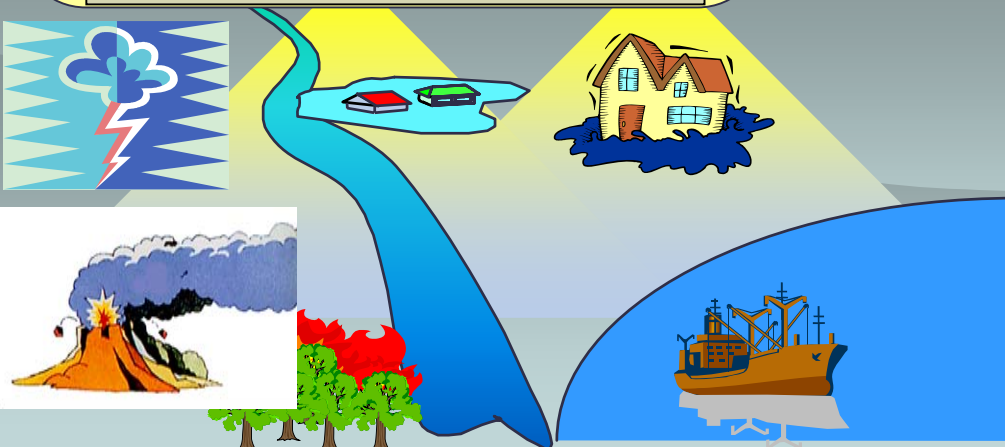
Warning

Refuge

Rescue



Residents in disaster areas



# International Law and Disasters

- ◆ Lack of comprehensive treaty or legal framework on natural disasters\*
  - ❖ Bilateral Treaties
    - ◆ Agreements on specific circumstances or individual disaster response activities
    - ◆ Early-warning notification and information sharing
    - ◆ Mutual assistance treaties covering most of central Europe
  - ❖ Multilateral Treaties
    - ◆ Limited numbers of multilateral treaties
      - ❖ Agreement on the Temporary Importation, Free of Duty, of Medical Surgical and Laboratory Equipment of Diagnosis of Treatment (1960)
      - ❖ Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986)

\*International Federation of Red Cross and Red Crescent Societies, *International Disaster Response Law: A Preliminary Overview and Analysis of Existing Treaty Law*, Jan. 2003.

<http://www.ifrc.org/what/disasters/idrl/research.asp>

# Humanitarian Assistance and Disaster Management Support from Space

- ◆ International human rights law, humanitarian law and refugee law (see “Humanitarian Charter” Principles [www.sphereproject.org/](http://www.sphereproject.org/))
- ◆ International Charter "Space and Major Disasters"
- ◆ UN Remote Sensing Principles (resolution 47/65 of 1986)
  - ❖ Principle XI  
Remote Sensing shall promote the protection of mankind from natural disasters. To this end, States participating in RS activities that have identified processed data and analysed information in their possession that may be useful to States affected by natural disasters, or likely to be affected by impending natural disasters, shall transmit such data and information to States concerned as promptly as possible.



# Disaster Monitoring through a Multilateral International Institution

- ◆ International Control – “Supervision”; “Surveillance” by a multilateral international institution, for the implementation of an objective obligation/standard\*
- ◆ Disaster management – Disaster monitoring  
... lack of a multilateral international institution or an objective obligation/standard (at the level of international law)
- ➡ Is this a developing process, or not?

\*A. Morita, 2000.

# Data Policy Issues

- ◆ To what extent should humanitarian assistance be provided through provision of EO data ?  
(balance with cost and technical capability)
  - Warning, Rescue, Refuge
  - Hazard, Mitigation, Prevention
- ◆ Open access to data  $\leftrightarrow$  Data rights protection
- ◆ Responsibility on data flaws

# Further Research Questions

- ◆ What is the status of international law in relation to natural disasters, are there any general principles or trends, and what is the relevance to space activities?
- ◆ Relation of disaster monitoring and the supervisory techniques at the level of international law.
- ◆ First step should be to identify the international obligations and to clarify the procedures, in coordination with humanitarian agencies, at the same time addressing the policy issues in order to establish a working framework.



*Thank You*

A stylized illustration of Mount Fuji, showing the snow-capped peak and the surrounding slopes in shades of green and grey. The mountain is centered in the background.

masami.naito@gakushikai.jp