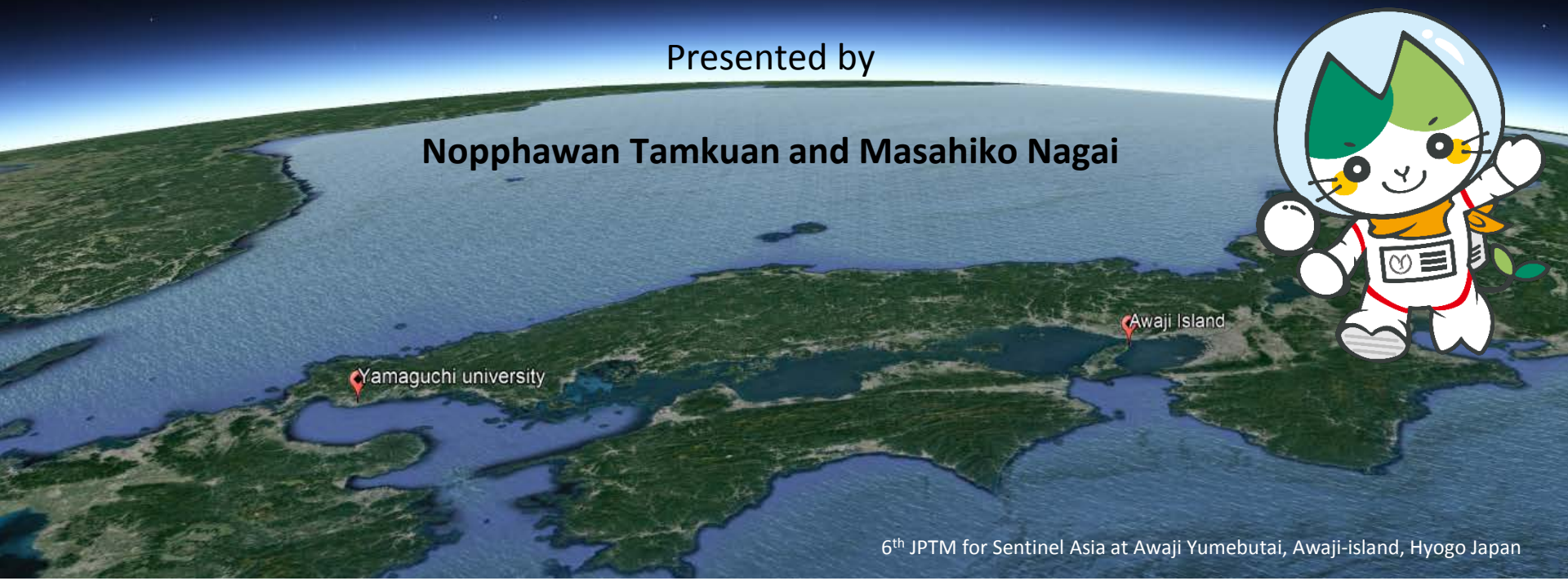
Activities in Yamaguchi University for Data Analysis Node (DAN) in 2018

Presented by

Nopphawan Tamkuan and Masahiko Nagai



6th JPTM for Sentinel Asia at Awaji Yumebutai, Awaji-island, Hyogo Japan

Sentinel Asia

Space Utilization Engineering Laboratory

Graduate School of Sciences and Technology for Innovation

Yamaguchi University

YAMAGUCHI UNIVERSITY 山口大学

Disasters

Data analysis in emergency response phase by Yamaguchi university

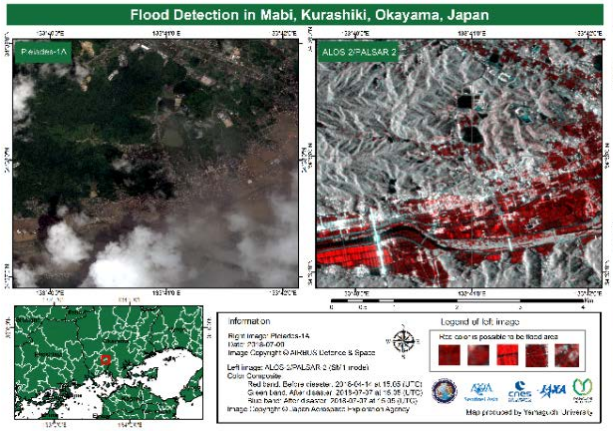
Date	Disaster	Area
07 July 2018	Flood in Japan	Okayama, Hiroshima
23 July 2018	Flood in Laos	
26 July 2018	Flood in Myanmar	
29 July 2018	Earthquake in Indonesia	Lombok island
29 July 2018	Flood in Thailand	
05 August 2018	Earthquake in Indonesia	Lombok island
09 August 2018	Flood in India	
05 September 2018	Earthquake in Japan	Hokkaido
28 September 2018	Earthquake in Indonesia	Palu, Sulawesi

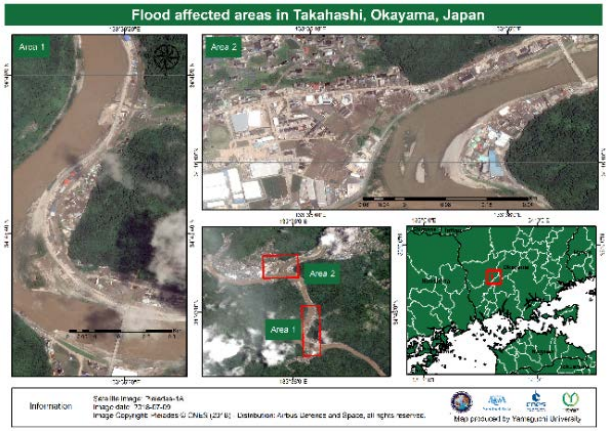
Water related disaster —> flood, landslide

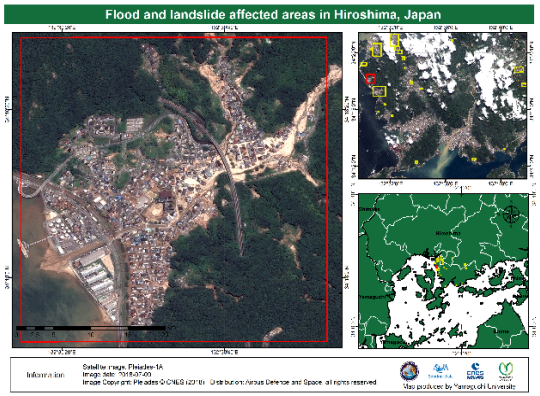
Earthquake related disasters —> tsunami, liquefaction, landslides

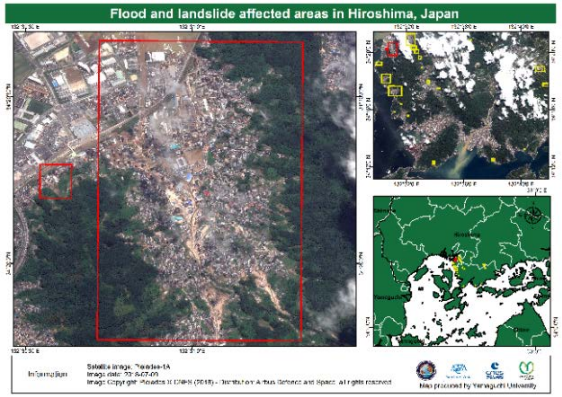
Flood in Japan

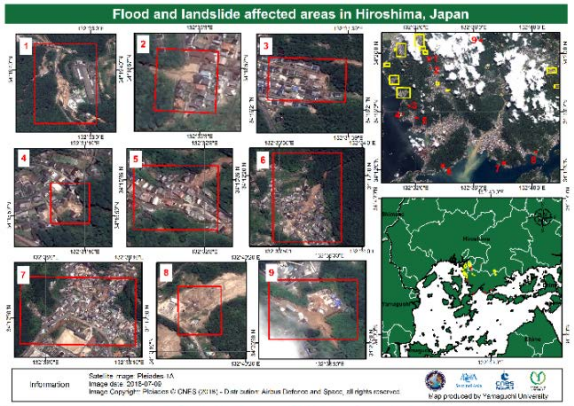
Occurrence date: 7 July 2018
Input data:
ALOS-2 StripMap (SM1) on 7 July 2018 and 7 July 2018
Pleides-1A on 9 July 2018
Analysis method:
Before-after images color composite

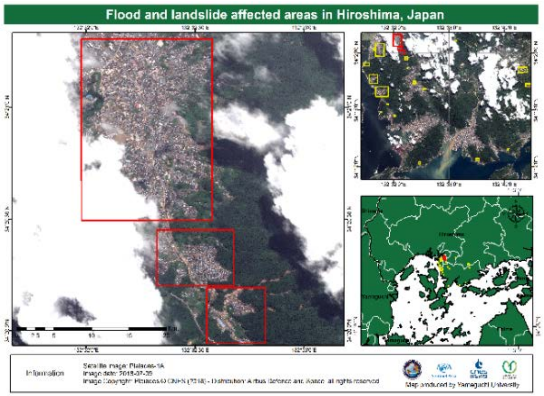


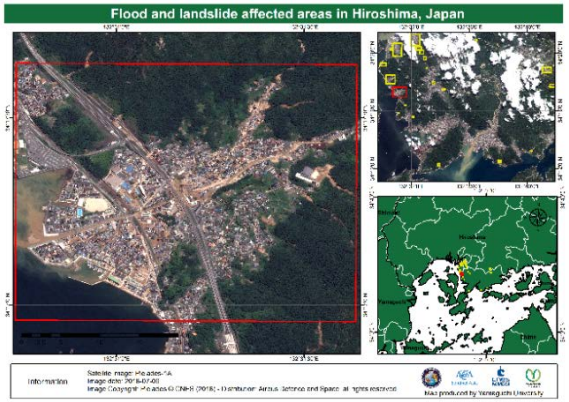


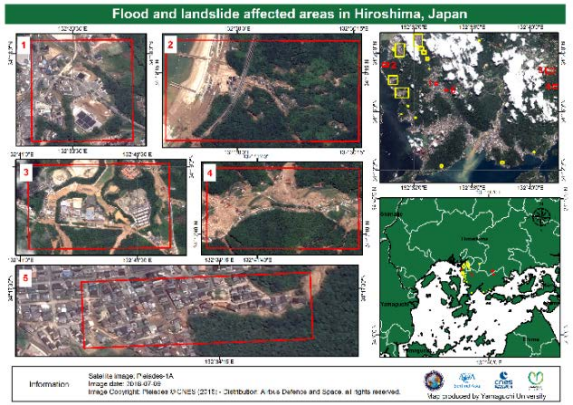












Flood in Myanmar

Occurrence date: 23 July 2018

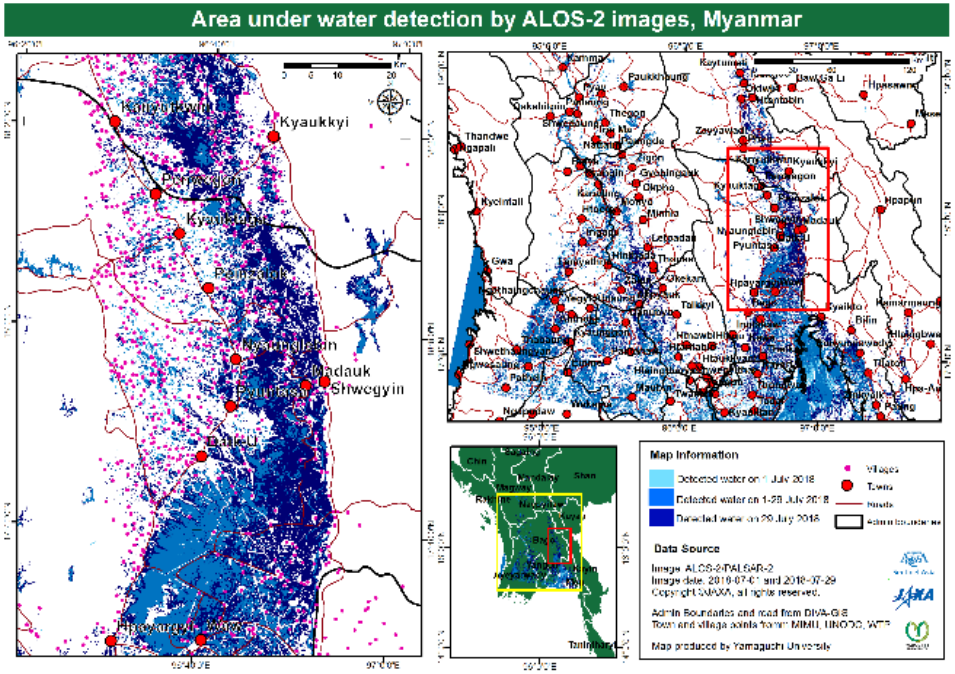
Input data:

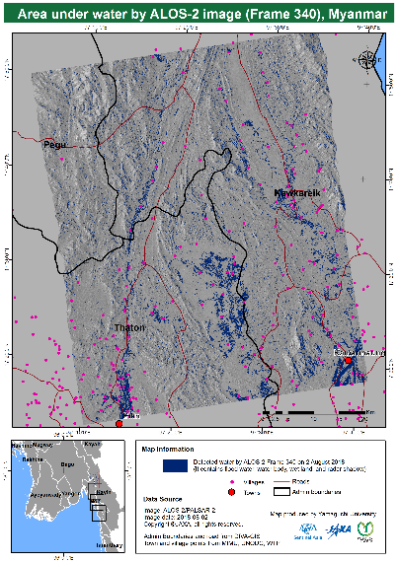
ALOS-2 ScanSAR on 29 July 2018 and 1 July 2018

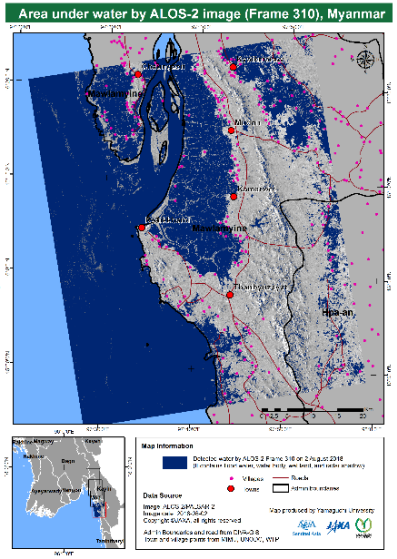
ALOS-2 StripMap on 2 August 2018

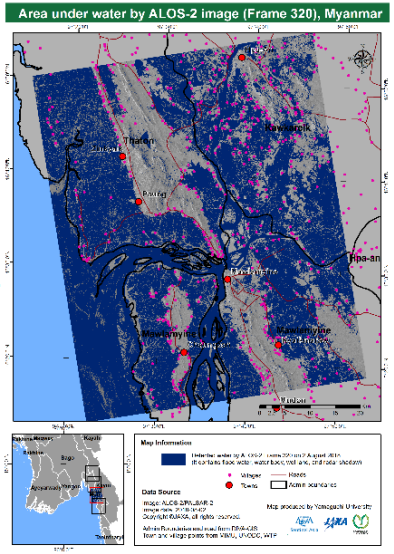
Analysis method:

- water detection by before- and during- flood images
- water detection by during flood image

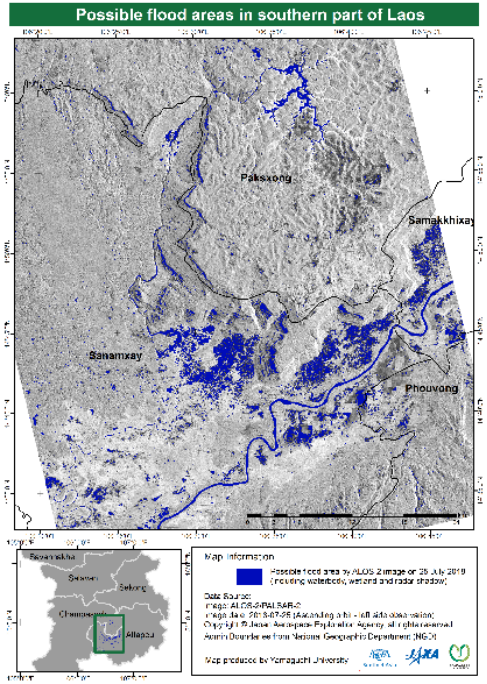






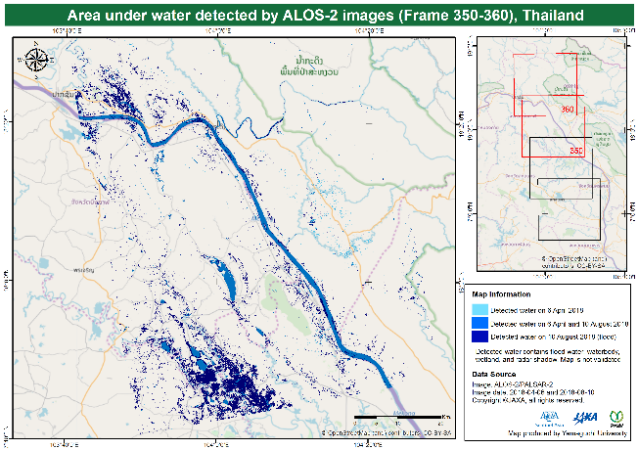


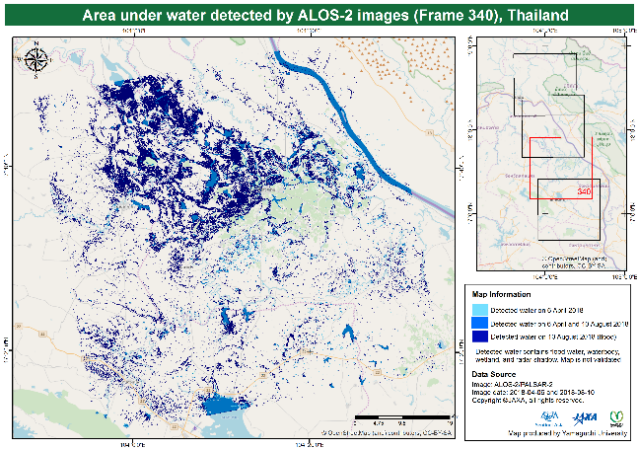
Flood in Laos and Thailand

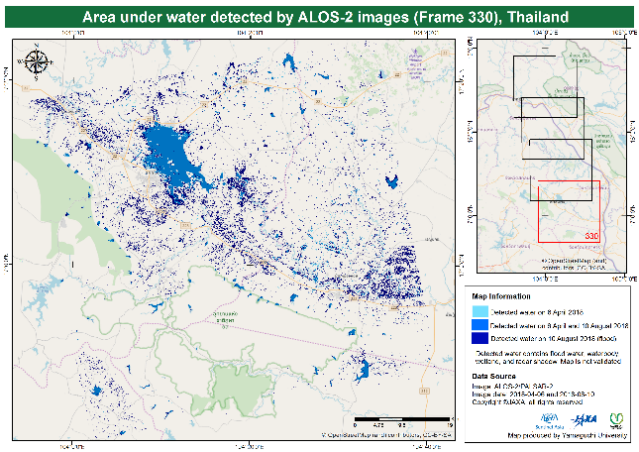


Flood in Laos
Occurrence date: 23 July 2018
Information: dam collapsed
Input data:
ALOS-2 StripMap (SM1) on 25 July 2018
Analysis method: water detection by during flood image

Flood in Thailand
Occurrence date: 29 July 2018
Input data:
ALOS-2 StripMap (SM3) on 10 August and 6 April 2018
Analysis method:
- water detection by before- and during- flood images







Flood in India

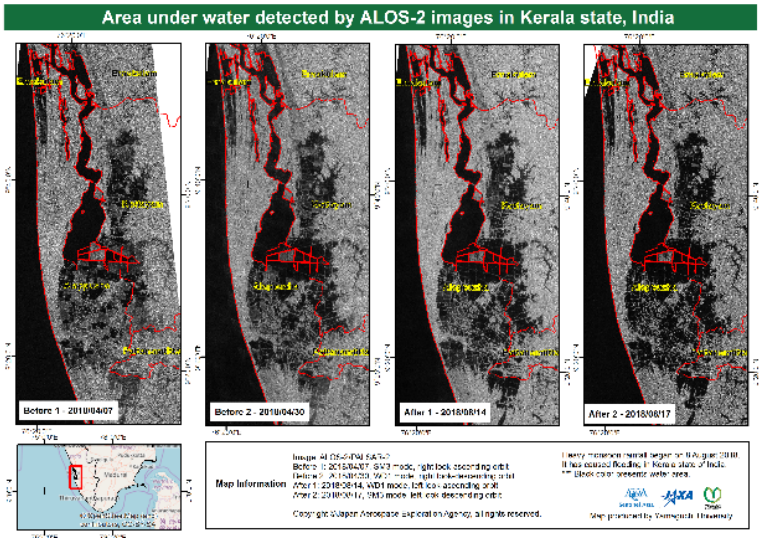
Occurrence date: 9 August 2018

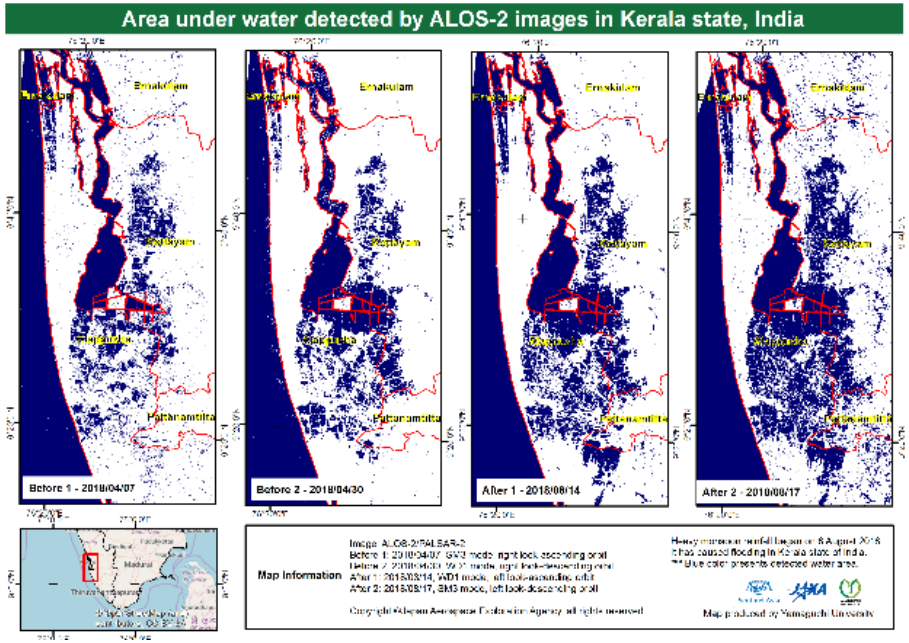
Input data:

Before ALOS-2 StripMap (SM3) on 7 April 2018
Before ALOS-2 ScanSAR (WD1) on 30 April 2018
After ALOS-2 ScanSAR (WD1) on 14 August 2018
After ALOS-2 StripMap (SM3) on 17 August 2018

Analysis method:

- water detection by multi-temporal images



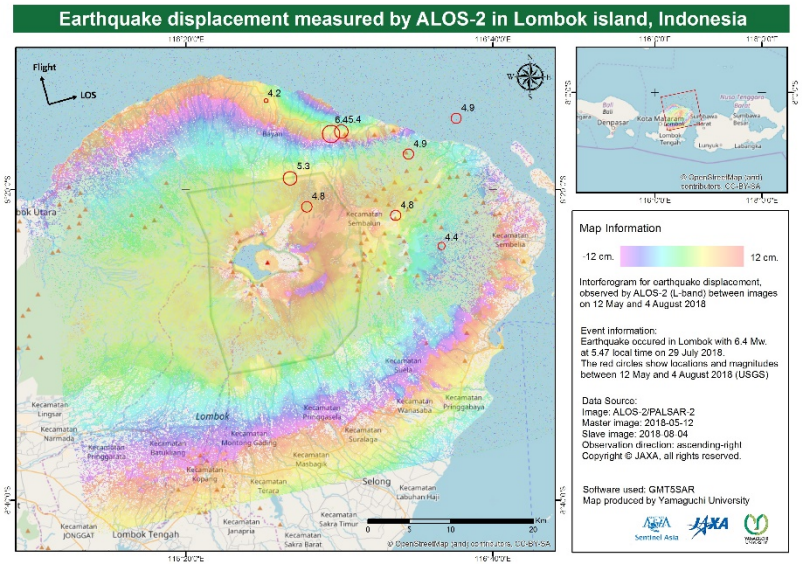


Blue: permanent water
Green: seasonal water
Red: flood water

Earthquake in Lombok Island, Indonesia

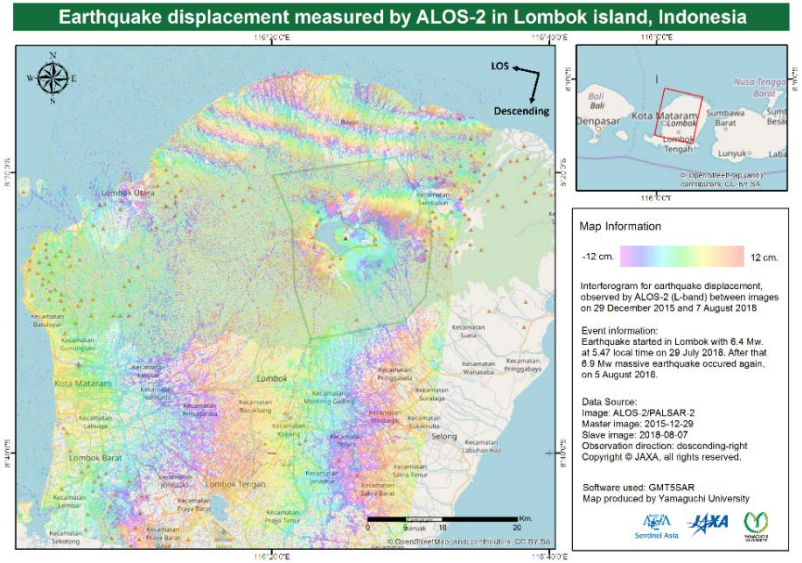
Occurrence date: 29 July 2018
Information: 6.4 Mw.
Input data:
ALOS-2 StripMap on 4 August and 12 May 2018
Analysis method:

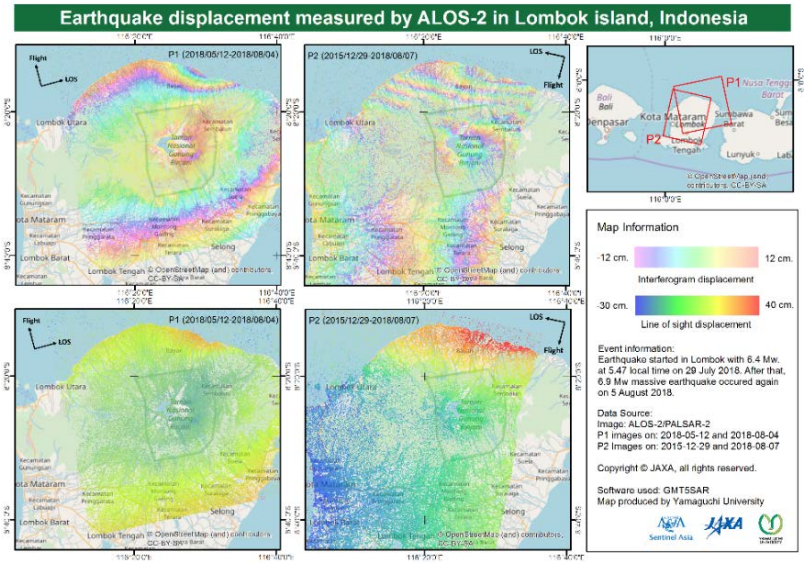
- Differential SAR interferometry (DInSAR)



Occurrence date: 5 August 2018
Information: 6.9 Mw.
Input data:
ALOS-2 StripMap on 7 August 2018 and 29 December 2015
Analysis method:

- Differential SAR interferometry (DInSAR)

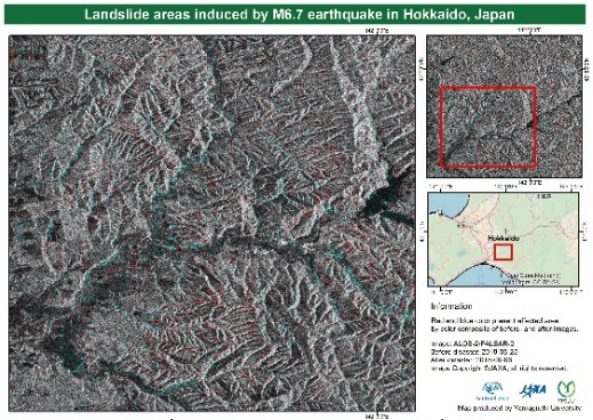




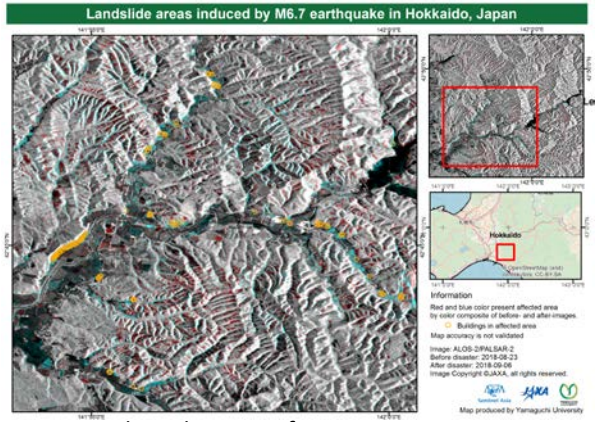
Earthquake in Hokkaido, Japan

Occurrence date: 5 September 2018
Information: 6.7 M
Input data:
ALOS-2 StripMap on 6 September and 23 August 2018
Analysis method:

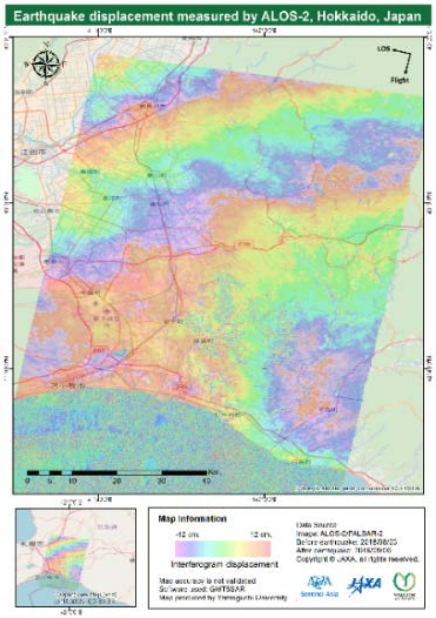
- Before and after-images color composite
- Differential SAR interferometry (DInSAR)
- Backscattering change detection

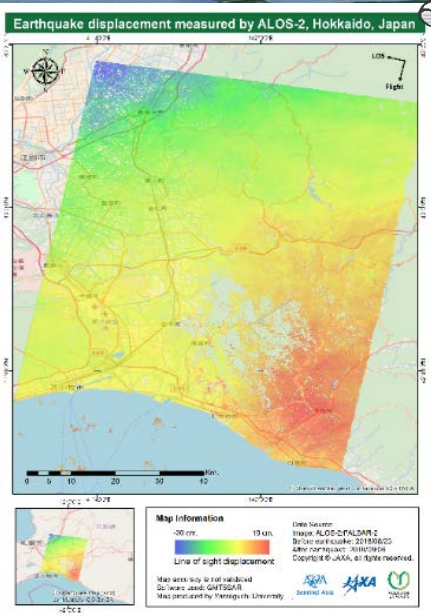


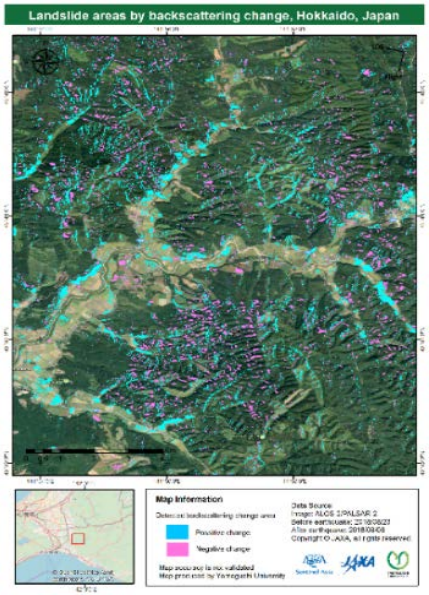
Original ALOS-2 L1.5 Fastest analysis

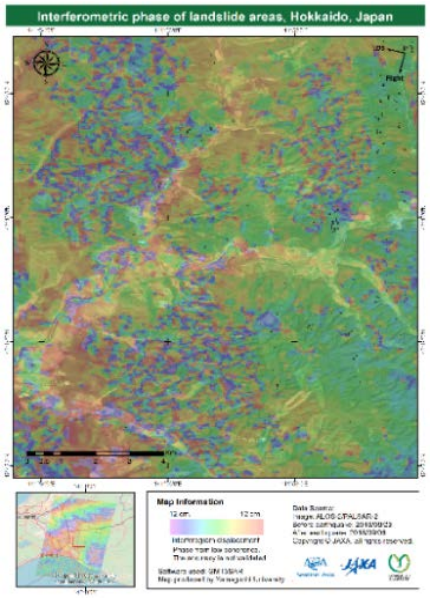


Filtered Sigma 0 from ALOS-2 L1.1





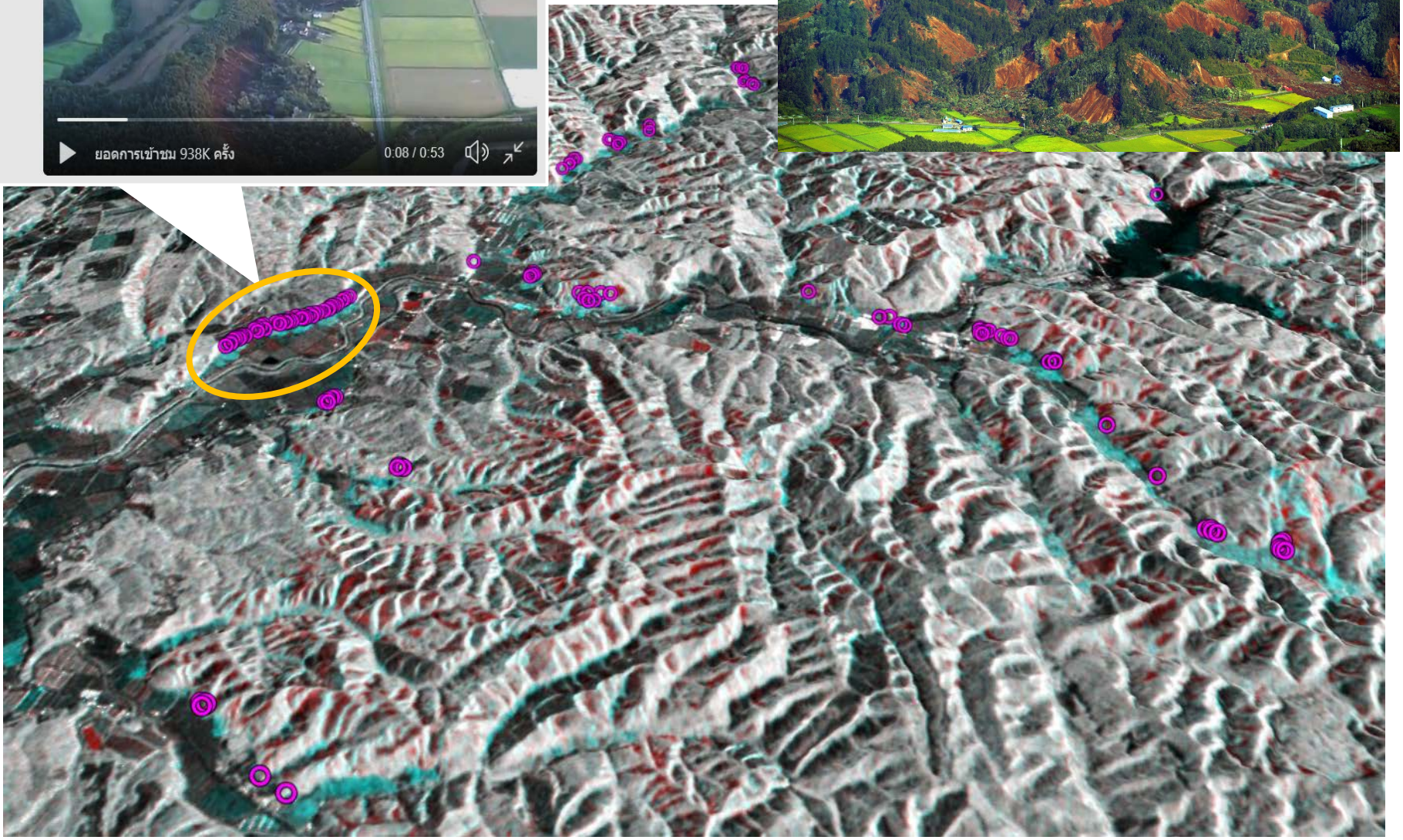




NHKニュース @nhk_news · 5 ก.ย.

震度５弱以上を観測したと考えられるものの震度のデータが入っていない北海道厚真町のようす　ヘリコプターから撮影

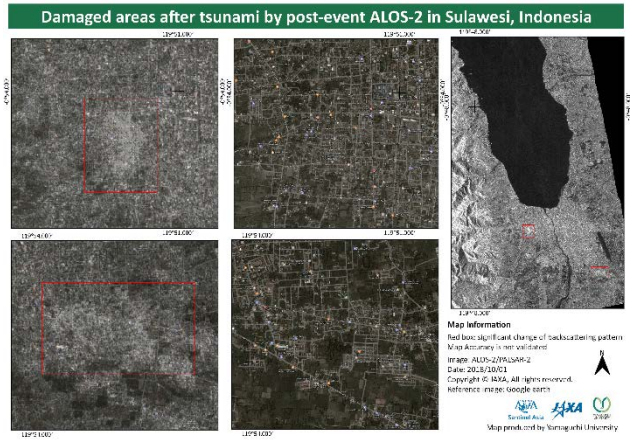
#nhk_news #地震 #震度６強

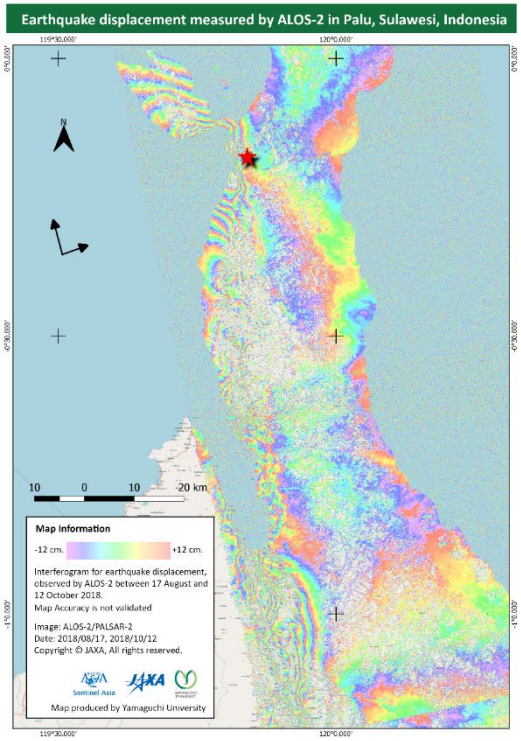


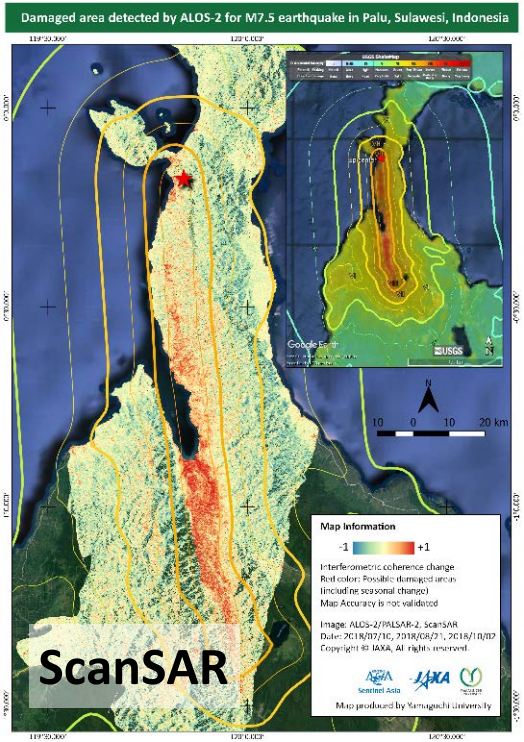
Earthquake and tsunami in Palu, Indonesia

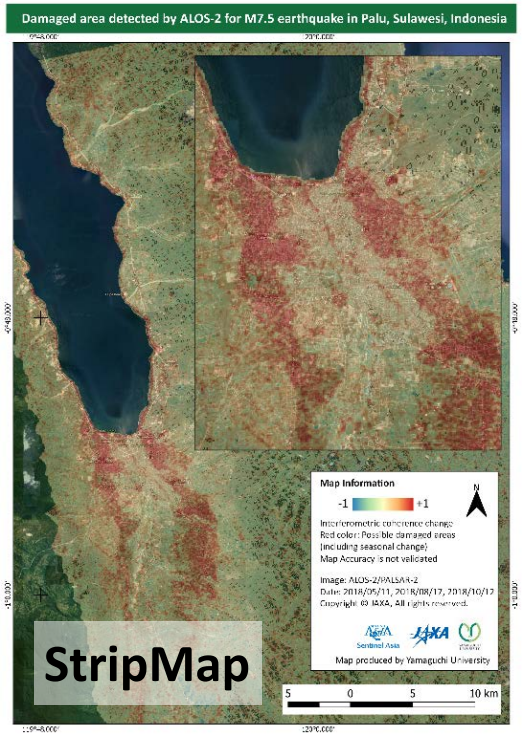
Occurrence date: 28 September 2018
Information: M7.5, induce tsunami and liquefaction
Input data:
ALOS-2 StripMap on 2018/10/01
ALOS-2 SCANSAR on 2018/10/02, 2018/08/21, 2018/07/10
ALOS-2 StripMap on 2018/10/12, 2018/08/17, 2018/05/11
Analysis method:

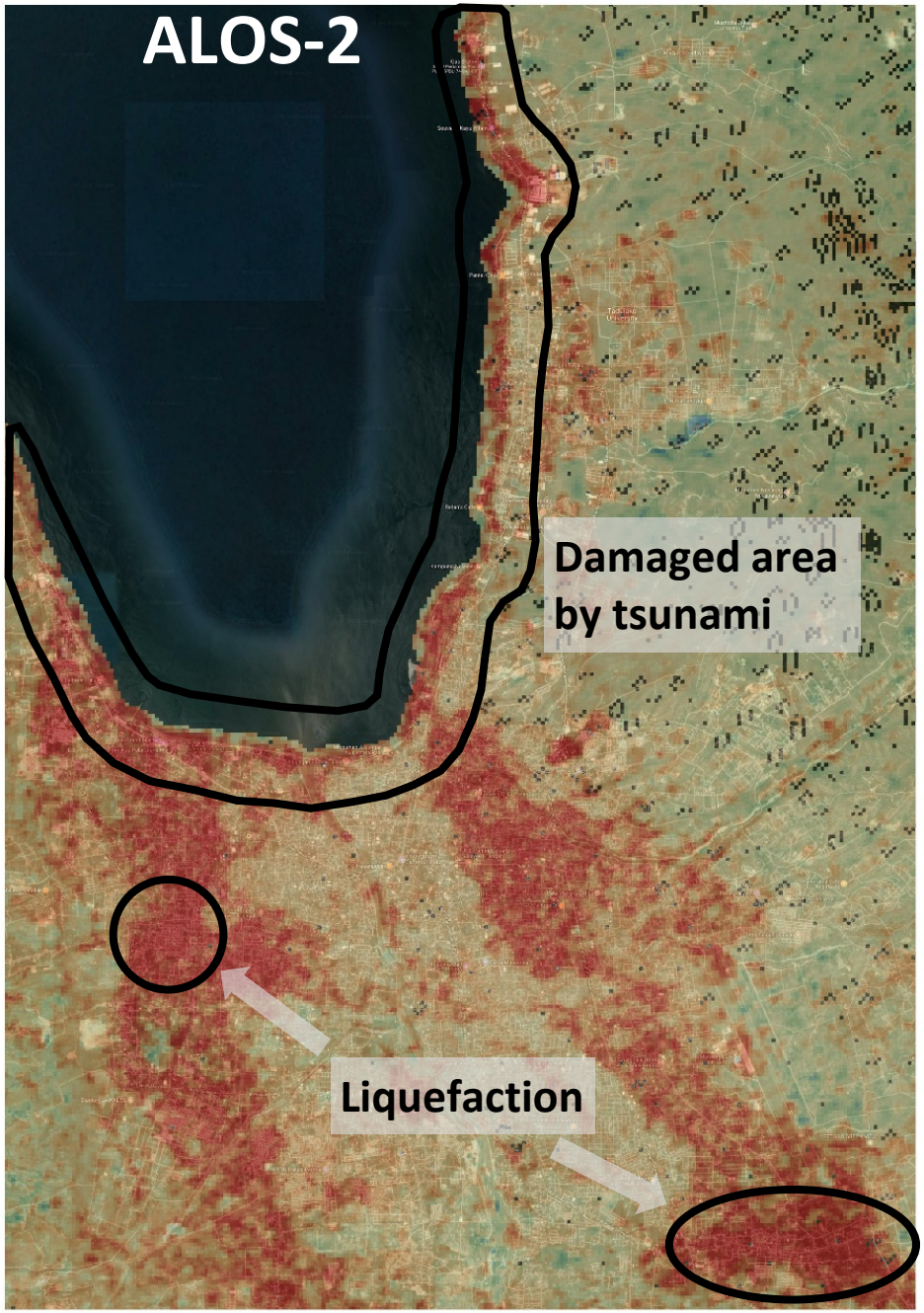
- Change of backscattering pattern
- Differential SAR interferometry (DInSAR)
- Interferometric coherence change

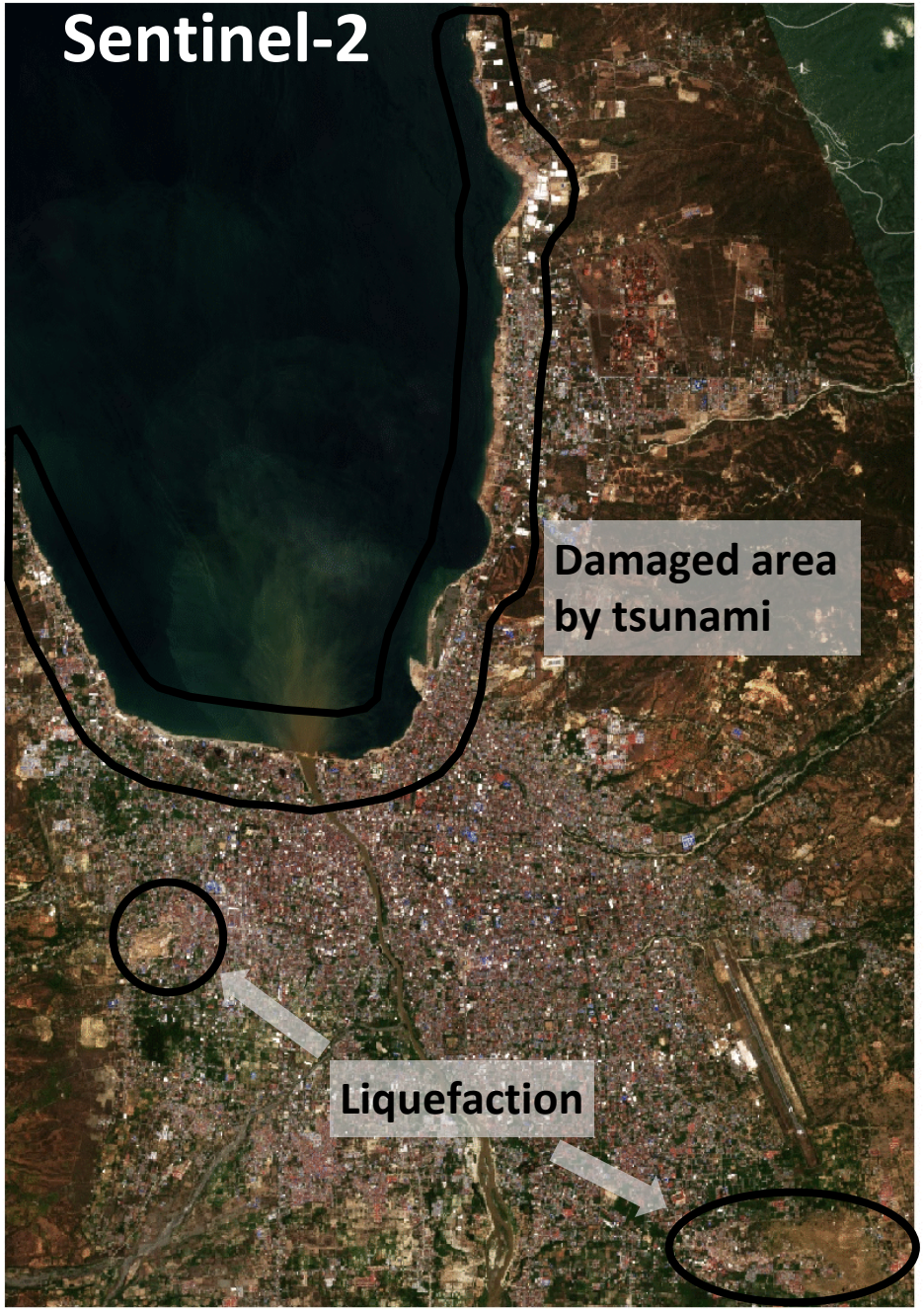




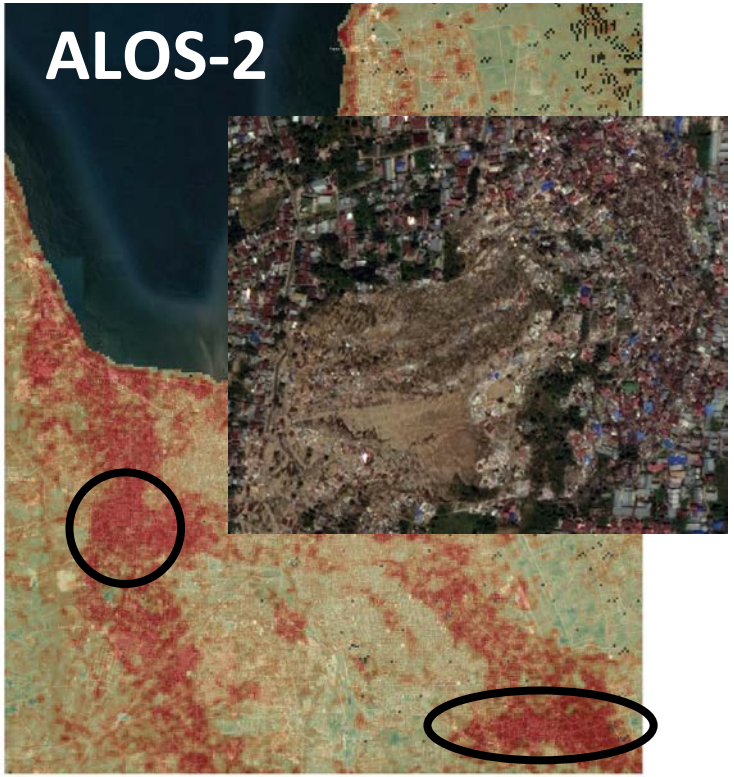


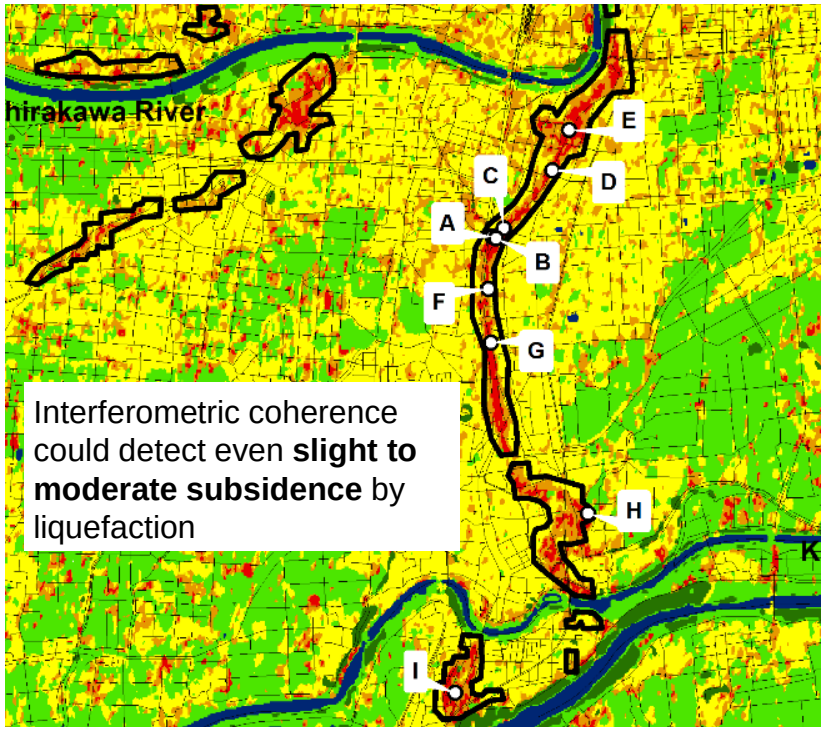


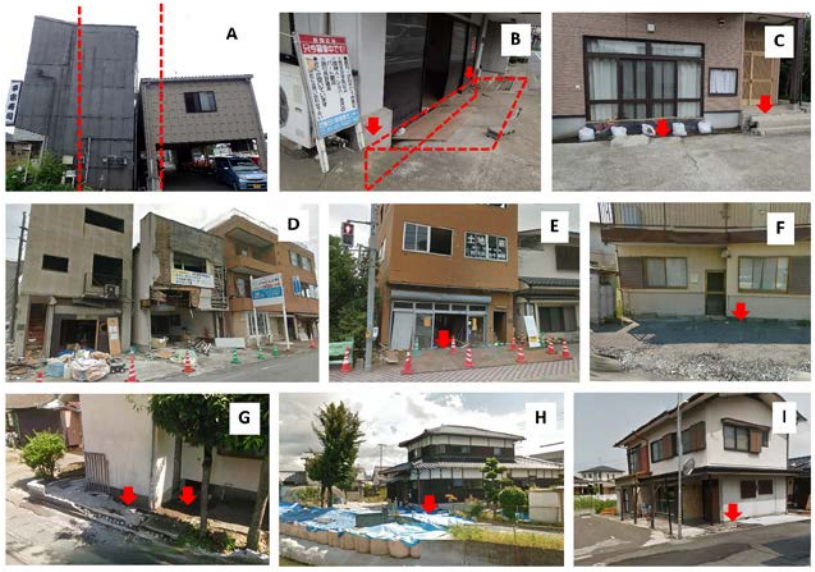

ALOS-2
Damaged area by tsunami
Liquefaction


Sentinel-2
Damaged area by tsunami
Liquefaction

Learn from Kumamoto earthquake 2016



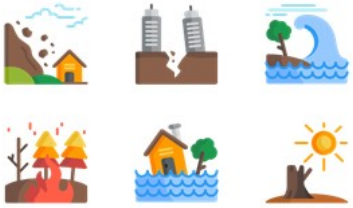




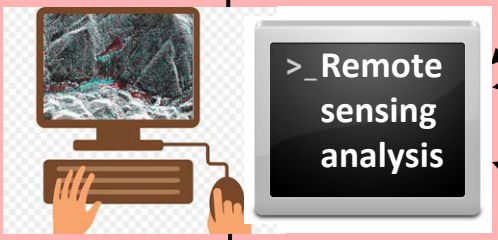
Coherence change technique could detect slight to moderate damage that can not see from optical sensor. However, we can just presents as the change of physical surface properties for emergency mapping.

Conclusion

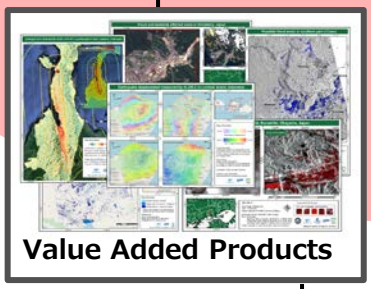
Response phase



Disasters



>_Remote sensing analysis



Value Added Products

Preparedness phase

Develop fully automatic processing

in data

Research

Material how to process data

out

9 disasters
34 value added products

Sentinel Asia

University Networks

Thank you very much for your attention