Utilization of IR imagery for wildfire management

with MTSAT and Himawari datasets

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Global Wildfire Distribution

- Wildfire emits CO$_2$, corresponding to $\frac{1}{2}$ to $\frac{1}{4}$ of CO$_2$ by fuel combustion
Sentinel Asia (SA) is a voluntary initiative by a collaboration between space agencies and disaster management agencies, applying remote sensing and Web-GIS technologies to assist disaster management in the Asia-Pacific region.

Wildfire WG is developing technologies for application of remote sensing for wildfire management. Currently, SA Web-GIS share fire location data by MTSAT and MODIS.
New Satellites for fire monitoring

ASTER, LANDSAT
Interval: >16 day
GSD: 30/90m

Almost everyday
Precise fire location

Multi-Satellites
Interval: ~ 1 day
GSD: <250m

More frequent,
More precise

MODIS
Interval: 3-4/day
GSD: 1km

Realtime
Fire intensity

Himawari-8,9
Interval: 30min
GSD: 2km

Daytime
Wildfire detection

MTS
Interval: 1/hr
GSD: 4km

>16day
everyday
10min
CIRC Observed Wildfire around Bikal on 2015-08-24

The pseudo colored images are CIRC Thermal Infrared Image. We acquired 16 scenes along truck.

Blue area seems to be clouds.

Red is fire pixel by MODIS Yellow is fire pixel by CIRC

← cold Brightness Temperature hot →

These parts are magnified at next page
CIRC Observed Wildfire around Bikal on 2015-08-24

Yellow rectangles show fire pixels by CIRC

Red rectangles show fire pixels by MODIS

Zone A  Zone B  Zone C

Source data is available at http://circgs.tksc.jaxa.jp/data
Integrated fire monitoring with multiple satellites

Fire location: Available Everyday after launch of GCOM-C

Fire Intensity
by Himawari

Precipitation
by GSMaP

Integration of fire location, intensity, precipitation, fire danger, smoke prume.

Providing integrated fire information to Asia region with suitable way depending countries.
Demonstration in Indonesia (TBD)

- Integration with fire expansion risk and smoke transportation
- Existing models available for each segment
- Collaboration with Sentinel Asia by SAPC
Summary

• **Current:** Sentinel Asia uses wildfire dataset including MTSAT and MODIS
  – Limited Geolocation accuracy for fire location
  – Limited Frequency for fire intensity

• **Wildfire WG will utilize Himawari as well as CIRC, GCOM-C and other IR sensors.**
  – Drastical change in geolocation and frequency utilizing Himawari-8,9 and CIRC, GCOM-C Satellites.