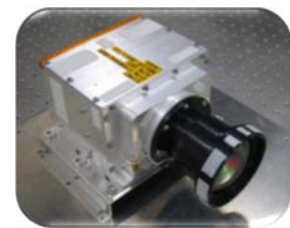


Wildfire WG

Monitoring of Heat Related Disaster using Volcano and Wildfire monitoring system

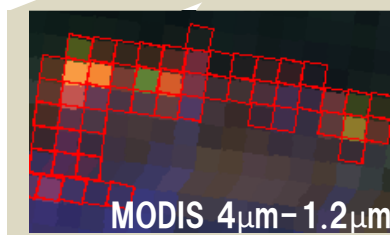
2018-11-01

Koji Nakau,
JAXA/SAOC

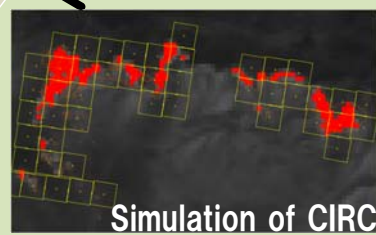


- Fire danger related indexes
- Volcano and Wildfire monitoring system
- Volcano monitoring
 - Although this is Wildfire WG, we can use resemble technology for the other heat related disasters.
 - In Japan, we had significant fatality in several volcano eruption recently.
- Summary and Future work

	MODIS(NASA)	CIRC	GCOM-C	Himawari 8
Agency(launch)	NASA(1998~)	JAXA(2014~)	JAXA(2017~)	JMA(2016~)
Resolution	1km	210m, 130m	250m	2km
Wavelength	36bands	1 band(8-12 μ m)	19 bands	16 bands
Frequency	4times a day	2times/14days	40times/34days	Every



MODIS 4 μ m-1.2 μ m
We can detect wildfire as red rectangle pixels, however, we do not know exact place.



Simulation of CIRC
Sensitivity is same as MODIS, However, pixel size is small (210m), we can find exact place of wildfire.



Simulation of GCOM-C
Small pixel (250m) and 2.2 μ m SW allow us to find exact place of wildfire.

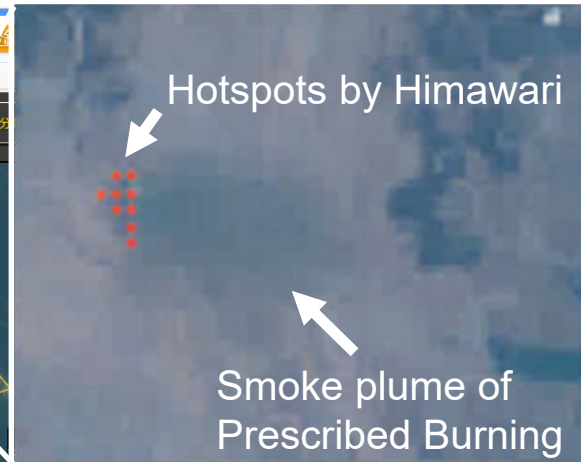
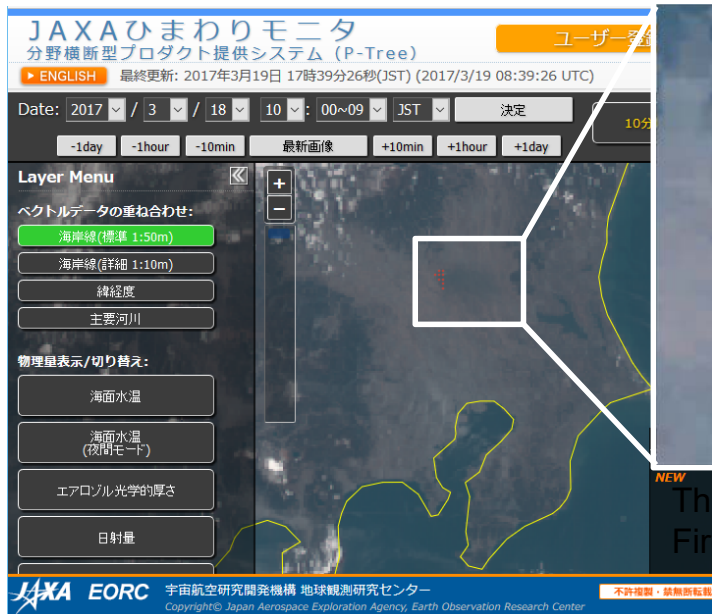
Example of Himawari HS Prescribed burning on 2017-03-18

At Watarase lake, prescribed burning of grassland held on March 18. This fire has been detected frequently by JAXA Himawari monitor.

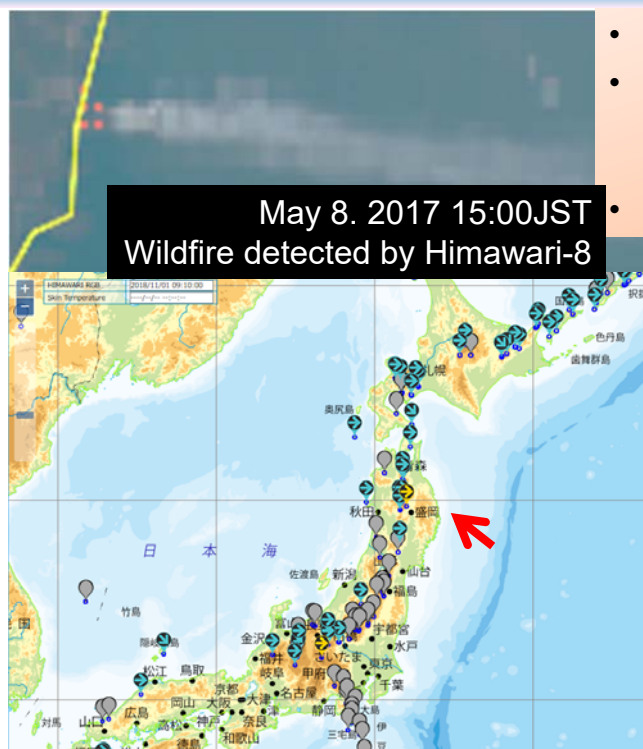


From Twitter photo
@yasyukukumo
<http://pic.twitter.com/dgzHdOCp>
gS

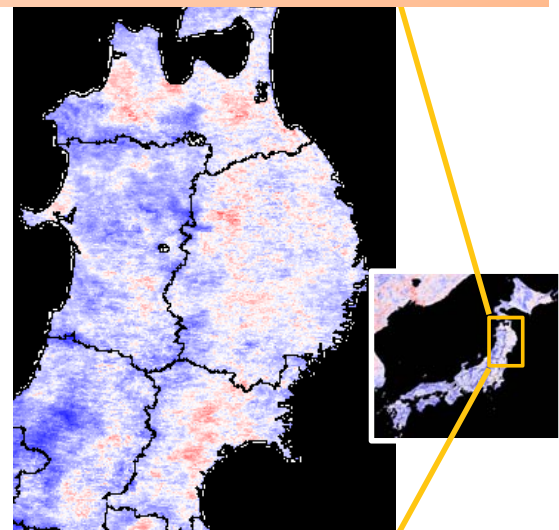
At Watarase lake, prescribed burning of grassland held on March 18.
This fire has been detected frequently by JAXA Himawari monitor.



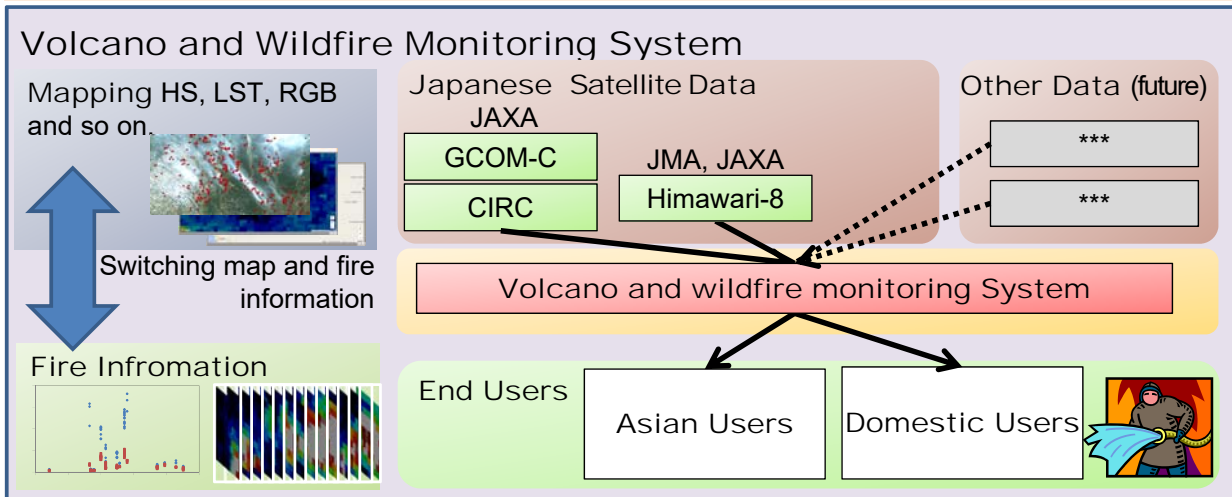
This example is HS at 10AM Mar 18.
Fire is detected frequently till noon.



- Large WF occurred in Iwate prefecture in 2017.
- As well as fire detection, JAXA estimates dryness of land cover utilizing day and night time IR imagery, based on heat capacity.
- Spring in 2017, we had dry condition in Iwate.



- ✓ A system to monitor wildfire and volcano activity.
- ✓ One stop service combining Himawari, GCOM-C and CIRC
 - Discussion with Japanese disaster related agencies for improvement
- ✓ Wildfire part will be released in this Fiscal Year end.



Left shows snapshots of Volcano and Wildfire Monitoring system.

- This system can show satellite images on map and fluctuation of volcanos and wildfires.

Volcano monitoring system (under research)

min 2018/11/01 05:31:08 +10 min Latest Date Top page Sign in 日本語

MAVIARI RGB 2018/11/01 05:00:00

in Temperature

Map looks like google maps with balloons of each volcanos. We have 300 volcano locations around Japan (Tokyo VAAC area).

Policy

<https://kazan.jaxa.jp>

Left shows snapshots of Volcano and Wildfire Monitoring system.

- This system can show satellite images on map and fluctuation of volcanos and wildfires.
- Easy to zoom and switch satellite images or observation time including temperature imagery

The screenshot shows the 'Volcano monitoring system (under research)' interface. At the top, there are navigation controls for time (-1 hour, 2018/10/31 14:33:26, +10 min) and a 'Latest Date' button. The main map displays satellite imagery of Japan with several volcano markers. A text box at the bottom right of the map area says 'We can look at Himawari RGB'. On the right side, there is a 'Himawari on yesterday' header and a 'BaseMap' menu with options for 'Standard map' and 'Observation Overlay'. The 'Observation Overlay' menu is expanded, showing 'Volcano Observat...', 'Volcano Observat...', and 'HIMAWARI RGB'. At the bottom, there is a 'Site Policy' link and JAXA/EOIRC logos with the copyright notice '© 2018 Japan Aerospace Exploration Agency'.

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Left shows snapshots of Volcano and Wildfire Monitoring system.

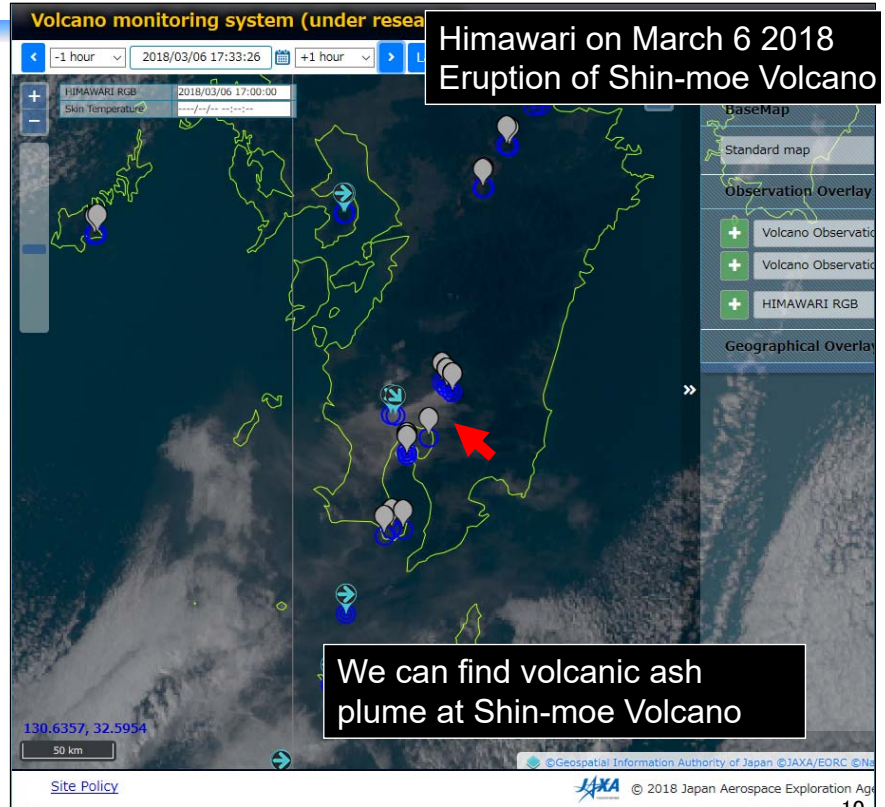
- This system can show satellite images on map and fluctuation of volcanos and wildfires.

The screenshot shows the 'Volcano monitoring system (under research)' interface with a topographic map. At the top, there are navigation controls for time (2018/11/01 05:31:08, +10 min) and a 'Latest Date' button. A 'Map on top page' button is visible in the top right. The main map displays a topographic view of Japan with volcano markers. A red arrow points to a specific volcano marker labeled 'Shin-moe'. A text box at the bottom right of the map area says 'The first example is Shin-moe Volcano.' At the bottom, there is a 'Policy' link and JAXA logos with the copyright notice '© 2018 Japan Aerospace Exploration Agency'.

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Left shows snapshots of Volcano and Wildfire Monitoring system.

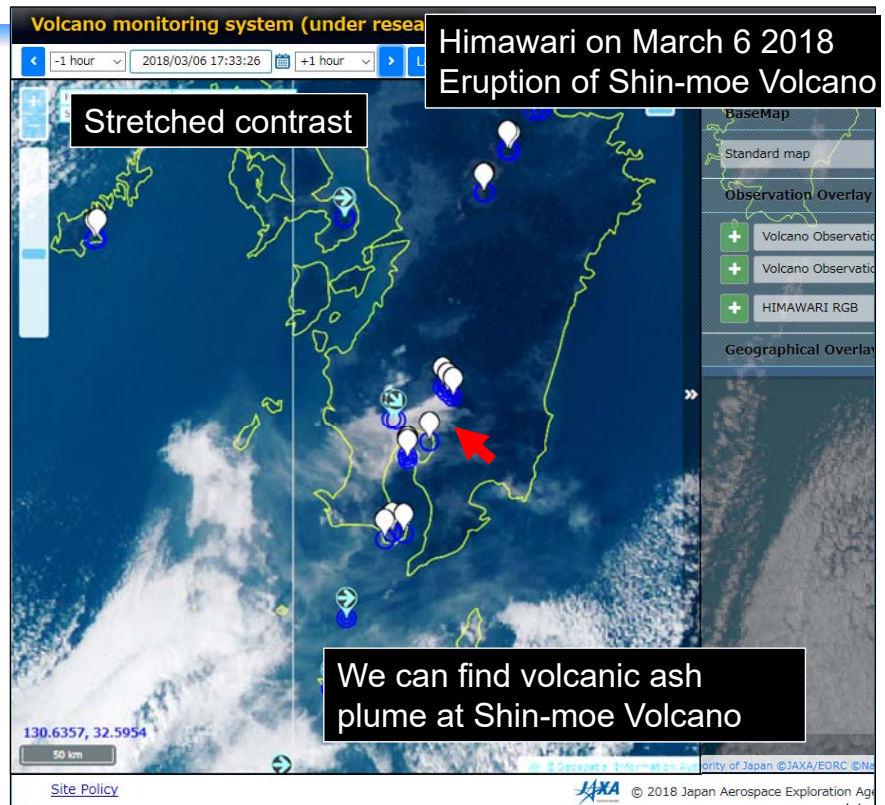
- This system can show satellite images on map and fluctuation of volcanos and wildfires.
- Easy to zoom and switch satellite images or observation time including temperature imagery



<https://kazan.jaxa.jp>

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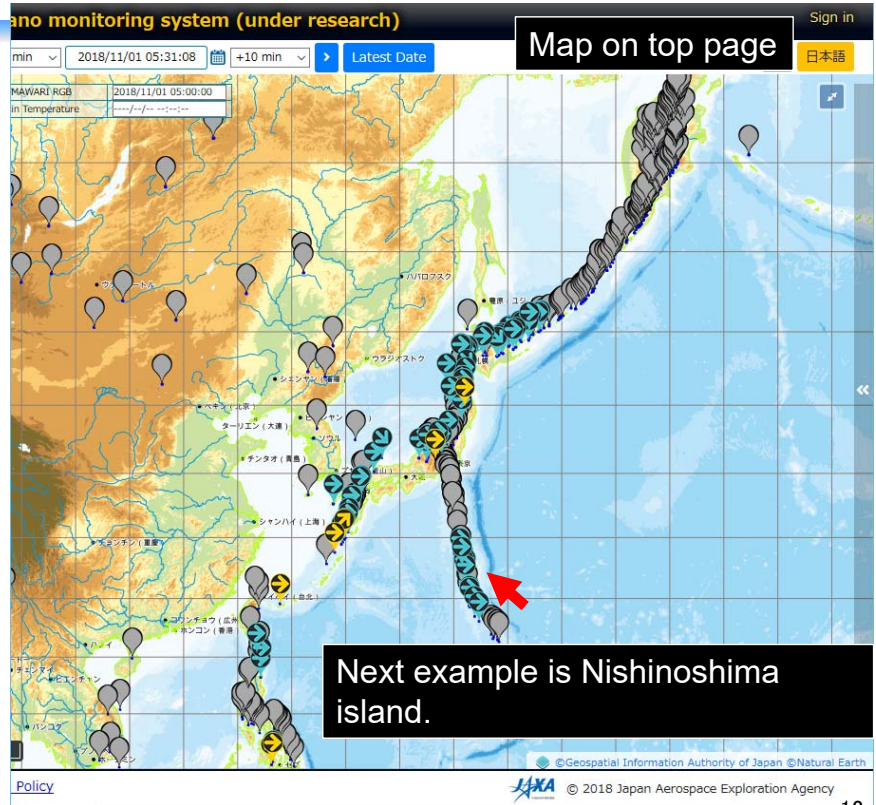
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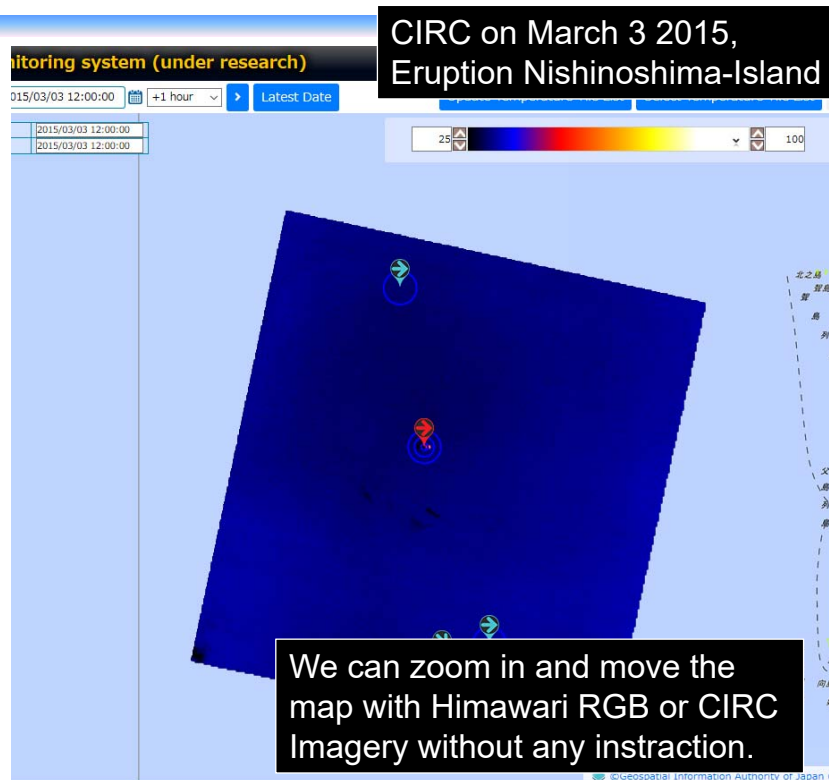
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<https://kazan.jaxa.jp>

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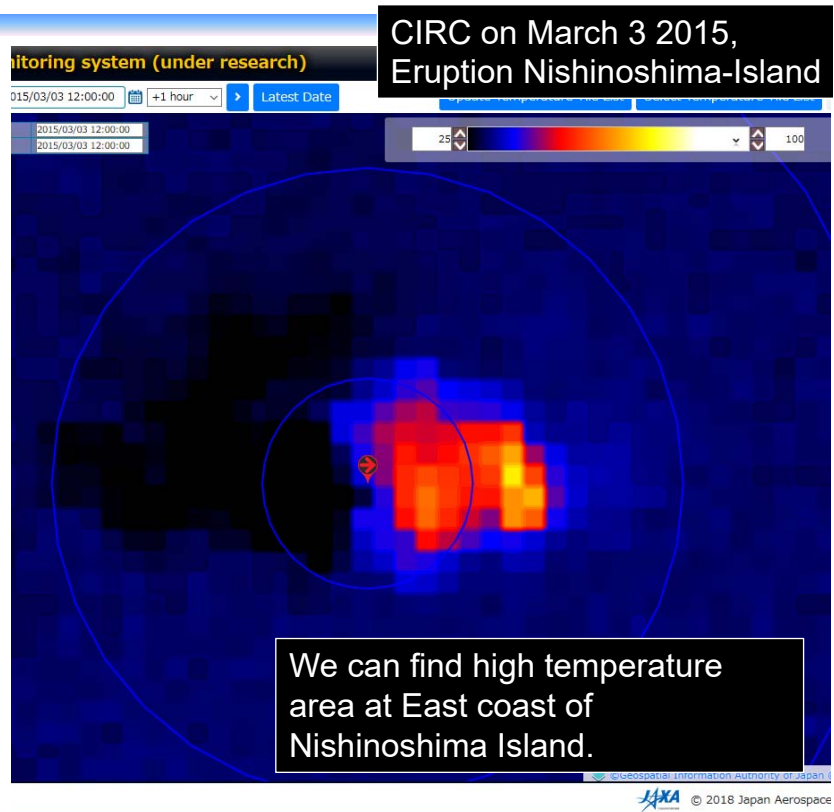
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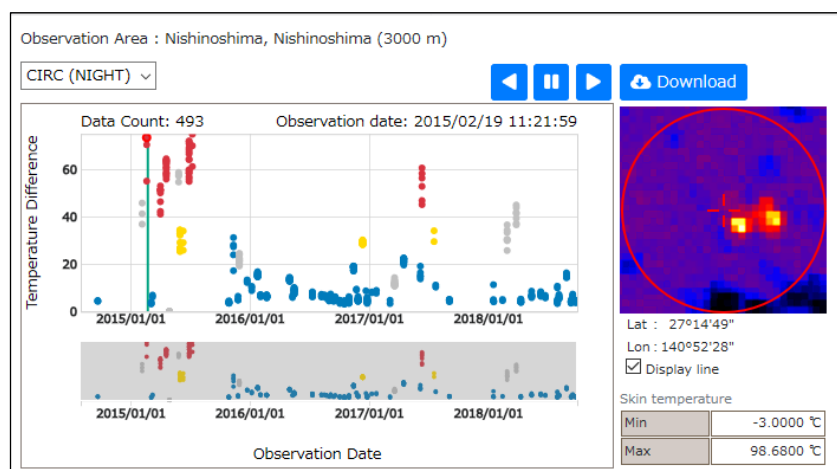
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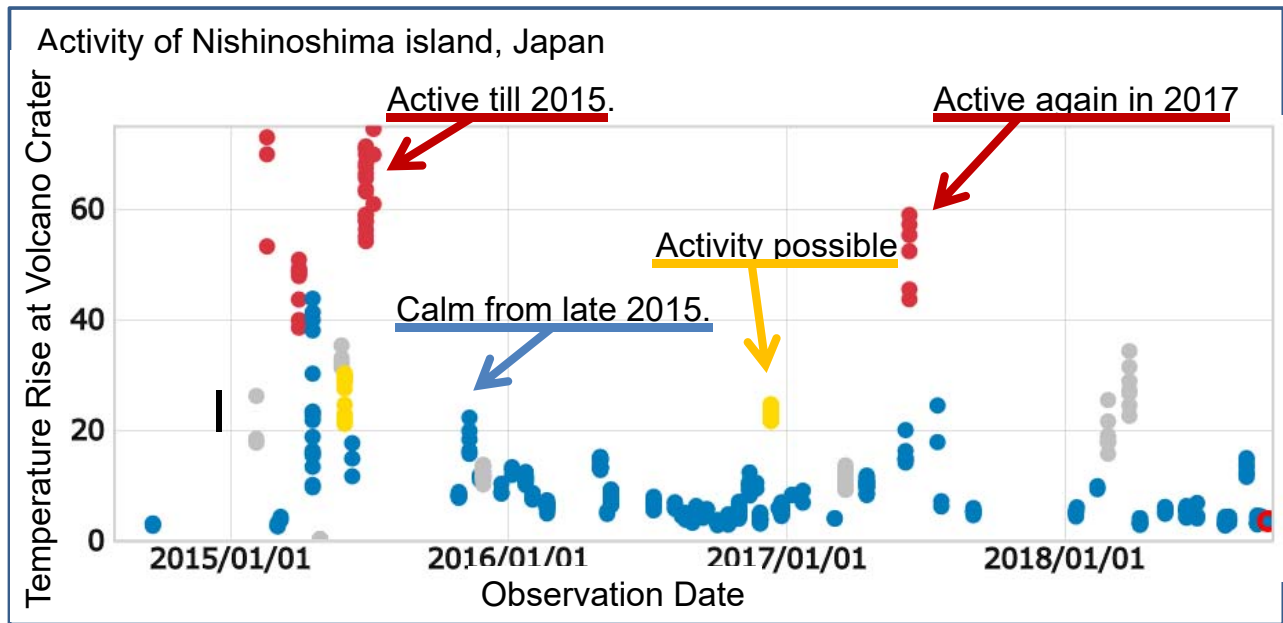


<https://kazan.jaxa.jp>

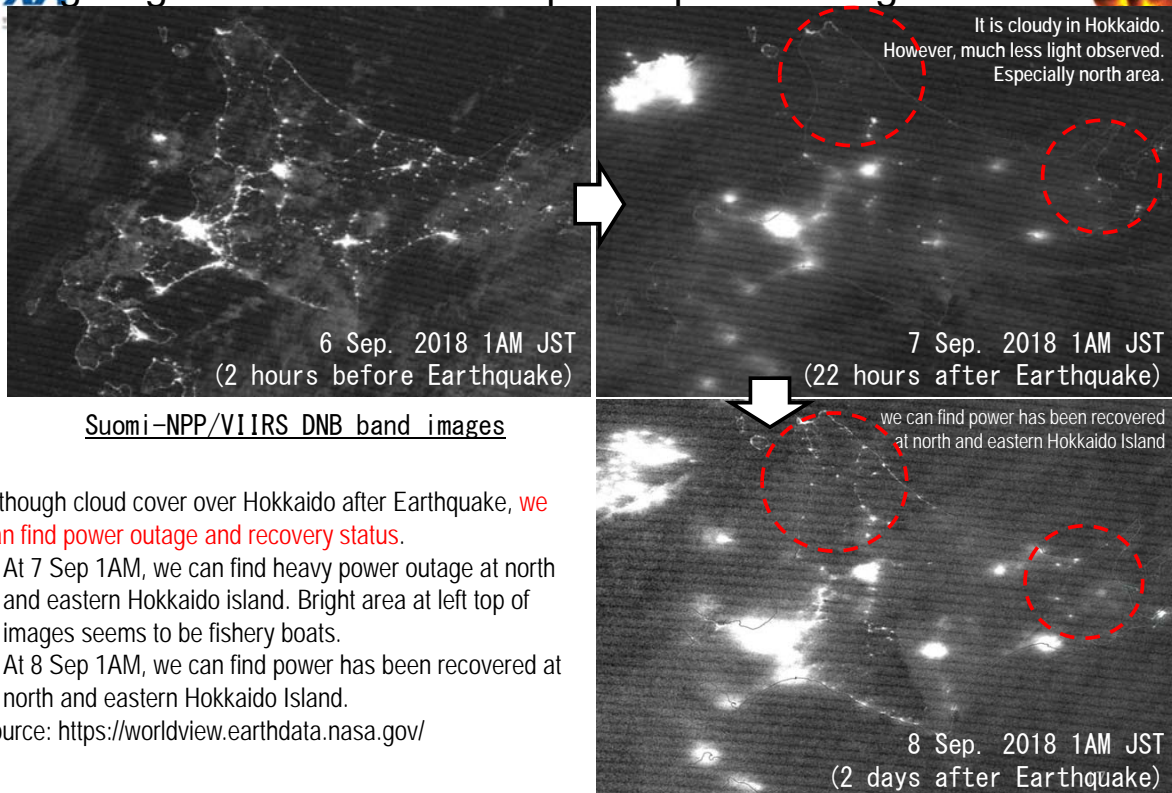
Left shows snapshots of Volcano and Wildfire Monitoring system.

- This system can show satellite images on map and fluctuation of volcanos and wildfires.
- Easy to zoom and switch satellite images or observation time including temperature imagery
- Changes of volcano activity is available as a graph of temperature difference for each volcanos crater.
- Currently, Volcano and wildfire monitoring system covers Japan and adjacent area.
 - If needed, we can discuss





Night light of Suomi/VIIRS captured power outage in Hokkaido



Suomi-NPP/VIIRS DNB band images

Although cloud cover over Hokkaido after Earthquake, **we can find power outage and recovery status.**

- At 7 Sep 1AM, we can find heavy power outage at north and eastern Hokkaido island. Bright area at left top of images seems to be fishery boats.
- At 8 Sep 1AM, we can find power has been recovered at north and eastern Hokkaido Island.

source: <https://worldview.earthdata.nasa.gov/>

Progress in FY2017/18

- Area of large wildfire had a dry index by IR analysis by MODIS. This can be used for precaution of wildfire.
- Volcano part of the system has been released.

Future Plan

- FY2018
 - Release of Wildfire part of monitoring system
 - Utilization of GCOM-C dataset
- FY2019
 - Add more layers for wildfire and volcano monitoring
 - Improvement of algorithms
 - Volcano activity change detection
 - Fire history estimation
 - Validation of wildfire or volcano product

Other heat related disasters?

18

Thank you
<https://kazan.jaxa.jp>