Agency Report
JAXA Earth Observation Programs

WGISS-45 @ INPE, Brazil

April 8th – 12th, 2018

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Japan Aerospace Exploration Agency (JAXA)

Satellite Applications and Operations Center (SAOC)

Space Technology Directorate I

Topics

- Overview of JAXA Earth Observation Programs
- New Satellite “GCOM-C”
- Renewal of G-Portal

Overview of JAXA - Organizations

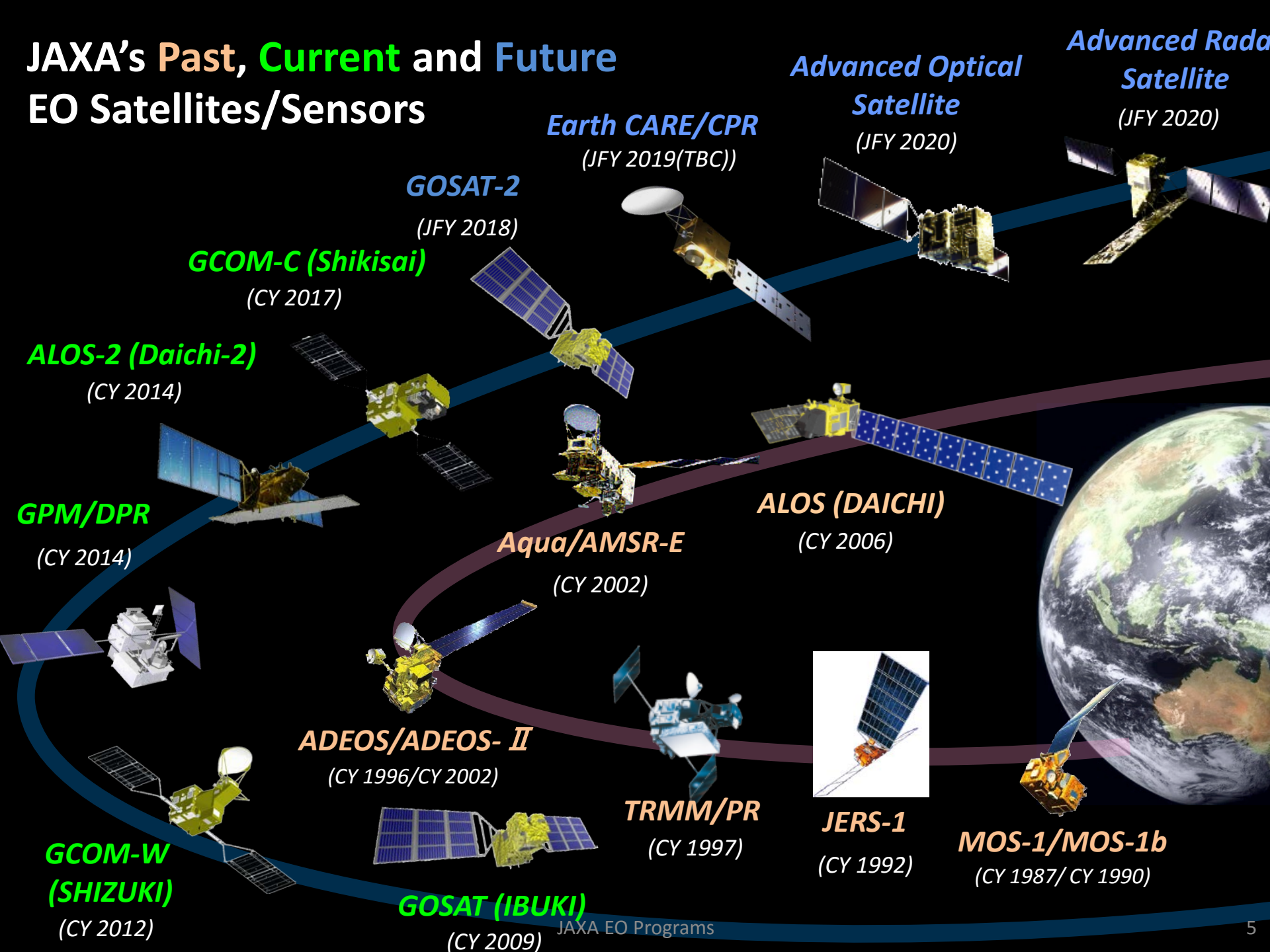
- President
  - EO Related Group
  - HQ
  - Space Tracking and Communication Center
  - Space Technology Directorate I
    - Satellite Applications and Operations Center (SAOC)
    - Earth Observation Center (EORC)
    - Earth Observation Center (EOC)
    - GCOM Project Team
    - ALOS-2 Project Team
    - EarthCARE/CPR Project Team
    - SLATS Project Team
    - Advanced Rader Satellite Project Team
    - Advanced Optical Satellite Project Team
    - Space Transportation Technology
    - ...
  - Space Technology Directorate II
  - Research and Development Directorate
  - Institute of Space and Astronautical Science
  - Aeronautical Technology Directorate
  - Human Spaceflight Technology Directorate
  - Space Exploration Innovation Hub Center

- Established in 2003 after merging NASDA, ISAS, and NAL
- Total Number of Staffs : 1,525 (As of Apr. 1, 2018)
- FY28 Budget 182,100 Million JPY

JAXA Centers

★・・・EO related

JAXA's Past, Current and Future EO Satellites/Sensors



GCOM-C "Shikisai"

Global Climate Observation Mission - Climate

- ✓ Multi-band Imaging Radiometer
- ✓ Near UV ~ TIR + Polarimetry
- ✓ Tilt Observation

GCOM-C SGLI Characteristics	
Orbit	Sun-synchronous (local time: 10:30) Altitude: 798km Inclination: 98.6 deg.
Power/Mass	About 4kw/798kg
Mission Life	5 years
Scanning	Push-broom electric scanning Wisk-broom mechanical scanning
Digitalization	12 bit
Polarization	3 Polarizations angles
Sensor	SGLI (Second Generation Land Imager) Band: 380nm～12μm (19 bands) Resolution: 250m～1km Swath: 1150～1400km

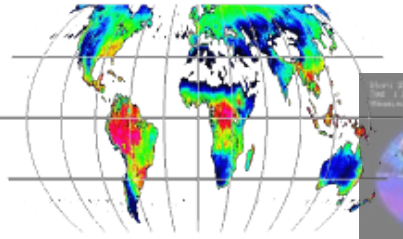
Successfully Launched on Dec. 23rd, 2017!

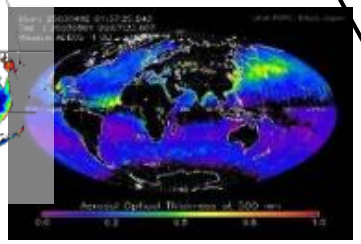
- Initial Calibrations and Validations are on going
- Product Release is planned in Dec., 2018

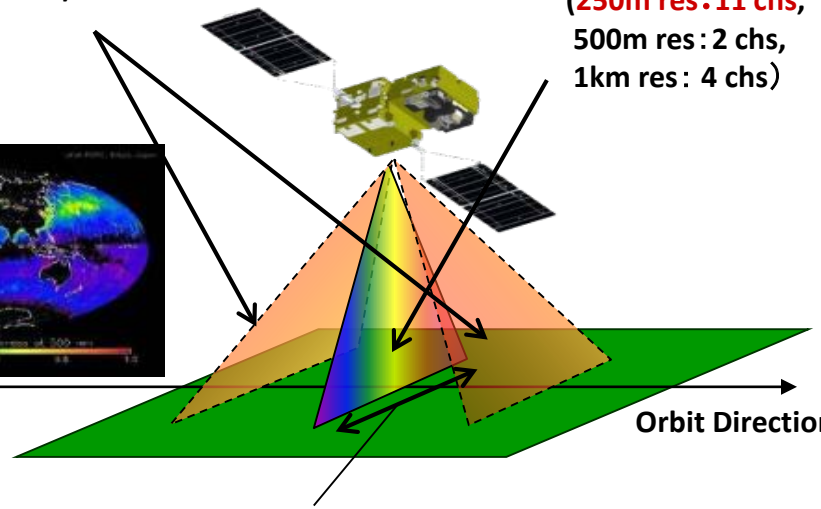
Main targets of GCOM-C

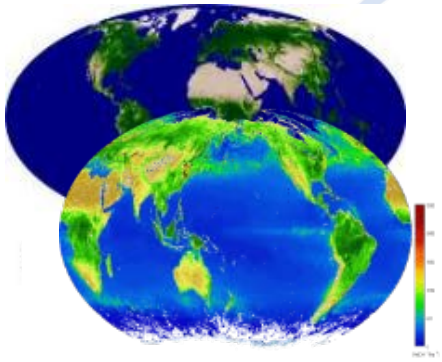
Polarization and forward-backward observation function
- Forward or backward polarization
- Along-track slant view (1km res: 2 chs)

Nadir multi-channel observation
17 channels in the visible, NIR, and thermal infrared wavelength ranges
(250m res：11 chs,
500m res：2 chs,
1km res： 4 chs）





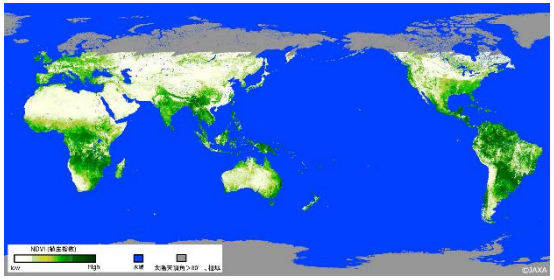




Vegetation, aerosol, cloud, SST, ocean color

Swath：1150km（Visible・Near-infrared, Polarization）
1400km（Short-wavelength infrared・Thermal infrared）

⇒GCOM-C observes the whole globe at least once every 2 days.



NDVI observed from Jan. 1st – 9th, 2018

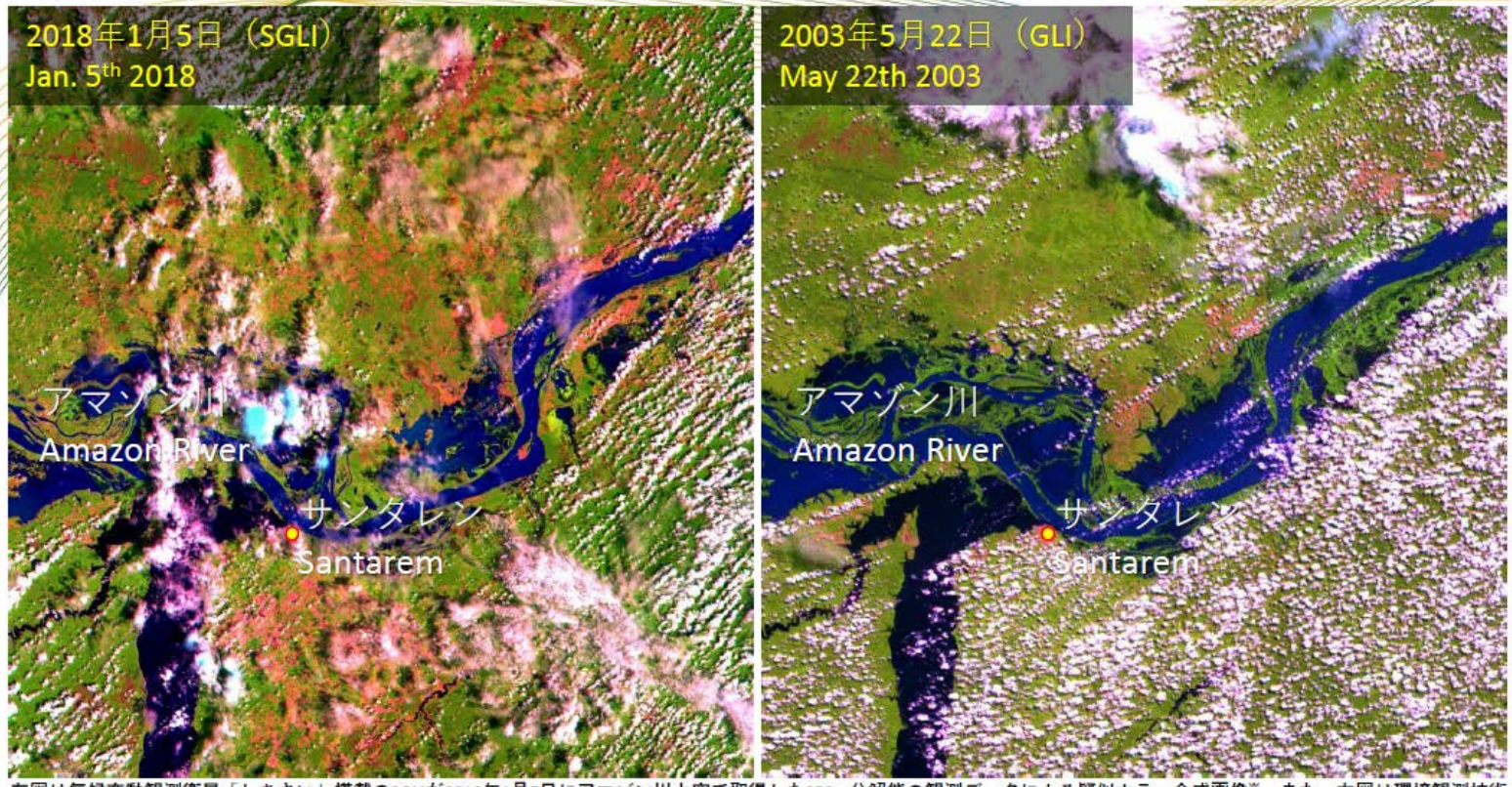
GCOM-C monitors changes of vegetation on a long-term by using its forward-backward observation function, which improves accuracy in measuring biomass production. It also observes ground aerosols by polarimetry observation and estimates the impact of aerosols and clouds on the Earth's radiation budget.

⇒ Contributing to improving numerical climate models by clarifying ecosystem processes and microphysical processes in the atmosphere

Forest Change

気候変動観測衛星「しきさい」
Global Change Observation Mission-Climate "SHIKISAI"

アマゾン川流域の熱帯雨林の変化
Changes in the tropical rain forest in Amazon



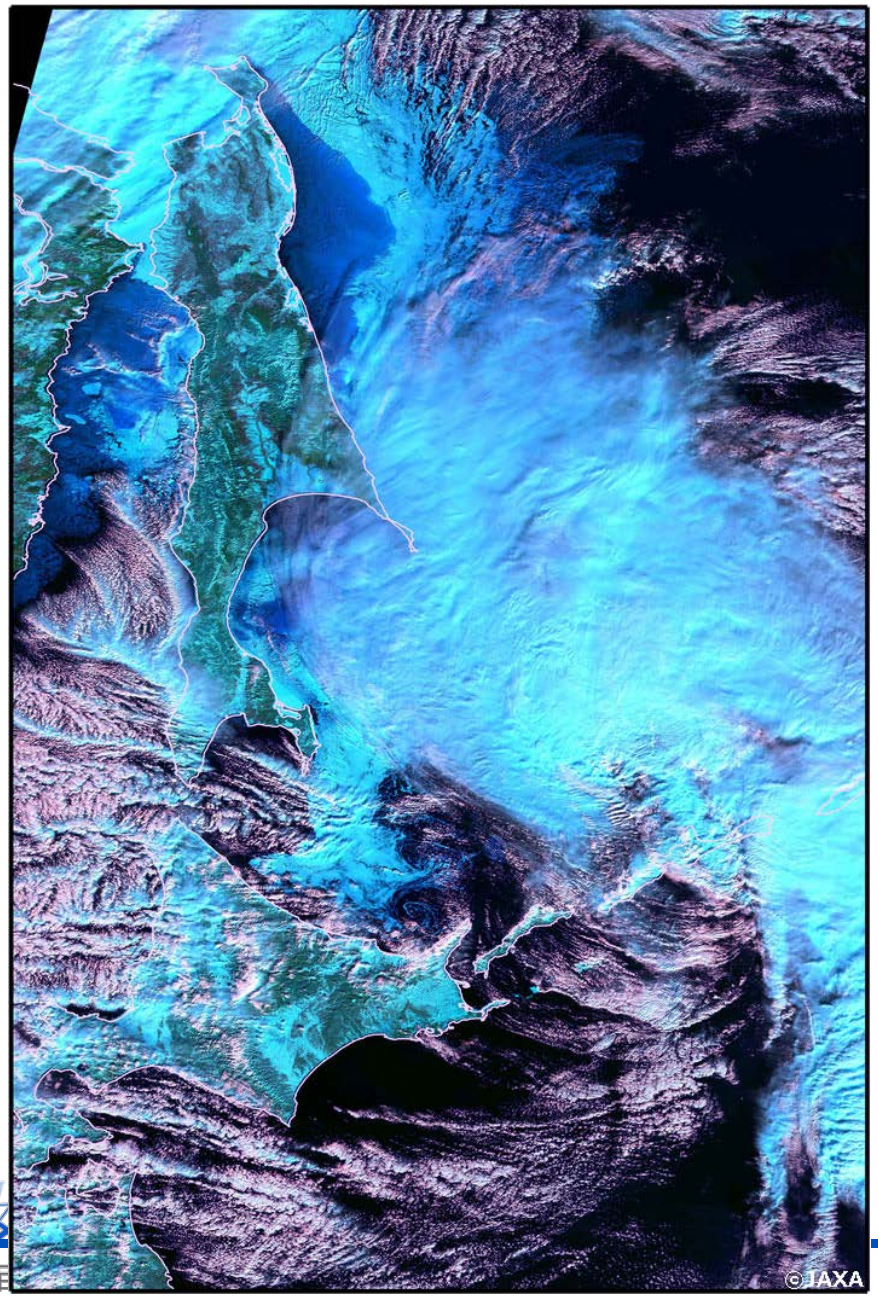
左図は気候変動観測衛星「しきさい」搭載のSGLIが2018年1月5日にアマゾン川上空で取得した250m分解能の観測データによる疑似カラー合成画像※，また，右図は環境観測技術衛星「みどりII」搭載のGLIが2003年5月22日に同地域を観測した同種画像をそれぞれ示しています。森林域は緑色，非森林域は赤茶色に見えており，また，雲域は白～紫色，河川は濃い水色に見えています。15年間にアマゾン川流域で森林伐採がすすみ，非森林域が拡大している様子が分かります。

Left is a false color composite image* of 250m resolution acquired over Amazon River with SGLI on Jan. 5, 2018. Right is a false color composite image of 250m resolution acquired over the same location with GLI on May 22, 2003. Forested areas are seen in light green whereas non-forested bare lands are seen in reddish brown in the images. During the fifteen years from 2003 to 2018 forests in large areas have been lost.

※赤，緑，青に波長SW3, VN11, VN8の放射輝度を割り当てたRGB合成画像
*Reflectances of SGLI SW3, VN11, VN8 channels are assigned to red, green, and blue colors

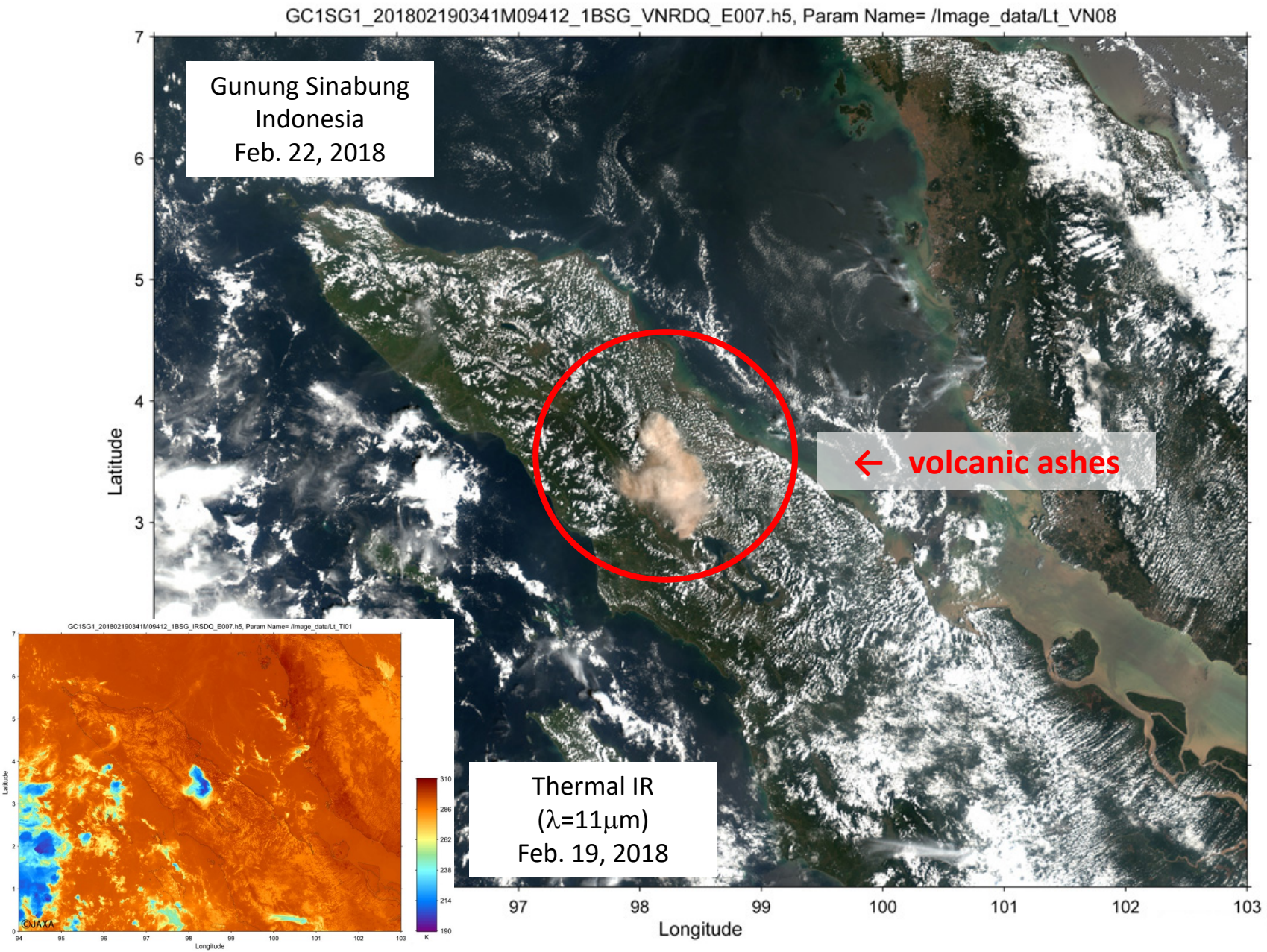
これらの図は、「しきさい」（GCOM-C）と地上局の通信確認のための試験電波により、平成30年1月1日から9日（世界標準時）にかけて取得された観測画像です。
These images are obtained by using the test radio wave transmitted from GCOM-C/SGLI on January 1st to 9th, 2018 (UTC).

Snow, Sea Ice, Water Cloud, Ice Cloud

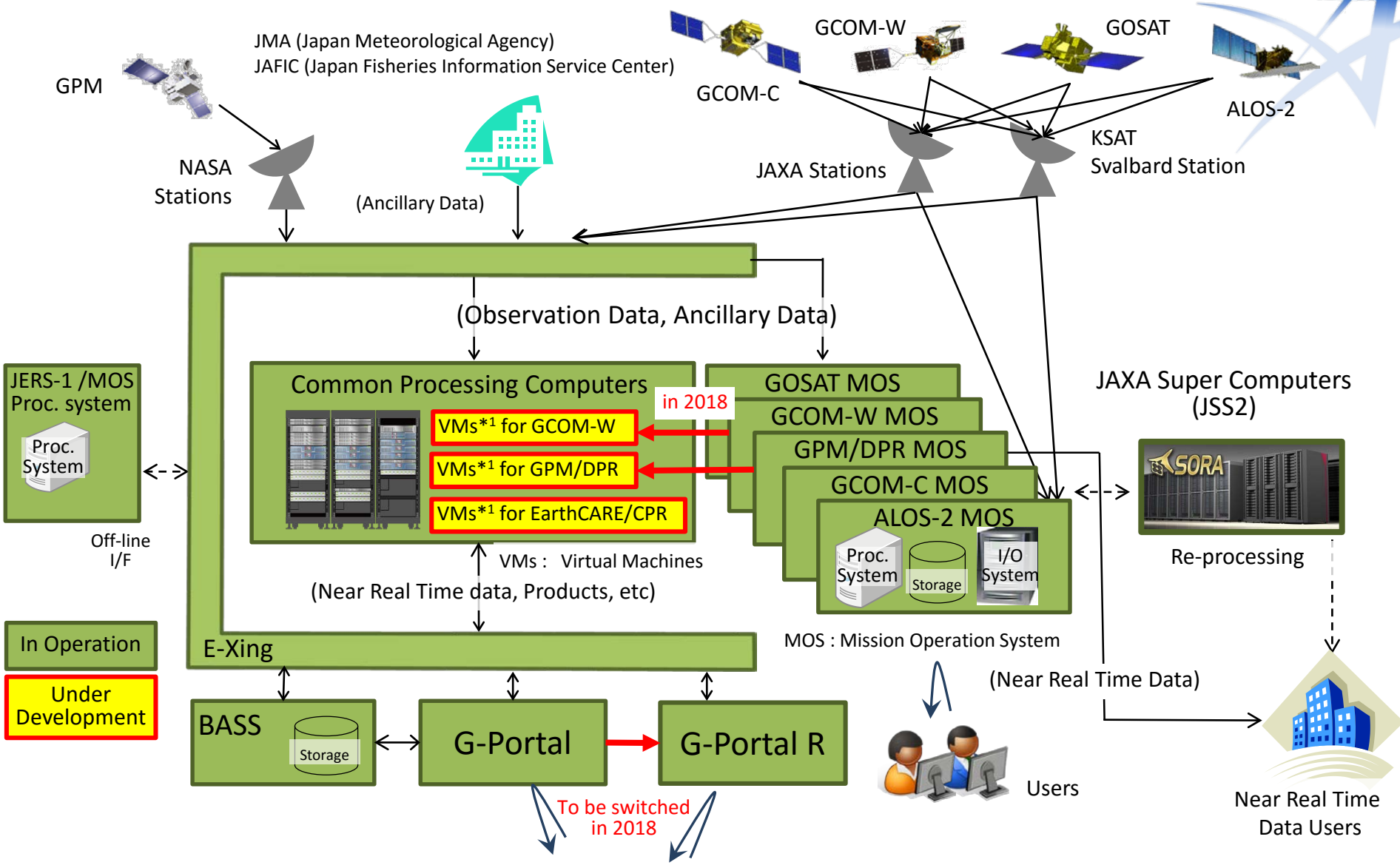


Snow and sea ice are shown in deep blue while water and ice clouds are seen in white and light blue, respectively.

Volcanic Ashes - Aerosols

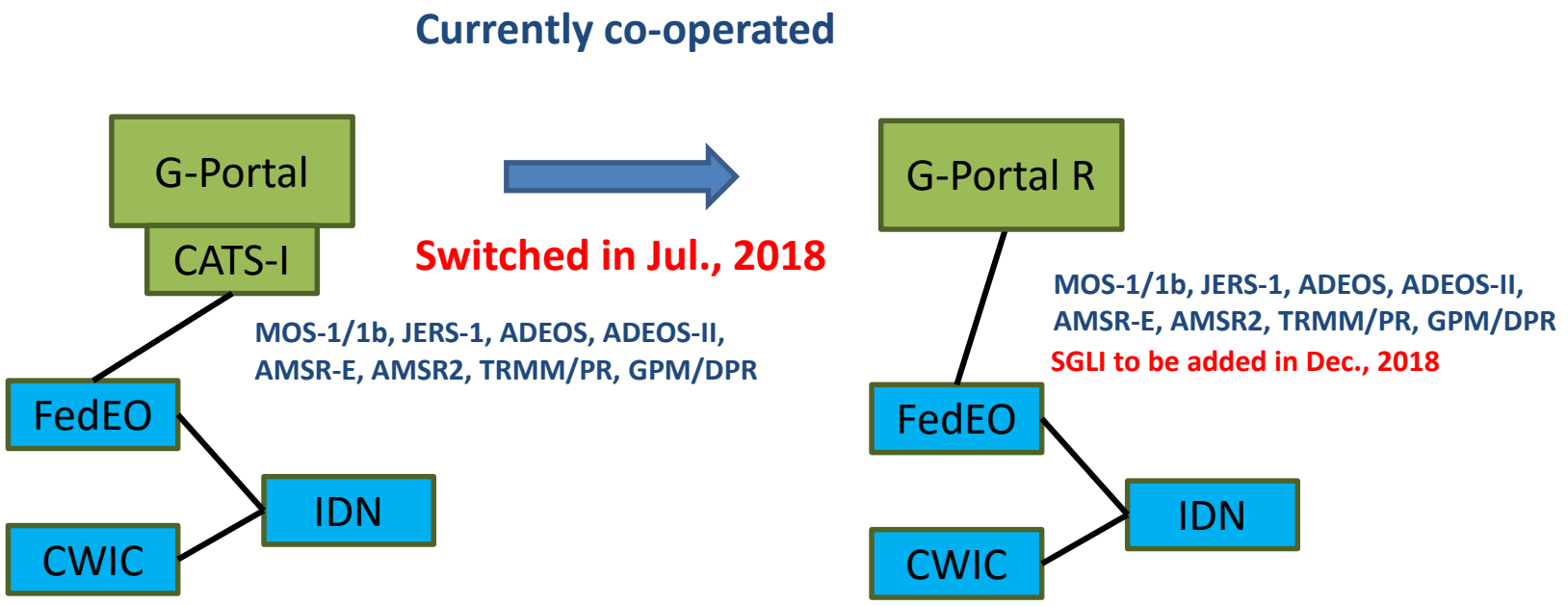


Ground Segments for the Global EO Satellites



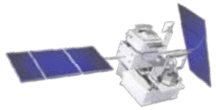
Renewal of G-Portal

- "G-Portal" is a primary gateway for JAXA Global EO standard products.
- The new version "G-Portal R" is now co-operated.
- G-Portal will be fully switched into G-Portal R in July, 2018.

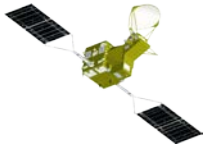


Portals for Environmental Products

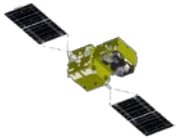
GOSAT



GPM/DPR

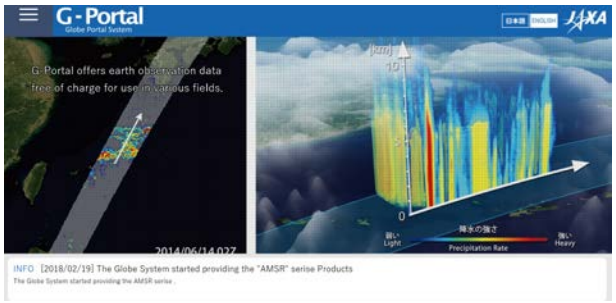


GCOM-W

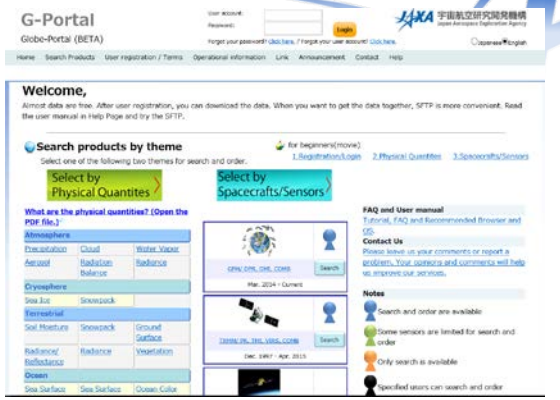


GCOM-C

+ Past Satellites and Sensors
(MOS-1/1b, JERS-1, ADEOS, ADEOS-II, Aqua/AMSR-E, TRMM/PR)

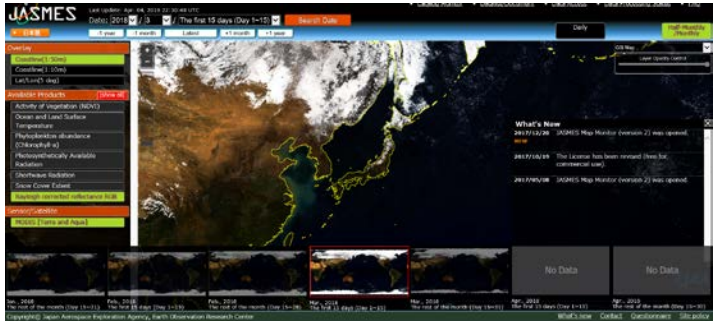


G-Portal R
https://gportal.jaxa.jp/gpr/



G-Portal
https://www.gportal.jaxa.jp/gp/top.html

GSMaP
http://sharaku.eorc.jaxa.jp/GSMaP/index_j.htm



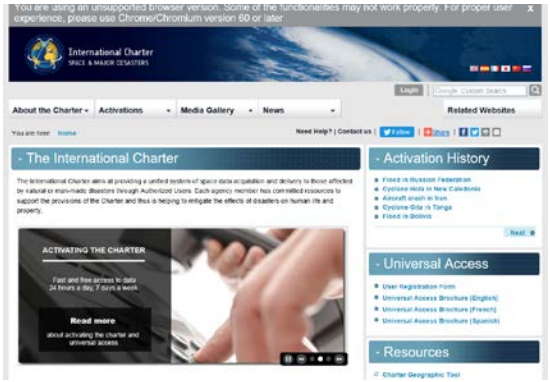
JASMES
http://www.eorc.jaxa.jp/JASMES/index_map.html

GDAS by NIES*
https://data2.gosat.nies.go.jp/gallery/L4B/concmov/concmov.html
* National Institute for Environmental Studies

Portals for Disaster Preventions

ALOS-2
(L-band Rader)

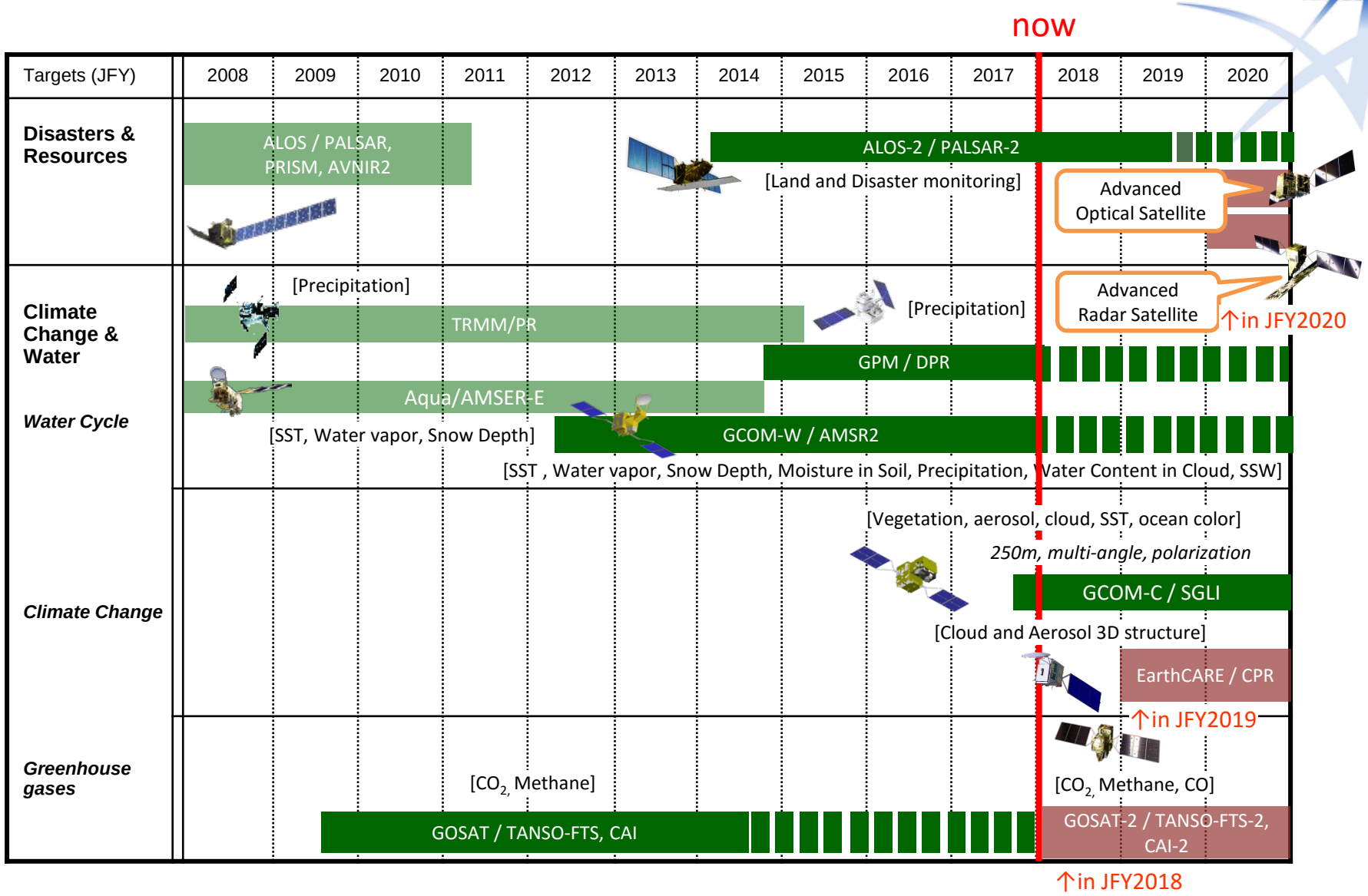
Daichi Bousai WEB
http://jaxa-dis.maps.arcgis.com/home/index.html



International Charter Space and Major Disasters
https://disasterscharter.org/web/guest/home

Sentinel Asia
https://sentinel.tksc.jaxa.jp

Long-term Plan



Mission status Terminated On orbit Under Development