

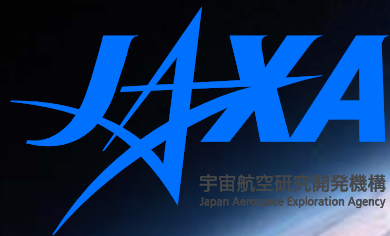


# Space Apps COVID-19 Challenge Introduction of GCOM-C satellite

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棚田 和玖

2020 May 27th





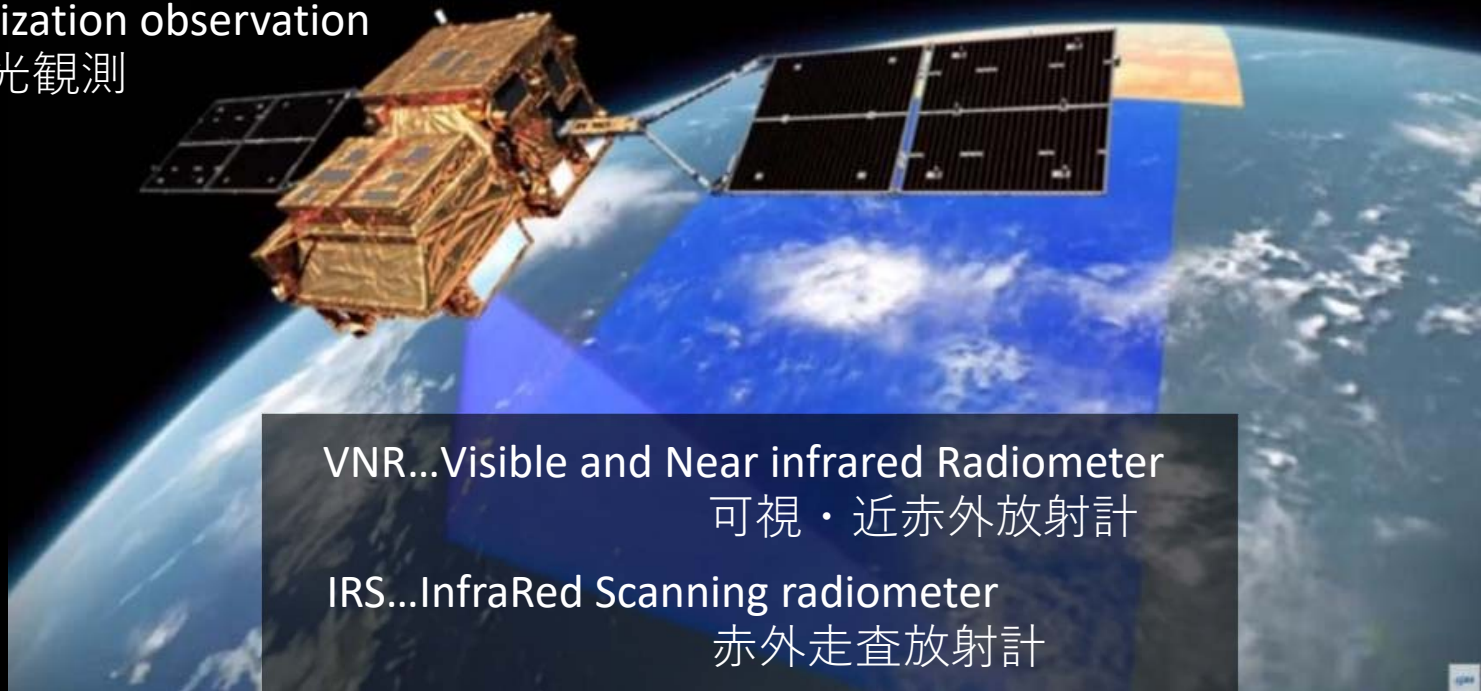
## しきさい衛星の紹介

## Introduction of GC0M-C satellite ("SHIKISAI")

- 19 spectral channels: 380nm – 12 $\mu$ m  
観測チャンネル数
- Spatial resolution: 250m – 1km  
空間分解能
- Entire observation: every 2 days  
全球観測
- Polarization observation  
偏光観測

## GC0M-C/SGLI

Second generation GLocal Imager  
Launched on December 23, 2017  
2017年12月23日打ち上げ



VNR...Visible and Near infrared Radiometer  
可視・近赤外放射計

IRS...InfraRed Scanning radiometer  
赤外走査放射計



# 衛星の特徴

## Characteristic of the satellites



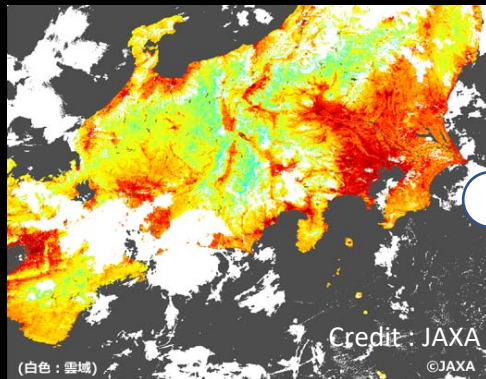
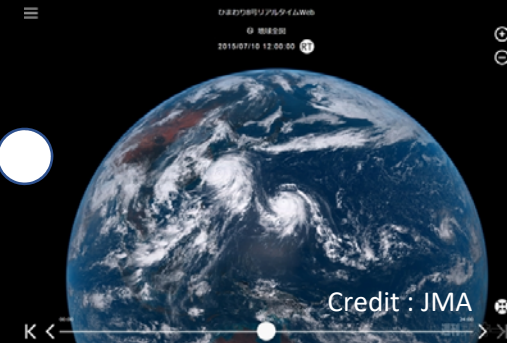
WorldView4

Spatial resolution = 0.31 m (空間分解能)

Himawari 8

Swath width = hemisphere (半球観測可能)

Time resolution = 10 min (時間分解能)



Shikisai (GC0M-C)

Spectral channel = 19 (観測波長数)

Standard product = 29 (物理量プロダクト)

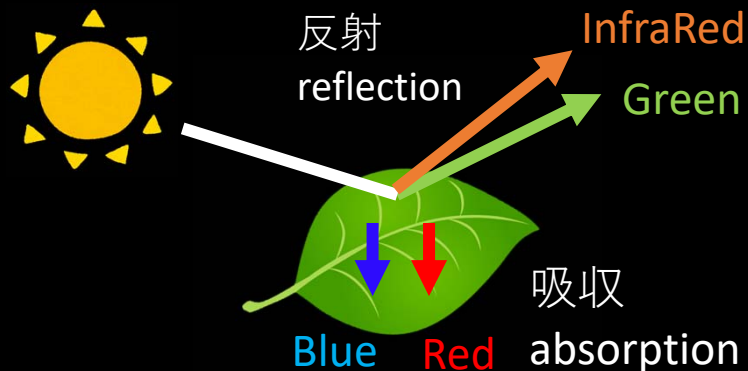
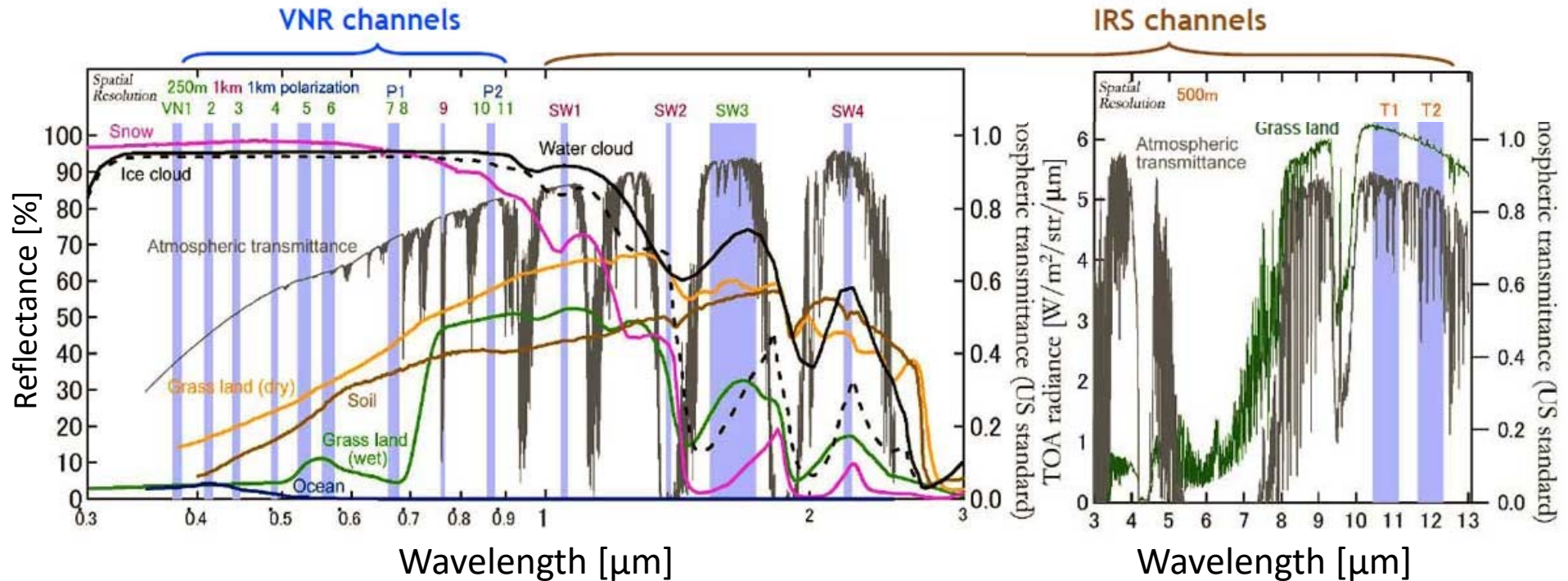


# しきさいの観測波長域 SHIKISAI observation wavelengths



13 channels (2 polarization)

6 channels



$$NDVI = \frac{IR \text{ (赤外)} - R \text{ (赤)}}{IR \text{ (赤外)} + R \text{ (赤)}}$$

正規化植生指数

Normalized Difference Vegetation Index



## 大気：Atmosphere

- ・エアロゾル/Aerosol
- ・雲頂高度  
/Cloud top height
- ・雲種別/Cloud class

## 雪氷：Cryosphere

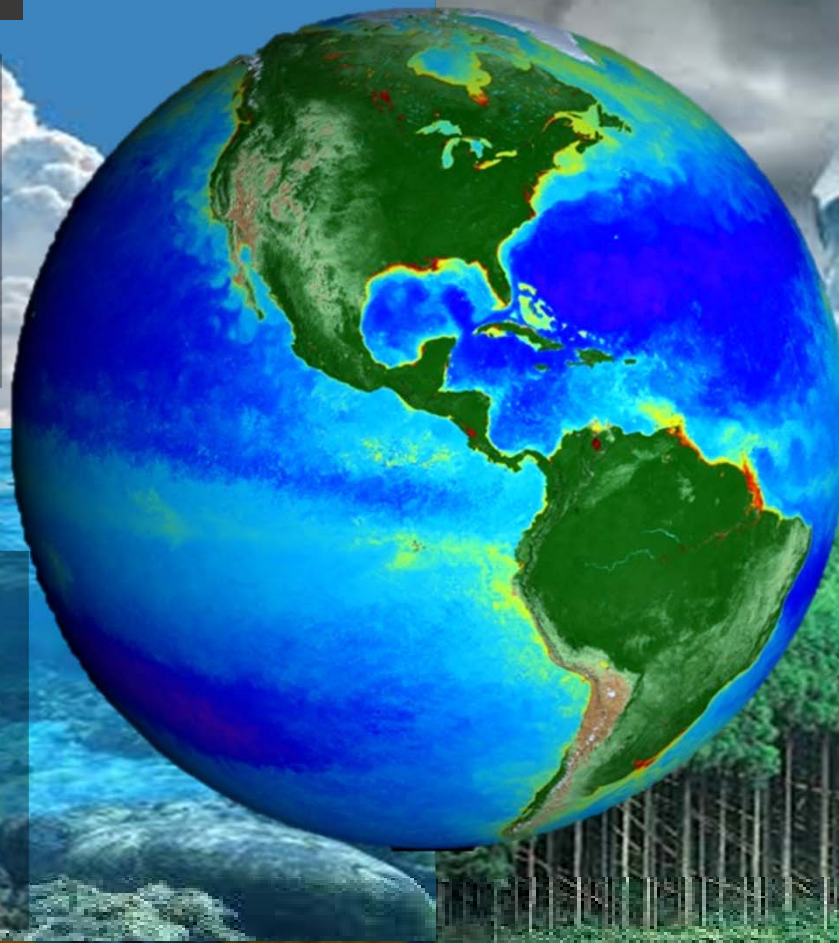
- ・積雪/Snow accumulation
- ・雪粒径  
/Snow particle size
- ・雪温度  
/snow temperature

## 海洋：Ocean

- ・海面温度  
/Sea surface temperature
- ・クロロフィルα  
/Chlorophyll-α
- ・懸濁物質濃度  
/TSM

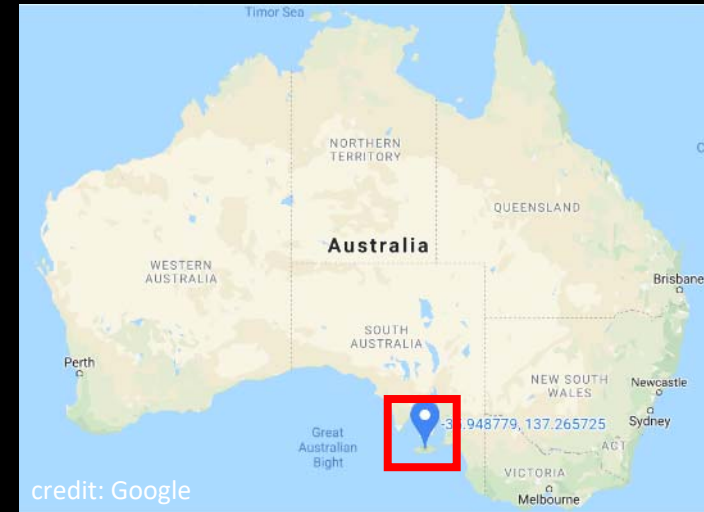
## 陸：Land

- ・植生指数  
/Vegetation index
- ・地表面反射率  
/Surface Reflectance
- ・林野火災/Wild fire





# オーストラリア林野火災 Wildfire in Australia



credit: Google



**RGB images** composed of

- Red: 673.5 nm
- Green: 530 nm
- Blue: 443 nm

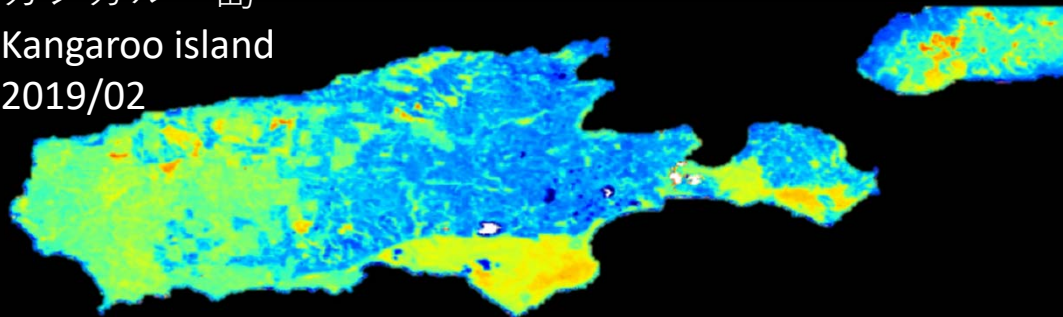


# オーストラリア林野火災 Wildfire in Australia

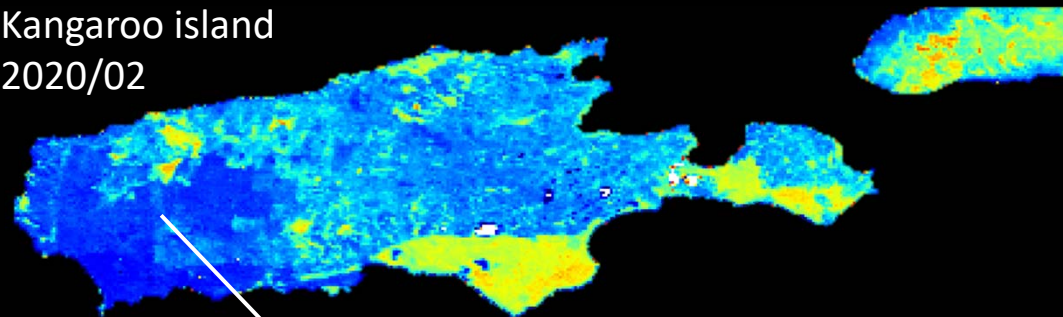
**NDVI = 正規化植生指数**

**NDVI = Normalized Difference Vegetation Index.**

カンガルー島  
Kangaroo island  
2019/02



カンガルー島  
Kangaroo island  
2020/02



Burned area

合計焼失面積は約1400 km<sup>2</sup>と推定

The total burned area can be calculated as ~ 1400 km<sup>2</sup>

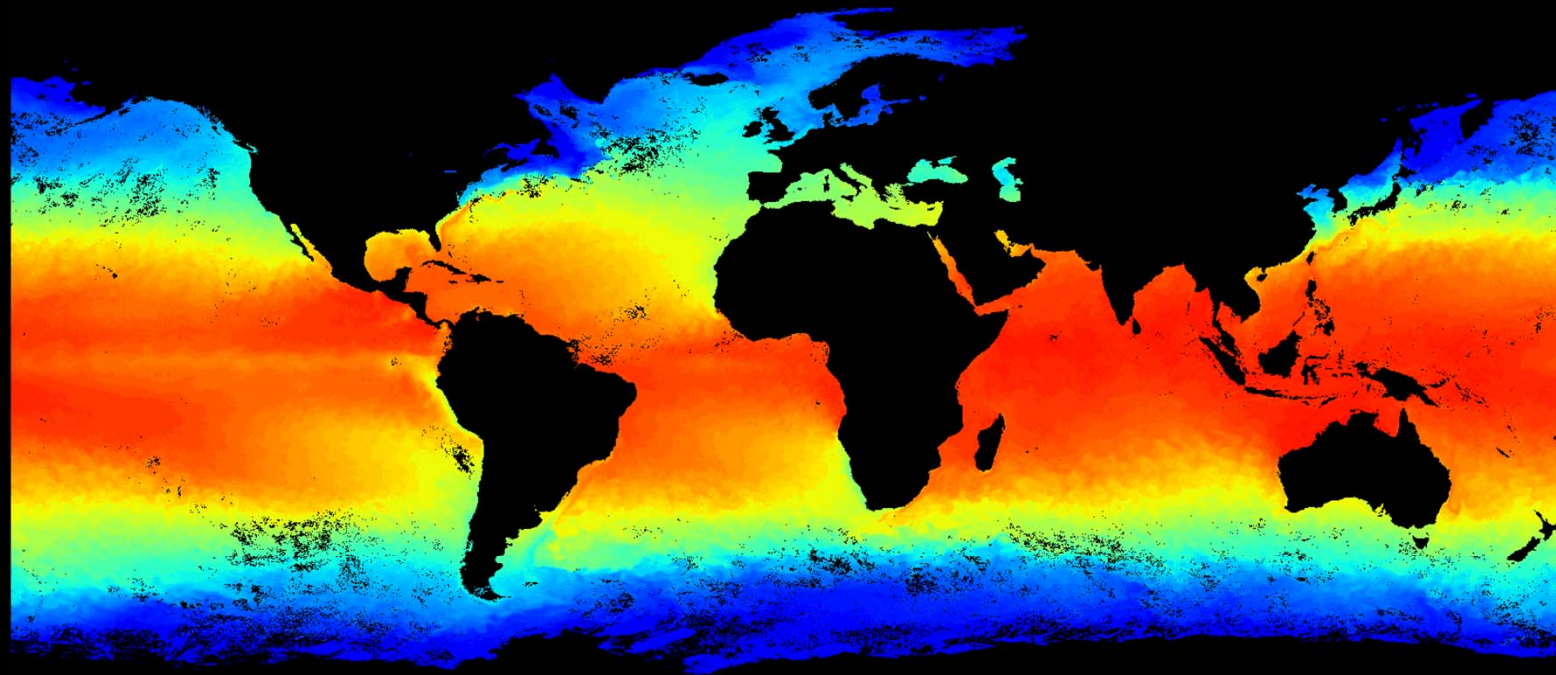


# 海面水温の全球変化

## Variation in sea surface temperature



20180401 SST



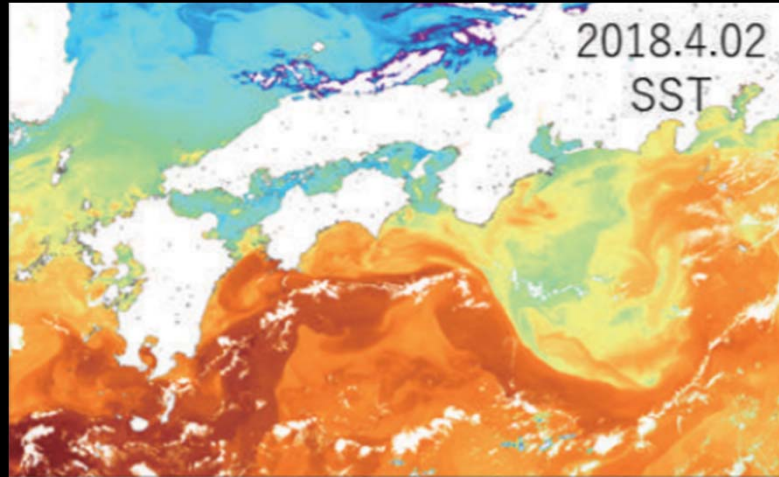
-5 0 5 10 15 20 25 30 35

海面水温 Sea Surface Temperature [deg.C]

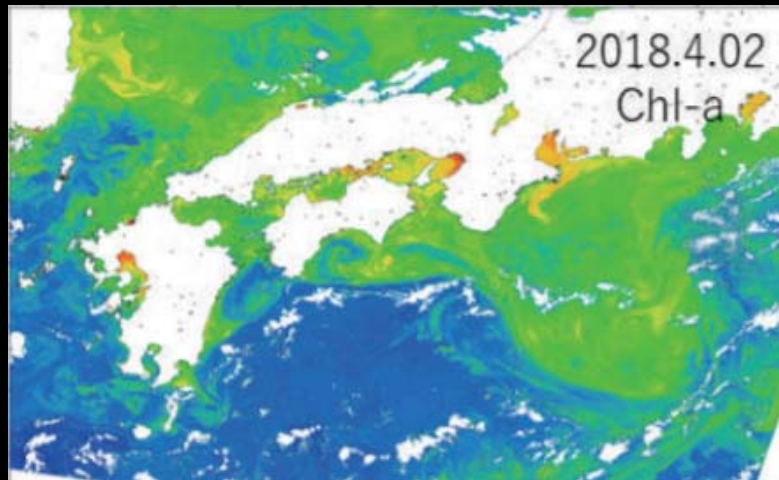




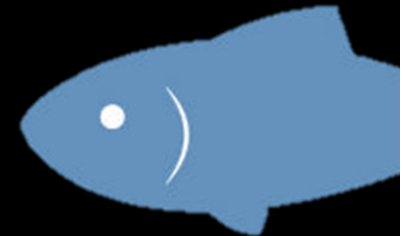
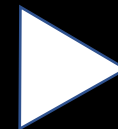
# 日本近海における海面水温 & クロロフィルα SST & Chlorophyll-a around Japan



海面水温 Sea surface temperature



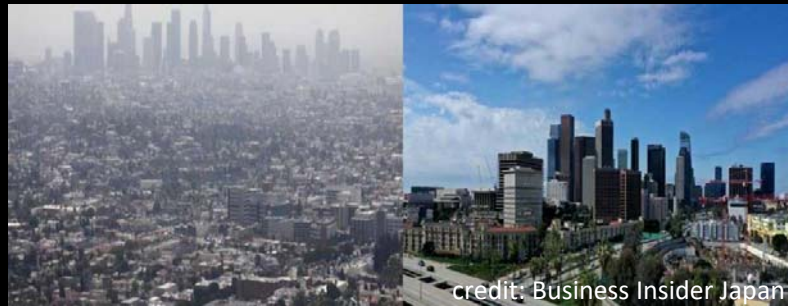
クロロフィルα Chlorophyll - α



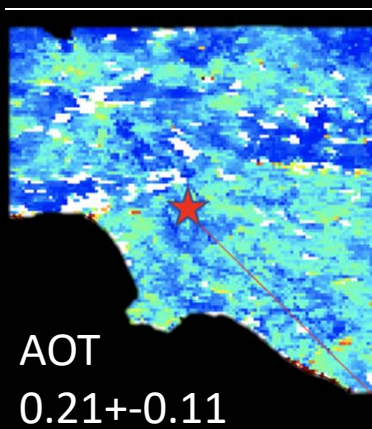


# ロサンゼルス上空におけるエアロゾル濃度変化 Variation in aerosol of Los Angeles

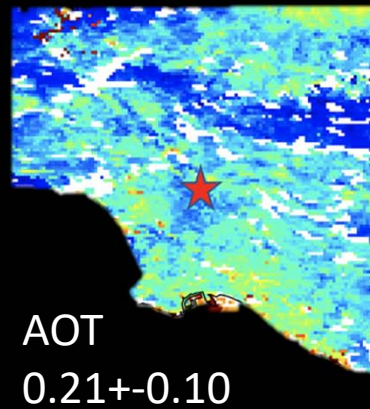
Thick ← エアロゾル光学的厚さ  
Aerosol Optical Thickness → Thin



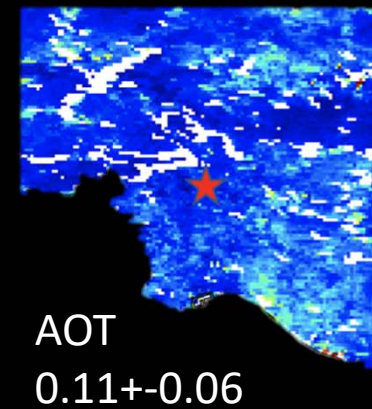
100 km



2018/5/1-10



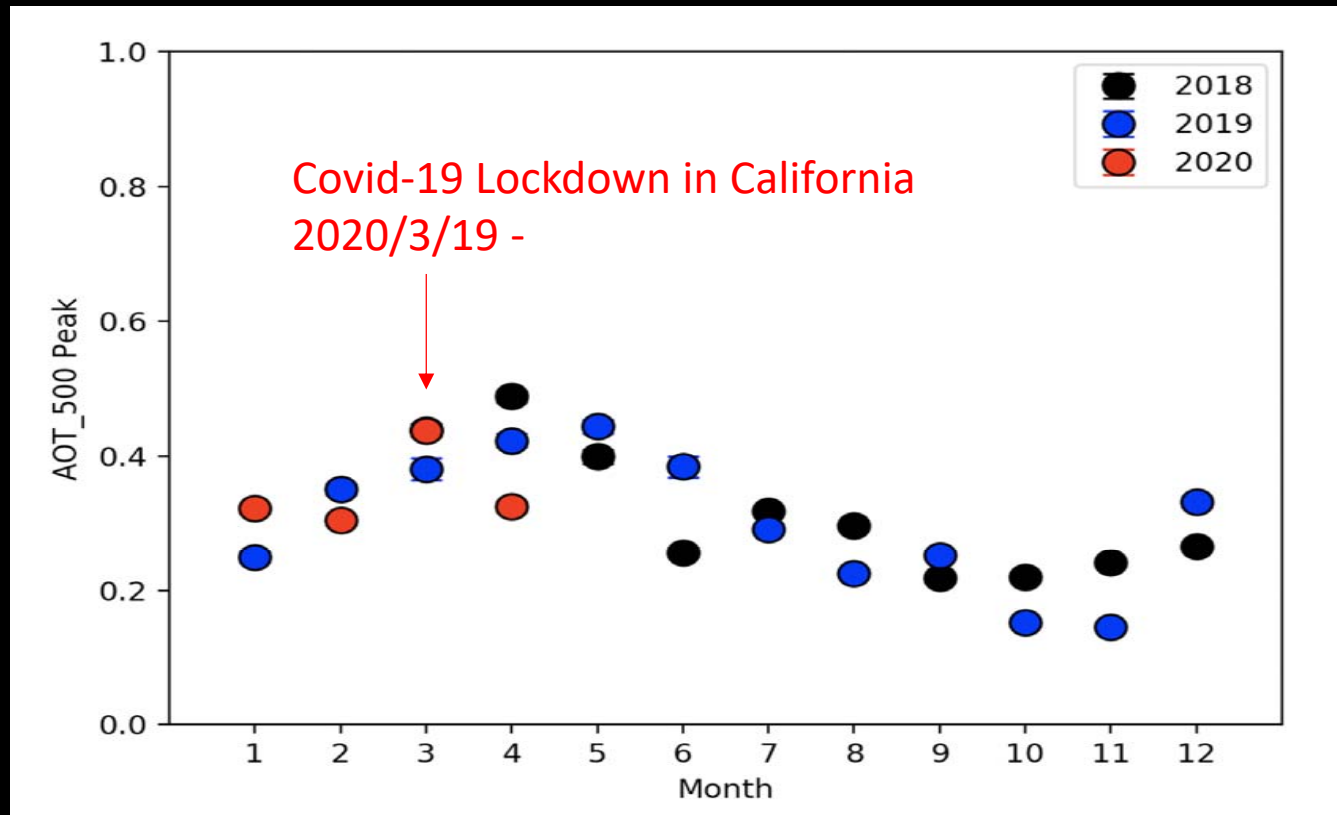
2019/5/1-10



2020/5/1-10



# ロサンゼルス上空におけるエアロゾル濃度変化 Variation in aerosol of Los Angeles



Covid-19が原因でエアロゾル濃度が低下したと断定することは難しい  
It is difficult to identify the origin of the changes in aerosol...

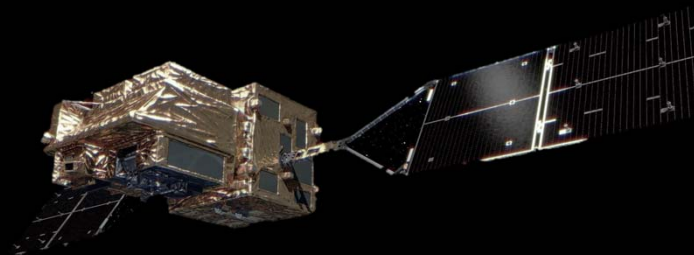
Thank you for your attention.  
Fight with covid-19 using **GCOM-C** satellite!!



Join us

May 30-31, 2020

Tackle COVID-19 using data from NASA,  
ESA, JAXA, CSA, and CNES in this global,  
virtual hackathon!



GCOM-C Ver.2 products will be released in end of June!!  
GCOM-C Ver2プロダクトが2020年6月末にリリース予定!!