Progress Report
GCOM-C

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GCOM-C update

- Successful launch on Dec. 23, 2017
- SGLI First Light on Jan. 1, 2018. → stable operation for 4 years
- SGLI ALL 29 products are in public since Dec. 20, 2018 (Ver.1 release)
- Ver.3 data release on Nov. 29, 2021 as planned

Everything is nominal
as planned.

→ Post routine operation
Phase review is planned
at the end of 2022

GCOM-C Launch
H-IIA rocket F-37
01:26:22 UTC
On Dec. 23, 2017

Japanese name
"SHIKISAI"

Satellite operation in 2021

- Satellite and ground system are stable since launch.

Satellite System	Normal	
TTC-RF, MDHS-RF	Normal	
MDHS-DH	Tentative stop of MDR operation on Nov. 27, 2021	No MDR recording for 16hours Radiation effect is suspected
TTC-DH	Normal	
AOCS, RCS	Normal	
EPS, PDL	Normal	
TCS	Normal	
SGLI VNR	Normal	
SGLI IRS	Normal	Regularly TIR health check for noisy detectors with 3 months interval
Ground System	Normal	Ver.3 release and re-processing

Satellite & ground system information such as products, status and obs. plan is available at “SHIKISAI Portal”. **https://shikisai.jaxa.jp/index_en.html**

SGLI Calibration

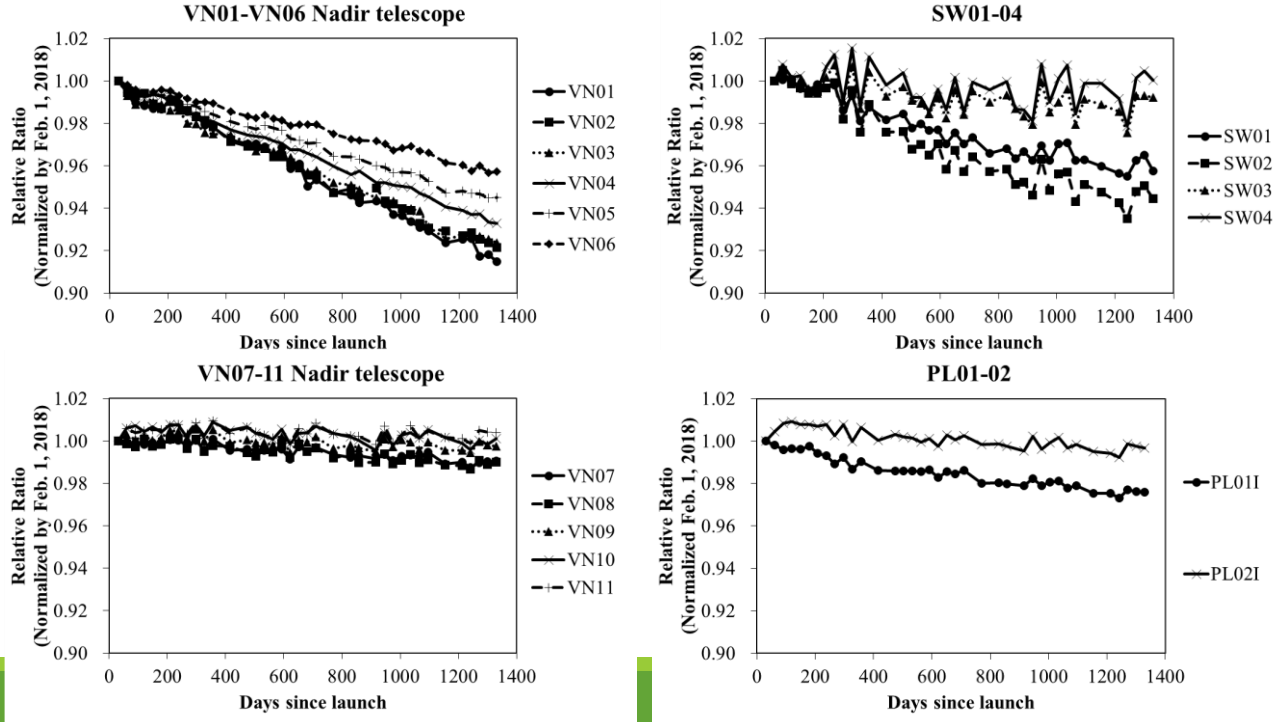
VN & SW Cal. Coefficients is reflected to products since Ver.2 data processing

- Lunar, Solar & LED(& Halogen) Cals are consistent for VNR & SWI.
- TIR is calibrated using black body & deep space in real time, degradation is very small.

$$L_{L1B}(\lambda) = L_{orig}(\lambda) / (1.0 + k_{vt}(\lambda) * D)$$

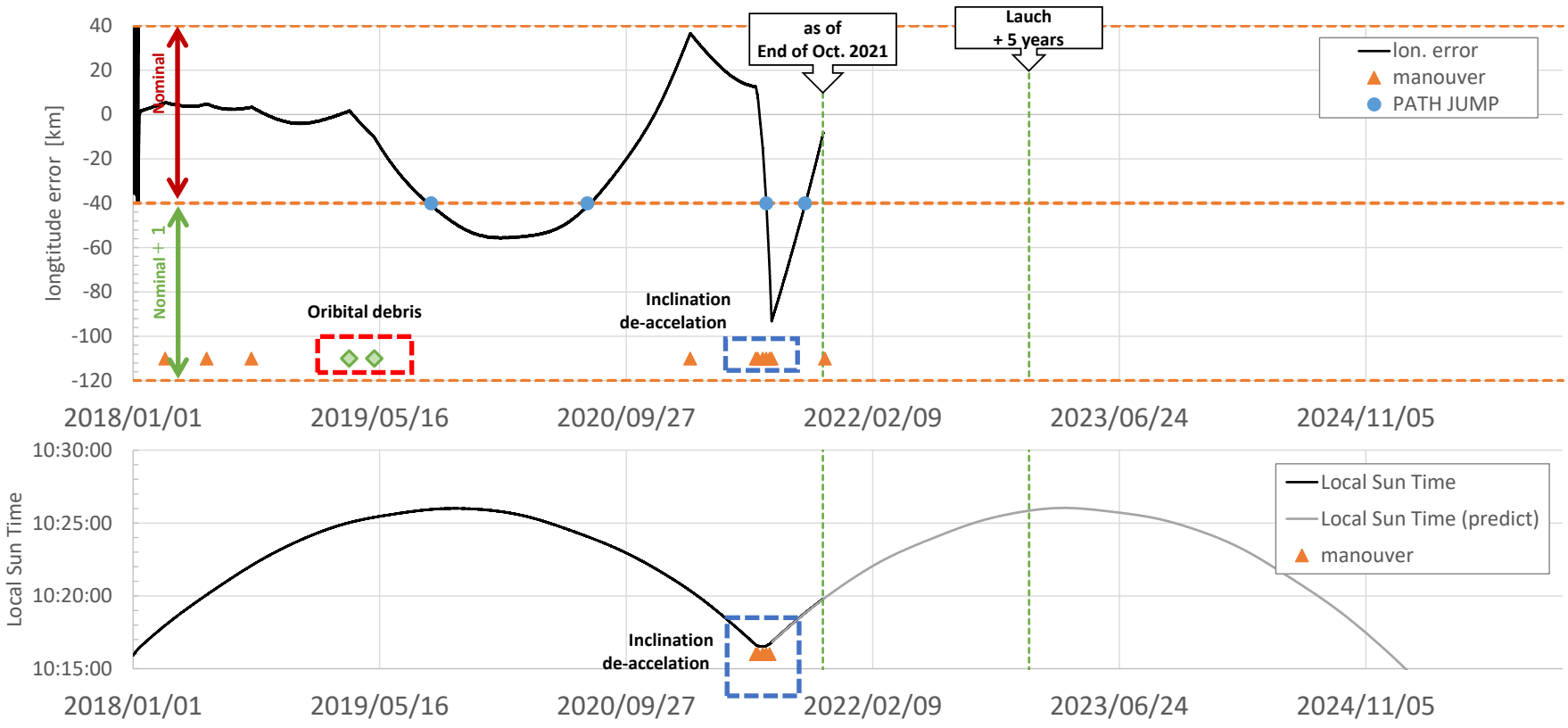
$k_{vt}(\lambda)$: calibration constant from SGLI/GIRO time series comparison

D: days from 00:00 1st Jan. 2018



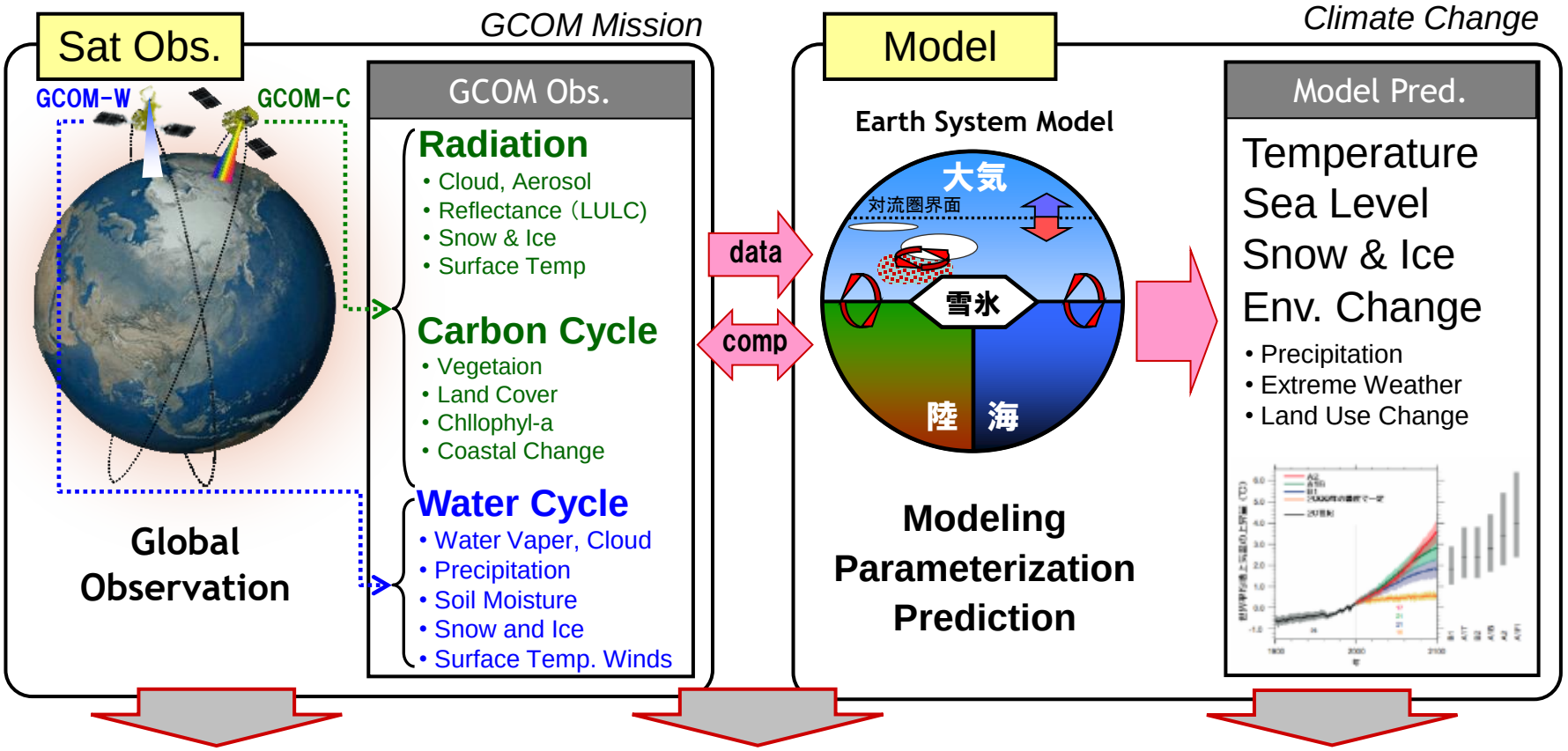
GCOM-C satellite orbit in 2021

- Successful inclination and de-acceleration maneuver to maintain Local Sun Time within 10:15-10:26 frame in June-July 2021.



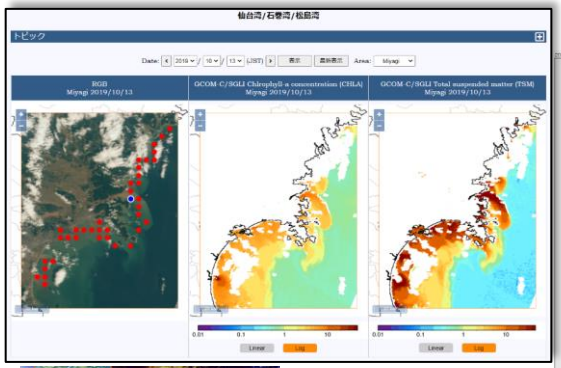
GCOM mission target

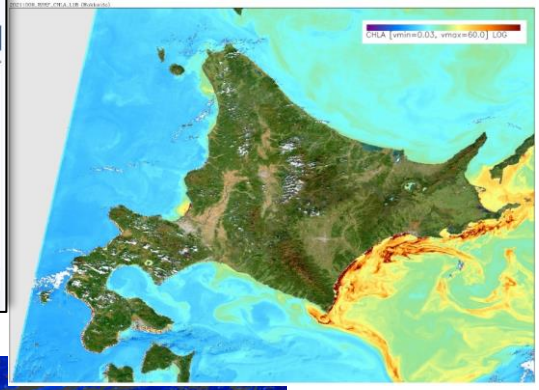
✓ GCOM is long term observation mission aiming over 13 years.

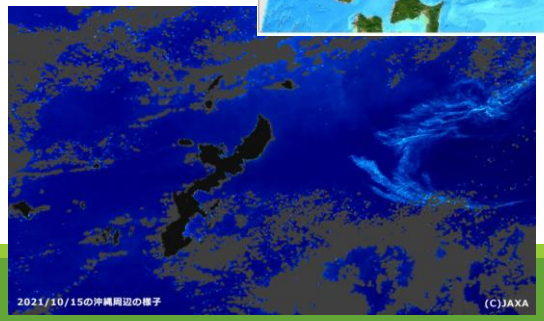


Data Utilization

- GCOM-C data is delivered and utilized in many organizations including local governments and RS data platformers.
- G-Portal, JASMES & SHIKISAI portal sites delivers many practical data, such as sea ice, SST, CHLA, inner bay monitor, floating algae index, volcano … etc.





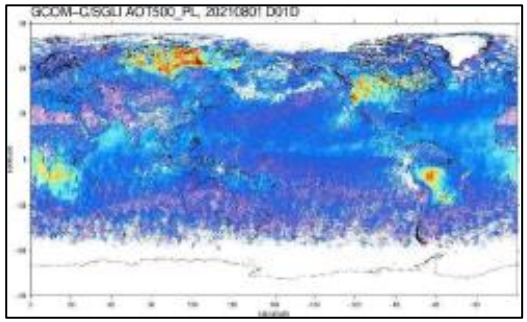


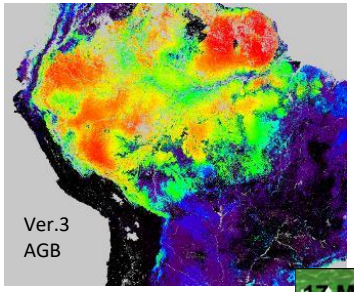
Fishery organizations with GCOM-C monitoring web page.

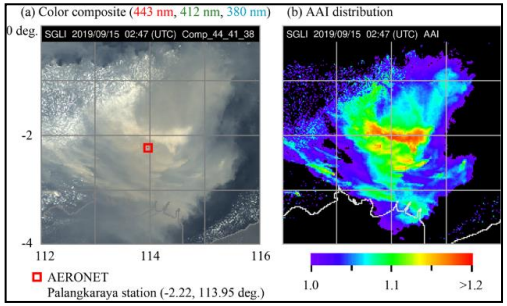
https://shikisai.jaxa.jp/SuisanRiyou/index.html

Env. monitoring & process study

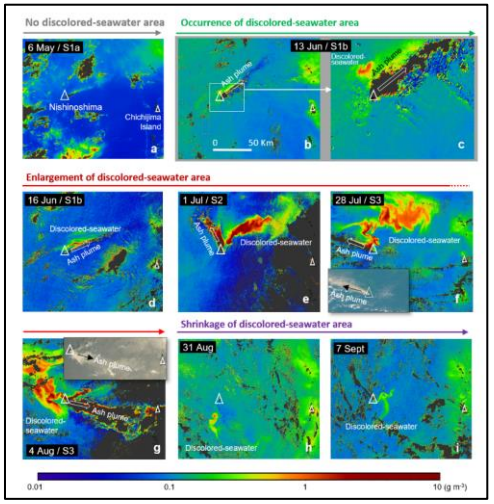
- EORC/RA research framework is successful.
- Many environmental monitoring and process studies using SGLI data has already activated.
- ECVs generation is also considered for IPCC/GCOS contribution.

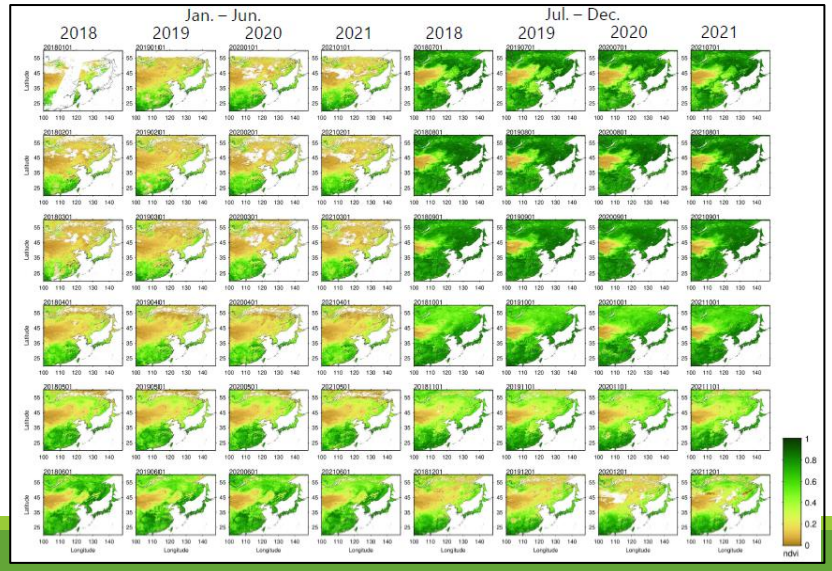


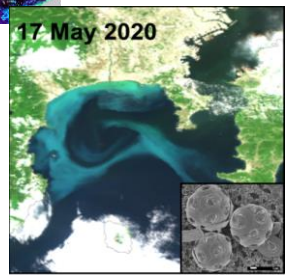


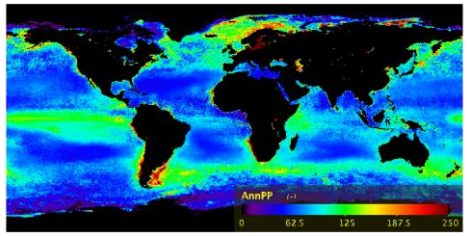


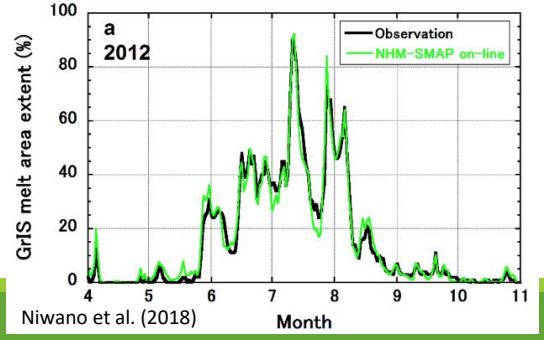
Mukai et al. (2020)



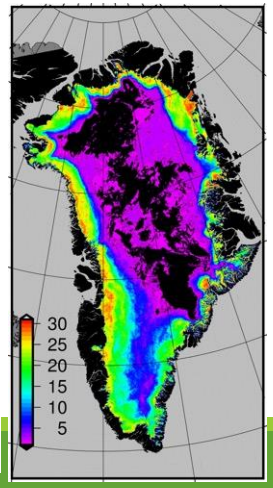








Niwano et al. (2018)



Collaboration between
model research and satellite earth observation

To the next phase, the integrated model research program (TOUGOU) and JAXA earth observation research groups are planning to enhance collaboration to investigate the global warming issues more effectively

Model (TOUGOU, ..)

Satellite (including GCOM-C)

TOUGOU: Integrated research program for advancing climate models

- **Theme A:** Prediction and Projection of Large-Scale Climate Changes Based on Advanced Model Development
- **Theme B:** Sophisticated Earth system model for evaluating emission reductions needed
- **Themes C and D**: Integrated Climate Change Projection and Integrated Hazard Prediction

Collaboration

- **Obs. data analysis**
- **Model evaluation**
- **Parameter constrain by satellite obs.**

JAXA: Satellite product development

- **Aerosol and cloud**: use of SGLI NUV and polarization channels
- **Land vegetation**: temporal change (phenology), and above-ground biomass
- **Ocean phytoplankton**: distribution, types, and primary production
- **Snow/ice**: distribution and albedo

On-going collaborative researches:

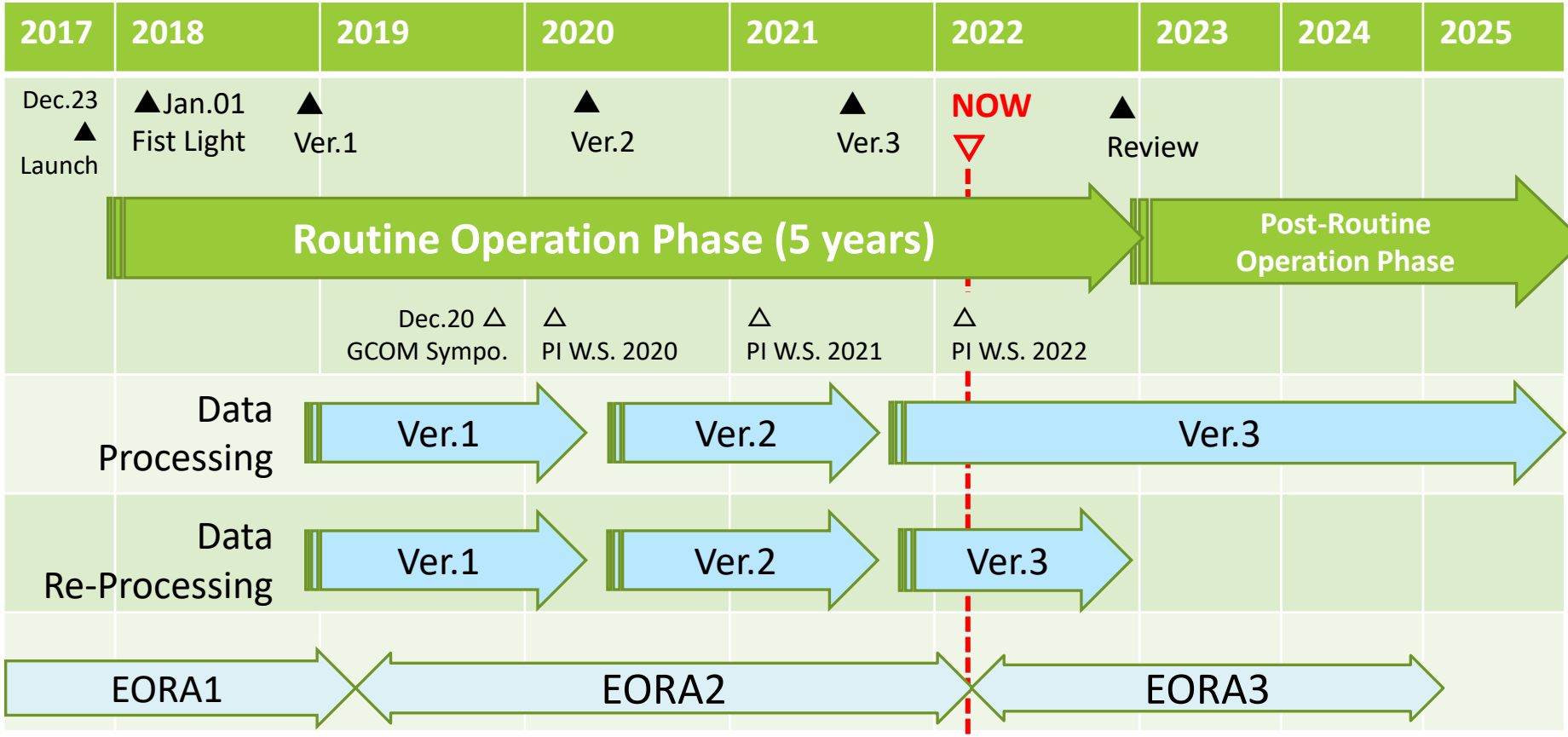
- ✓ Comparison of variables characterizing **the aerosol-cloud system** (EORA2 GCOM-C PI: Suzuki, Tokyo Univ)
- ✓ Seasonal change (phenology) of **land vegetation**; and distribution of **ocean phytoplankton** (EORA2 GCOM-C PI: Tachiiri, JAMSTEC)
- ✓ **Ice sheet** observation and modeling (EORA2 GCOM-C PI: Aoki, NIPR, ArCS II)

To the next phase:

- **Increase collaboration research targets** (e.g., carbon budget, climate sensitivity..)
- **Increase visibility of the collaboration**

Schedule

- Post routine operation phase review is planned at the end of this year



Summary

- GCOM-C satellite and ground system are stable.
- GCOM-C data has been provided to the public continuously since Dec. 20, 2018.
- GCOM-C routine phase operations is 5 years (Dec. 2017 – Dec. 2022)
- GCOM mission is in the execution phase
- Encouragement to the practical use for the social benefits.
- Encouragement to the env. monitoring, process study and climate model research for GCOM mission.

Thank you

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https://shikisai.jaxa.jp/index_en.html