



Committee on Earth Observation Satellites

# GHR SST Connections with CEOS: The SST-VC

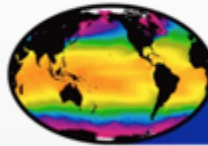
Kenneth S. Casey, NOAA, and Anne O'Carroll,  
EUMETSAT, on behalf of the SST-VC

GHR SST-20  
Frascati, Italy  
June 2019

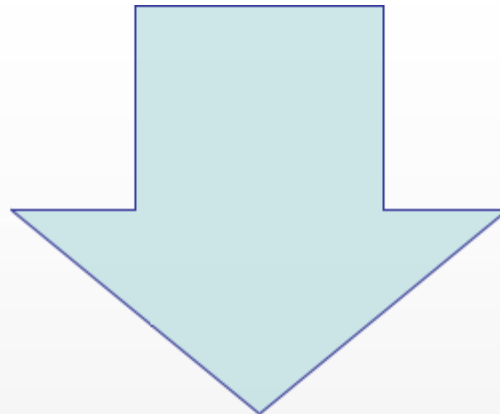




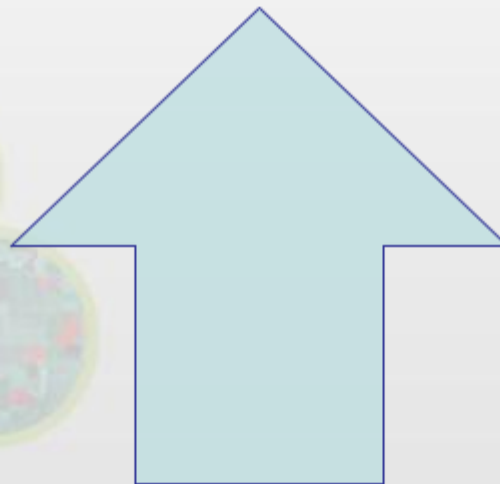
= The Committee on  
Earth Observing Satellites, the  
international coordinating group  
for earth-observing agencies.

**GHR SST***Group for High Resolution  
Sea Surface Temperature*

= The Group for  
High Resolution SST, the  
international coordinating group  
for SST.



Where these two meet = the  
CEOS SST Virtual Constellation





- **The current membership comprises: NOAA, EUMETSAT, ESA, CSIRO, SANSA, ISRO, CMA, KMA, JAXA, UKSA and NASA**
- **The whole team is active and focused with regard to discussions / meetings / year-round contributions,**
- **ESA, EUMETSAT, JAXA, NOAA and NASA are all active in submitting GHR SST-compliant data through the R/GTS data sharing framework**
- **The team meets once a year alongside the annual GHR SST science team meeting**



- **SST Constellation Whitepaper**

- Next generation SST constellation, including on-orbit assets, measurement methods (MW and IR, Geo and Polar), fiducial reference measurements, and data management systems
- Final draft in preparation with publication planned in 2019
- Finalization delayed due to change in position of key contributor and preparation for OceanObs '19 community white papers
- Writing task assignments completed over the last year
- Final figures in progress

- **Passive Microwave Radiometer Continuity**

- See bonus slides for details
- SST-VC advocacy supported the work and progress of JAXA and Copernicus towards PMW capability for SST. Both AMSR2 follow-on and CIMR have planned launches in 2022-2025 timeframe. The two missions are highly complementary and would provide an unprecedented coverage and revisit of the global ocean and high latitude sea ice conditions





- **Community White paper for OceanObs '19, "Observational needs of Sea Surface Temperature"**
- **96 standardized GHRST products**, spanning 7.21 million CF/ACDD netCDF data files, 161 TB, from Sep 1981 – May 2019
- **Progress on Regional/Global Task Sharing (R/GTS) framework, with ongoing pilot leading toward federated system (bonus slide)**
- **Updated fly-out charts and continued PMW advocacy (bonus slides)**



- **CEOS Leadership has proposed a merger of the ocean virtual constellations**
  - SST-VC
  - Ocean Color Radiometry
  - Ocean Surface Vector Winds
  - Altimetry
- **Participation in CEOS by the other VCs has been weak lately, and combining the ocean VCs into one would make it more similar to the terrestrial domain, which has one Land Surface Imaging VC**
- **A study group has been commissioned and will report back at the next CEOS meeting, this September in Alaska**
- **This potential merger will be a key discussion point this week at the SST-VC meeting, and we welcome all input**



Thank-you! Questions?

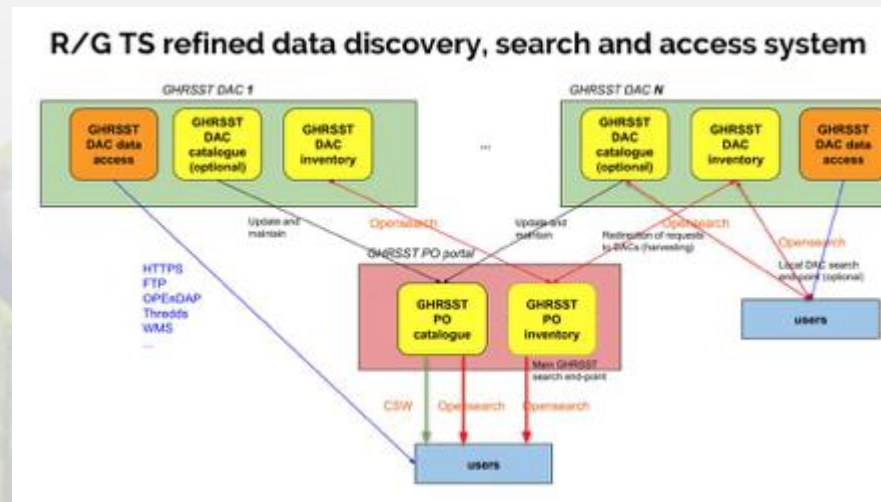


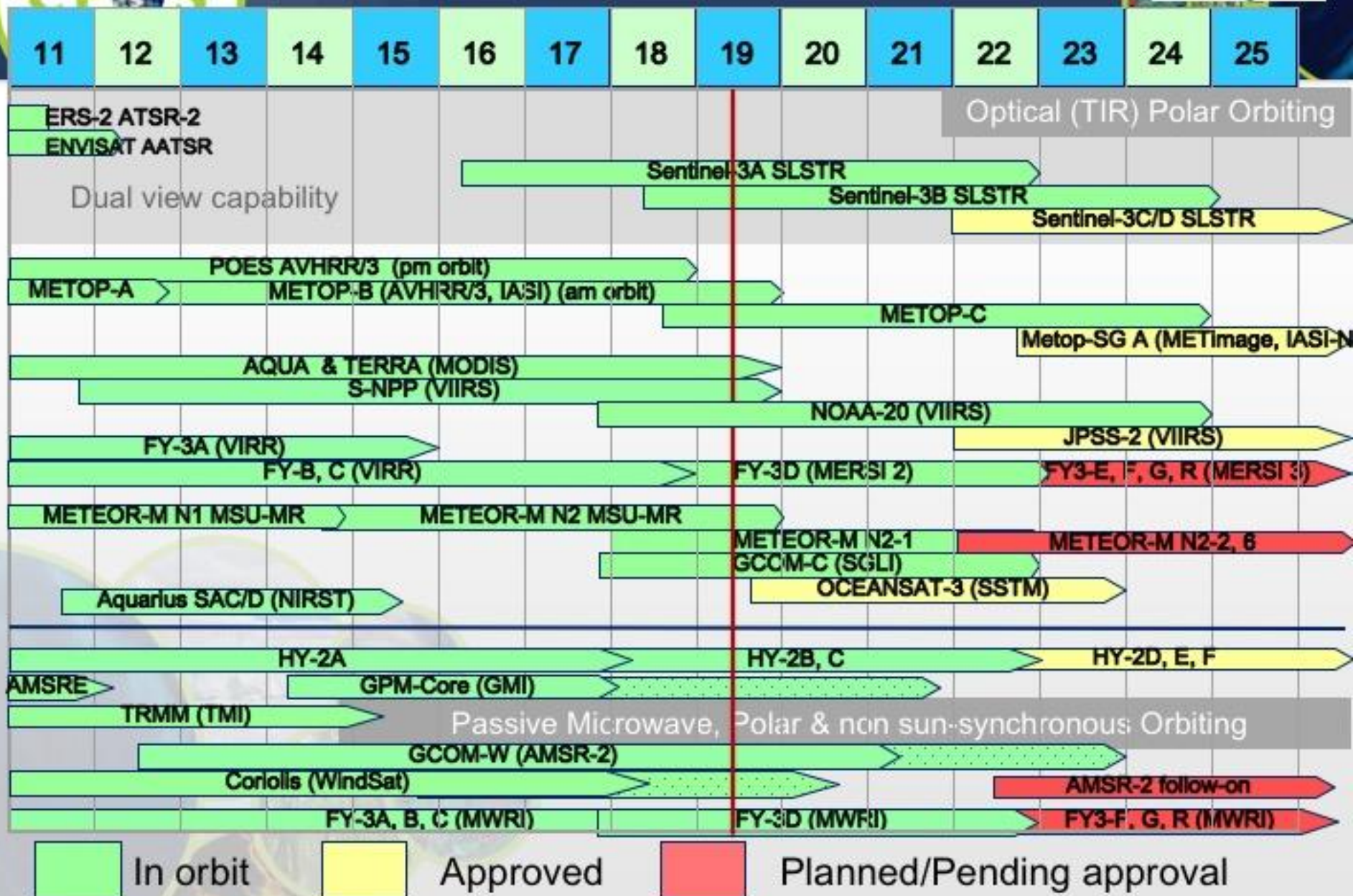


## Bonus Material

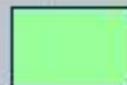
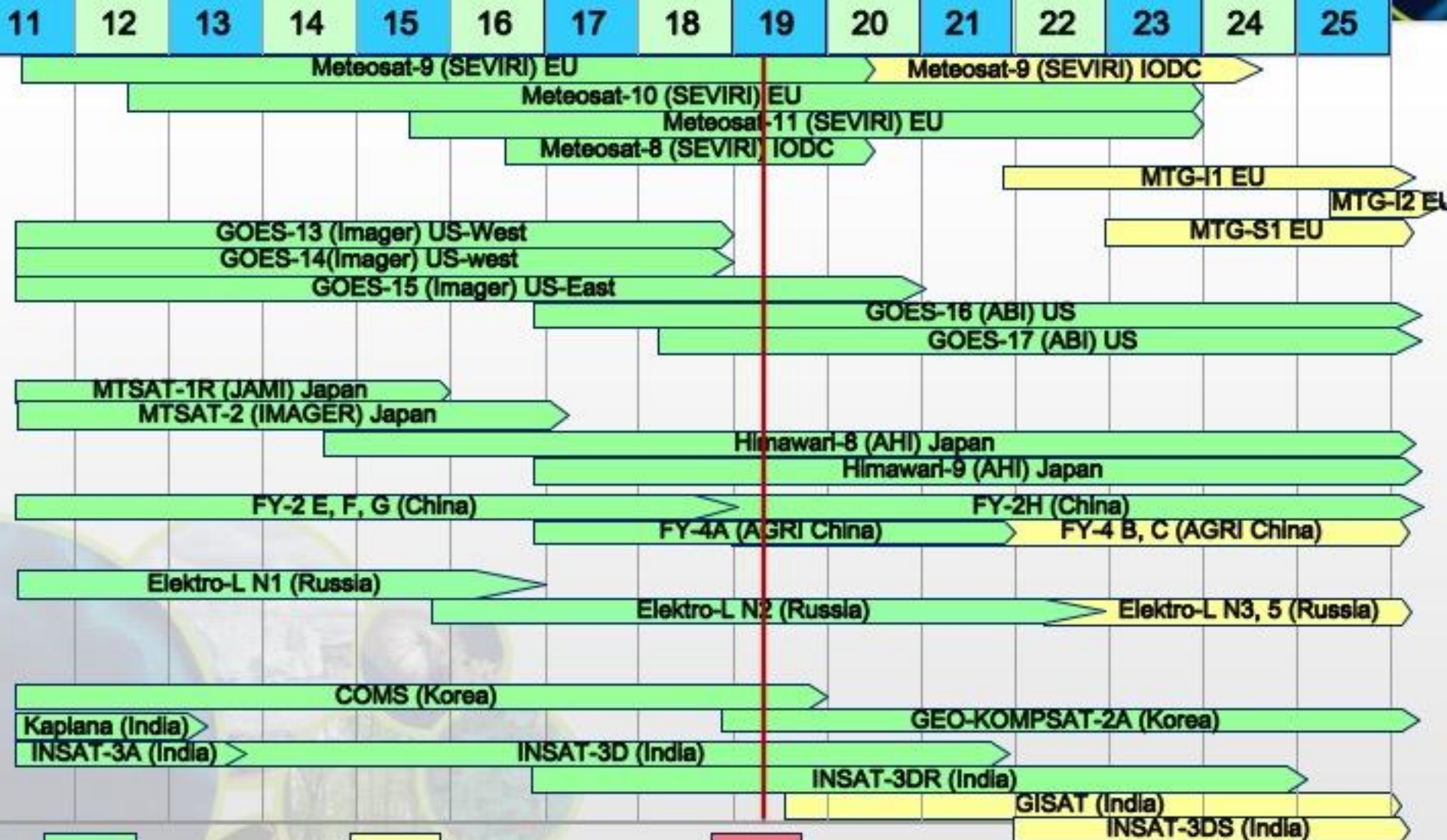


- GHRSSST Regional/Global task sharing (R/GTS) framework evolution continues, toward implementation of a federated distribution architecture
- Draft report on R/GTS evolution prepared and ready for final consolidation with the GHRSSST science team in June 2019
- Pilot phase in progress, demonstrating federated catalog at IFREMER capable of consolidating discovery from NASA and NOAA
- Implementation phase to follow in 2020

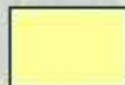








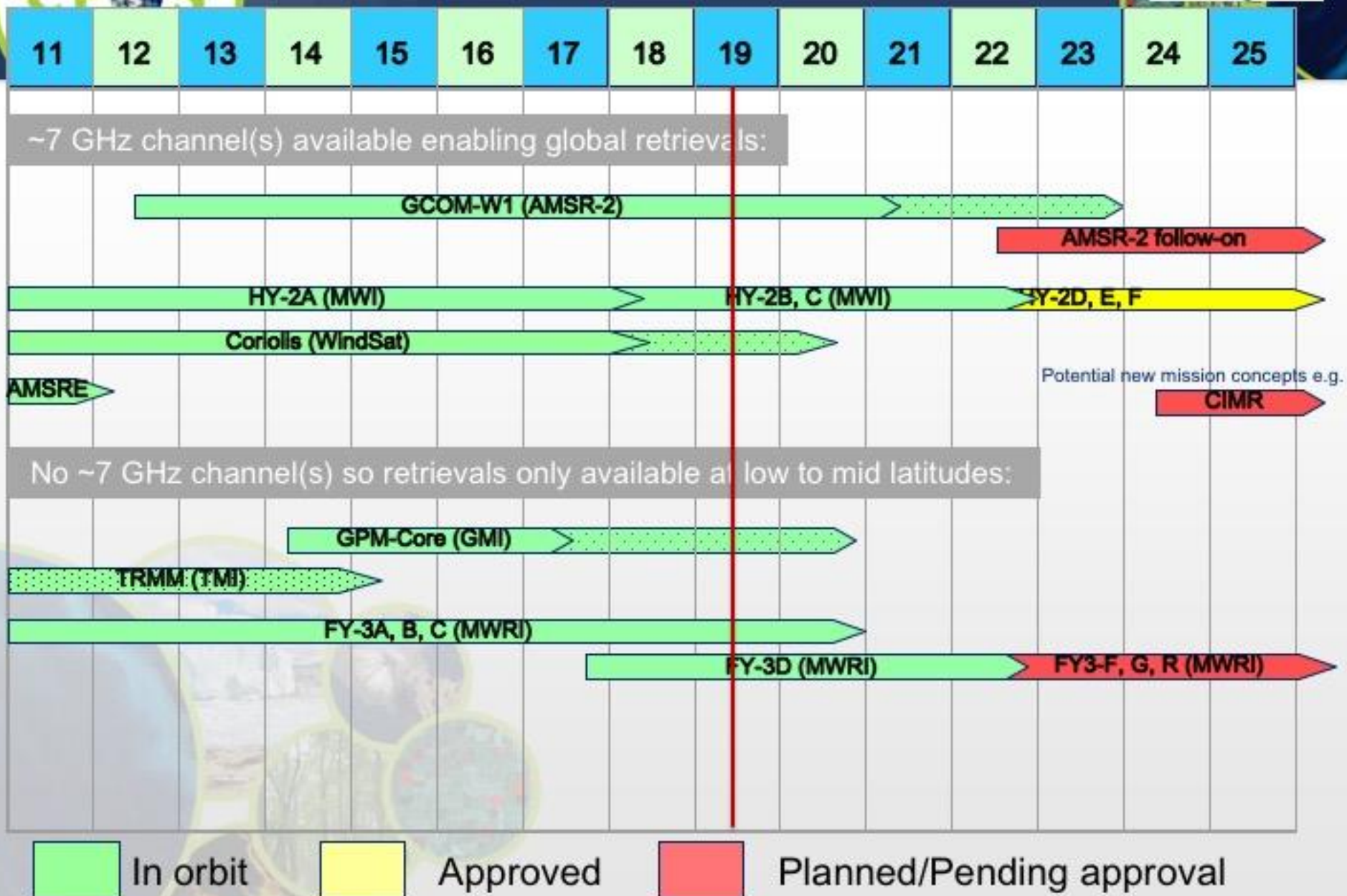
In orbit



Approved



Planned/Pending approval





# Continued PMW Advocacy

## AMSR-3 Status

- From JAXA: (as of April 2019)
  - AMSR3, the AMSR2 follow-on sensor for GOSAT-3, in the pre-project phase (Phase A) since Sep. 2018
  - JAXA just completed the System Requirement Review in January 2019
  - System Definition Review and Project Approval Review to be held in autumn 2019.
  - AMSR3 expected to become "official" after approval by the Project Approval Review
  - Orbit of the satellite will be 666 km altitude (same as GOSAT-1) and 13:30 LT in Ascending node (same as GCOM-W)
  - AMSR3 is almost equivalent to the current AMSR2 (antenna size, channels) except it has additional higher frequency channels of 166 and 183 GHz for snowfall retrievals

# Continued PMW Advocacy

## CIMR Status



From ESA: (as of April 2019)

Starting from prioritised user needs managed by the European Commission, a Copernicus Imaging Microwave Radiometer (CIMR) candidate mission is under study by the European Space Agency. CIMR will uniquely observe a wide range of floating sea ice parameters, sea surface temperature, thin sea ice thickness, snow products, sea surface salinity, surface roughness and wind speed with 95% global coverage every day and priority over the polar oceans. The mission will provide high spatial resolution (4-15 km), temporal resolution (sub-daily) and excellent geophysical accuracy. Additional measurement and other parameters (eg. soil moisture, precipitation) having global coverage may also be included. The CIMR mission will carry a wide-swath (>1900 km) conically scanning multi-frequency microwave radiometer. CIMR measurements will be made over a forward scan arc followed ~260 seconds later by a second measurement over a backward scan arc. Full Stokes vector channels centered at 1.414, 6.925, 10.65, 18.7 and 36.5 GHz are included in the mission design. The real-aperture resolution of the 6.925/10.65 GHz channels is <15 km and 5.5/4 km for the 18.7/36.5 GHz channels respectively. The 1.414 GHz channel will have a real-aperture resolution of ~60 km (fundamentally limited by the size of the ~8m deployable mesh reflector). However, all channels will be oversampled allowing gridded products to be generated at much better spatial resolution. Channel NEdT is 0.2-0.8 K with a goal absolute radiometric accuracy of 0.5K. CIMR will fly in a dawn-dusk orbit providing ~95% global all weather coverage every day with one satellite and complete (no hole-at -the-pole) sub-daily coverage of the polar regions. CIMR will operate in synergy with the EUMETSAT MetOp-SG(B) mission so that over the polar regions (>60N and 60S) collocated and contemporaneous measurements between CIMR and MetOp MWI/ICI and SCA measurements will be available within +/-10 minutes. Two satellites are foreseen to be launched in succession with the first launch anticipated in 2027/28 with sustained operations until 2037. The mission Phase A has been successfully completed in early 2019 and the Phase B1 activities are now in progress. Performance budgets presented at the preliminary Requirements Review (PRR) are consistent with the mission objectives and the wide set of products specified to address Mission Requirements (see Mission Requirements Document at <http://cimr.eu>). A Phase B2 is now being planned with an expected kick off in 2020.