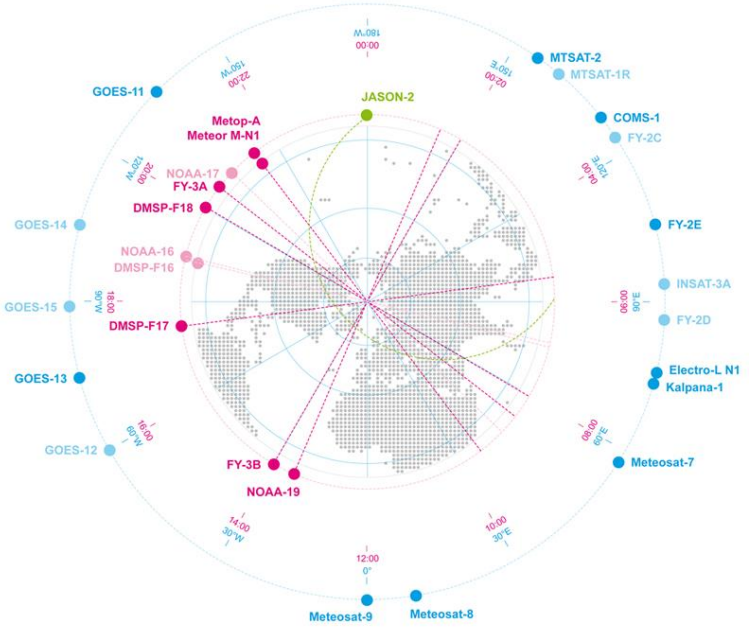

NASA Report on Current & Future Satellite Systems

Presented to CGMS-49 Plenary Session, Agency Interventions/Reports, Agenda Item 2

Presenter: Jack Kaye, NASA Headquarters

Report prepared based on inputs from numerous colleagues at NASA HQ, NASA Centers, and the broader research community

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REPORT OUTLINE

Executive Summary

Section 1: Introduction

Section 2: Currently Operating Satellite Systems

Section 3: Operating Status Updates of Satellite Systems

Section 4: Status Updates of Satellite Systems Operating in Highly Elliptical Orbit

Section 5: Status Updates of Research and Development Satellite Systems

Section 6: Future Satellite Systems

Section 7: Additional Topics of Interest to CGMS Members

EXECUTIVE SUMMARY

The National Aeronautics and Space Administration (NASA) continues to provide operational support for twenty-two Earth-observing satellites. Guided in its efforts by the recommendations of the decadal survey, Thriving on our Changing Planet, NASA's Earth Science Division (ESD) continues to execute a balanced and robust program of technology development, research, and applications.

The highlight of last year was launch of the **joint U.S.-European satellite, Sentinel-6 Michael Freilich**. Named in honor of former director of NASA's Earth Science Division, Michael Freilich, who was a pioneer in oceanography from space, Sentinel-6 Michael Freilich is the first of two identical satellites in the Copernicus Sentinel-6/Jason CS (Continuity of Service) mission that will continue the uninterrupted collection of sea level measurements that began in 1992.

The **RainCube mission** provided the first-ever demonstration of pulse compression applied to a spaceborne precipitation radar, which is needed to achieve high sensitivity and resolution without high-power amplifiers.

In May 2021, NASA will initiate **Pre-Phase A activities that address four out of the five Designated Observables** prioritized by the 2017 Earth Science Decadal Survey. This transition authorizes NASA centers to establish project offices to further define the mission concepts, execute trade studies related to architecture(s) identified during the DO studies, and continue to develop opportunities for collaboration with international partners.

The **Decadal Survey Incubation Study** Teams completed white papers to inform strategy and decisions related to release of a research solicitation in 2021, which will accelerate the readiness of cost-effective flight implementation of Planetary Boundary Layer and Surface Topography and Vegetation targeted observables.

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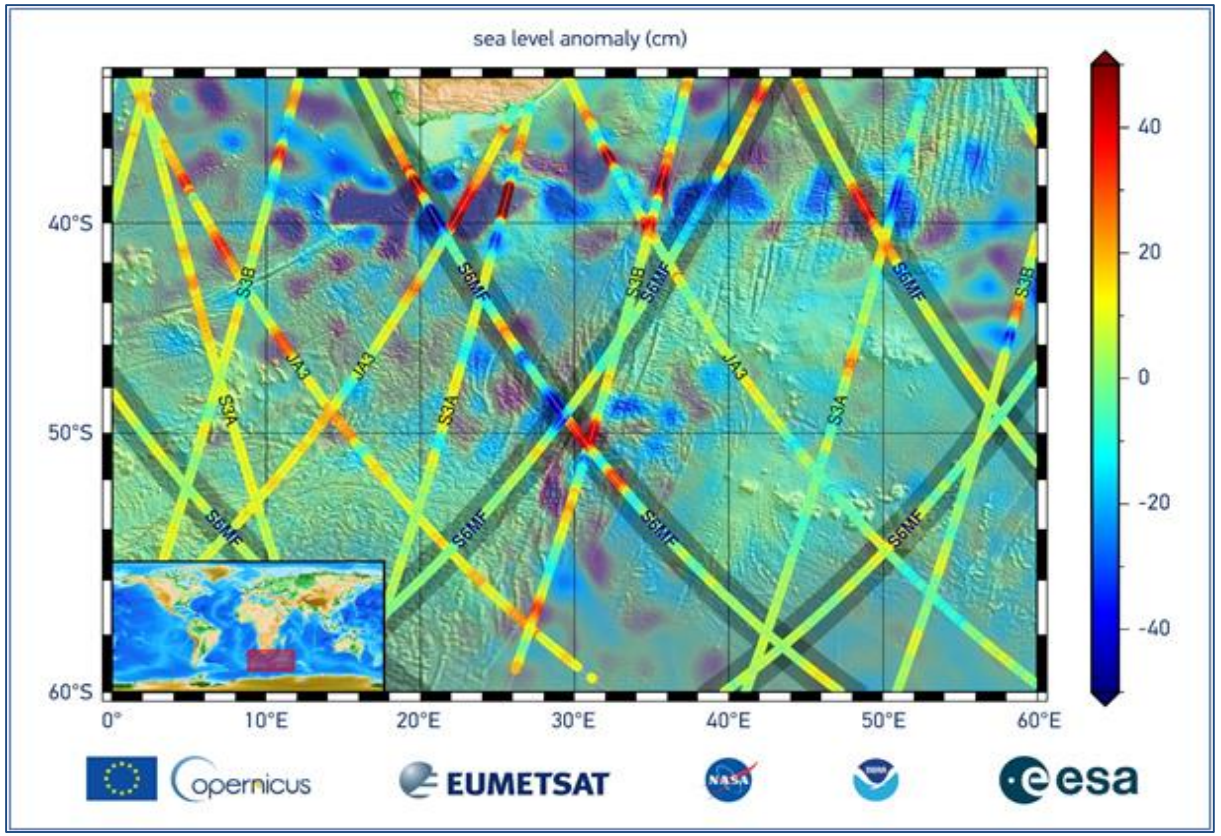
Sentinel-6 Michael Freilich (S6MF) Launched Nov 21, 2020

S6MF launches from Vandenberg Air Force Base.

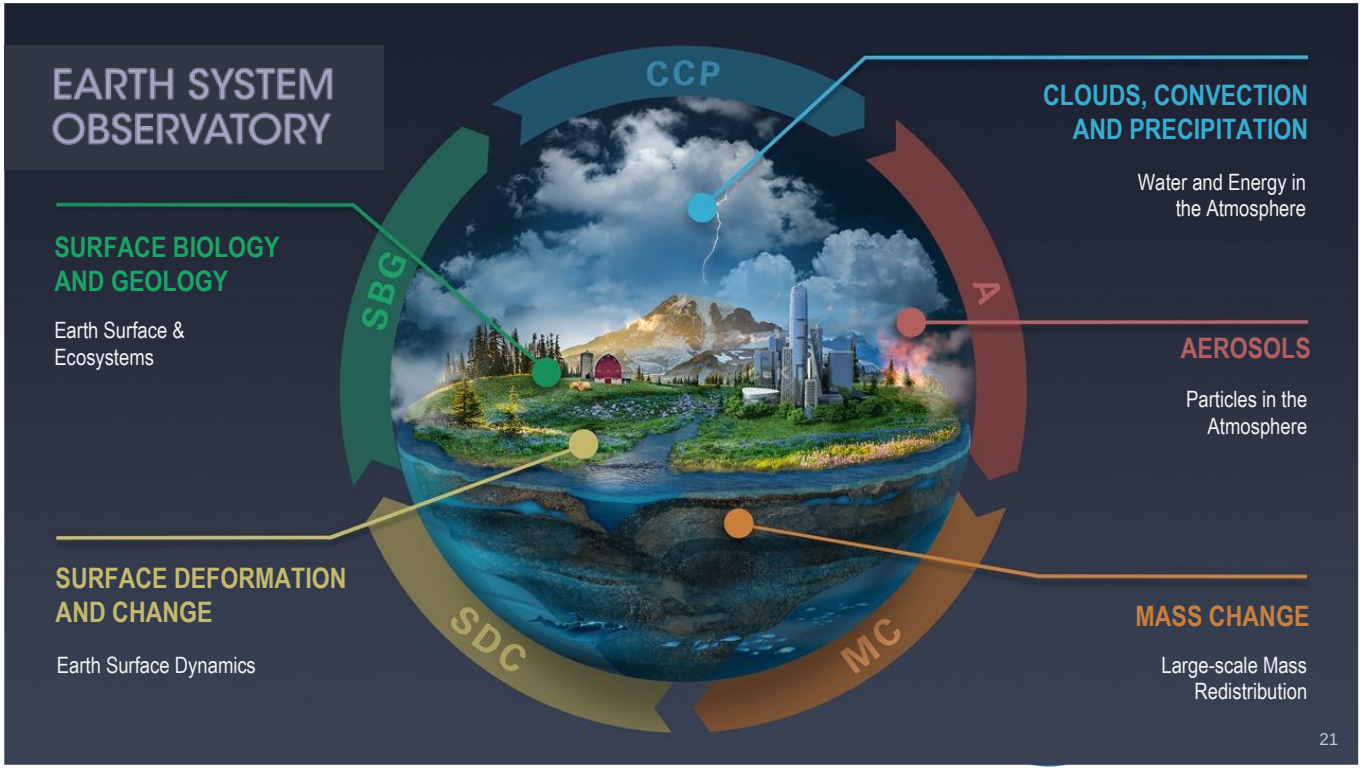


First sea surface height measurements from the S6MF satellite off the southern tip of Africa, as compared with other ocean altimetry missions and underlying historical reference sea level anomaly measurements.

Red and purple colors indicate higher sea level anomalies relative to blue areas, which are lower.

Future Missions – Decadal Survey

In May 2021, NASA will initiate Pre-Phase A activities that address four out of the five ***Designated Observables (DO)*** prioritized by the 2017 Earth Science Decadal Survey. This transition authorizes NASA centers to establish project offices to further define the mission concepts, execute trade studies related to architecture(s) identified during the DO studies, and continue to develop opportunities for collaboration with international partners.



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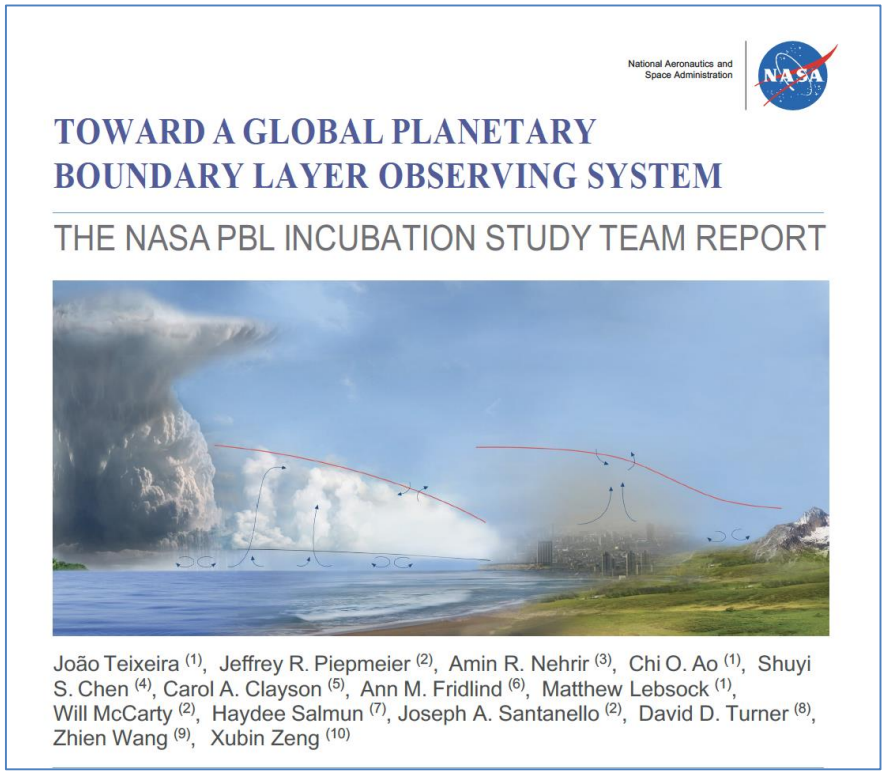
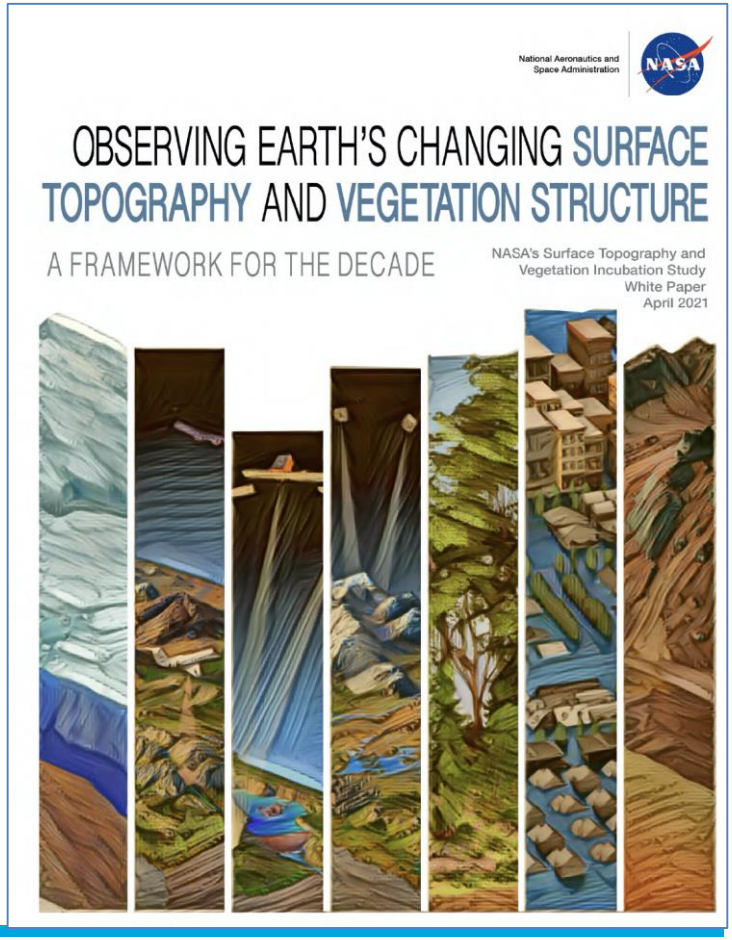
Future Missions – Incubation

The Decadal Survey ***Incubation*** Study Teams completed white papers to inform strategy and decisions related to release of a research solicitation in 2021, which will accelerate the readiness of cost-effective flight implementation of Planetary Boundary Layer and Surface Topography and Vegetation Targeted Observables.





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Next Launch: Landsat 9

Designed and operated to repeatedly observe the global land surface at a moderate scale that shows both natural and human-induced change. (with USGS)

Launch ready by November 2021.

Landsat 9 removal from TVac chamber in April 2021 after successful tests.

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