

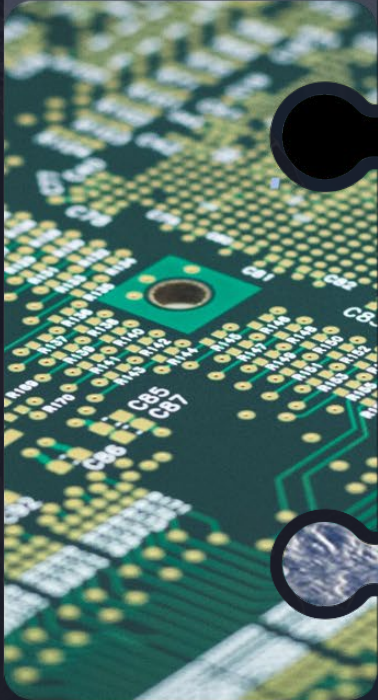


Earth System Explorers: A Critical Role for NASA's Earth Science Division

Dr. Julie A. Robinson
Deputy Director, Earth Science Division
NASA Science Mission Directorate
May 22, 2023

Advancing Earth System Science End-to-End

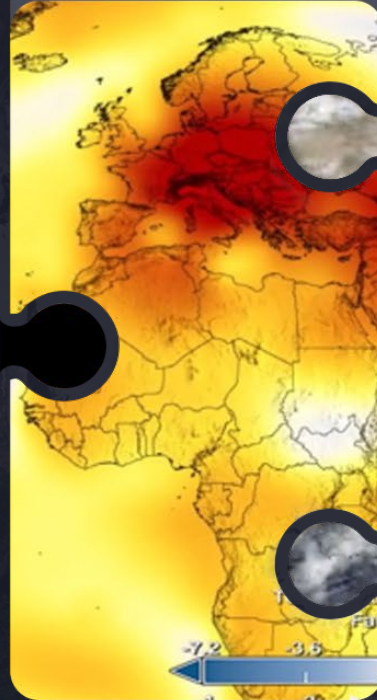
TECHNOLOGY



FLIGHT



RESEARCH
AND ANALYSIS



DATA
AND COMPUTE

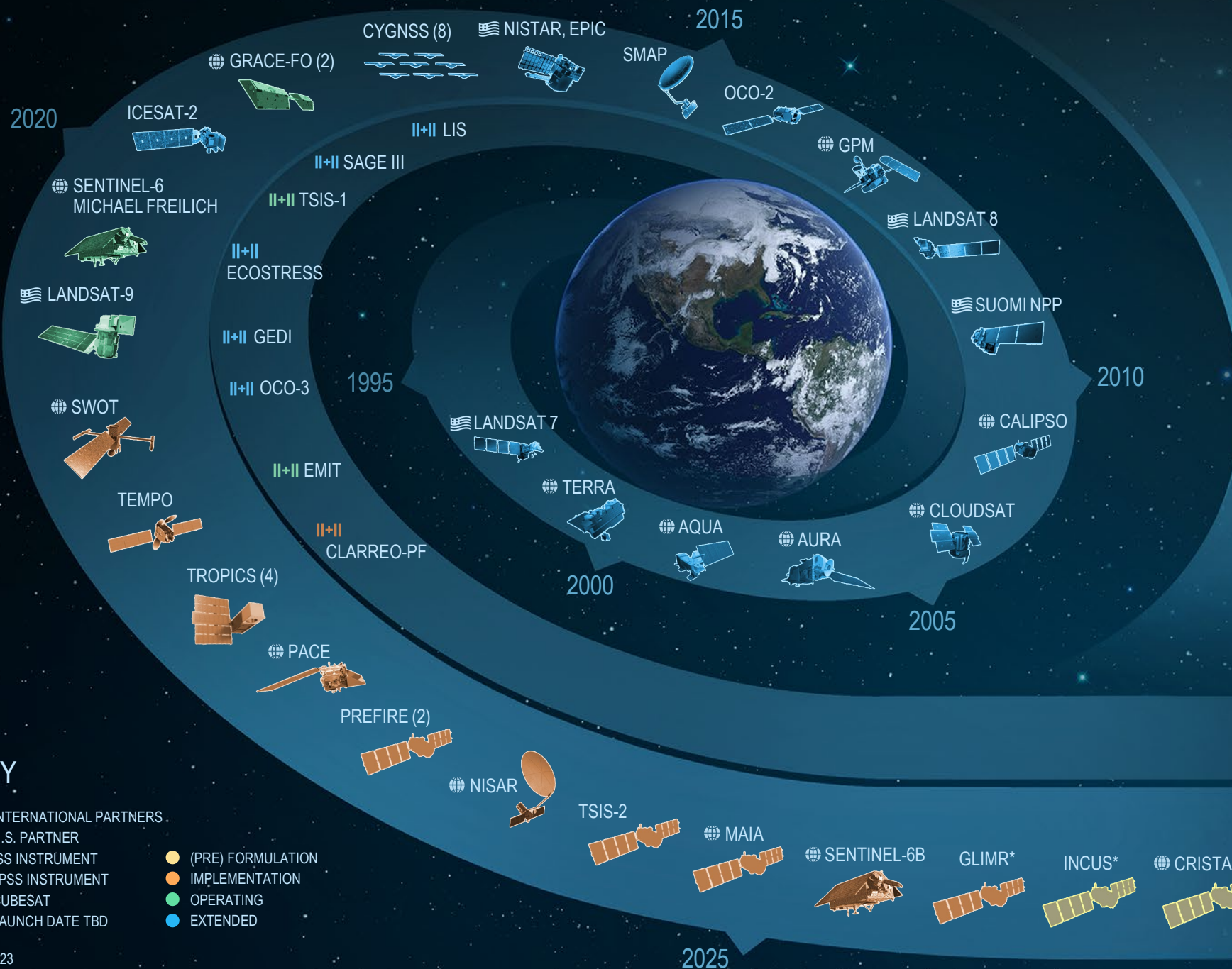


APPLICATIONS





EARTH FLEET



INVEST/CUBESATS

- NACHOS 2022
- CTIM 2022
- NACHOS-2 2022
- MURI-FD 2023
- SNOOPI* 2024
- HYTI* 2024
- ARGOS* 2024

JPSS INSTRUMENTS

- OMPS-LIMB 2022 +
- LIBERA 2027 +
- OMPS-LIMB 2027 +
- OMPS-LIMB 2032 +

ISS INSTRUMENTS

- LANDSAT NEXT*
- ESO-1, 2, 3, 4*

KEY

- INTERNATIONAL PARTNERS
- U.S. PARTNER
- ISS INSTRUMENT
- JPSS INSTRUMENT
- CUBESAT
- LAUNCH DATE TBD

- (PRE) FORMULATION
- IMPLEMENTATION
- OPERATING
- EXTENDED

EARTH SYSTEM OBSERVATORY

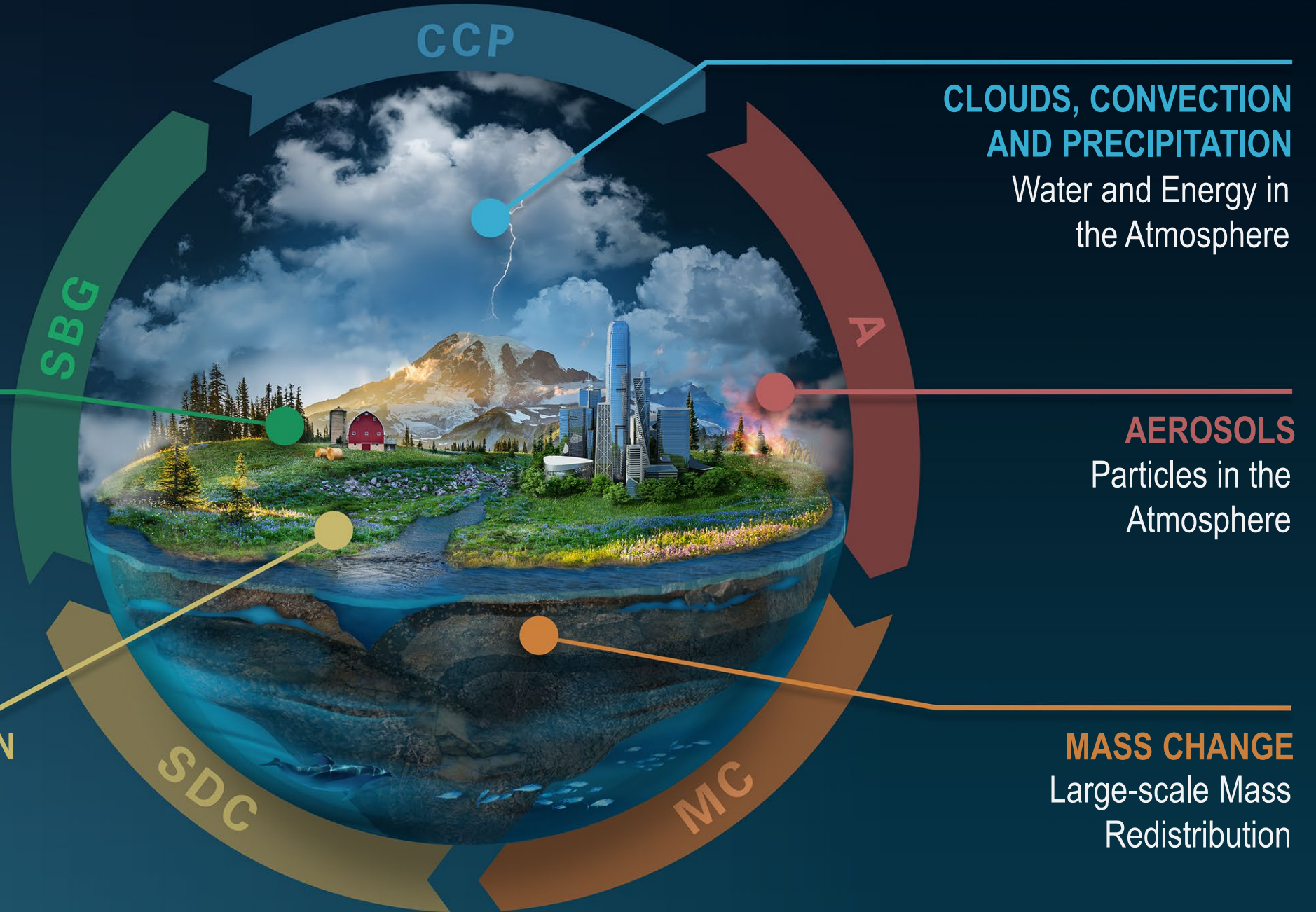
INTERCONNECTED
CORE MISSIONS

SURFACE BIOLOGY AND GEOLOGY

Earth Surface &
Ecosystems

SURFACE DEFORMATION AND CHANGE

Earth Surface Dynamics



AOS

MCR: May 2022
KDP-A: Jan 2023

SBG

MCR: Jun 2022
KDP-A: Nov 2022

MC

MCR: Jun 2022
KDP-A: March 2023

SDC

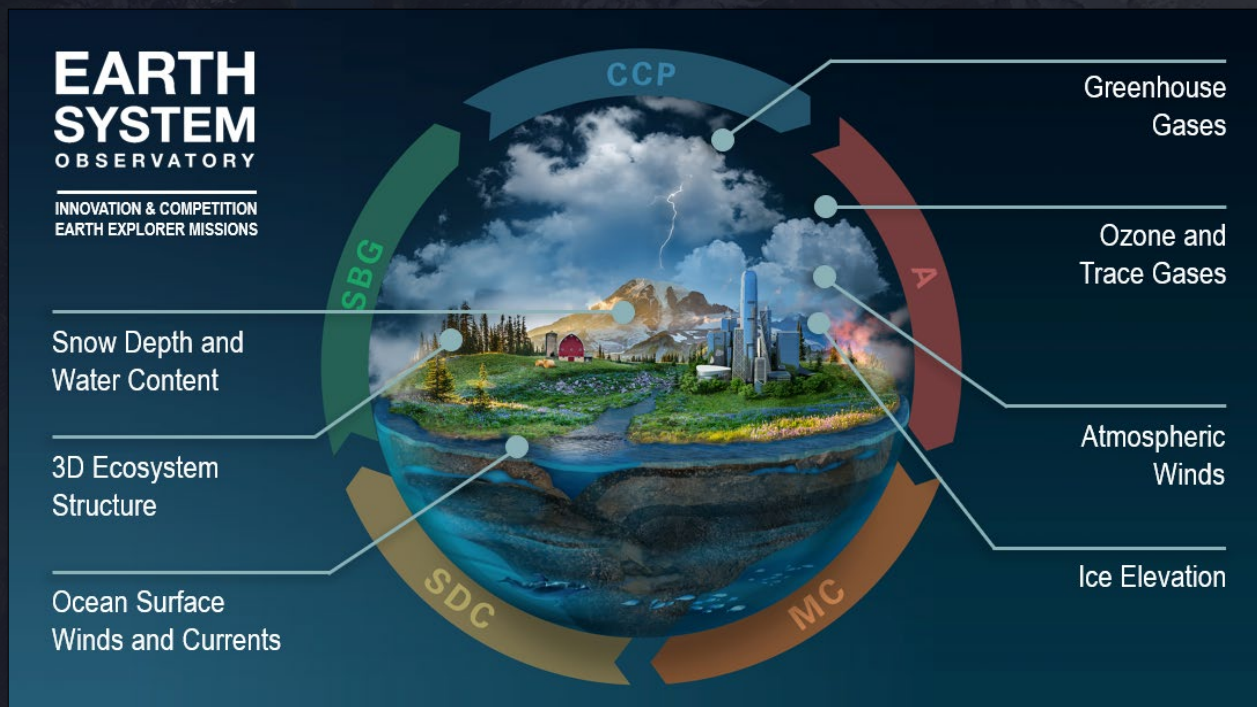
Remaining in extended
Study Phase

ESO Core Missions

- Successfully completed Mission Concept Reviews in summer 2022
- Missions passed KDP-A and now in Formulation
- SDC will remain in extended study phase to take advantage of NISAR mission lessons learned
- ESO Independent Review Board, July - October 2022
 - IRB report and NASA response posted at nasa.gov/reports

Earth System Explorers (ESE)

**EARTH
SYSTEM**
OBSERVATORY



- Final AO released May 2, 2023
- PI-Managed Mission Cost (PIMMC) cap of \$310M (FY24 \$)
- NASA will provide launch vehicle services
- Two-step selection process

ESD is in process of standing up a new Earth System Explorers Program Office at GSFC

Integration of Earth System Observatory Data

New Open-Source Science Policy:

- All **mission data, metadata, software, databases, publications, and documentation** shall be available on a full, free, open, and unrestricted basis **starting in Phase B** with no period of exclusive access.
- **Science workshops and meetings** shall be **open** to broad participation and documented in public repositories.

Collaborative, accessible, inclusive, transparent, and reproducible from the beginning.

Exploring **common data approaches** for the ESO:

- A **data processing study** to examine data system efficiencies and promote Open Science principles, including co-location of mission data to enable Earth system science and applications.
- A **latency study** to evaluate flight hardware and ground system architectures to **minimize product latency** and support cross-ESO science product generation.

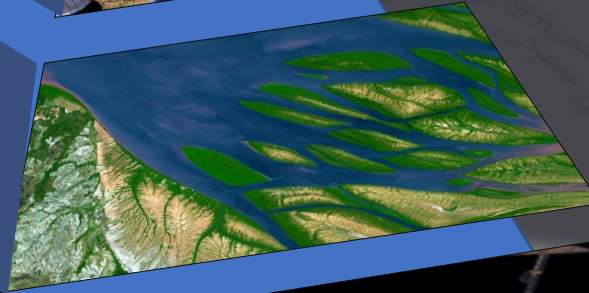
Earth Science to Earth Action



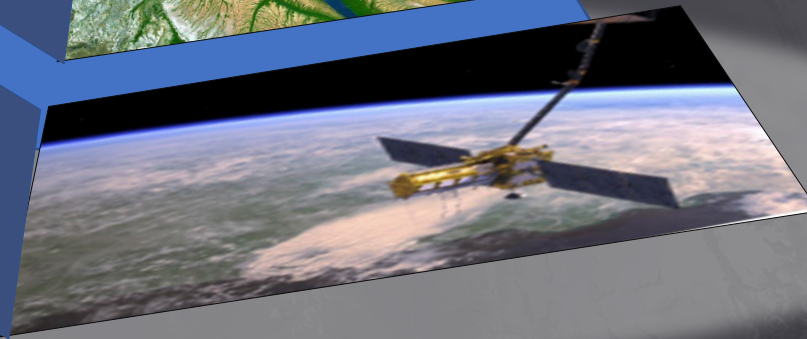
New Earth Information Center



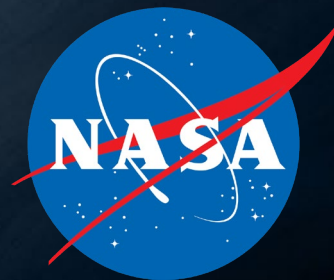
**Earth Action Solutions
for Impact**



**Earth System Science &
Applications Incubation**



**Earth System
Observations**



NASA EARTH
Your Home. Our Mission.