

National Aeronautics and
Space Administration



NASA OBB Updates

EXPLORE EARTH

2023 OCB Meeting

The background of the slide is a piece of marbled paper with a complex, swirling pattern of teal, blue, and white. A semi-transparent, light blue horizontal band runs across the middle of the image, containing the text.

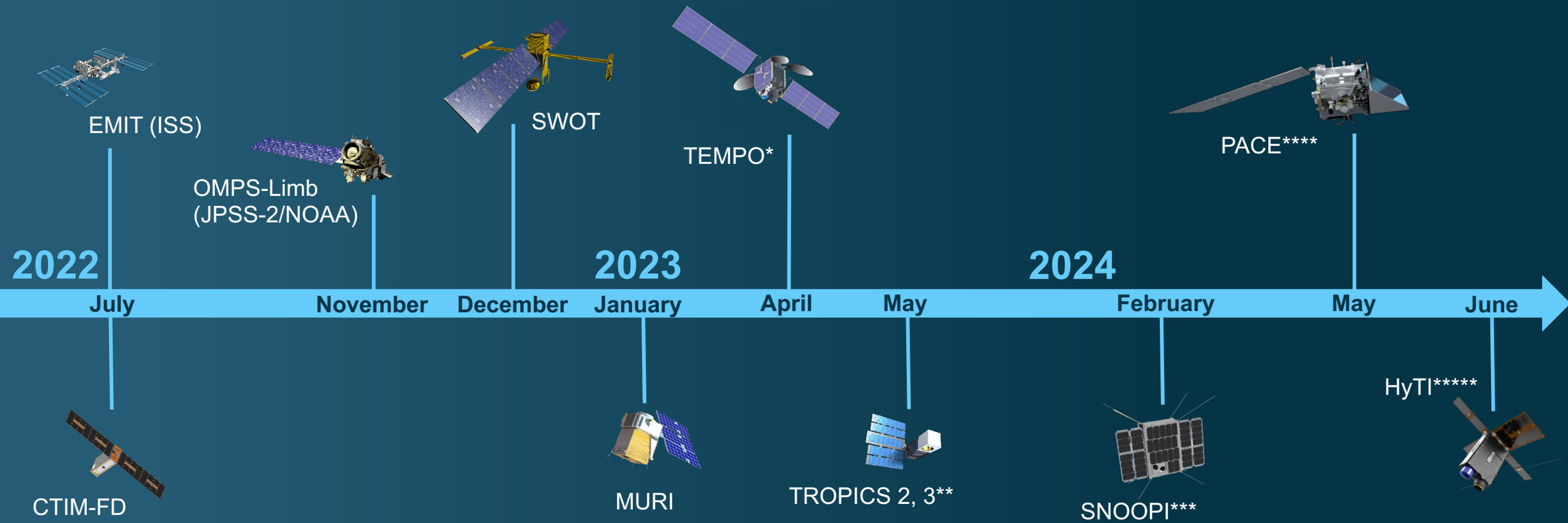
What are we excited about?

Coming to an orbit near you in
early 2024!

PACE

Plankton, Aerosol, Cloud, ocean Ecosystem

Recent and Upcoming Earth Science Launches



*Agency LRD March 2023

**Agency LRD November 2023

***Launch Date NET February 2024

****Agency LRD May 2024

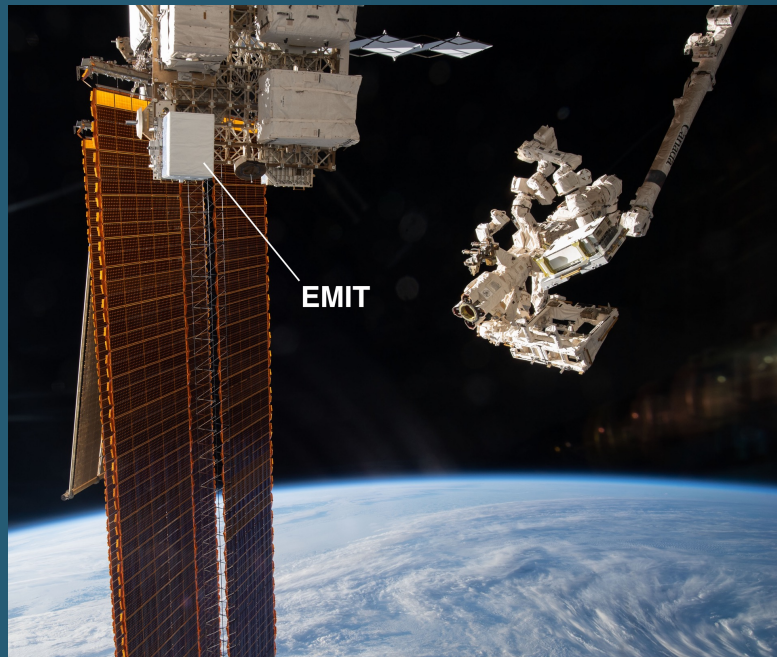
*****Launch Date NET June 2024

EMIT (EVI-4)

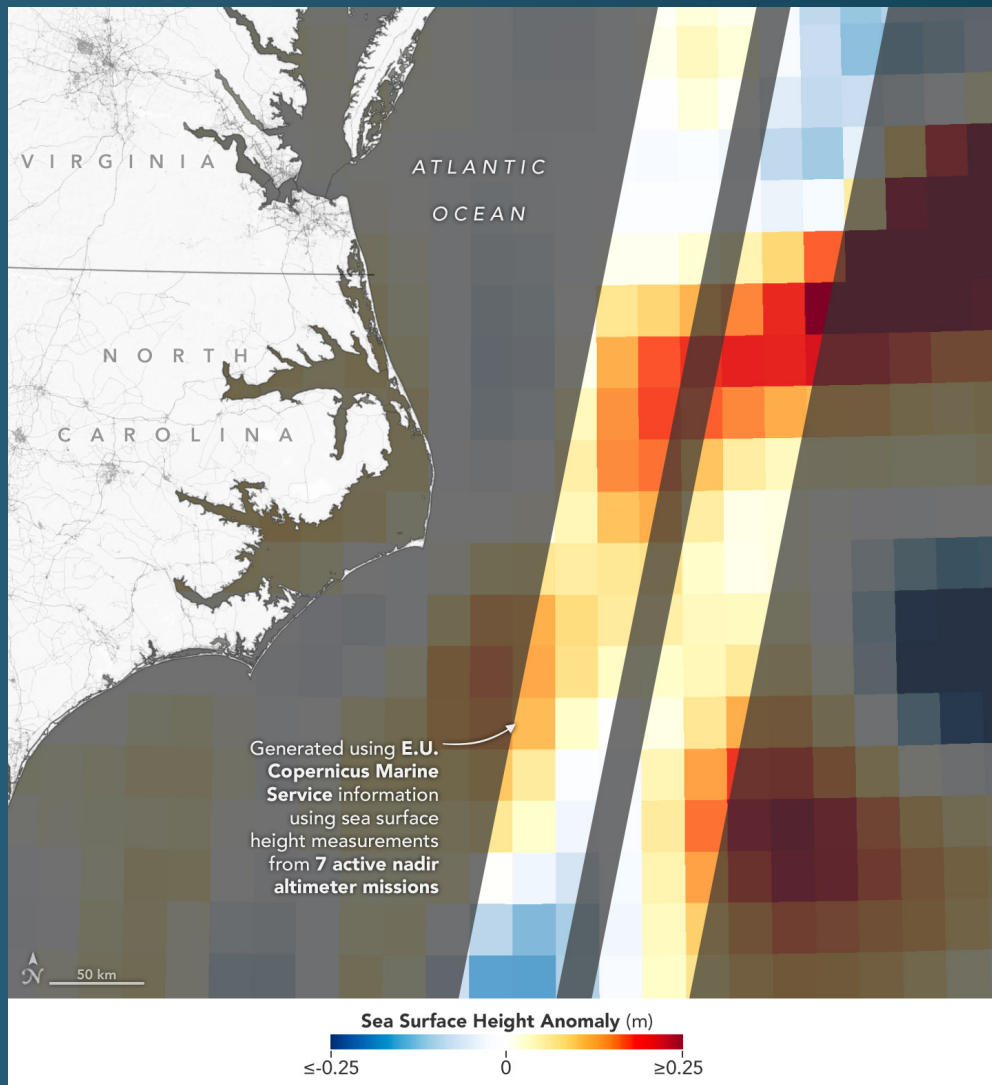
- Launched aboard SpaceX CRS-25 on July 14, 2022
- Earth Surface Mineral Dust Source Investigation (EMIT) is analyzing airborne dust impact on climate



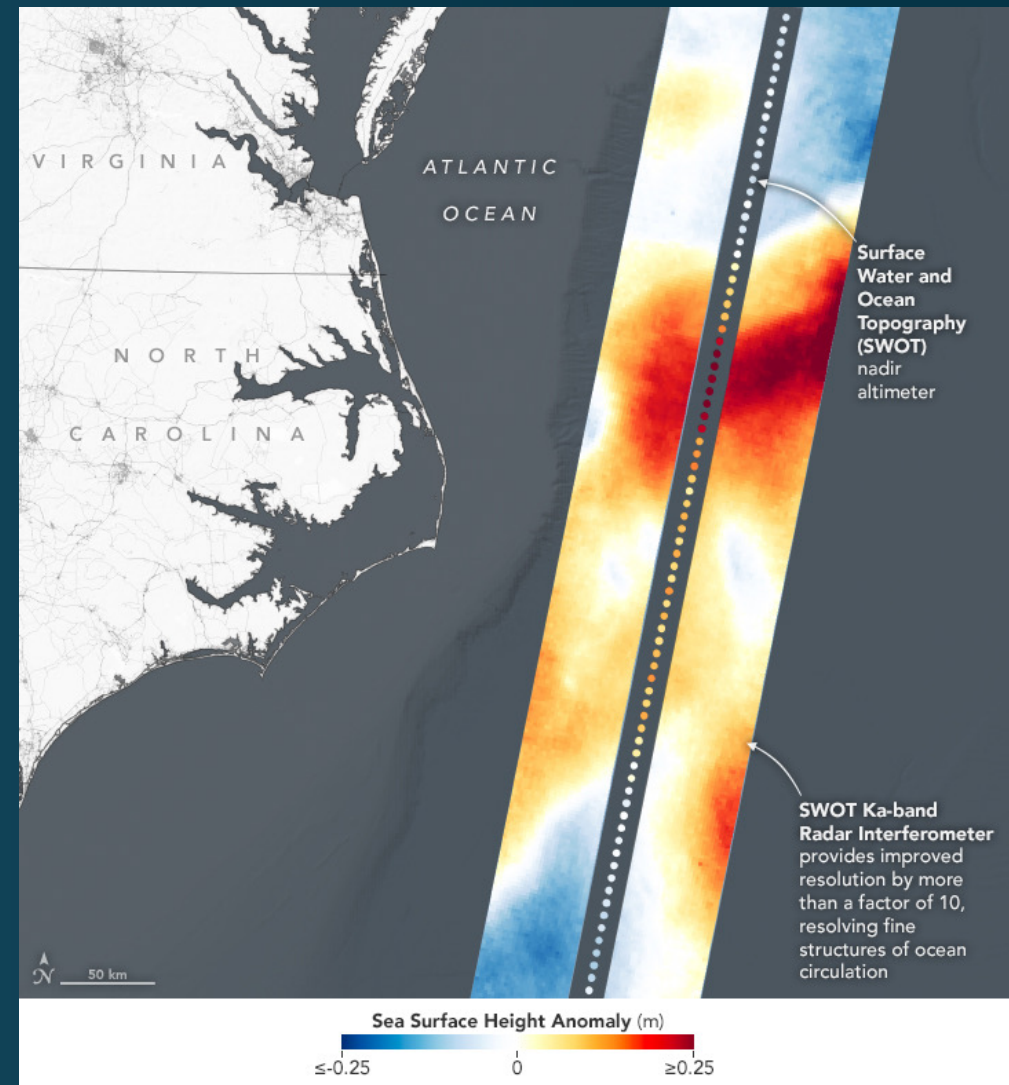
Turkmenistan methane plumes, detected Aug. 2022



Global mapping of 100's of methane and carbon dioxide plumes



Comparison image: The spatial resolution of SWOT ocean measurements is 10 times greater than the composite of sea surface height data gathered over the same area by seven other satellites: Sentinel-6 Michael Freilich, Jason-3, Sentinel-3A and 3B, Cryosat-2, Altika, and Hai Yang 2B.



SWOT first light image: On Jan. 21, 2023, SWOT measured sea surface height in the Gulf Stream off the coastal North Carolina and Virginia. The two KaRIn antennas acquired data that was mapped as two wide, colored strips spanning a total of 75 miles (120 kilometers) across.

Recent Launch: TEMPO



First space-based instrument for hourly monitoring of daytime air pollutants across the North American continent, launched April 7, 2023

Will fly as part of global constellation including Sentinel-4 over Europe and GEMS over Asia

Science to be provided to NOAA, EPA





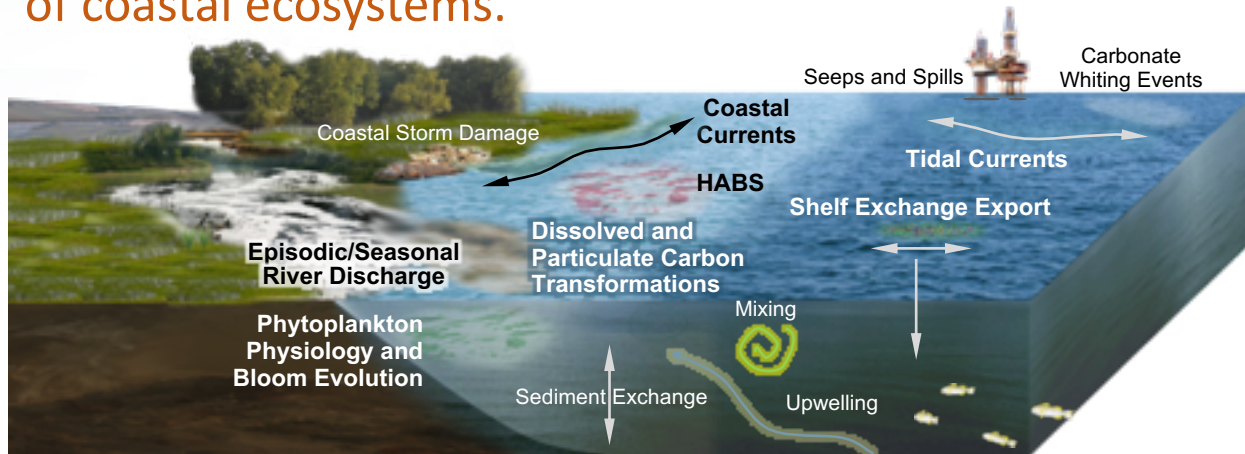
GLIMR — Geostationary Littoral Imaging and Monitoring Radiometer

Hyperspectral (350-1040 nm) ocean color sensor in Geostationary orbit

- Targeting Gulf of Mexico and other coastal/ocean waters of N. and S. America
- **Hourly imaging** frequency; spatial resolution of 300 m (nadir)
- Spectral sampling and resolution: ~7 nm and 10 nm; SNR: ~600 to >1000

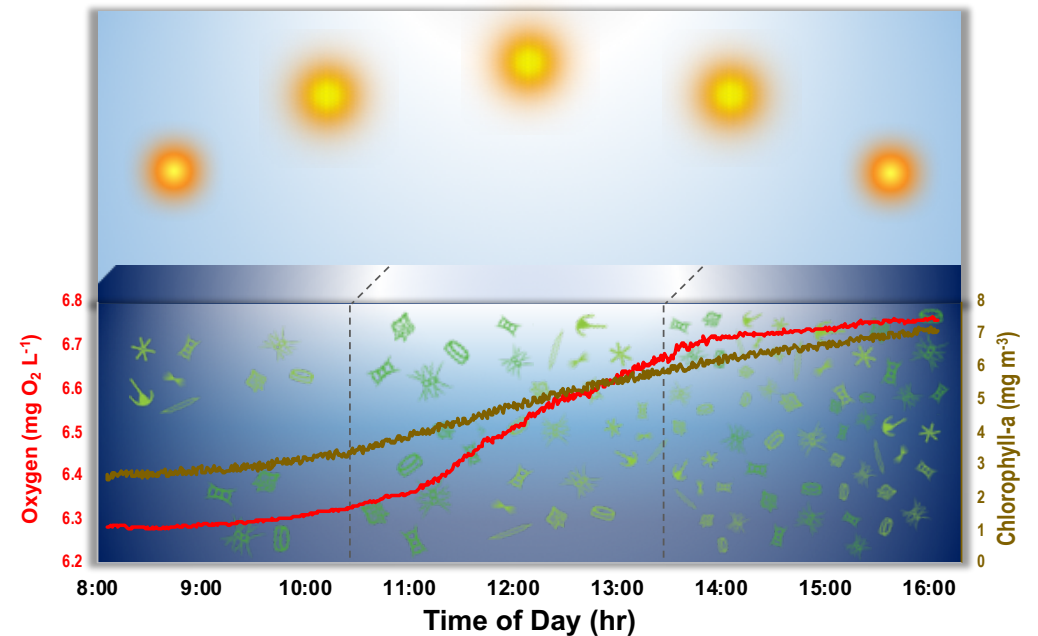
Short Term Coastal Processes:

Investigate how high frequency fluxes of organic matter, sediments, and other materials between and within coastal ecosystems regulate the productivity and health of coastal ecosystems.



Phytoplankton Growth and Physiology

Understanding processes contributing to rapid changes in phytoplankton growth rate and community.



APPLICATIONS: Formation, magnitude, and trajectory of harmful algal blooms (HABs) and oil spills

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

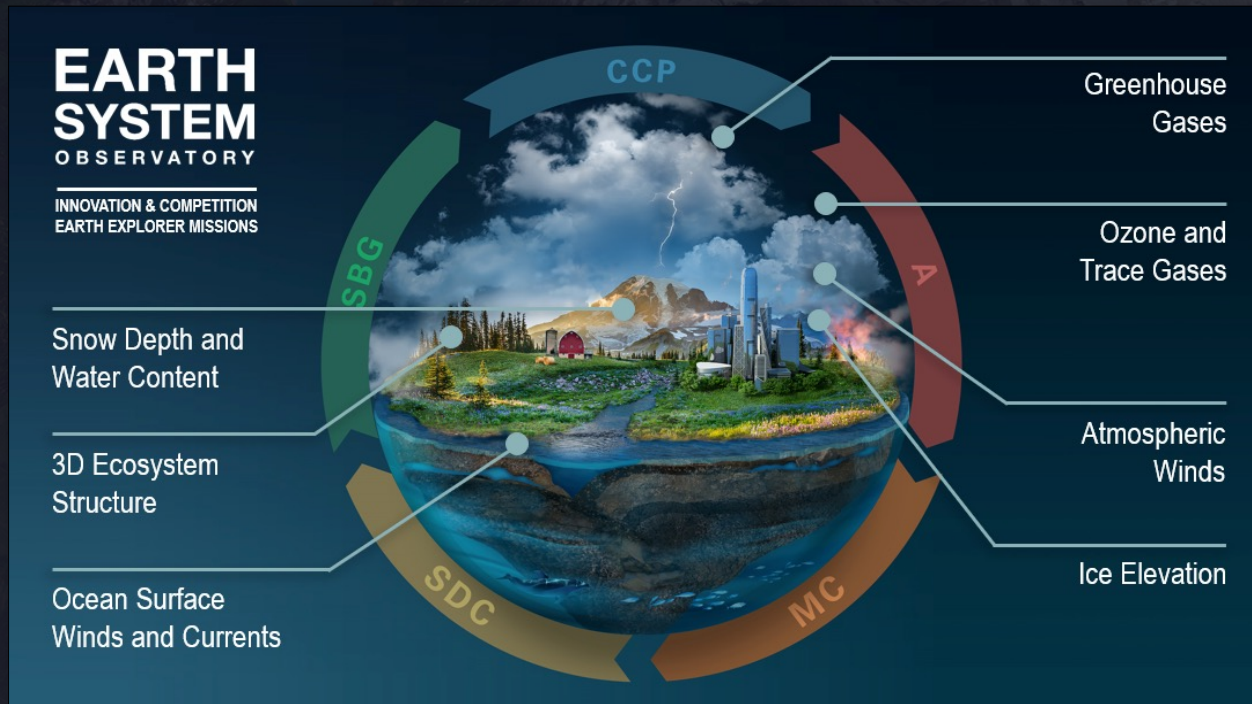
Remaining in extended
Study Phase

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



- Draft Announcement of Opportunity (AO) released on Dec 6, 2022
- 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

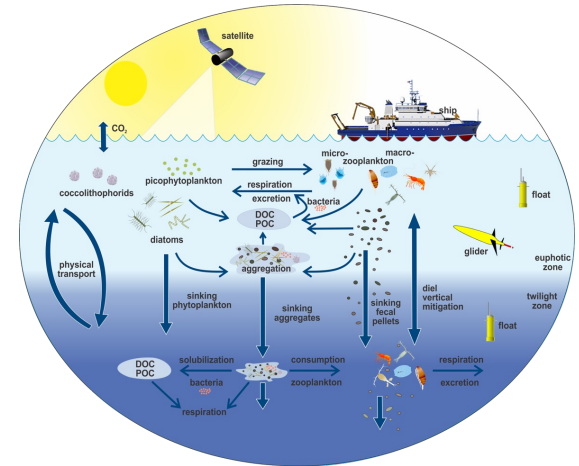
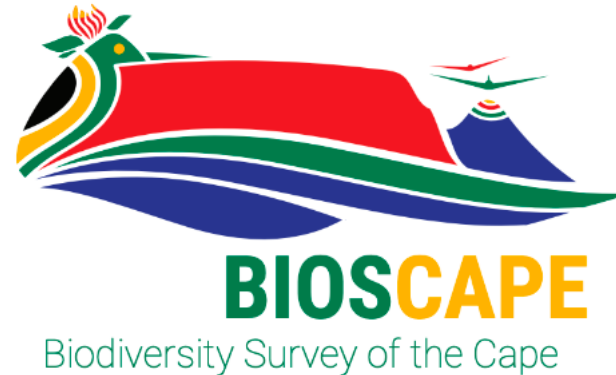
- New Earth System Explorers Program Office in process of being stood up at GSFC; undergoing SRR/SDR in March 2023

Field Campaign Planning/Field Project Updates

- EXPORTS Phase I has been completed. Phase II (synthesis) anticipated no earlier than 2023.
- BioSCape (fall 2023, South Africa): Biodiversity focused on South Africa's Greater Cape Floristic Region, including surrounding coastal and marine environments.
- ASTraL/EKAMSAT (ONR led; Arabian Sea, 2024?): Exchange across the Air-Sea interface in the Arabian Sea.
- Continued support for in situ measurements (e.g SOCCOM).
- Arctic-COLORS (Arctic, 2025?): improve understanding and prediction of land-ocean interactions in the Arctic coastal zone.

EXPORTS

<https://oceanexports.org/index.html>





Arctic COLORS

Arctic - Coastal
Land Ocean
Interactions

Science Definition Team
kicked off in Feb. 2023

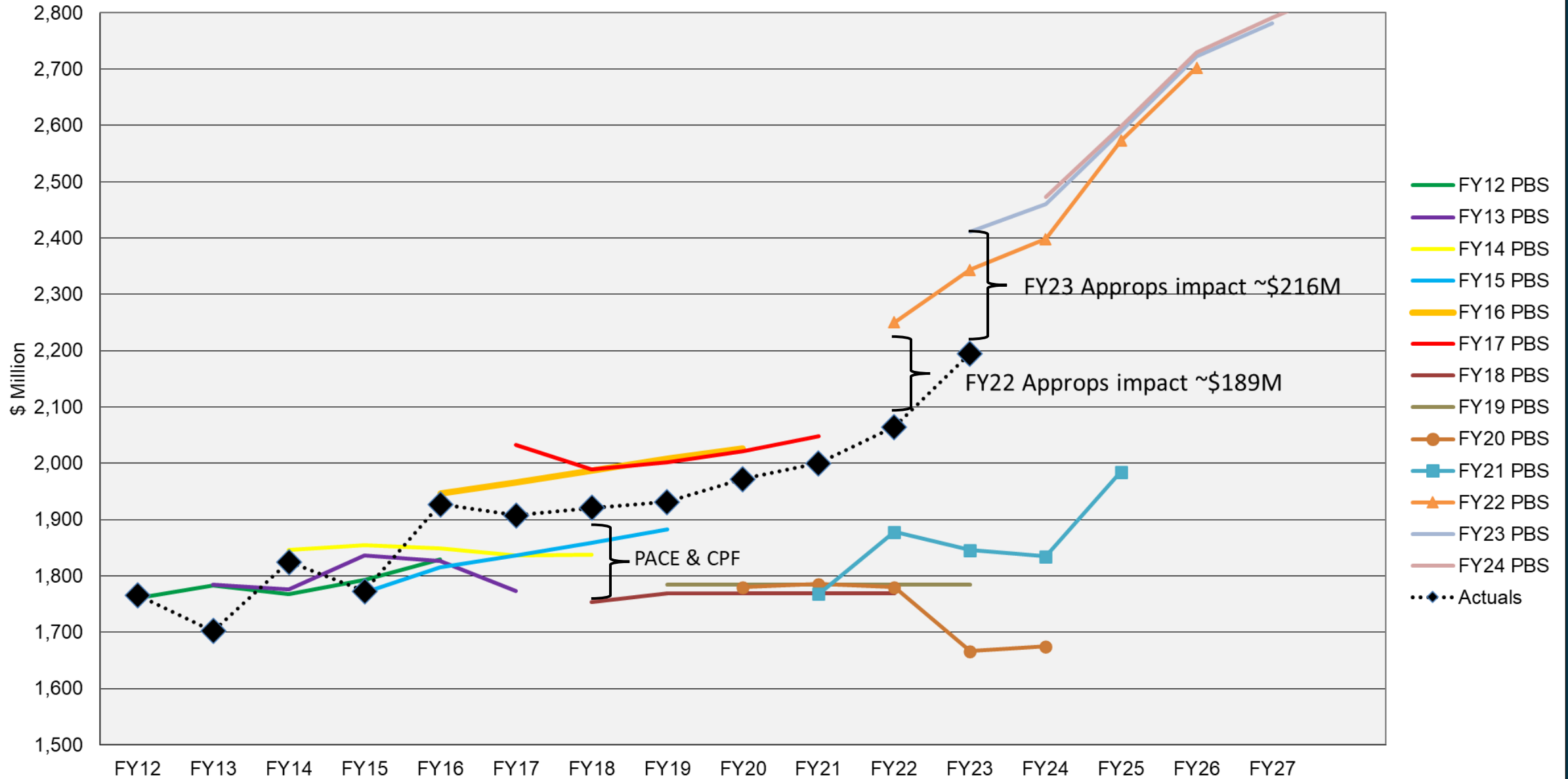
Arctic COLORS aims to
**quantify the coupled
biogeochemical/
biological and
ecological response** of
the Arctic nearshore
system to rapidly
changing **terrestrial and
ice conditions**, in the
context of environmental
(short-term) and climate
(long-term) change





What are we not that excited about?

ESD President's Budget and Appropriations History



Accumulating Budget Challenges

- Landsat Next (**\$1.5B**) was not accounted for in 2018 Decadal Survey mission targets against the ESD top line
- COVID-19 shut down multiple flight programs & Center instrument programs at peak staffing, amounting to **~\$300M cost growth**
- Technical challenges for NISAR, PACE, and SWOT, exacerbated by COVID-19, led to **~250M cost growth**
- Record inflation for materials, shipping, and labor costs, and longer lead times are driving total costs AND the need to phase resources earlier in project life
- Cumulative challenge for the 2020s approaches \$2B
- OBB got a cut of ~17%; the rest of R&A got similar budget cuts... ouch!



What else is going on?

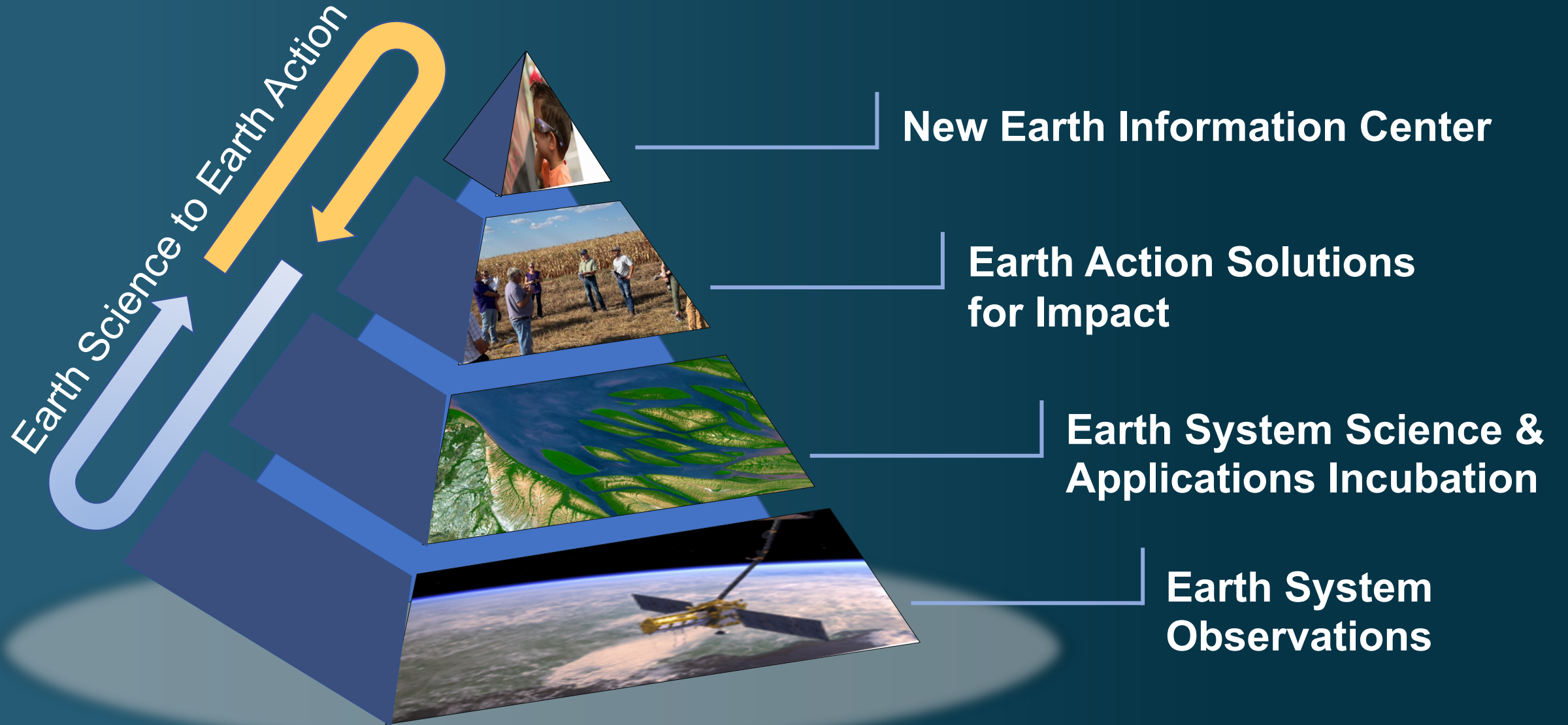
Joel... is gone... 
Program Executive for Earth Science
Data Systems at NASA HQ



BUT... we're so happy
to welcome Kelsey!



NASA Earth Action Strategy



ROSES-23 ESD Highlights

- ROSES-23 came out in February and offers numerous opportunities for Earth Science community to propose (**And review** - Thank you to those who support the peer review process!)
- 15 Elements have defined due dates; 17 are listed as TBD – watch ROSES as they are "definitized"
- 5 elements use Dual Anonymous Peer Review
- 1 element calls for Inclusion Plan – A.24 Earth Surface and Interior
- 2 no-due date elements – A.25 Rapid Response and Novel Research in Earth Science; A.59 (Step 1)
- ESD continues to participate in SMD-wide FINESST solicitation (F.5)
- TWSC will become a stand-alone solicitation but don't panic, the ROSES-2022 TWSC program element will continue to accept proposals until its close date July 21, 2023, and ROSES-2023 will retain a TWSC row in Tables 2 and 3 with a hypertext link to the new TWSC when its released.
- When TWSC-22 closes, this ROSES program element will be replaced by a stand-alone TWSC notice of funding opportunity (NOFO). The TWSC coordinator seeks comments on the current TWSC-22 text or other feedback that may improve the stand-alone TWSC NOFO. Please email TWSC comments/feedback by May 31, 2023, to mary.f.sladek@nasa.gov. Feedback may or may not be incorporated in the future TWSC NOFO.

Inclusion Plans

- Inclusion is a core NASA value, and diversity and inclusion are prioritized in Strategy 4.1 from A Vision for Scientific Excellence (formerly known as the Science Plan).
- NASA defines diversity broadly as "The entire universe of differences and similarities" and inclusion as "the full participation, belonging, and contribution of organizations and individuals."
- SMD believes in the importance of diverse and inclusive teams. To this end, an inclusion plan (IP) is now being required in an increasing number of ROSES elements.
- Plan implementation does offer the possibility to request as needed, and it should be justified in the budget.
- Ever growing list of resources to help proposers:
<https://science.nasa.gov/researchers/inclusion>
- Inclusion experts evaluate the IPs during panel.

2023 is NASA's Year of Open Science

TOPS will energize and uplift open science across the scientific community through:



Visibility

Publishing articles, appearing on podcasts, developing targeted communication that expands footprint

Integrating Open Science into themes at large-scale events and conferences



Capacity Sharing

Producing online, free, Open Science curriculum on Open edX

Hosting workshops, events, cohorts, science team meetings, hackathons

Constructing multiple pathways to Open Science Badge



Incentives

Developing Open Science Badge/Certification

Sponsoring high profile prizes and challenges

Establishing high profile awards in support of open science research



Moving Towards Openness

Recognizing open science practices

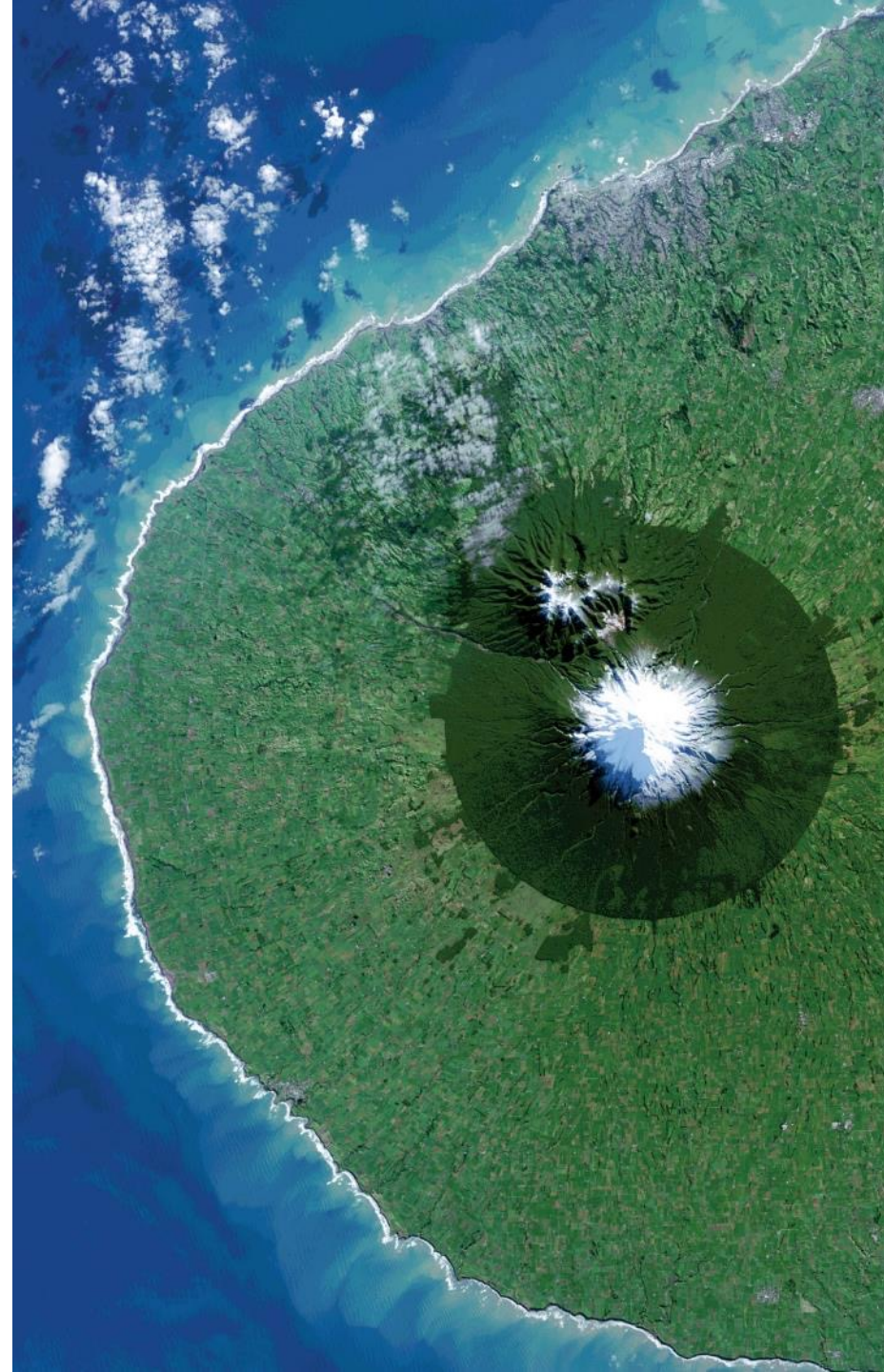
Holding open meetings

Sharing hidden knowledge

Inclusive collaboration

Other activities

- **If you need anything email or call. Always, any time** (well, within reason...).
- Uncosted – Thank you to all of you that have worked with us in reprofiling your awards (don't be afraid of being proactive)
- We need your progress reports to process funding AND to brag about your science. If something cool is happening you have to let us know!
- Next Decadal Survey – We're halfway through the current one – aquatic sciences need to be ready for the next one!
- OBB Science Vision - The Science Vision is built around five Grand Challenges, which will link together science questions facing the OBB community over the coming decade. You can find it at https://cce.nasa.gov/ocean_biology_biogeochemistry/



Funding Opportunities

Research Opportunities in Space and Earth Sciences

<http://nspires.nasaprs.com/> Annual release mid-February

- Rapid Response and Novel Research in Earth Science – ROSES 2023 A.25 – [rolling deadline] - No budget for this –funded out of core programs.
- Topical Workshops, Symposia, Conferences – ROSES 2023 F.2 – (Max Bernstein, POC) – [rolling deadline] - No budget for this –funded out of core programs.
- EMIT Science/Applications Team - [NOI due June 1; proposals due July 19, 2023]
- PACE Science and Applications Team 3 – [ROSES-23 TBD – early summer]
- Carbon Cycle Science – [ROSES-23 TBD – late summer]
- A.39 Early Career Investigator Program in Earth Science (ECIP-ES) – [NOI due July 21; proposals due August 11, 2023]
- Ocean Biology and Biogeochemistry – ROSES-24



Engagement Opportunities with MUREP and EPSCoR; Student opps.

Love bragging about our MUREP-OCEAN partnership!

ESD regularly solicits via the EPSCoR Rapid Response Research (R3) call. Release in the Fall.

Internship opportunities - <https://intern.nasa.gov>

Postdoc opportunities - NPP

Want to make an effort to truly engage all of our communities in current/future research/capacity development.