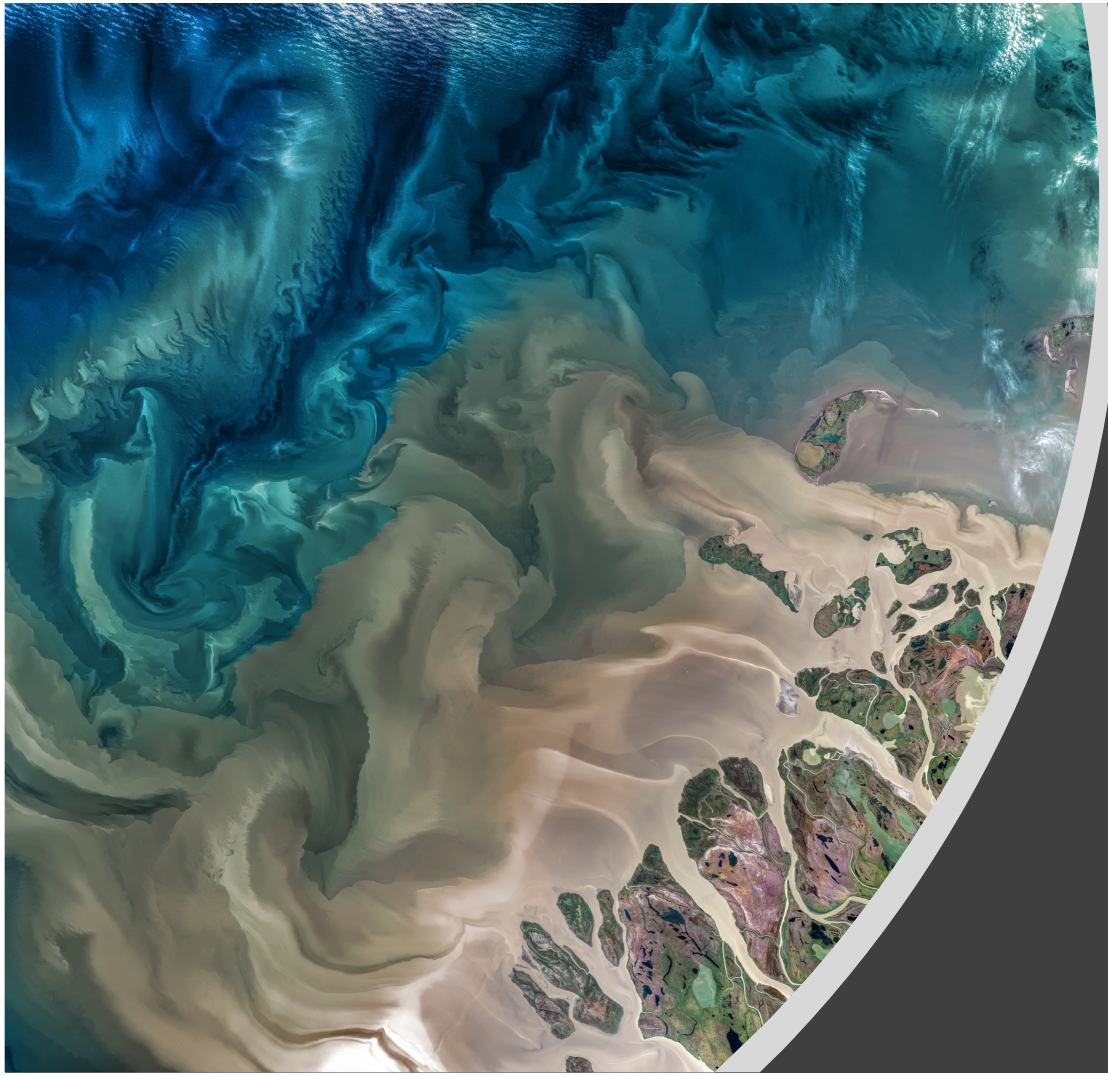


NASA Headquarters Perspectives

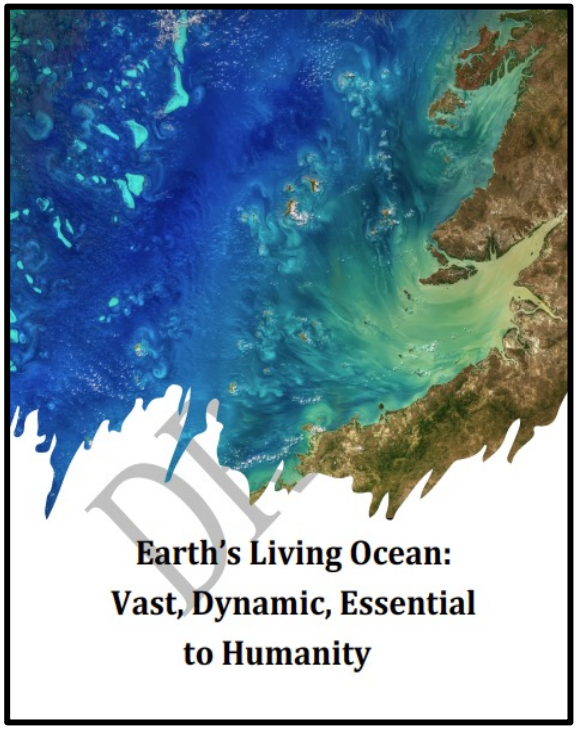
Laura Lorenzoni
Joel Scott

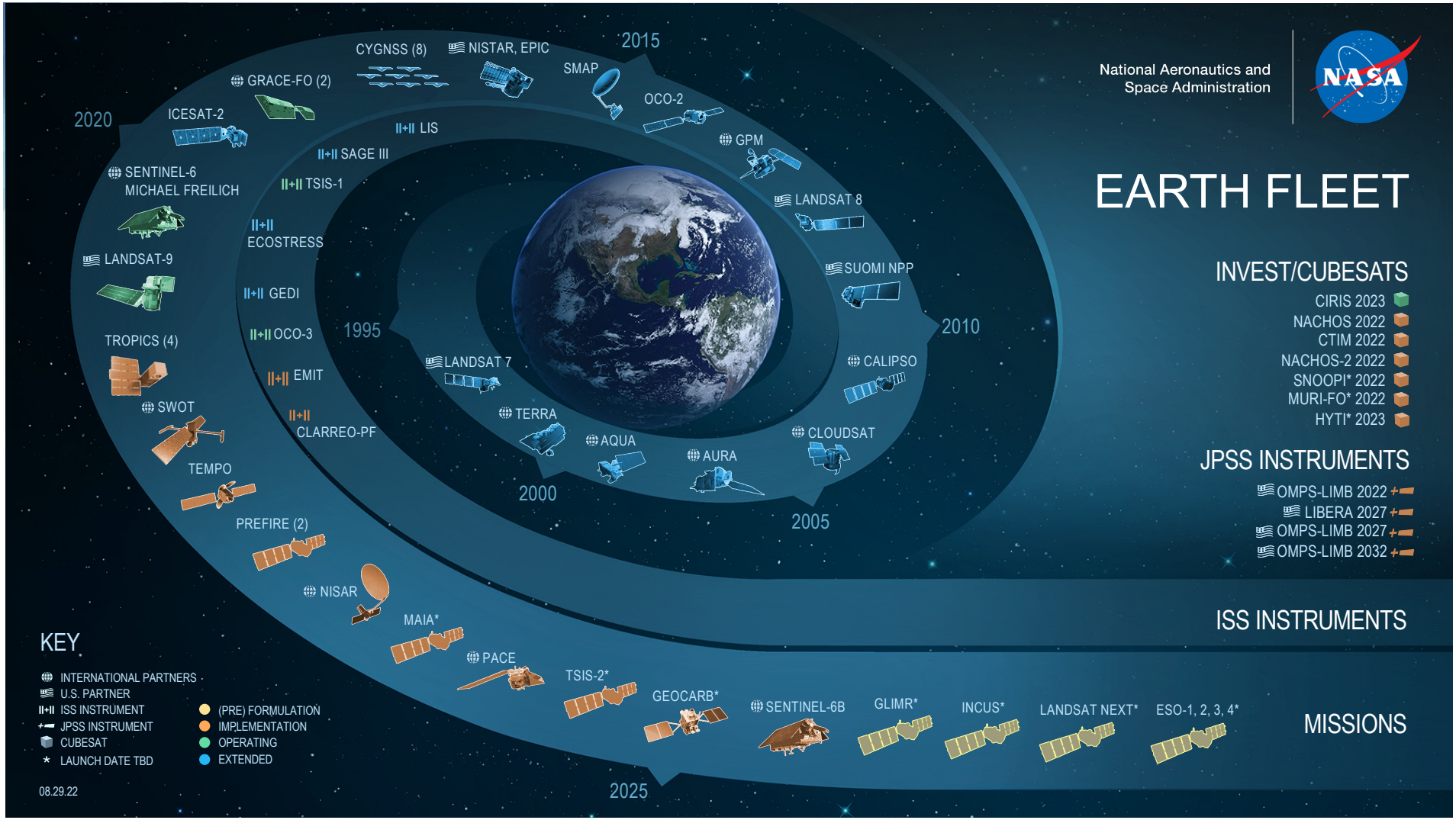
NASA HQ

NASA Ocean Biology & Biogeochemistry's Science Vision

Grand Challenge: Leveraging Big Ocean Data

- Access and Utility of Ocean Observational Data
  - *Data Access*: Accessibility of different data streams through networked computational and data facilities
  - *Skills*: Tools and training for researchers and others to work with 'Big Data'
  - *Syntheses*: Syntheses and common currencies for diverse and multi-dimensional data
  - *Machine Learning*: Integrate machine learning specialists and statisticians within ocean biology and biogeochemical research groups
  - *Ocean Digital Twin*: Ocean version of 'Earth Digital Twin'




National Aeronautics and Space Administration
NASA
EARTH FLEET
2015
2020
1995
2010
2000
2005
2025
CYGNSS (8)
NISTAR, EPIC
SMAP
OCO-2
GRACE-FO (2)
ICESAT-2
LIS
SAGE III
GPM
SENTINEL-6 MICHAEL FREILICH
TSIS-1
LANDSAT 8
ECOSTRESS
LANDSAT-9
SUOMI NPP
GEDI
OCO-3
TROPICS (4)
LANDSAT 7
CALIPSO
EMIT
SWOT
TERRA
CLARREO-PF
AQUA
CLOUDSAT
AURA
TEMPO
PREFIRE (2)
NISAR
MAIA*
PACE
TSIS-2*
GEOCARB*
SENTINEL-6B
GLIMR*
INCUS*
LANDSAT NEXT*
ESO-1, 2, 3, 4*
INVEST/CUBESATS
CIRIS 2023
NACHOS 2022
CTIM 2022
NACHOS-2 2022
SNOOPI* 2022
MURI-FO* 2022
HYTI* 2023
JPSS INSTRUMENTS
OMPS-LIMB 2022
LIBERA 2027
OMPS-LIMB 2027
OMPS-LIMB 2032
ISS INSTRUMENTS
MISSIONS
KEY
INTERNATIONAL PARTNERS
U.S. PARTNER
ISS INSTRUMENT
JPSS INSTRUMENT
CUBESAT
LAUNCH DATE TBD
(PRE) FORMULATION
IMPLEMENTATION
OPERATING
EXTENDED
08.29.22

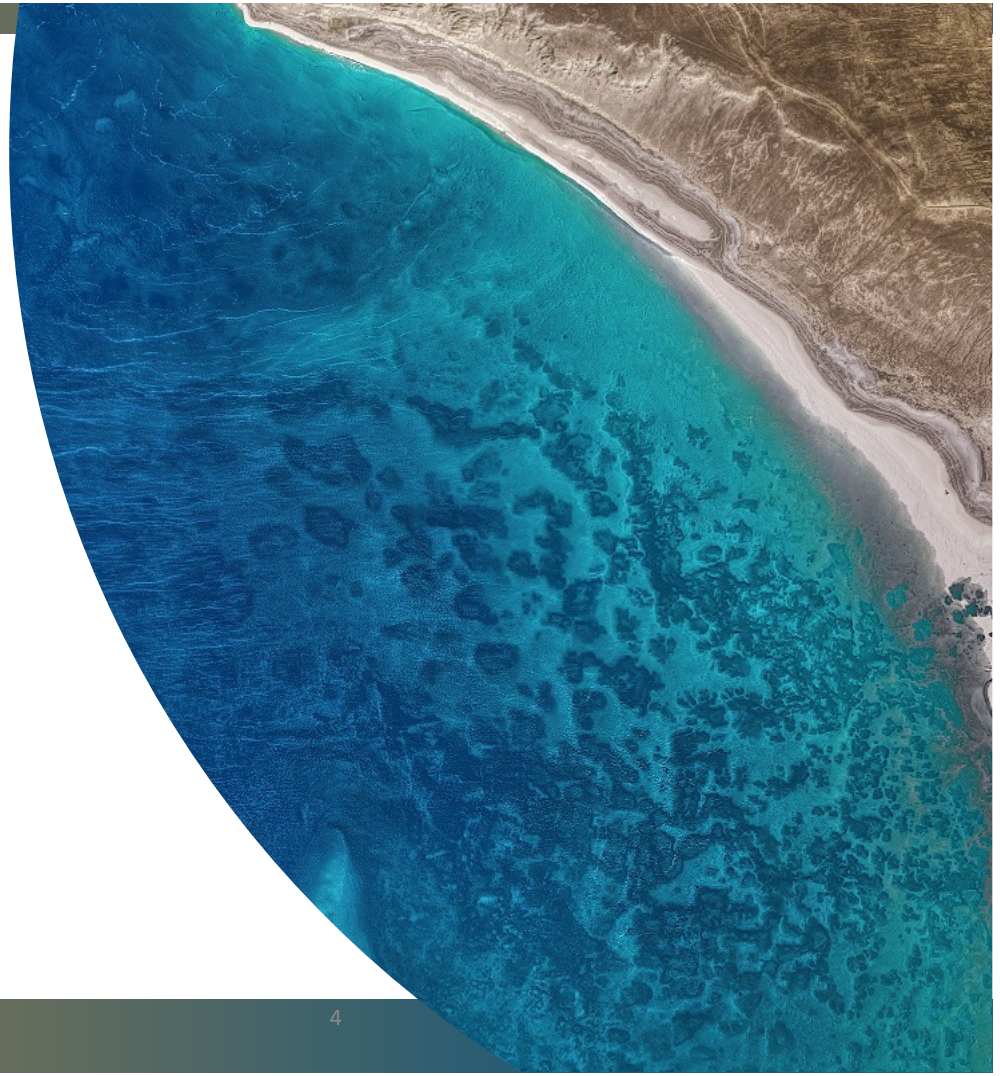
OB.DAAC Active & Heritage Missions

Global Processing & Distribution

- **VIIRS/JPSS1** (USA)
- **VIIRS/SNPP** (USA)
- **MODIS/Aqua** (USA)
- **MODIS/Terra** (USA)
- **OLCI/S3A** (Europe)
- **OLCI/S3B** (Europe)
- SeaWiFS (USA)
- MERIS (Europe)
- OCTS (Japan)
- CZCS (USA)

Regional Processing & Distribution

- **Hawkeye** (USA)
- GOCI (South Korea)
- HICO (USA)



Multi- and Cross-mission Synergies

Aerosols — AOS
Gases — SBG
Surface Deformation — NISAR
Surface Composition and Geologic Hazards — SBG

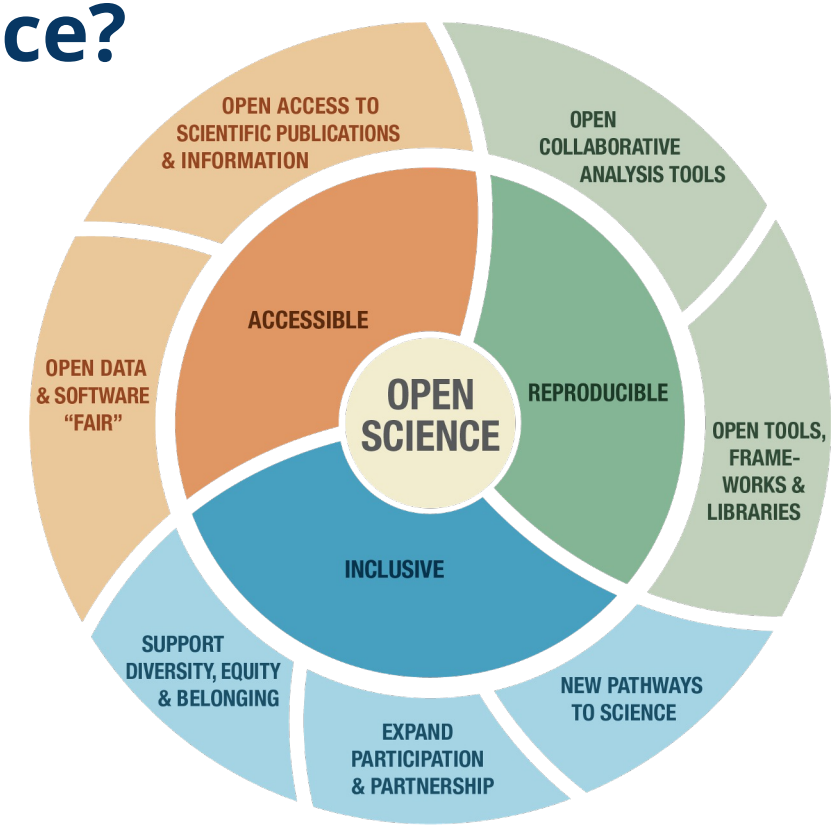
Precipitation — AOS
Ice Mass Evolution — NISAR
Snow Albedo and Melt — SBG
Water storage-MC

Boundary Layers — AOS
Ecosystem Structure — NISAR
Vegetation Type and Physiology — SBG

Phytoplankton, Organic Matter, Sediment — SBG, GLIMR, PACE

What is Open Science?

- **Open** the entirety of the scientific process, ***from start to finish***
- **Broaden** community involvement in the scientific process
- **Increase** accessibility of data, software, & publications
- **Facilitate** inclusion, transparency, and reproducibility of science



Why Open Science?

We are facing **Big** Challenges:

COVID, climate change, marine heat waves, increases in HABs & hypoxia, ocean acidification, ecosystem shifts, loss of biodiversity

We need ***more*** people – more hands, more eyes, more minds – with diverse experiences to be engaged and participate in the science and applications to ask the best questions and find the best solutions

Open Science:

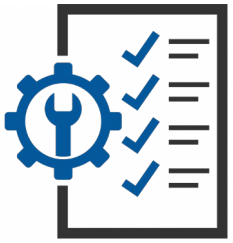
- Accelerates the ***pace*** of science
- Increases the ***impact*** of science
- Expands the ***applications*** of data and science
- Shares hidden ***knowledge*** and expands ***participation*** in science

Image credit: NOAA

Image credit: Twentieth Century Fox

Open-Source Science Initiative

Unlocking the full potential of a more equitable, impactful, efficient, scientific future



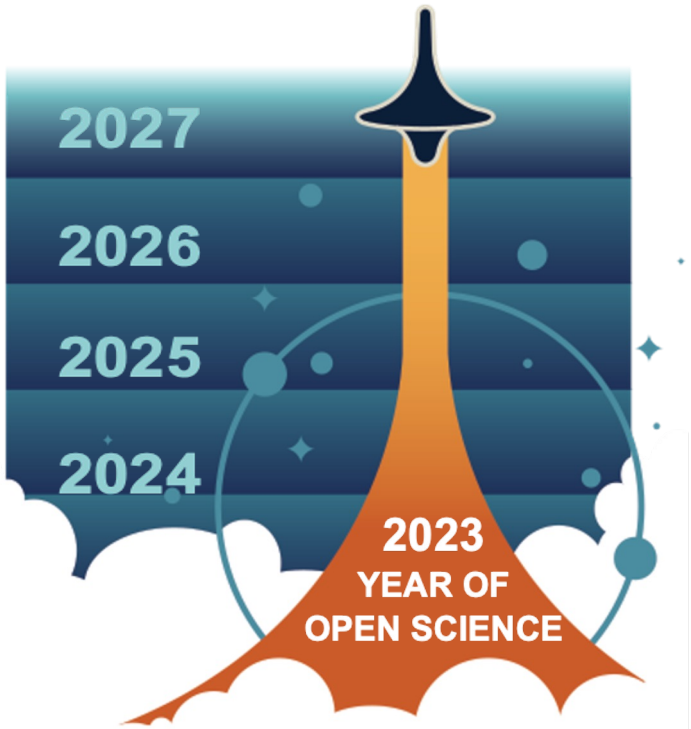
Policy development, education, compliance tools
Updating NASA policies on scientific information to better enable the activation of open science

Core Services for Science Discovery
Developing core data and computing services to enable open science

ROSES Elements
Supporting open-source software, tools, frameworks, libraries, platforms, and training with over $5 million dollars in grants

Community Building & Partnerships - Transform to Open Science (TOPS)
Accelerating adoption of open science

Leading the Path to Open-Source Science



Transform to Open Science (TOPS) is a $40 million* 5-year NASA Science Mission Directorate mission geared towards accelerating the adoption and understanding of open science

Key Goals:

- Increase understanding & adoption of open science
- Accelerate major scientific discoveries.
- Broaden participation by historically underrepresented communities

TOPS mailing list: https://go.nasa.gov/3Lwlb87

*pending appropriations

The Future is in your hands!

- Thank ***you*** for your involvement and support of the OB.DAAC User Working Group!