State of the Program: NASA Ocean Biology & Biogeochemistry

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NASA Headquarters
OCB Summer Workshop 2019

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Dr. Paula Bontempi named acting Deputy Division Director of ESD as of April 2019.

ESD Budget/Program Overview

The FY19 Appropriation

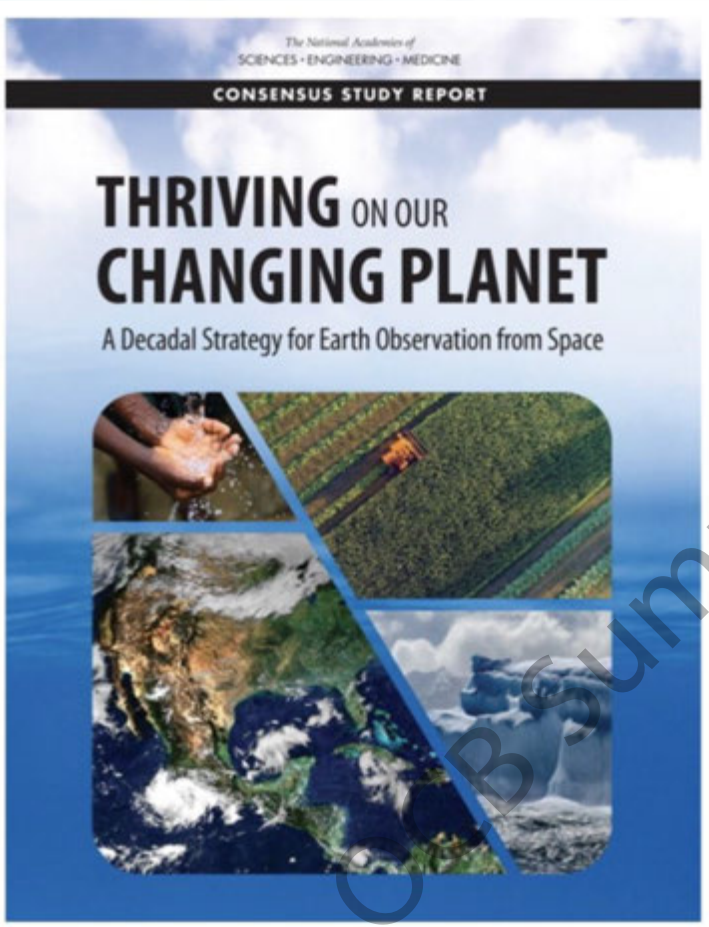
- NASA's Earth Science Division - $1,931 billion ($10M increase from FY2018)
- Plankton, Aerosol, Cloud, and Ocean Ecosystem, or PACE, mission fully funded

FY20 President's Budget – released in March 2019

- https://www.whitehouse.gov/omb/budget/
- The President's 2020 Budget requests $21.0 billion for NASA, a ($481M decrease from the 2019 annualized CR level).
- Provides $1,779.8 billion for a focused, balanced Earth science portfolio that supports the priorities of the science and applications communities, a reduction of $151.2 million from FY19.
- Consistent with prior budgets, provides no funding for PACE, CLARREO-PF, and the Office of Science, Technology, Engineering, and Mathematics (STEM) Engagement.
- Initiates the Decadal Incubation project to address needs for two targeted observable areas: Planetary Boundary Layer and Surface Topography and Vegetation.
- Moon in the next five years, and Mars after

Quick Recap: 2017 Decadal Survey

2017 DECADAL SURVEY



- Publicly released January 5, 2018.
- Supports the ESD (and international) *Program of Record.*
- Prioritizes *observations* rather than specific missions.
- Emphasis on *competition* as cost-control method.
- Explicitly allows *implementation flexibility.*
- Explicitly encourages *international partnerships.*
- Endorses *existing balances* in ESD portfolio.
- NASA has been briefing the community on progress (next one July 11, 2019).

NASA's DS website for more information: https://science.nasa.gov/earth-science/decadal-surveys

ESAS Observing System Priorities

TARGETED OBSERVABLE	SCIENCE/APPLICATIONS SUMMARY	CANDIDATE MEASUREMENT APPROACH	Designated	Explorer	Incubation
Aerosols	**Aerosol properties, aerosol vertical profiles, and cloud properties** to unders… effects	Backscatter lidar and multi-channel/multi-…aging …ether on	X		
Clouds, Convection, & Precipitation	**Couple… dynamics** for monitoring global hydrological cycle and understanding contributing processes	…requency passive microwave and sub-mm radiometer	X		
Mass Change	**Large-scale Earth dynamics** measured by the changing mass distribution within and between the Earth's atmosphere, oceans, ground water, and ice sheets	Spacecraft ranging measurement of gravity anomaly	X		
Surface Biology & Geology	**Earth surface geology and biology,** ground/water temperature, snow reflectivity, active geologic processes, vegetation traits and algal biomass	Hyperspectral imagery in the visible and shortwave infrared, multi- or hyperspectral imagery in the thermal IR	X		
Surface Deformation & Change	**Earth surface dynamics** from earthquakes and landslides to ice sheets and permafrost	Interferometric Synthetic Aperture Radar (InSAR) with ionospheric correction	X		

Get involved!!

NASA Ocean Biology and Biogeochemistry updates

- Ocean Biology and Biogeochemistry Advanced Planning (Ongoing)
  - From 2005 – 2007, NASA developed an OBB Advance Plan with a volunteer writing team.
  - A new Advance Plan is being developed (2015). Build on the 2007 plan with actionable science
  - Original timeline evolved – will be undergoing additional reviews
  - Anticipate release by the end of 2019
- Field Project Updates
  - NAAMES
  - CORAL
  - EXPORTS (David Siegel)
- PACE (Ivona Cetinic)
- Arctic Colors (Maria Tzorztiou)
- ROSES Solicitations/others
- Ocean Worlds

NASA Opportunities

- FINESST: Change from the NESSF fellowship; each grant is $45K/yr [annual competition – selection target for May-June]
  - Selections announced last week: https://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId={913A7DEE-2747-6539-130C-0AB1E2322F42}&path=closedPast.

- ROSES 19 relevant solicitations:
  - Carbon Monitoring System (closed May 23; $3.9M/y1; 3 yr projects)
  - Interdisciplinary Research in Earth Science (IDS) – ROSES 2019 A.32 – $11.5M/yr for 3 yrs - [15 November 2019]
    - Volcanoes in the Earth System
    - Interactions Between Sea Ice and the Atmosphere
    - Polar Ocean/Biology/Biogeochemical Coupling
    - The Life Cycle of Snow
    - Impacts of urbanization on local and regional hydrometeorology
    - Space Archaeology: Using the Past to Inform the Present and Future
    - Exploring the Microbial Biodiversity of the Atmosphere

NASA Opportunities

- ICESat-2: ROSES 2019 A.36. Notices of intent due August 1, 2019; proposals due October 8, 2019.

PACE-relevant Competitions in ROSES 2018-2019

- PACE System Vicarious Calibration – ROSES 2018: A.48 amendment (released 22 Feb 2019). Notices of Intent were due March 26, 2019; full proposals were due May 23, 2019. Estimated total funding available: $5-8M over four years; Number of new awards: Up to two, downselect to one after 12 months.

- PACE Science Team – ROSES 2019: A.38 (released 14 March 2019). Notices of Intent (encouraged, but not required) were due on May 15, 2019; full proposals are due July 15, 2019. Estimated total funding available: $3.2M over three years; Number of new awards: 12-20.

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NASA Opportunities

- Rapid Response and Novel Research in Earth Science – ROSES 2019 A.29 – [rolling deadline] - No budget for this –funded out of core programs.
- Topical Workshops, Symposia, Conferences – ROSES 2019 E.2 – (Max Bernstein, POC) – [rolling deadline] - No budget for this –funded out of core programs.

Research Opportunities in Space and Earth Sciences

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

- Ocean Biology and Biogeochemistry – Anticipated to be released in ROSES2020.
- Carbon Cycle Science – TBD

Overarching Goal

Advancing comparative studies to characterize Earth and other ocean worlds across their interiors, oceans, and cryospheres, to investigate their habitability, to search for biosignatures, and to understand life - in relevant ocean world analogues and beyond.