Earth Science "Earth System Explorers" AO Community Announcement NNH22ZDA002L

The National Aeronautics and Space Administration (NASA) Science Mission Directorate (SMD) is releasing this Community Announcement concerning its intention to solicit investigations for the Earth Science Division's (ESD) Earth System Explorers (ESE) Program. The new ESE Program conducts Principal Investigator (PI)-led space science investigations as recommended by The National Academies of Sciences, Engineering, and Medicine 2017 *Decadal Survey for Earth Science and Applications from Space* (https://www.nationalacademies.org/our-work-decadal-survey-for-earth-science-and-applications-from-space).

The current state of planning calls for NASA SMD to release a draft Announcement of Opportunity (AO) in the December 2021 timeframe that will solicit proposals for ESE missions. As stated in the Decadal Survey, the Program is designed to accomplish high-quality Earth system science investigations addressing one or more observables identified as ESE Target Observables (TO). These missions will conduct scientific investigations of modest and focused programmatic scope and can be developed relatively quickly (generally in 40 months or less) and executed on-orbit in 3 years or less. NASA Earth Science defines science to include research, applied research, and applications. The program line opens Earth system science to the benefits of innovation and to new, but flight-ready, technology alternatives including novel spacecraft bus concepts, miniaturized instrumentation, small satellites, constellations, and distributed launch options. NASA applies insights from Earth science to benefit the economy, health, quality of life, and environment around the globe. The Earth Science Explorer program can help achieve this objective and increase the overall value and benefits of a mission by considering innovative and practical applications for the collected data as part of the overall mission concept.

SMD is committed to a culture of inclusion, diversity, equity, and accessibility (IDEA) where all employees feel welcome, valued, respected, and engaged. NASA also expects that IDEA will be reflected in the composition of AO proposal teams. All ESE mission proposals will clearly define the principles by which team members can operate in an inclusive and equitable environment in accordance with the SMD Science Plan Strategy 4.1 (https://science.nasa.gov/science-red/s3fs-public/atoms/files/2020-2024%20Science.pdf). The Earth System Explorers Program will ask all proposers to include a plan to involve a diverse and inclusive workforce as well as any plans to broaden participation with underrepresented groups.

Launch Vehicle costs and procurement will be the responsibility of NASA. Launch vehicle standard services will be provided as Government Furnished Equipment (GFE). The GFE cost will not be included in the cost cap. The cost of mission specific and special launch services is the responsibility of the PI and must be included within the cost cap. Investigations will be capped at a Phase A-F cost of $310M (Fiscal Year 2024), excluding standard launch services (GFE).

NASA expects to solicit concepts that include one or more of the 2017 Decadal Survey Earth System Explorer Targeted Observables, i.e.,

- Greenhouse Gases
- Ice Elevation

- Ocean Surface Winds and Currents
- Ozone and Trace Gases
- Snow depth and Snow Water Equivalent
- Terrestrial Ecosystem Structure
- Atmospheric Winds

The current planning is for the selection process to be done in two steps. In Step 1, NASA anticipates that 4 mission proposals may be selected for nine-month Phase A concept studies. Each concept study would be funded up to $5M in real year dollars. For Step 2, NASA will conduct a detailed review of the Phase A Concept Study Reports (CSRs). As a result of this second evaluation, NASA expects to select two Earth Science Explorer missions to proceed into Phase B and subsequent mission phases. Phasing and funding of the two missions will be staggered. NASA desires to launch the first mission by 2029 and the second mission by 2031. The mission selected for the second launch will have a slower ramp up with enhanced funding to enable extended Phase A (~1 year), then ramping up in FY25.

Proposals in response to this AO will be due 90 days after its formal release. Participation will be open to all categories of U.S. and non-U.S. organizations with some restrictions, including educational institutions, industry, not-for-profit organizations, Federally Funded Research and Development Centers, NASA Centers, and other Government agencies.

Subject to funding availability, the schedule for the solicitation is intended to be:

Release of draft AO:	December 2021 (target)
Release of final AO:	July 2022 (target)
Preproposal conference:	~ 3 weeks after final AO release
Proposals due:	90 days after AO release
Selection for competitive Phase A studies:	August 2023 (target)
Concept study reports due:	June 2024 (target)
Down-selection:	November 2024 (target)

NASA has not approved the issuance of the Earth System Explorer Announcement of Opportunity (AO), and this Community Announcement (CA) does not obligate NASA to issue the final AO and solicit proposals. Any costs incurred by prospective investigators in preparing submissions in response to this CA are incurred at the submitter's own risk.

The forthcoming Earth Science Earth System Explorer AO may contain provisions that differ from this preliminary notice, in which case the provisions in the AO will take precedence. The Earth Science Earth System Explorer AO will be based on the Standard PI-led Mission AO Template available at http://soma.larc.nasa.gov/standardao/sao_templates.html. Proposers should read the Draft Earth Science Earth System Explorer AO carefully when it is released.

Questions or comments about this intention to release an Earth Science Explorer AO may be addressed by email to the Earth Science Explorer Program Scientist: Dr. Thorsten Markus at Thorsten.Markus@nasa.gov using subject line “ESE AO Community Announcement.” Send questions/comment no later than November 30, 2021, 11:59 p.m. Eastern time. Depending on the

nature of the question(s), NASA may respond on an individual basis by email or may post responses at the Frequently Asked Questions (FAQ) location of the Explorer Program Acquisition website (https://explorers.larc.nasa.gov/2022ESE/); anonymity of persons/institutions who submit questions will be preserved.