Earth Science Advisory Committee Meeting

March 10-11, 2020; NASA Headquarters, Washington, DC.

From: J. Marshall Shepherd (Chair, marshgeo@uga.edu), Thomas Herring (Vice-Chair, tah@mit.edu), Andrew Dessler, Ian Joughin, Nancy Glenn, Lucy Hutyra, Jasmeet Judge, Colleen Mouw, Ying Fan Reinfelder, Anastasia Romanou, Ray Schmitt and Sara Tucker.

To: Sandra Cauffman (Earth Science Division Director, Acting)

CC: Lucia Tsaoussi (Earth Science Advisory Committee Executive Secretary), Jack Kaye (ESD Associate Director for Research), Charles Webb (ESD Associate Director for Flight Programs, Acting), Lawrence Friedl (ESD Associate Director for Applied Sciences), Pamela Millar (Associate Director for Earth Science Technology Office)

Date: March 16, 2020

Dear Ms. Cauffman:

The Earth Science Advisory Committee (ESAC) met at NASA HQ and via WebEx on March 10-11, 2020 to discuss the Earth Science Division's (ESD) progress in implementing the recommendations of the 2017 Decadal Survey (DS). The topics discussed in the meeting were Earth Science Division Update and Decadal Survey Implementation Strategy (S. Cauffman), Designated Observable studies (ESD Program Scientists), Earth Venture Missions (C. Webb), Earth Venture Continuity -1 (D. Considine), Decadal Survey Incubation Studies (R. Bauer), Commercial Data Buy and Machine Learning- Artificial Intelligence (K. Murphy) and Research & Applications Cross-Benefits (J. Kaye /L. Friedl/Program Managers). The latter topic included discussions of air quality, natural hazards/disasters and biodiversity/conservation.

Findings:

- The Earth Science Division is successfully implementing the program of record recommendations of the decadal survey and advancing in the implementation of largely all the DS recommendations (see Earth Science Explorer missions below for one area of concern). With the advancement of dedicated studies, progress is being made on defining options for observing systems for all the Decadal Survey designated observables, namely Aerosol and Cloud, Convection, and Precipitation

(combined) (ACCP), Mass Change (MC), Surface Biology and Geology (SBG), and Surface Deformation and Change (SDC). Some of these observables already have missions making measurements (GRACE-FO for mass change) or will soon have dedicated missions (NISAR for surface deformation and change, launch expected 2022).

- The Earth venture missions (EVM) are bringing in new investigators. These missions are PI lead and include all components of the mission, including launch and the logistical support and management of the whole mission. Based on the transfer of project management to a NASA center for the GeoCARB project selected in EVM-2 solicitation, the ESAC finds that NASA has taken necessary steps to restructure the mission by moving project management to a NASA center. The ESAC also finds that in future EVM solicitations NASA should make clear to proposers the importance of the selection of the project management team and educate them in the best practices of forming a project management team, which ideally should have experience with projects of similar complexity and be able to maintain independent oversight of the implementing organizations.

- The ESAC was informed that the Earth Science Explorer line of missions are on hold due to budget restrictions. There is insufficient budget in the out-years to support the initiation of the new program for the development of this class of missions, making it one recommendation from the DS that cannot be implemented in the near term. However, depending on future budgets, the ESAC was informed that new starts may be possible in the 2023-2024FY time frame, which is still inside the decadal survey time window. The ESAC finds that delaying the Earth Science Explorer Program starts is prudent at the time.
- ESD collaborations and partnerships with US agencies and international partners to avoid redundancies and produce a unified observation strategy have been very successful and the ESAC strongly supports these joint activities.
- There has been significant progress in expanding the impacts and the cross benefits of the applied sciences and applications elements in ESD. The ESAC finds the separation between science and applications is important but that the interaction between them has large benefits in both directions.
- Data buys by ESD have been important but the ESAC finds significant impediments due to the restrictions in the end user license agreements (EULA) associated with these data buys. The ESAC recommends that data buys should be continued and the efforts continued to make these data adhere to the open data policies of NASA as much as possible.

Recommendation:

ESD should monitor the feasibility of the proposed timeline for the Libera instrument launch and develop a plan for action so as to ensure the measurement continuity.

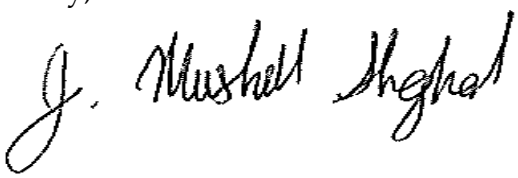
Major reasons for recommendation:

The Earth Venture Continuity (EV-C) mission for measurement of the Earth's radiation budget in both short and long wavelength bands is planned to be launched in 2027 on JPSS-3. The Libera Instrument selected for this mission meets the continuity recommendations in the DS. The concerns of the ESAC are (1) the launch timeline if JPSS-2 needs to replaced earlier than expected and (2) the new instrument design and the risk to continuity. Helping to mitigate the latter concern, NASA has some budget flexibility because the proposed instrument cost is less than the $150M instrument cap.

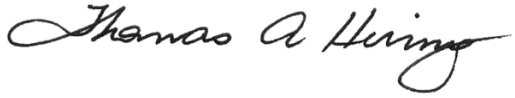
Consequence of no action on recommendation:

If Libera does not perform as expected or is unable to launch due to an early launch of JPSS-3, there will be a loss of continuity of Earth radiation measurements that will hamper our ability to assess long term changes in the Earth's radiation budget for which we currently have a 20-year continuous record.

Sincerely,



J. Marshall Shepherd, Chair
Earth Science Advisory Committee



Thomas Herring, Vice Chair
Earth Science Advisory Committee