Committee on Earth Science and Applications from Space

Update to the Space Studies Board

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October 23-24, 2017 Meeting in Boulder—Highlights

- Review of Potential Activities
  - Workshop with NRC Mathematics Board: Novel techniques and applications for data analytics on Earth Observational Data
  - NRC Study Called for in Weather Modernization Act of 2017 (and its relation to a BASC study, "Building a Community-Driven Vision for the Next Generation U.S. Weather Enterprise: Discussion of a Proposed Study")
- Briefings from UCAR (Tony Busalacchi), NOAA (Karen St. Germain), and NASA (Mike Freilich)
- Closed Session Discussions with the ESAS 2017 Co-Chairs, Waleed Abdalati and Bill Gail
- Discussion of 1st draft of ESAS 2017 "Popularization"
- Planning for March 2018 meeting during SSW

Novel Techniques and Applications for Data Analytics on Earth Observation Data

Summary

- The National Academies of Science, Engineering, and Medicine proposes to organize a 2-day workshop to explore novel frontiers and challenges of applying machine learning and other data analytics techniques to Earth observational datasets
- This workshop would bring together domain researchers and industry specialists across disciplines to describe cases where Earth observational data research is currently underway; discuss some approaches, challenges, and opportunities to expanding its use in new domains; and highlight the value of doing so
- The workshop discussions would outline possible future steps for industry and research applications so that the various kinds of Earth observational datasets can be utilized to increase understanding between Earth systems and a myriad of other disciplines

- Per meeting discussions, prospectus to be revised to include additional material on issues related to cloud computing, possibly including operations of the NASA DAACs

Weather Research and Forecasting Innovation Act of 2017 Independent Study On Future Of NOAA Satellite Systems And Data

[NOAA] shall seek to enter into the agreement [by September 30, 2018] with the NAS [for a] study on matters concerning future satellite data needs. Study shall:

(i) develop recommendations on how to make the data portfolio of the Administration more robust and cost-effective;

(ii) assess the costs and benefits of moving toward a constellation of many small satellites, standardizing satellite bus design, relying more on the purchasing of data, or acquiring data from other sources or methods;

(iii) identify the environmental observations that are essential to the performance of weather models, based on an assessment of Federal, academic, and private sector weather research, and the cost of obtaining the environmental data;

(iv) identify environmental observations that improve the quality of operational and research weather models in effect on the day before the date of enactment of this Act;

(v) identify and prioritize new environmental observations that could contribute to existing and future weather models; and

(vi) develop recommendations on a portfolio of environmental observations that balances essential, quality-improving, and new data, private and nonprivate sources, and space-based and Earth-based sources

Building a Community-Driven Vision for the Next Generation Weather Enterprise

Draft Statement of Task

The committee will engage the broad weather community to develop a shared vision for the U.S. weather enterprise, identify a set of shared goals for advancing the enterprise during the next decade, and recommend critical investments, institutions, and coordination mechanisms to make rapid progress towards meeting these goals. Their report will:

1. Describe the weather enterprise today
2. Consider how the weather enterprise may change in the next few decades
3. Describe a comprehensive ideal vision of a robust and successful weather enterprise for the next decade and beyond
4. Recommend key steps to enable the weather enterprise to achieve the vision

Building a Community-Driven Vision for the Next Generation Weather Enterprise

Draft Statement of Task (cont.)

In addressing its charge, the committee shall consider the full continuum from research to decision making, including:

A. Research in the physical, natural, and social and behavioral sciences
B. Development of next generation modeling and data assimilation capabilities
C. Space based and in situ observations/platforms – both traditional and novel approaches
D. Education and work force development
E. Weather-related decision making

March 2018 Meeting: Possible Focus Sessions

- Discussion of Decadal Survey with ESD Director and Colleagues
  - Support the start of a series of survey-related implementation studies by the ESD Director
- Presenters to support one or both of the potential *ad hoc* studies/workshops
- Other survey-related implementation issues—all TBD as survey has not been completed and briefed to the agencies. However, some committee ideas include:
  - Technology on-ramps to facilitate the NOAA recommendations
  - Examination of the survey Venture-class recommendations