New report offers NASA framework for establishing priorities among Earth observations

October 26 2015

A new report from the National Academies of Sciences, Engineering, and Medicine offers NASA a framework for prioritizing satellite observations and measurements of Earth based on their scientific value.

NASA's Earth Science Division conducts a coordinated series of satellite and airborne missions for long-term global observations of the land surface, biosphere, solid Earth, atmosphere, and oceans. Data from these observations are used to understand Earth as an integrated system and to support critical societal applications, including resource management, weather forecasts, climate projections, agricultural production, and natural-disaster response.

Like all federal agencies, NASA is operating in a constrained budgetary environment that necessitates making difficult choices among competing priorities for investment. For the Earth Science Division, this challenge is exacerbated by increasing demands for the information provided by its programs and missions, as well as by congressional and executive branch direction to undertake responsibility for sustaining a number of measurements that were formerly supported by other federal agencies.

NASA's current process for making decisions about Earth-observation priorities is primarily qualitative. As an alternative, the framework presented in the new report provides a partially quantitative and transparent approach that rates the relative importance of different

measurements based on their scientific value. (The report does not tell NASA which observations to prioritize, but instead offers methodologies and metrics that NASA can use to establish priorities.)

The report recommends that NASA begin by developing a small set of quantified objectives for its earth science measurements, using the same sources it uses to develop its program plan - the consensus priorities of the scientific community expressed in the Academies' decadal surveys, as well as guidance from the executive and congressional branches. The report offers examples to illustrate the form of a quantified objective, such as determining the rate of global mean sea-level rise or the change in ocean heat storage within a quantified range of uncertainty. NASA should then rate the benefit of a particular measurement to meeting a quantified objective based on a small set of characteristics—importance, utility, quality, and success probability. Considering these ratings, as well as affordability, will enable NASA to distinguish the relative value of competing measurements.

The report illustrates use of the framework with science objectives, but notes that it could also be applied to help NASA prioritize measures in terms of their relationship to societal benefits. However, this use of the framework would require NASA to determine how to identify and assess quantified objectives in this area.

More information: www.nap.edu/catalog/21789/cont … ce-a-value-framework

Provided by National Academy of Sciences

https://phys.org/news/2015-10-nasa-framework-priorities-earth.html