UC SANTA BARBARA
NATIONAL CENTER FOR ECOLOGICAL ANALYSIS AND SYNTHESIS
SANTA BARBARA, CALIFORNIA 93101

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Dear Editors,

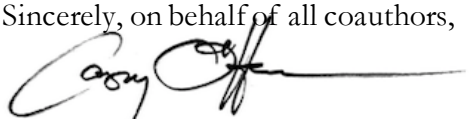
Remotely sensed Earth science information (ESI) from satellites, unmanned aerial vehicles, and in situ sensor networks are increasingly important for addressing global challenges including climate change, wildfires, agriculture, air quality, and water resource management. Certainly the value of ESI is implicit in its widespread use across many applications and decision contexts, in particular toward the scientific questions the ESI instruments were originally designed to address. But these instruments and data offer potential value far beyond their intended design, especially as researchers apply sophisticated algorithms to probe questions of societal relevance. The full range of ESI's contributions to real world decisions and societal outcomes are rarely examined, thus the full potential remains an open question and we risk underinvesting in vital information essential for protecting or enhancing our quality of life.

To understand the current landscape of ESI valuation, we assembled a working group of academics across disciplines of ecology, economics, psychology, risk assessment, sustainable development, and data science, with broad experience valuing ecosystem services and information, including ESI. Here we present the results of our work, "A Systematic Map of Methods for Assessing Societal Benefits of Earth Science Information," for publication in *PNAS*. Using machine learning to support our manual screening process, we identified 171 papers among 13,823 candidates where researchers applied valuation methods based on decision analysis (e.g., value of information, cost-benefit analysis) and/or preference elicitation (e.g., stated preference, surveys, interviews) to understand the magnitude of benefits derived from ESI-informed decisionmaking, including both instrumental and non-instrumental values.

Understanding the value of ESI toward societal benefits will help amplify the use of existing data in research, inform future investments in remote observation systems, and enhance public support for ESI. To this end, our results highlight the range of valuation methods available to researchers and practitioners to further the field of ESI valuation. We anticipate that our paper will appeal broadly to scientists and policymakers in the ESI space, as well as the technology-minded public.

The research and results presented here are novel from any past work my colleagues or I have done. This work has not yet been published, has been approved for publication by all authors, and is only under consideration for publication by *PNAS*. All data and code to support this analysis are available at https://github.com/convei-wwf/sp1_systematic_map. If additional information is needed, please feel free to contact me.

Sincerely, on behalf of all coauthors,



Casey C. O'Hara
National Center for Ecological Analysis and Synthesis
University of California, Santa Barbara
ohara@nceas.ucsb.edu