

# Towards a U.S. Framework for Continuity of Satellite Observations of Earth's Climate and for Supporting Societal Resilience



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**What is this?** A study sponsored by the Keck Institute of Space Studies ([kiss.caltech.edu](http://kiss.caltech.edu)) to codify best practices, articulate successes, and identify challenges and opportunities in the prioritization, acquisition, curation, and stewardship of sustained space-based environmental records. The goal of the study is to accelerate discussion and plans for a greater and more impactful U.S. contribution to the global satellite observing system that will support decision-making regarding climate change, environmental hazards, and national security.

**Why study this?** Space-based Earth observations enable us to understand the wonder and complexity of the planet we live on. They provide society with situational awareness of local-to-global environmental conditions and support predictive guidance for near-term weather extremes. While these capabilities are indispensable to safeguarding life and property – as well as supporting trillions of dollars in economic and resource management decisions – there are needs and opportunities to greatly expand their utility and impact. Society's growing reliance on environmental information supporting the connectivity and complexities of our food, water, transportation, shipping, energy, communications, and health sectors, along with the growing impacts of climate change on these sectors, suggest an increasing need for continuous monitoring, enhanced user access and data discoverability, and authoritative long-term data stewardship.

**Who is involved?** The Keck Institute of Space Studies, a privately-funded think-tank based at Caltech, is funding and hosting the study. The study team is composed of 30 experts on environmental sensing technology and methods, Earth prediction modeling, and data stewardship across academia, industry, government, and international organizations.

**Why now?** This study seeks to capitalize on the confluence of several key factors, including: a maturing user community for long-term climate data records; the availability of affordable and scalable cloud computing; the development of new business models and partnership opportunities in earth observations; the enhancement and miniaturization of Earth observation technologies; and the emergence of a programmatic window for formulating the next generation of observatories. Together, these factors provide a unique opportunity for the U.S. and the world to provide improved climate and environmental situational awareness and support decisions aimed at safeguarding life and property and improving societal resilience.

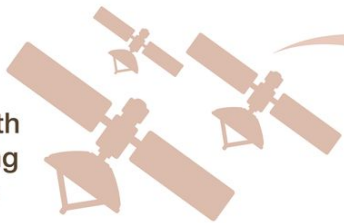
**Next Steps:** Based on this study, the KISS study team suggests the establishment of a nimble and responsive coordination framework to help guide and shepherd U.S. concerns regarding sustained Earth observations. This coordination framework should account for: 1) approaches to identify and prioritize satellite observations needed to meet U.S. needs for science and services, 2) the rapidly evolving landscape of space-based Earth viewing architecture options and technology improvements with increasing opportunities and lower cost access to space and 3) the technical and programmatic underpinnings required for proper and comprehensive data stewardship with a broad science and services user base in mind.

For more information, see:

- [https://kiss.caltech.edu/programs.html#satellite\\_observations](https://kiss.caltech.edu/programs.html#satellite_observations)
- *KISS Continuity Study Team*, Towards a U.S. Framework for Continuity of Satellite Observations of Earth's Climate and for Supporting Societal Resilience, *Earth's Future*, American Geophysical Union, **Submitted**.

# Sustained Observations of Earth Contribute to U.S. Security, Resilience and Prosperity

New Earth Observing Systems



Partners contributing to a sustained observing system (e.g. NOAA, NASA, USGS, International, Commercial, Philanthropic)

## Continuity Plan and Framework

- Prioritize U.S. needs for sustained satellite observations
- Leverage the growing ecosystem of architecture options
- Provide long-term stewardship and maximize information dissemination and impact

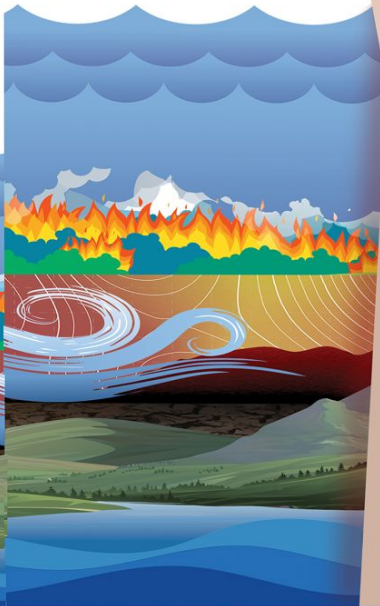


## Environmental Risks

Present



Future



## Sustained Earth Observing Systems

SEA LEVEL

LAND IMAGING

WEATHER

**Building Resilience**

## Thriving, Resilient Society

