



Towards a Continuity Framework for the US

A “list” of priorities

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Questions for the U.S. Concerning Sustained Observations

European Model



ESA

Science
Missions

EU Copernicus

Other Missions
w/ Continuity

EUMETSAT

Meteorology
Satellites
w/Continuity

Plan/Framework?

Science
Missions

Other Missions
w/ Continuity
e.g.
• Land Imaging
• Sea Level

Many others
outstanding
with no plan

Meteorology
Satellites
w/Continuity

NASA

NOAA

U.S. Model



- Apart from weather, what are our national priorities for sustained Earth observations?
- What paradigm will the U.S. use as the basis for setting these national priorities?
- What organization or body will be chartered to develop these priorities for the U.S.?
- What is our national approach to implementing sustained Earth observations that meet these priorities, including the information production and delivery services?

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

KISS Study Program 2022



kiss.caltech.edu

AGU Earth's Future, 2023

Earth's Future

RESEARCH ARTICLE
10.1029/2023EF003757

Key Points

- There is growing urgency for improved public and commercial services to support a resilient, secure, and thriving US.
- Space-based Earth observations represent an essential component of the infrastructure needed to support the delivery of needed information.
- The US would benefit from an overarching plan for sustained Earth observations to support our science, policy, and resilience goals.

Supporting Information
Supporting Information may be found in the online version of this article.

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Methodology: KISS Continuity Study Team
Investigation: KISS Continuity Study Team
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KISS CONTINUITY

Toward a US Framework for Continuity of Satellite Observations of Earth's Climate and for Supporting Societal Resilience

KISS Continuity Study Team¹

¹See Appendix A.

Abstract There is growing urgency for improved public and commercial services to support a resilient, secure, and thriving United States (US) in the face of mounting decisions support needs for environmental stewardship and hazard response, as well as for climate change adaptation and mitigation. Sustained space-based Earth observations are critical infrastructure to support the delivery of science and decision support information with local, national, and global utility. This is reflected in part through the United States' sustained support of a suite of weather and land-imaging satellites. However, outside of these two areas, the US lacks an overarching, systematic plan or framework to identify, prioritize, fund, and implement sustained space-based Earth observations to meet the Nation's full range of needs for science, government policy, and societal support. To aid and accelerate the discussion on our nation's needs, challenges and opportunities associated with sustained critical space-based Earth observations, the Keck Institute for Space Studies (KISS) sponsored a multi-week think-tank study to offer ways forward. Based on this study, the KISS study team suggests the establishment of a robust coordination framework to help address US needs for sustained Earth observations. This coordination framework could account for: (a) approaches to identify and prioritize satellite observations needed to meet US needs for science and services, (b) the rapidly evolving landscape of space-based Earth viewing architecture options and technology improvements with increasing opportunities and lower cost access to space, and (c) the technical and programmatic underpinnings required for proper and comprehensive data stewardship to support a wide range of research and public services.

Pain Language Summary The Keck Institute of Space Studies has carried out a think tank study to codify best practices, articulate successes, and identify challenges and opportunities in the prioritization, acquisition, curation, and stewardship of sustained space-based Earth observations. The goal of the study is to accelerate discussion and plans for a greater and more impactful US contribution to the global satellite observing system that will support decision-making regarding climate change, environmental hazards, and national security. Based on this study, the KISS study team suggests the establishment of a nimble and responsive coordination framework to help guide and shepherd US concerns regarding sustained Earth observations. This coordination framework should account for: (a) approaches to identify and prioritize space-based Earth viewing architecture options and technology improvements with increasing opportunities and lower cost access to space and (b) the technical and programmatic underpinnings required for proper and comprehensive data stewardship with a broad science and services user base in mind.

1. Introduction

Our environment is continually changing in ways that impact our lives and livelihoods. These environ-

2024 Mid-Term Review of the 2017 NASEM Earth Decadal Survey

NATIONAL ACADEMIES
Sciences
Engineering
Medicine

Thriving on Our Changing Planet A Midterm Assessment of Progress Toward Implementation of the Decadal Survey



Consensus Study Report

PUBLIC DRAFT: NATIONAL PLAN FOR CIVIL EARTH OBSERVATIONS

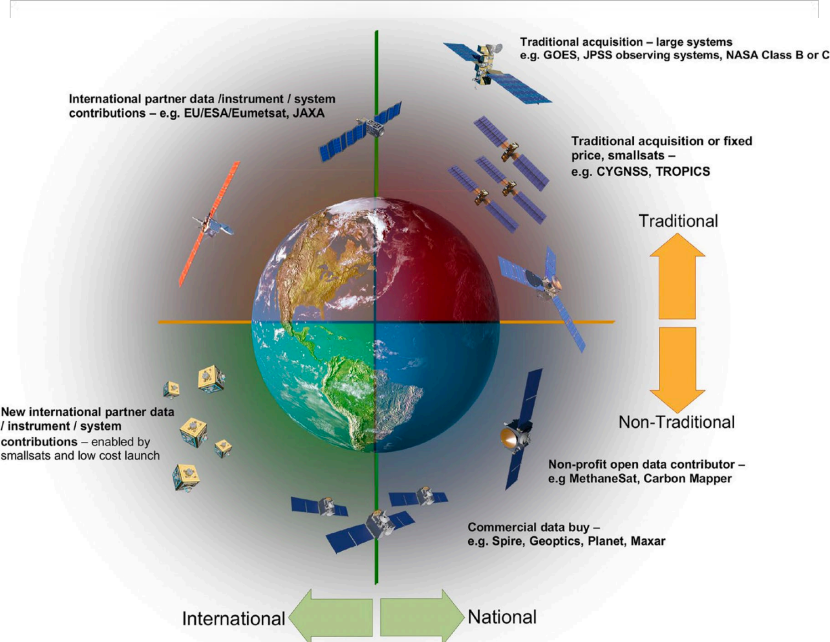
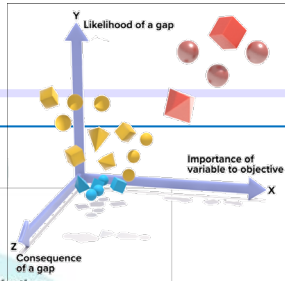
A Report by the
SUBCOMMITTEE ON U.S. GROUP ON EARTH OBSERVATIONS
COMMITTEE ON ENVIRONMENT
of the
NATIONAL SCIENCE AND TECHNOLOGY COUNCIL

NOVEMBER 2023

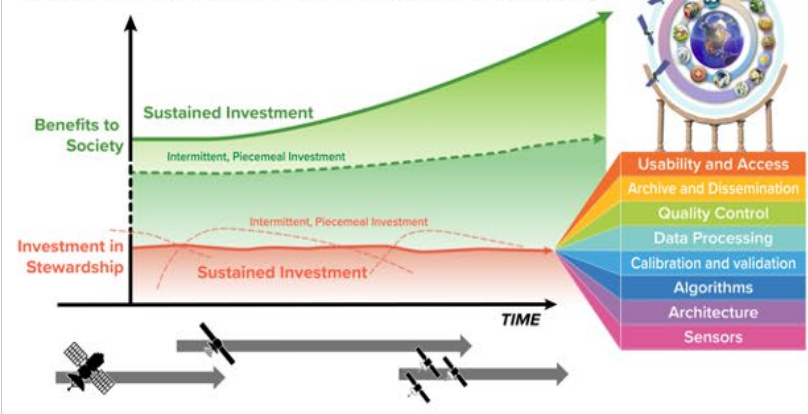
U.S. National Plan for Civil Earth Observations, 2024

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

Sustained Space-based Earth Observations: An Essential Information Infrastructure



Realizing the Full Value and Impacts of Sustained Observations: Requires Sustained Investments in Data Stewardship, Dissemination & Usability



Identifying Science and Application Priorities

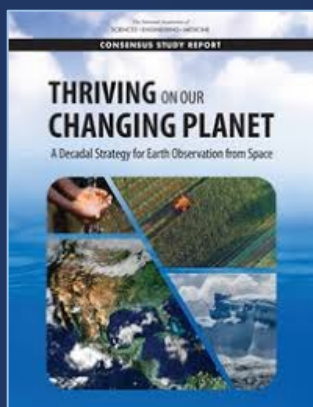
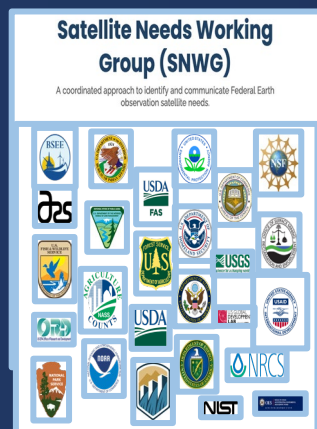
Developing Architecture Options & Opportunities

Long-term Programmatic and Technical Support

The U.S. could benefit from a systematic and overarching plan or framework for identifying, prioritizing, funding, and implementing sustained Earth observations critical for supporting our nation's science, policy, and societal resilience goals.

What are our priorities?— An “Easy” Starting Point

US. Decision-Support Agency Input
Somewhat minor adjustments to SNWG Process



U.S. Earth Science Priorities
*Relatively easy inclusion in NASEM Decadal
Survey Statement of Task*

Working List of U.S.
Priorities for
Sustained
Observation



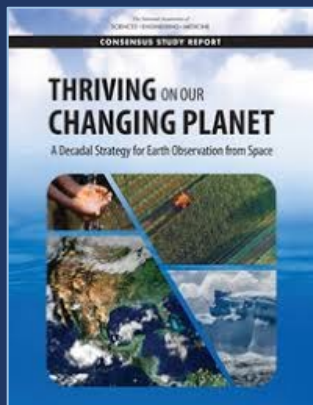
- *Could use tiers/categories rather than strict priorities*
- *CESAS and/or NASA – could adjudicate / moderate the list?*

Benefits and Uses

1. Value to US commercial space sector looking to add value to, and plug holes for, the Earth applications decision support.
2. Could provide some additional elements of focus for NASA’s Commercial Satellite Data Acquisition Program (CSDA)
3. Would provide some level of prioritization for targets of the Earth Ventures (EV) program concerned with Continuity.
4. Could be the basis for more concerted efforts by the US – via NASA, NOAA, USGS, and international and commercial partners

Working our Priorities: An Active Body & Framework

US. Decision-Support Agency Input

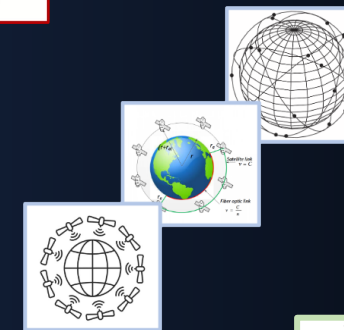


U.S. Earth Science Priorities

Working List of U.S. Priorities for Sustained Observation

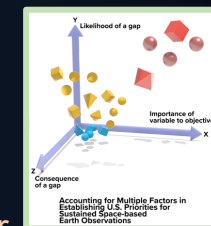


Body of U.S. Technical Experts Developing Potential Solutions with International and Commercial Actors



Working List of Candidate Solutions

Means of Evaluating Candidate Solutions for Viability and Readiness (follow-up to NASEM, 2015)



As solutions become feasible, and sponsor(s), federal \$ and/or partners materialize, items can be removed from the list

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