National Earth Observations Portfolio Assessment

Briefing for the Subcommittee on Disaster Reduction

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US Group on Earth Observations Program

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National Strategy Approach

- Steps back from immediate questions of hardware procurement investments
- Creates a policy, assessment, and planning framework focused on the broader, multi-purpose benefit of Earth observations for society
- Results in advice to OSTP and OMB on the relative priorities for the Nation's observing system investments

National Earth Observations Strategy Outcomes

1. Establishes a framework and method for Federal assessment of Earth observations (data and products derived from Earth-observing systems) based on societal benefit areas, evaluates information products produced for those areas, identifies critical data streams that support those products, and prioritizes the observing systems on which those data streams depend, taking account of both present and anticipated needs and technologies.

2. Provides data-management guidelines, advancing data-management frameworks, and improving information-delivery systems for Earth-observation data.

3. Establishes a routine process for drafting and updating a National Plan for Civil Earth Observations informed by the results of the assessment and which takes fiscal and programmatic considerations into account.
   - The first plan is currently undergoing NSTC/CENRS review and is expected to be released in 2014. It will be updated every 3 years.

National Earth Observations Assessment Working Group 2011-2012

Leadership and Membership

- Co-Chairs: Pamela Taylor (NOAA), Pat Jacobberger-Jellison (NASA), John Crowe (USGS)
- Membership includes representatives of 13 agencies of the NEO Task Force, appointed by Task Force Principals
- Subject Matter Teams formed by CENRS subcommittees. Sequence of elicitation workshops with each team to perform the assessment, facilitated by elicitation teams

Deliverable

- The first National Civil Earth Observations Assessment (September 2012). Internal results to USG only

National Earth Observations Assessment Overview

From *National Strategy for Civil Earth Observations*:

> "The assessment will document, for internal Federal use, the baseline current portfolio and define an integrated portfolio of observing systems, networks and platforms that will provide optimal continuity, fulfillment, and advancement of required measurements over the 10-year planning period."

Assessment Framework

12 Societal Benefit Areas (SBAs) + Reference Measurement; areas debated and finalized by CENRS, February 2012

First National Earth Observations Assessment
12 Societal Benefit Areas + Ref. Measurements

SBAs plus Reference Measurements	
Agriculture & Forestry	Ocean & Coastal Resources
Biodiversity	Space Weather
Climate	Transportation
Disasters	Water Resources
Ecosystems	Weather
Energy & Earth Resources	Reference Measurements
Human Health	

National Earth Observations Assessment Key Elements

- "Value Chain" Approach - Provides traceability of observations collected to societal benefit delivered, with research needs integrated within the value chain

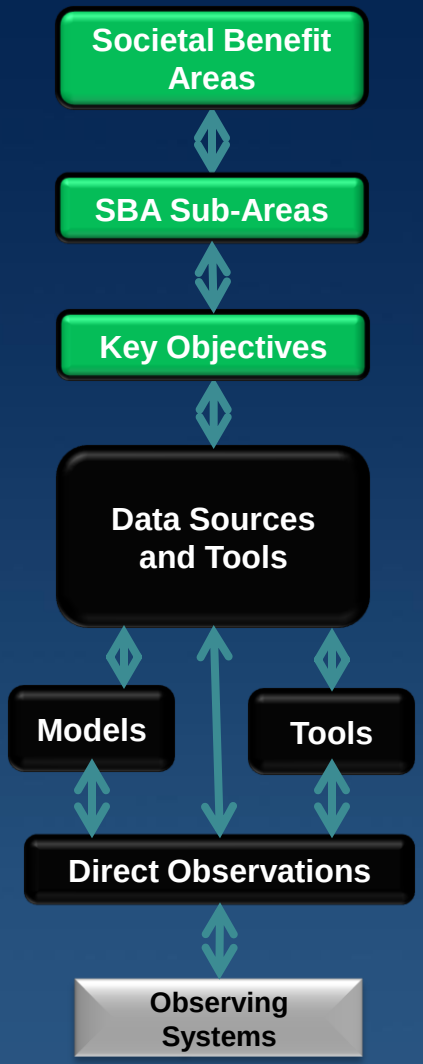
- Impact Assessment Method - Applied at each level of the Value Chain
  - Evaluates both the relative criticality of an individual input and the overall performance of that input
  - Standardized performance scale, based on swing weighting, results in standardized product from each team, facilitating integration

"Observing Systems" Definition and Assessment Scope

Observing System:
"Observing system" refers to one or more sensing elements that directly or indirectly collect observations of the Earth, measure environmental parameters, or survey biological or other Earth resources (land surface, biosphere, solid Earth, atmosphere, and oceans). Sensing elements may be deployed as individual sensors or in constellations, and may include instrumentation or human elements. Observing system platforms may be mobile or fixed and are space-based, airborne, terrestrial, freshwater, or marine-based. Observing systems increasingly consist of integrated platforms that support remotely sensed, in situ, and human observations.

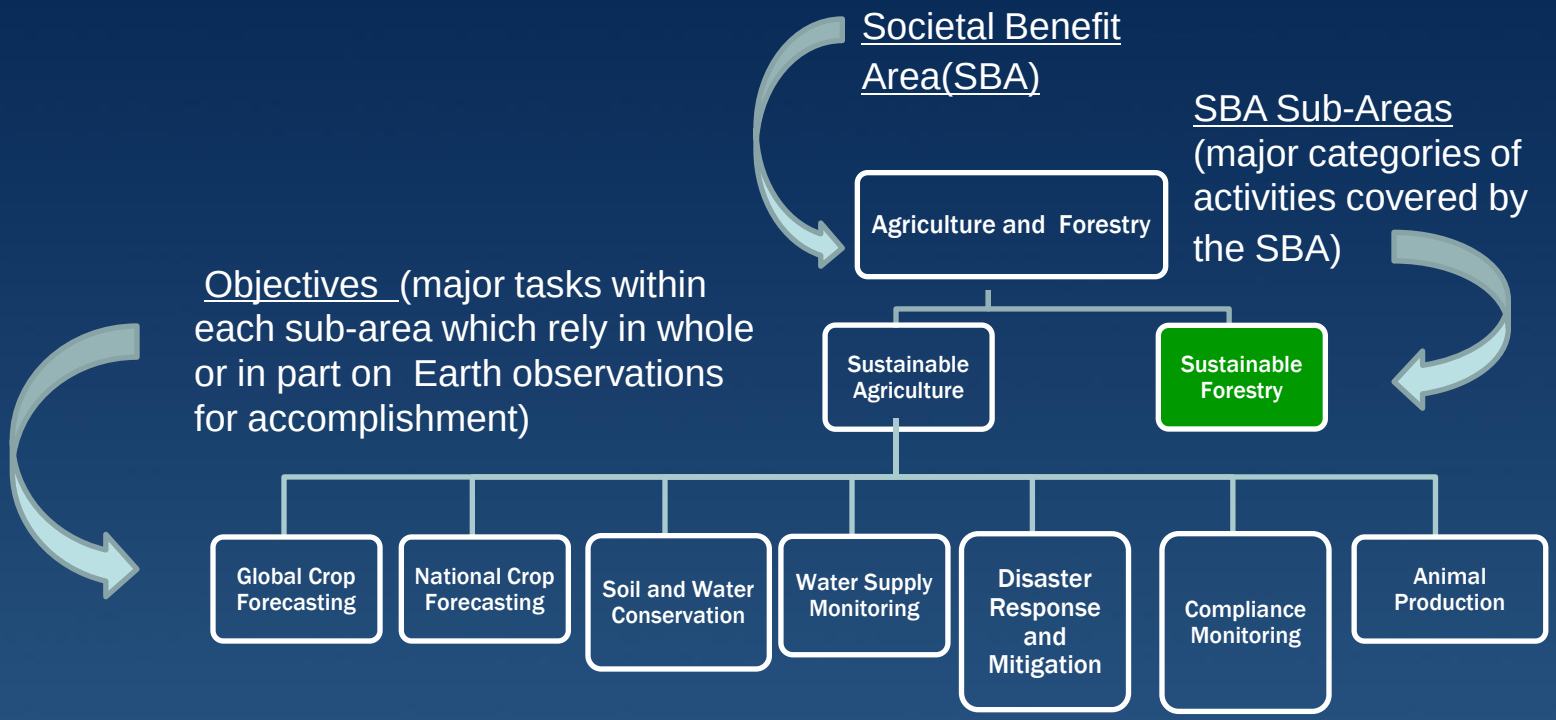
- Assessment includes ALL unclassified systems relied upon regardless of owner
  - U.S. government, foreign systems, state and local government, private sector, commercial, etc.
  - Includes "research" systems as critical to meeting objectives
  - For satellite sources, identify the sensor capability used
- Assessment excludes Intelligence Community / Classified Systems, but broader National Strategy emphasizes need to more fully exploit unclassified products from classified sources.

First Earth Observations Assessment Value Chain



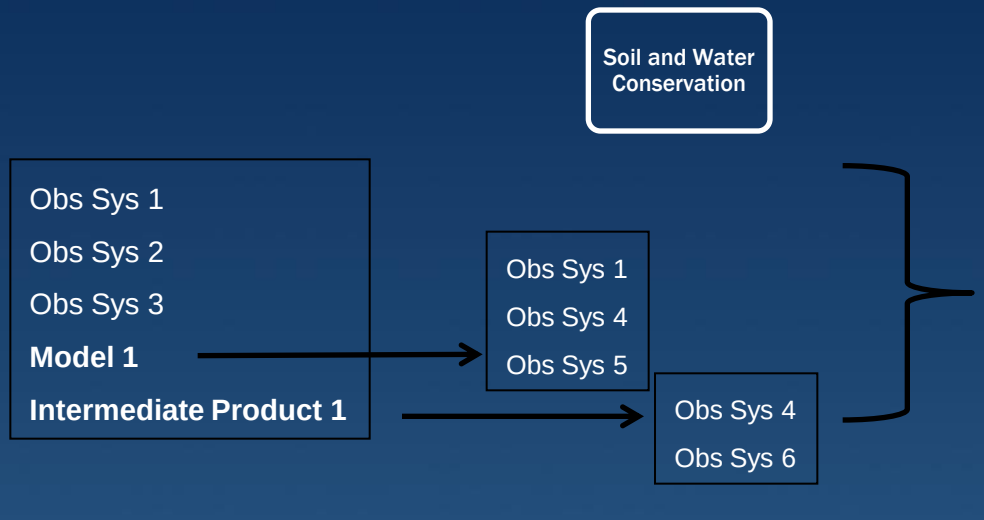
- The value chain construct links major functional activities to the data sources, tools, and direct observations needed to deliver societal benefit
- SBA Sub-Areas provide a natural breakdown of the SBA into topical/application areas that encompass the major functions within the SBA
- Key Objectives represent the most important things to be accomplished within the Sub-Area
- Data Sources and Tools include direct observations, model output, intermediate products, and tools that require Earth observations to achieve the Key Objectives
- Observing Systems

National Earth Observations Assessment
Value Chain Example: Agriculture and Forestry



National Earth Observations Assessment Key Objective, Data Sources and Tools

For each key objective, data sources and tools are deconstructed to understand the structure of observing system inputs to meeting each objective



National Earth Observations Assessment Performance and Criticality

At each level of the value tree, subject matter experts are asked to do two things:

1. Assess the overall performance of each of the elements using a standard performance satisfaction scale.

2.Assess the impact on each element if inputs are systematically removed (criticality) using simplified “swing weighting” technique

National Earth Observations Assessment Translating Performance into Numerical Values

- Performance (satisfaction) is scored using the scale at right for the various elements of the value chain
  - SBA Sub-Areas
  - Data Sources and Tools Observing Systems
- Any integer between 1 and 100 is a valid score
- Scale used to populate the spreadsheets using swing-weighting

Performance (Satisfaction) Scale		
100	**Ideal**	Meets all requirements and exceeds some
90	**Fully Satisfied**	Meets all requirements
80	**Good**	Meets all major requirements, with minor limitations
60	**Fair**	Meets most major requirements, with significant limitations
40	**Poor**	Fails to meet many major requirements, but provides some value
20	**Very Poor**	Fails to meet most major requirements, but provides minor value
1	**No Capability**	Provides no value

Second National Earth Observation Assessment

- Second Assessment: 2014-2015
  - Leverages the methodology from the first Assessment
  - Incorporates “lessons learned” from the first Assessment and subsequent use of this methodology at NOAA (NOSIA) and USGS (NLIR)
  - The USGEO Subcommittee’s Assessment WG will provide guidance to help SBA teams structure subareas and key objectives in a standardized manner
    - Guidance will help ensure adequate coverage and address gaps or areas or overlap
  - Improve agency representation and engagement
    - Will ensure broad coverage through SMEs with scientific knowledge and agency expertise
  - More even representation of “research” throughout SBAs
    - How observations support the generation of fundamental knowledge
    - How observations support the development of new tools and techniques