



Societal Benefits of NOAA Data

2016 STAR JPSS Annual Science Team Meeting

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Purpose



- Introduce the Office of Performance, Risk, and Social Science (PRSS - CFO)
- Present a Brief Summary of NOAA's Social Science Vision and Strategy goals
- Value Concept and Economic Valuation
- Social Science Initiatives in Valuation Economics



Office of Performance, Risk, and Social Science (PRSS-CFO)



Mission: Deploy best practices from enterprise performance and risk management as well as social science integration to help decision makers achieve NOAA's mission.

Executive Decision Support
(NOAA Leadership, NEP, PMC)



Enterprise Performance
Management



Enterprise
Risk Management



Social Science
Integration



Strategy & Planning





Social Science Integration



Core Functions

- Quantify and promote value and impact of NOAA's products and services
- Incorporate social science research in management decisions
- Integrate social science in program planning and budgeting

FY16 Major Initiatives

- Developing Value of Information (VOI) approach and research in NOAA to quantify the impact of products and services
- Integration of ecosystem services across NOAA
- Promoting new risk communications strategies across NOAA

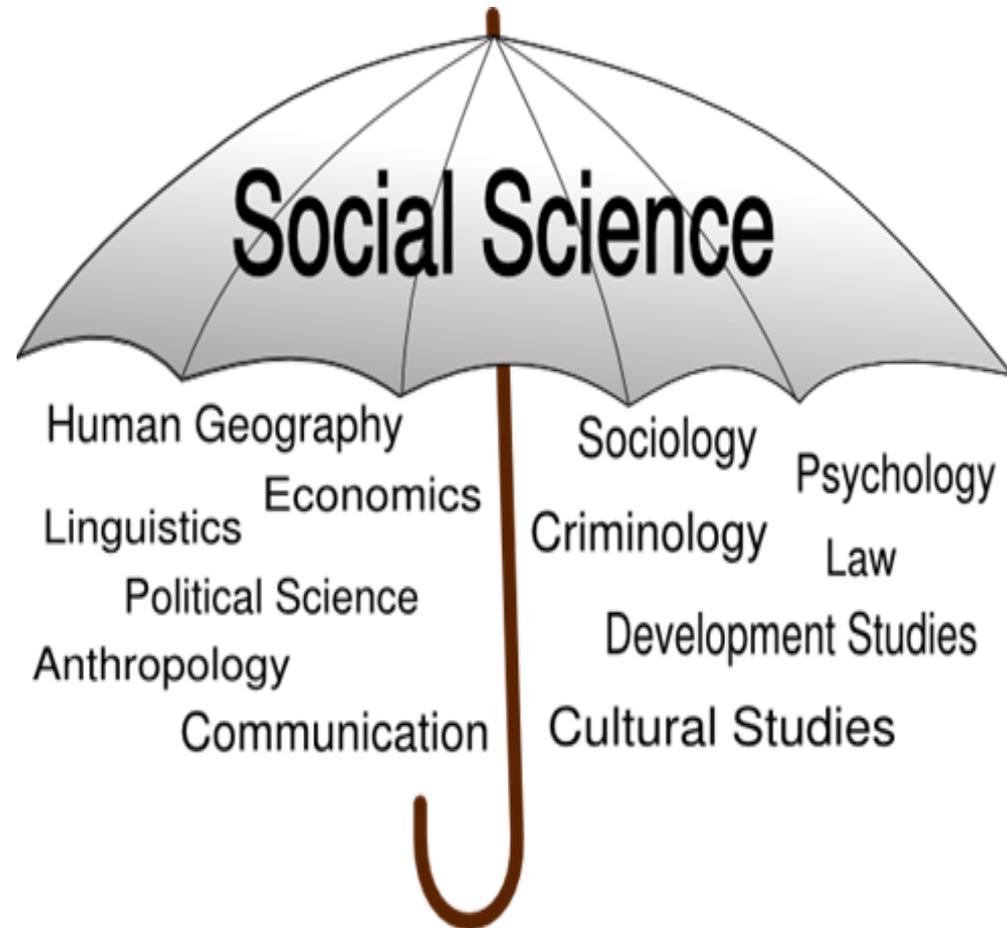


What is Social Science?



“Social science is the process of describing, explaining and predicting human behavior and institutional structures in interaction with their environments...”

NOAA Science Advisory

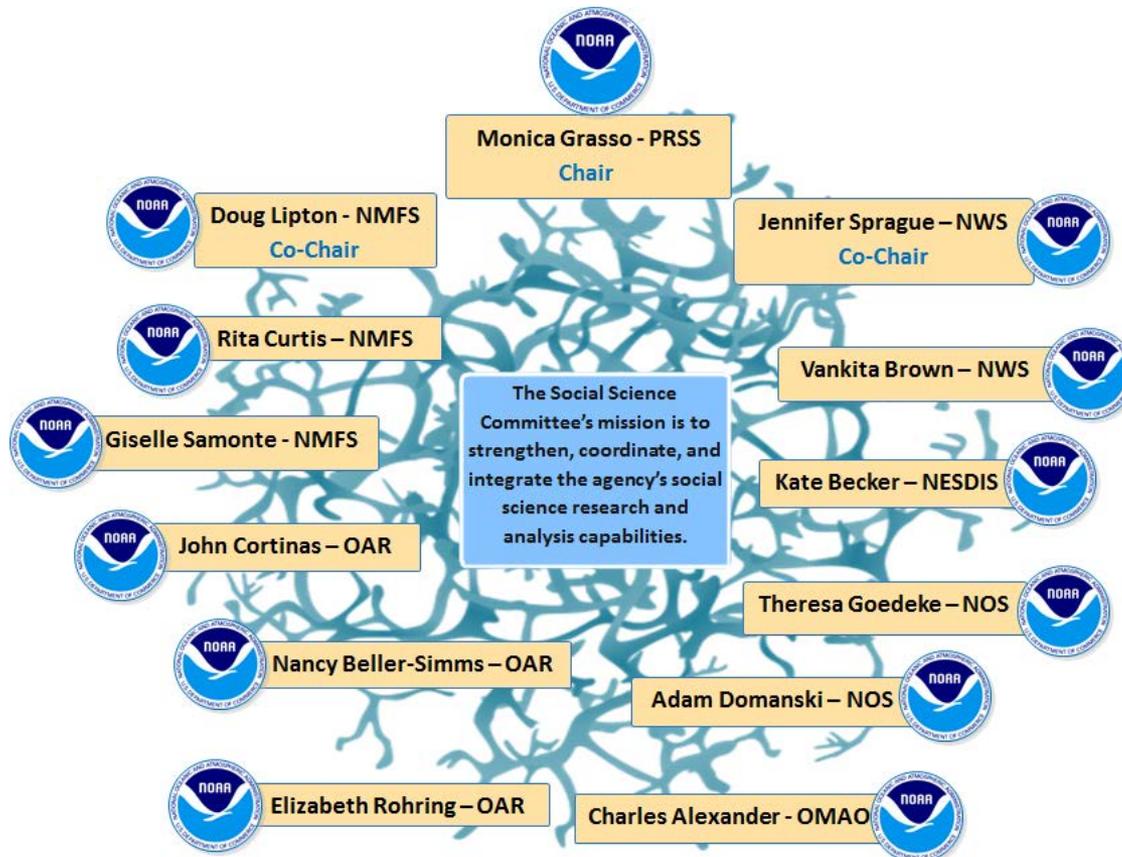




NOAA's Social Science Committee



The Social Science Committee is a formal NOAA Committee formed in 2014 and composed of representatives from each Line Office



SOCIAL SCIENCE

VISION AND STRATEGY



SUPPORTING NOAA'S MISSION WITH SOCIAL SCIENCE



VISION

NOAA's mission and priorities more effectively drive positive environmental, societal, and economic change.

STRATEGY

Integrate Social, Behavioral, and Economic science end-to-end in NOAA's mission and priorities.

Make communities more resilient

Evolve the Weather Service

Invest in observational infrastructure

Achieve organizational excellence

GOAL 1

NOAA's impact on society is defined and measured.

Quantify and promote the value and impact of NOAA's products and services in serving communities and meeting its mandates.

Standardize approaches for defining and measuring high profile economic data.

Strengthen the impact of investment by valuing improvements in NOAA products and services.

GOAL 2

NOAA's products and services strengthen societal decision-making.

Incorporate social science research in management decisions to increase community resilience.

Use social science methods to assess and communicate risk while reducing vulnerability to changing environmental conditions.

Consistently collect social science data and information to strengthen the implementation of ecosystem-based management.

GOAL 3

Institutionalize social science to further NOAA's mission.

Integrate social science in program planning and budgeting.

Apply social science methods in internal agency operations and decision-making.

Use only the most high-quality, robust, and innovative social science in NOAA products and services.

Science, Service, and Stewardship





NOAA Social Scientists



NOAA Employee Survey Results (2013)

- Number of Survey Recipients = 220 people
- Respondents = 160 people
- Economists = 53 people (20%)
- Line Office Distribution
 - NMFS = 68 people (43%)
 - NOS = 35 people (22%)
 - OAR = 31 people (19%)
 - NWS, PPI, NESDIS = 26 people (16%)



Social Science Newsletter



NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Social Science Community Newsletter

Volume 8, June 2016 – Sharing knowledge for better practices

NOAA Transitioning Research on Risk and Behavior

The National Oceanic and Atmospheric Administration (NOAA) spends billions of dollars each year monitoring and predicting risk from environmental hazards to help people, communities, businesses, and local governments find and use the correct information to understand risk and make smart decisions. However, those investments only achieve their full potential value if risk is communicated effectively, which empowers people to pursue the response options that are best for them. Research from NOAA and its external partners improves the ability to deliver weather and coastal warnings more effectively, communicate local hazards and risks, and provide guidance and decision support tools to stakeholders.



NOAA is working across its line offices to transition research on risk communication and behavior to application. This will help improve the public's response to information regarding risk and lead to more protection of life and property. The Social Science Committee recently released a report titled "Risk Communication and Behavior: Best Practices and Research Findings." The report reviews risk communication and public response research literature within the context of key episodic hazards. It covers three weather hazards (tornadoes/severe wind, floods, and tropical cyclones), findings for general weather, and three other environmental hazards (tsunami, volcano, and wildfire). These specific hazards were chosen for their relevance to NOAA's mission, priorities, and vision for the future.



This report also recommends best practices for risk communication relevant to NOAA practitioners including manager and forecasters, outreach coordinators, warning coordination meteorologists, and communication directors. The goal of this work is to provide information to develop community resilience and accelerate the transition of research to application across NOAA.

For more information on the Risk Communication and Behavior Report, contact Denna.Geppl@noaa.gov.

Multilevel Partnership to Support a More Weather-Ready Nation

Recently, the Office of Oceanic and Atmospheric Research (OAR), National Weather Service (NWS), and the Federal Highway Administration (FHWA) partnered to study how broadcasters, private companies, government forecasters, academics, and others use and support social and behavioral science research in the field of meteorology. Interest in social and behavioral sciences has grown because despite high-quality forecasts, recent weather events impacted communities negatively. For example, people have lost their lives because they ignored barricades, drove through flooded roadways, and were swept away. The NWS, OAR, and FHWA recognized a need to partner with external groups to improve their risk communication capabilities. While interest has grown, concerns remain about the amount of resources dedicated to social and behavioral science and the barriers that may exist in implementing research findings in operations. To address these concerns, the study will evaluate research implementation and make recommendations to improve the links between researchers and practitioners.

For more information contact Kim.Klockow@noaa.gov.



Page 1 of 4

"Gender Mainstreaming" in the National Weather Service

Did you know?

For some weather hazards, men are 80% of the fatalities in the United States because they do not perceive the threat.¹

Across the globe, natural disasters such as droughts, floods and storms kill more women than men, and tend to kill women at a younger age, according to the World Health Organization. In the U.S. however, statistics show more men die than women annually, due to cold, heat and floods. The reason for these inconsistencies are complex, and the National Weather Service is looking to social science to help explain these unique vulnerabilities.

Social science revealed that gender has tremendous, and sometimes inequitable, impacts on a partner's reception of and reaction to weather information. Gender roles are of particular concern. For one, socio-economic status, which is largely a product of gender roles, affects response and resilience to weather events differently for men and women. Consider that women, especially single mothers, are the majority of the nation's poor and simply don't have the tools, means, and opportunities to take protective

"Situational and cultural context are extremely important with regard to the ways women and men access information"

action. Women also make up a greater proportion of the elderly—one of the groups with the highest mortality rates during disasters such as heat events.

There are many gender differences, such as communication practices, social relations, and risk behaviors, that directly affect individual responses to weather information. Social science perspectives and approaches help to further understand how these and other gendered social norms, roles, behaviors, and preferences influence weather event outcomes for men and women. For example, men have been found to be more risk prone; thus making them more vulnerable to hazards.



58.6 percent of the U.S. population between the ages of 70-100 are female (U.S. Census Bureau, 2012)

In light of these findings, the National Weather Service is actively integrating "Gender Mainstreaming" into its operations. Gender Mainstreaming refers to the concept of assessing the different implications for women and men of any planned policy action, program design, and education. In practice it is simply to take into consideration gender differences when planning, deciding, studying, providing, and all other activities that serve people through organizational efforts. As such, Gender Mainstreaming functions as a social science lens through which implications for both men and women are viewed and assessed to determine appropriateness, which in turn places the focus directly on the impact piece of the National Weather Service's Impact Based Decision Support services, and the Weather-Ready Nation program (<http://www.nws.noaa.gov/com/weatherreadynation/>).

Gender Mainstreaming was first introduced to NWS by Deputy Director, Laura Furgione. "Situational and cultural context are extremely important with regard to the ways women and men access information. Even more important still are the ways women and men process and relay information, particularly disaster risk related weather and climate information," said Ms. Furgione, "and building a Weather-Ready Nation is about understanding those processes to make ALL people climate and weather resilient."



55.6 percent of the 45.3 million people living in poverty in the United States are women and girls (American Community Survey, 2013).

NWS established a Gender Mainstreaming Working Group to promote the concept within the organization and consider ways in which the concept can be used to address external partner needs. Among other activities, NWS will also host a Diversity and Inclusion Conference in October that will feature Gender Mainstreaming.

For more information contact: Yankita.Brown@noaa.gov or Dave.Rowell@noaa.gov

Page 2 of 4



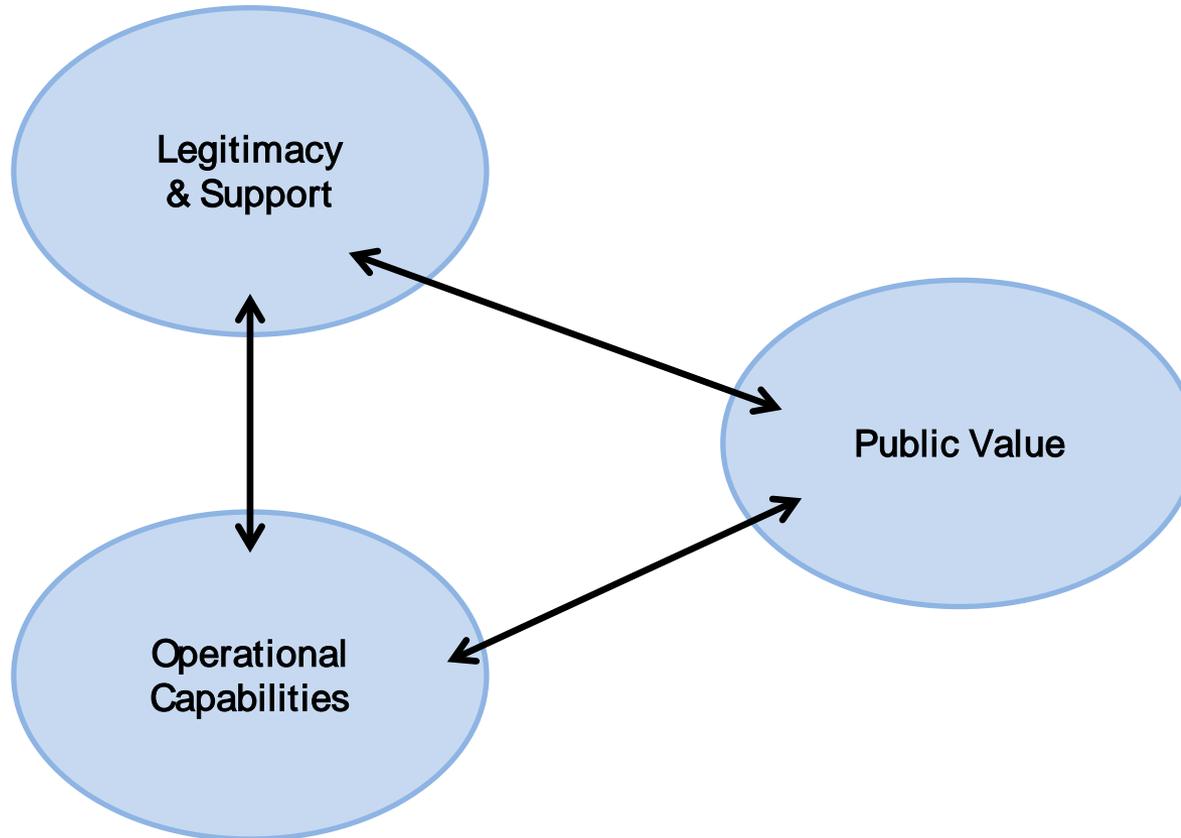
Public Sector Characteristics



- Focus on people's welfare (public goods)
- Long term and future oriented mission and strategy
- Emphasis on *ends* rather than *means*
- Efforts focus more on *macro* rather than *micro* levels
- Core mission remains constant



Public Sector Value Alignment



Moore, M. H. 1997. Creating Public Value: Strategic Management in Government. John F. Kennedy School of Government. Harvard University Press.

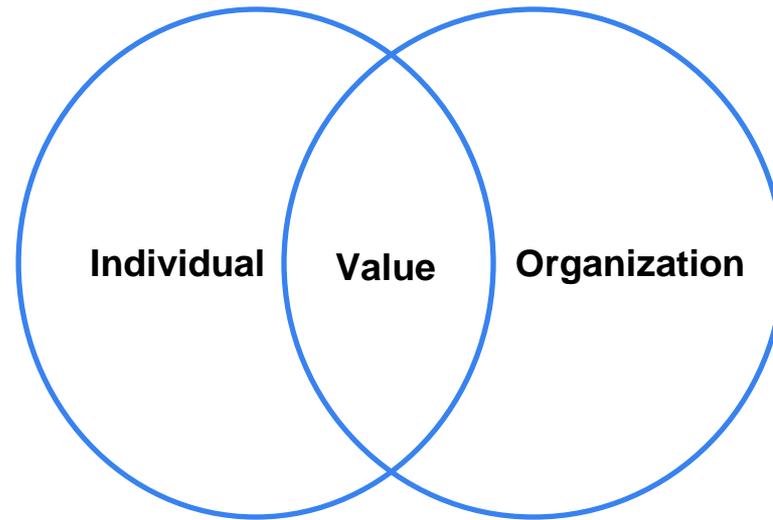


Value of NOAA Data



- NOAA products are used by both private and public sectors
- Value to Private Sector: leads to private sector productivity gains and creation of new products and businesses
- Value to Public Sector: contributes to protection of life and property, management of coastal resources, safety, security, etc.
- Open and free access information can boost economic efficiency and create new business lines and industries

Valuation Economics





Valuation Economics



- NOAA is a provider of environmental intelligence (public good)
- Value is a perceived benefit that can involve more dynamic and complex concepts such as emotions and human behavior
- Value is also acquired as an input to a production process that generates economic value



Valuation Economics (cont.)



- Benefits derive from the information products and services that result in improved economic decisions
- Cost-benefit analysis allows the comparison of net benefits among data/observing systems
- Analysis of alternatives provides cost and benefits of different scenarios of program/project implementation



Market and Non-Market Valuation



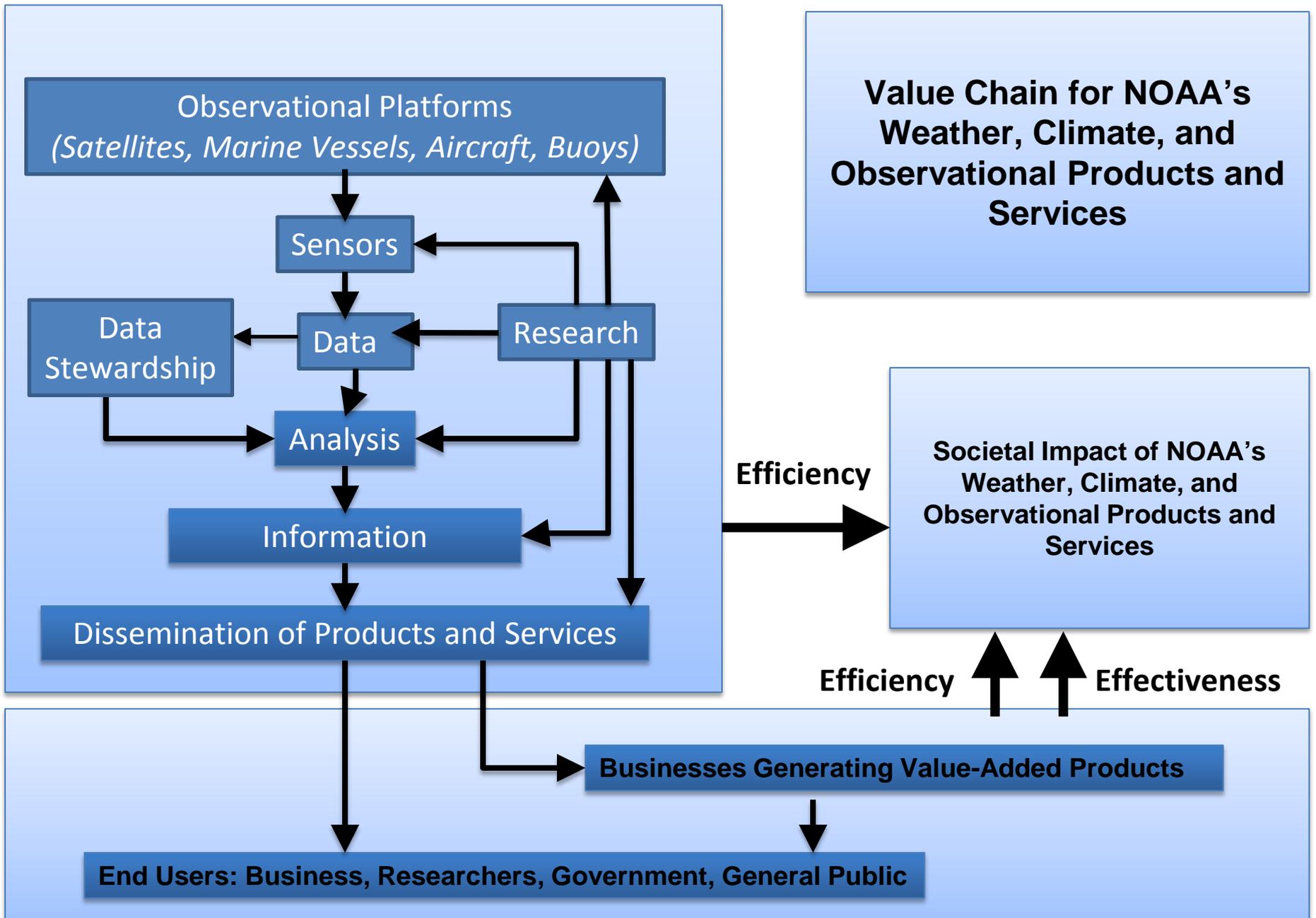
- Market values: estimated using market data, e.g., prices
- Non-market values: used when goods or services are not part of formal markets (*market failures*)
- Non-market valuation applied to monetize benefits
- Non-market valuation methods (stated and revealed preferences)



Why is Valuation Important?



- Justification for government funding
- Alignment of mission and operations to public value
- Provide information for the decision-making process (resource allocation process)
- Help prioritize investments in observing systems and information policy





Satellite Valuation Studies



Study (Date)	Description	Notes	2016 \$
JPSS Economic Benefit Analysis, Tecolote (2015)	Top-Down analysis of JPSS contribution to weather information	Inputs date back to 2002, <u>cumulative</u> benefits, 2012-2025	\$139b - \$213b
JPSS Preliminary Benefits Study, Wolfe (2010)	Top-Down analysis of JPSS contribution to weather information	Inputs date back to 1972, <u>annual</u> benefits	\$3b - \$10b
JPSS Preliminary Benefits Study, Wolfe (2010)	Bottom-Up analysis	Inputs date back to 1972, <u>annual</u> benefits, selected economic impacts	\$1.5b
The case for EPS/METOP Second Generation, EUMETSAT, 2014	Bottom-Up analysis, protect property, value added, private use	<u>Annual</u> , benefits to EU nations	\$18b - \$68b
GOES -R Sounder and Imager CBA, CENTREC 2002	Bottom-Up	<u>Annual</u>	\$855b



Satellite Valuation Studies



Study (Date)	Description	Notes	2016 \$
An Investigation of the Economic and Social Value of Selected NOAA Data and Products for GOES, CENTREC, 2007	Bottom-Up	<u>Annual</u>	\$1.4b
GPS Civilian Economic Value to the U.S., Interim Report. Leveson, 2015	Bottom-Up	Preliminary, based on existing data, 2013 data only	\$58b
State of the Satellite Industry Report, Satellite Industry Association (2015)	2014 global revenues of satellite industry	Revenues, not benefits	\$207b



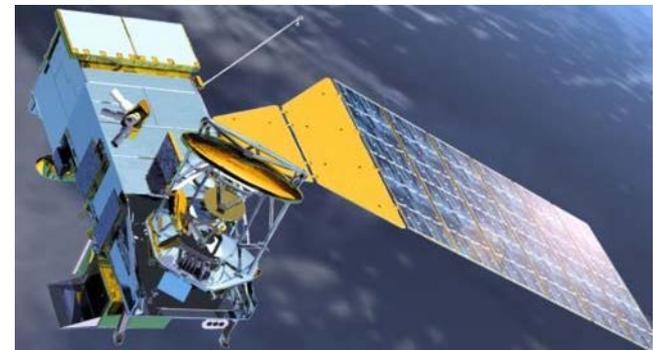
Current PRSS Initiatives



Value of Information Workshop



- Value of NOAA products and services #1 request from all Line Offices
- Workshop Goals
 - Creating same language across industries
 - Connecting scientists to user communities
 - Who is using the data and how can we track them?
 - The need for consistent practice





Community of Practice Draft Objectives



1. Improve the quality and consistency of VOI studies
2. Coordinate input from US agencies for use in international discussions
3. Advance implementation of strategic goals set by the international body
4. Provide a forum for information sharing and consultation for VOI studies



NASA ROSES Proposal



- Recently submitted NASA ROSES Proposal
 - “Linking Aquatic Satellite Observations to Social Benefits”
- End-to-end value from aquatic satellite observations to decision making and socio-economic benefits in the areas of:
 - Water quality and maritime safety
 - Navigation
 - Security
 - Incident response



Economic Impacts of Space Weather



Objective: Understand and quantify the impacts of extreme and moderate space weather events

This effort will gather information from users on impacts to

- Electric power distribution
- Global Navigation Satellite System signal
- Aviation, including health risks, and
- Damage or anticipated damage to satellites

Expected Results:

- Description of the value chain from observation to socioeconomic impact
- An estimate of the socioeconomic benefits
- A reusable model



Winter Storms NYC



Objective: Understand the value of existing products and services and to understand how they could be improved

This project will gather information from users on impacts to

- Aviation
- Ground transportation
- Human health and safety

Expected Results:

- Description and quantification of storm-related losses
- Description of the use of weather products that prevented higher losses
- Identification of the attributes of weather products that could reduce losses further



Economic Value of Marine Vessel Observations



Objective: Support ongoing fleet recapitalization studies

This project will gather information from users on

- Value of products and services supported by NOAA ship operations
- Cost-effectiveness of using contract vessels for collecting data
- Capacity of contract vessel fleet

Expected Results:

- Description of the value chains
- An estimate of the economic value of NOAA fleet
- Description of the cost-effectiveness of expanded use of contract vessels



How can Social Science help NOAA's Mission?



- ✓ Valuing NOAA's products and services and valuing what is at risk - ***economic statistics and valuation studies*** (e.g. *Space Weather, Value of Information*)
- ✓ Managing, mitigating and communicating risk – ***integrated risk assessment, research on risk communication and behavior***
- ✓ Enhancing and valuing stewardship (resources, protection)- ***valuing ecosystem services***
- ✓ Linking earth systems to human wellbeing (housing, job security, clean water access) - ***social indicators***
- ✓ Measuring long-term successes and societal impacts - ***performance metrics***



Thank you!



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