



Presentation to the National Association of Marine Laboratories

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Presentation Overview

I. Initiatives and Actions

- i. Science and Technology Highlights 2018
- ii. Executive Order on Ocean Policy
- iii. National Science and Technology Council

II. Overview of *Science and Technology for America's Oceans*

III. Questions

Science and Technology Highlights 2018

Ocean Science Highlights:

- E.O. 13840
 - Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States
- *SOST Ocean Decadal Vision*
 - NSTC ten-year plan identifying research needs and opportunities
- DARPA's Ocean of Things program
 - Sensor network for persistent maritime situational awareness
- NOAA & BOEM's Ocean Reporting Tool
 - Geospatial tool for exploring, permitting, siting, & de-conflicting ocean uses
- NOAA's EcoCast
 - Big Data tool for real-time fishing and management planning
- NOAA's Digital Imagery Fisheries Monitoring
 - New technologies to identify and measure fish from digital images



Science and Technology Highlights 2018

Select Polar Science Highlights:

- Stratified Ocean Dynamics of the Arctic (SODA) project
 - ONR, NOAA, NASA, NSF, DOI, U.S. Air Force, and U.S. Navy Arctic observation coordination
- Arctic Science Ministerial
 - International October meeting, signed Joint Statement
- Mapping Polar Regions
 - NASA Launched the Ice, Cloud and Land Elevation Satellite-2 (ICESat-2)

Select Natural Disaster Resilience Highlights:

- NOAA's record setting hurricane forecast
 - Predicted Hurricane Florence within 2 miles of the observed landfall with 5 days lead time; NOAA improved its next generation weather forecasting model, the Finite Volume on a Cubed-sphere (FV3) model
- Improving Earthquake and Tsunami Resilience
 - NOAA & USGS mapped underwater fast moving tectonic faults in southeastern Alaska



Executive Order 13840

- *Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States*
- Simplifies and elevates to focus on geospatial data, regional and coastal ocean management problem solving, and ocean S&T
- Establishes interagency Ocean Policy Committee (OPC), co-chaired by OSTP and CEQ



EXECUTIVE ORDER

OCEAN POLICY TO ADVANCE THE ECONOMIC, SECURITY, AND ENVIRONMENTAL INTERESTS OF THE UNITED STATES

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1. Purpose. The ocean, coastal, and Great Lakes waters of the United States are foundational to the economy, security, global competitiveness, and well-being of the United States. Ocean industries employ millions of Americans and support a strong national economy. Domestic energy production from Federal waters strengthens the Nation's security and reduces reliance on imported energy. Our Armed Forces protect our national interests in the ocean and along the Nation's coasts. Goods and materials that support our economy and quality of life flow through maritime commerce. Our fisheries resources help feed the Nation and present tremendous export opportunities. Clean, healthy waters support fishing, boating, and other recreational opportunities for all Americans.

This order maintains and enhances these and other benefits to the Nation through improved public access to marine data and information, efficient interagency coordination on ocean-related matters, and engagement with marine industries, the science and technology community, and other ocean stakeholders. To advance these national interests, this order recognizes and supports Federal participation in regional ocean partnerships, to the extent appropriate and consistent with national security interests and statutory authorities.

Sec. 2. Policy. It shall be the policy of the United States to:

(a) coordinate the activities of executive departments and agencies (agencies) regarding ocean-related matters to ensure effective management of ocean, coastal, and Great Lakes waters and to provide economic, security, and environmental benefits for present and future generations of Americans;

(b) continue to promote the lawful use of the ocean by agencies, including United States Armed Forces;

(c) exercise rights and jurisdiction and perform duties in accordance with applicable domestic law and—if consistent with applicable domestic law—international law, including customary international law;

(d) facilitate the economic growth of coastal communities and promote ocean industries, which employ millions of Americans, advance ocean science and technology, feed the American people, transport American goods, expand recreational opportunities, and enhance America's energy security;

(e) ensure that Federal regulations and management decisions do not prevent productive and sustainable use of ocean, coastal, and Great Lakes waters;

(f) modernize the acquisition, distribution, and use of the best available ocean-related science and knowledge, in partnership with marine industries; the ocean science and technology community; State, tribal, and local governments; and other ocean stakeholders, to inform decisions and enhance entrepreneurial opportunity; and

(g) facilitate, as appropriate, coordination, consultation, and collaboration regarding ocean-related matters, consistent with applicable law, among Federal, State, tribal, and local governments, marine industries, the ocean science and technology community, other ocean stakeholders, and foreign governments and international organizations.

Sec. 3. Definitions. For the purposes of this order, the following definitions apply:

(a) "Ocean-related matters" means management, science, and technology matters involving the ocean, coastal, and Great Lakes waters of the United States (including its territories and possessions), and related seabed, subsoil, waters superadjacent to the seabed, and natural resources.

Ocean Policy Committee

- Engage and collaborate with regions through regional ocean partnerships
- Coordinate the release of unclassified data and other information that agencies collect, and support common information management systems such as the Marine Cadastre
- Coordinate and ensure Federal participation in projects conducted under the National Oceanographic Partnership Program (NOPP)
- Supported by 2 subcommittees:
 - Ocean Science and Technology (OST [SOST])
 - Ocean Resource Management (ORM)



Image Courtesy of OSTP

ORM Subcommittee

- Co-Chairs: U.S. Navy, NOAA, DOI
- Identify regional data needs (through NOAA/BOEM study)
- Identify and review agency data availability (Spring 2019)
 - Compare stakeholder request datasets to available agency data collections
 - ID agencies responsible for datasets and propose methods for release
 - Explore ways to increase access to industry data
- **Develop and implement data plan for the prioritization and release of datasets for OPC review (Plan July 2019; Implementation October 2019+)**

Top 10 Regional Data Needs

1. Jurisdiction and regulated areas
2. Abundance and distribution of marine species
3. Synthesized oceanographic parameters
4. Commercial fishing effort - Vessel Monitoring System (VMS)
5. Vessel traffic - Automatic Identification Systems (AIS)
6. Human and cultural use areas
7. Commercial fishing effort - Vessel Trip Report (VTR)
8. Bathymetry
9. Sand and borrow sites
10. Species and habitat locations, including benthic habitat

Top 10 Regional Priority Issues

1. Offshore aquaculture siting
2. Fisheries management
3. Community resilience and climate adaptation
4. Offshore renewable energy siting and leasing
5. Sand and sediment management
6. Species and habitat management
7. Water quality (marine debris, acidification, HABs, oil spills)
8. Oil and gas exploration and extraction
9. Ocean disposal
10. Maritime and navigation safety

OST Subcommittee

- Co-Chairs: NSF, ONR, NOAA, OSTP
- Identify priority research and technology needs (March 2019)
- Develop a list of recommended prioritized projects supporting agency R&T needs (May 2019)
- Develop and present to the OPC recommendations on course of action the OPC and/or its agencies can take to execute prioritized projects (July 2019)

Priority Research and Technology Needs

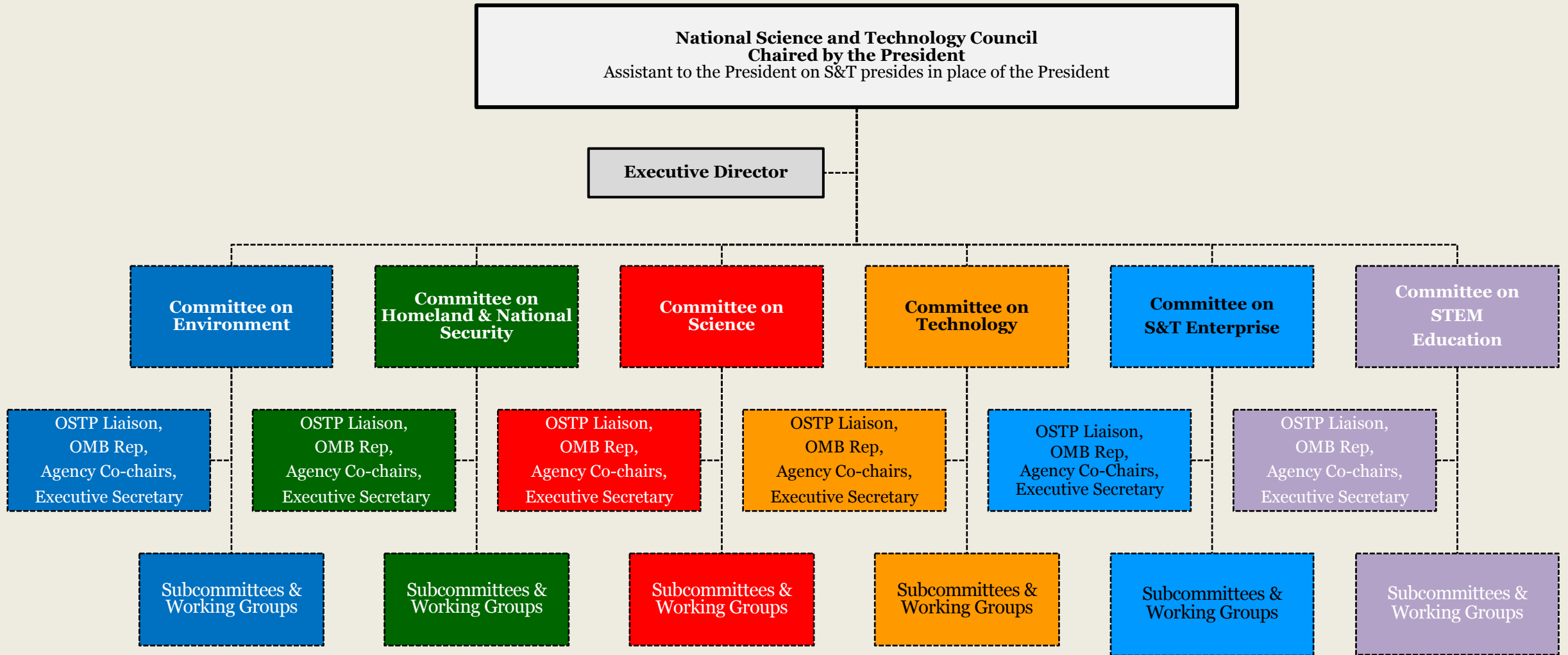
- Numerous materials address priority ocean-related research and technology needs relevant to or developed by government, industry, and academia (NAS SeaChange; Ocean Decadal; NOAA TFORT)
- OST action is not intended to replicate these efforts
- Identify research priorities that reflect interagency recommendations, present near-term opportunities, and support Administration policies

National Science and Technology Council

- Cabinet-level council established by Executive Order in 1993 to coordinate science and technology policy across the executive branch
- Chaired by OSTP on behalf of the President
- Objectives include the establishment of clear national goals for Federal S&T investments, and the completion of statutorily mandated reports to Congress

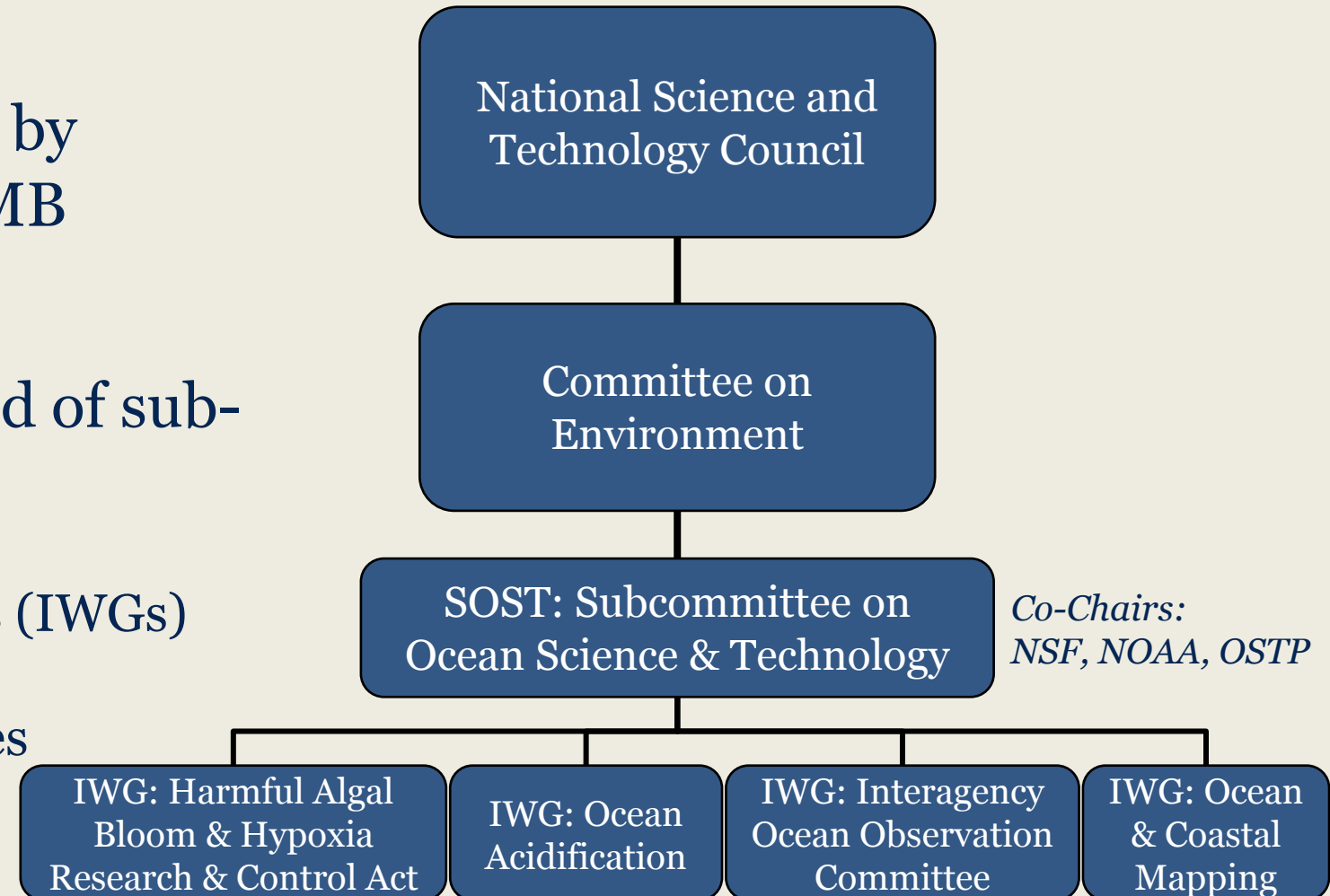


NSTC Structure



NSTC Organization: Subcommittee on Ocean Science and Technology

- The NSTC is comprised of 6 committees that are chaired by agencies and OSTP, with OMB representation
- Each committee is comprised of sub-bodies, that may include:
 - Subcommittees
 - Interagency Working Groups (IWGs)
 - Task Forces
 - Fast Track Action Committees



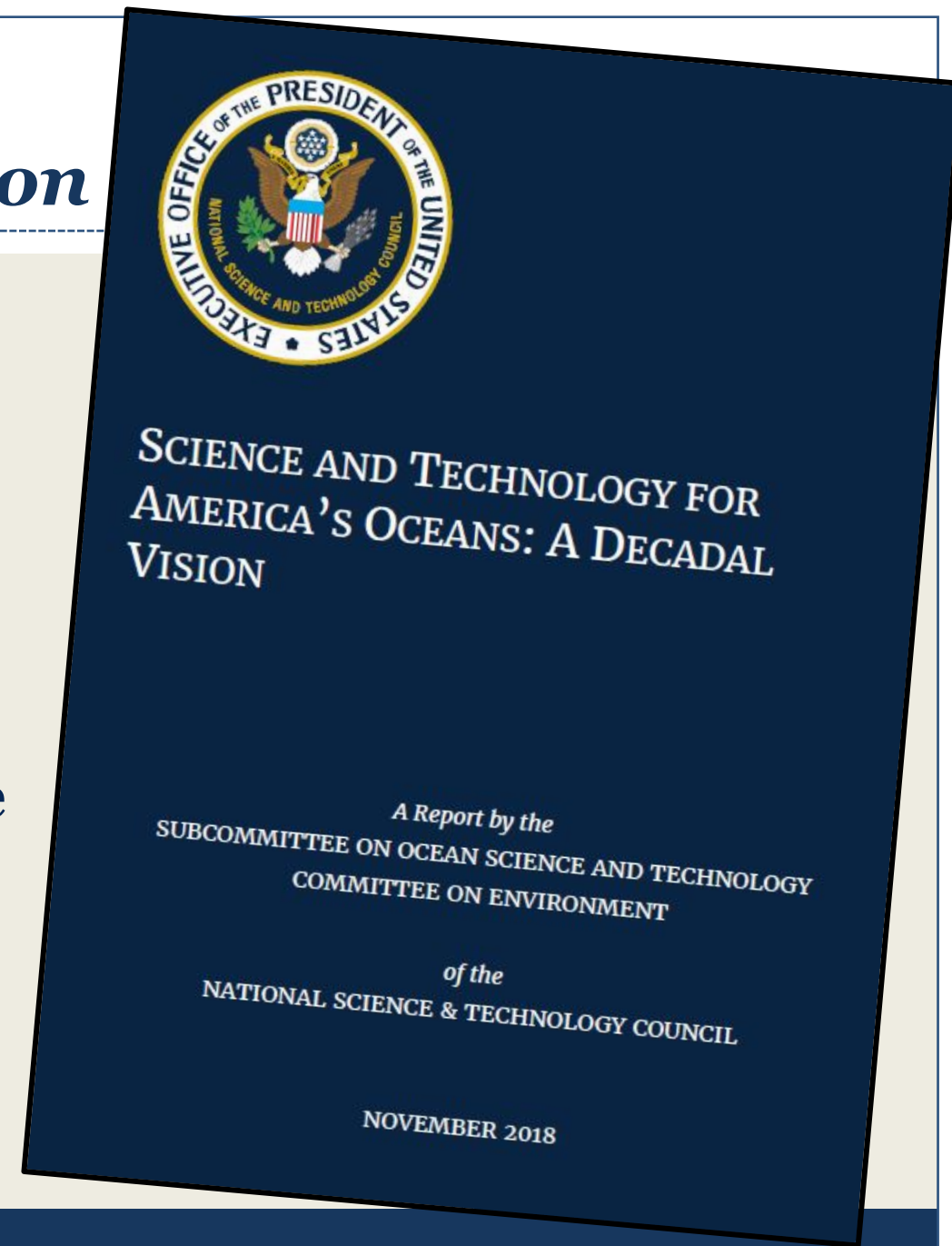
Select Recent NSTC Reports

- Plan for Addressing Critical Research Gaps Related to Emerging Contaminants in Drinking Water
- Charting a Course for Success: America's Strategy for STEM Education
- Science and Technology for America's Oceans: A Decadal Vision
- IARPC Arctic Research Plan FY2017-2021
- Coordinated Strategic Plan to Advance Desalination for Enhanced Water Security (*in prep*)
- Aquaculture Science and Technology (*in prep*)
- National Plan for Civil Earth Observations (*in prep*)

Can be found at: <https://www.whitehouse.gov/ostp/documents-and-reports/>

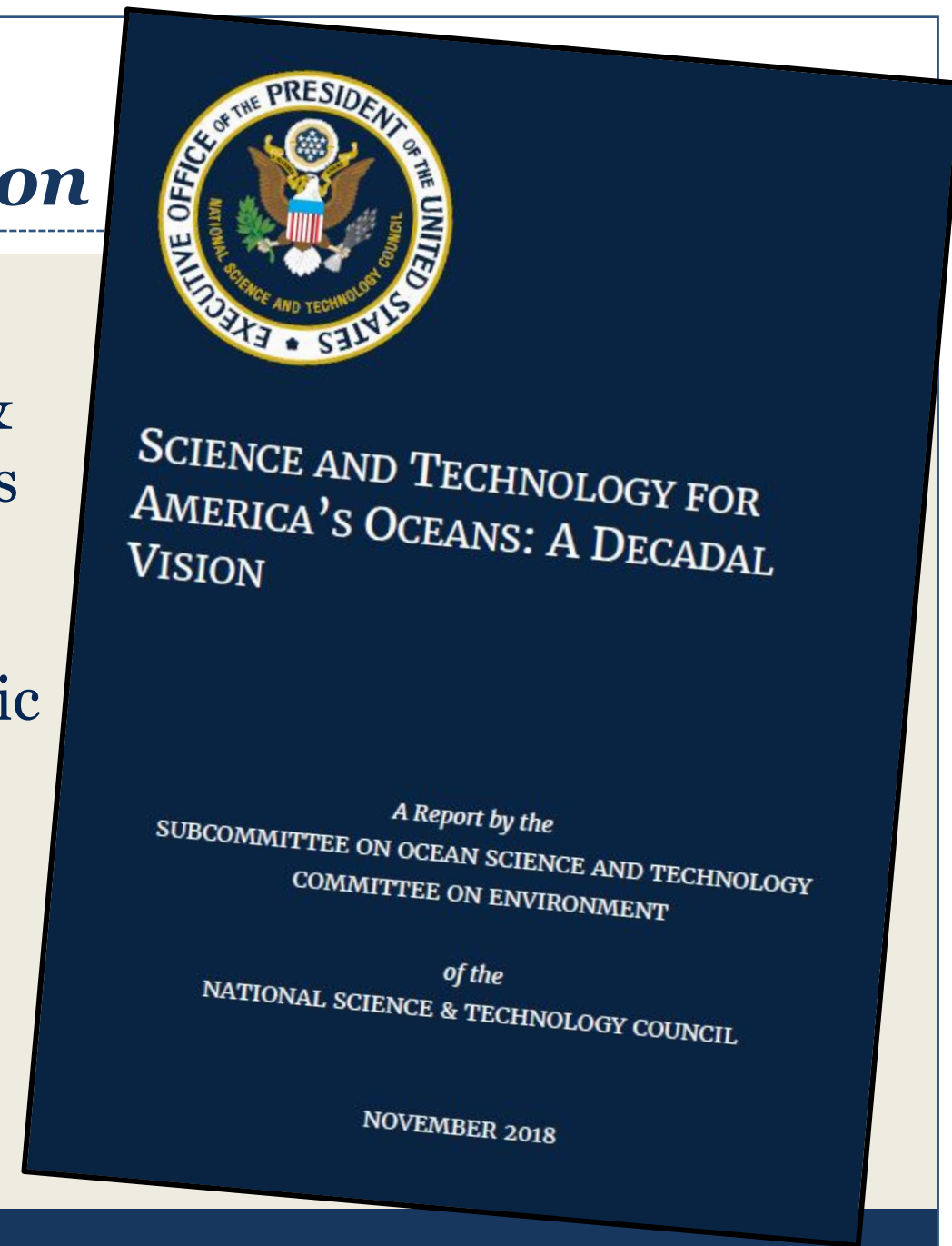
Science and Technology for America's Oceans: A Decadal Vision

- Identifies pressing research needs & areas of opportunity within the ocean S&T enterprise for 2018-2028
- Builds off of first plan published in 2007, which was updated in 2013
- Further builds the S&T foundation to improve our knowledge & stewardship of the ocean, address issues of national & global importance, & inform decision-making for the coming decade



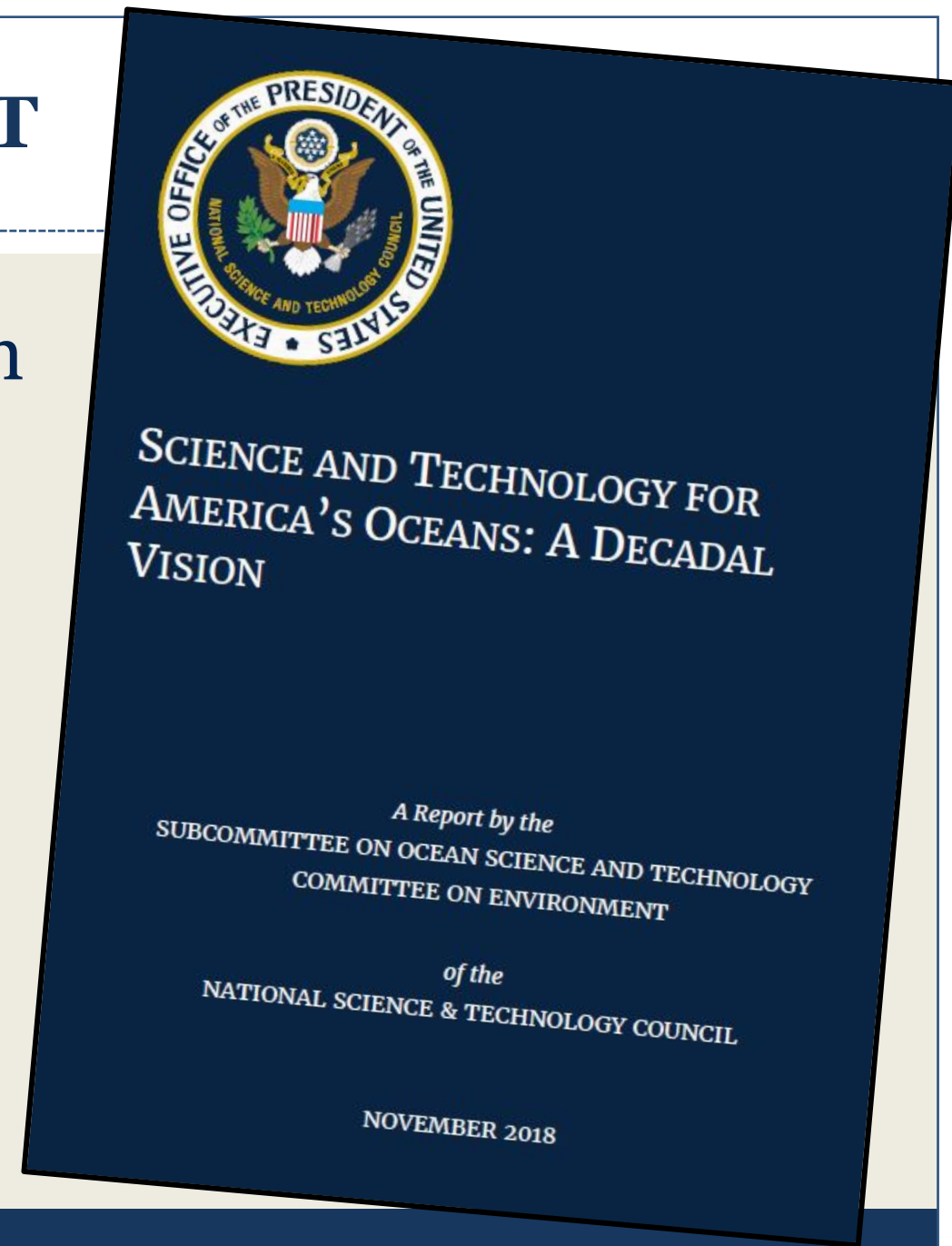
Science and Technology for America's Oceans: A Decadal Vision

- Provides guidance for U.S. Federal agencies & non-Federal sectors to align resources & areas of expertise
- Does not prescribe metrics and agency-specific tasks
- Guides the development of future Federal ocean research implementation plans



5 Goals to Advance U.S. Ocean S&T

- 1) Understand the Ocean in the Earth System
- 2) Promote Economic Prosperity
- 3) Ensure Maritime Security
- 4) Safeguard Human Health
- 5) Develop Resilient Coastal Communities



Goals, Objectives, Priorities

- Each goal has 3-5 objectives; actionable priorities support each objective:
- Goal – Understand the Ocean in the Earth System
- Objective – Modernize R&D Infrastructure
- Priority – Extend the Argo Program to include full-ocean depth coverage, biogeochemical sensors, and turbulence sensors

Goal 1 – Understand the Ocean in the Earth System

- 1) Modernize Research and Development (R&D) Infrastructure
- 2) Harness Big Data
- 3) Develop Models of the Earth System
- 4) Facilitate Research to Operations



Image Courtesy of NSF

Goal 2 Promote Economic Prosperity

- 1) Expand Domestic Seafood Production
- 2) Explore Potential Energy Sources
- 3) Assess Marine Critical Minerals
- 4) Balance Economic and Ecological Benefits
- 5) Promote the Blue Workforce



Image Courtesy of NSF

Goal 3 Ensure Maritime Security

- 1) Improve Maritime Situational Awareness
- 2) Understand a Changing Arctic
- 3) Maintain and Enhance Marine Transportation

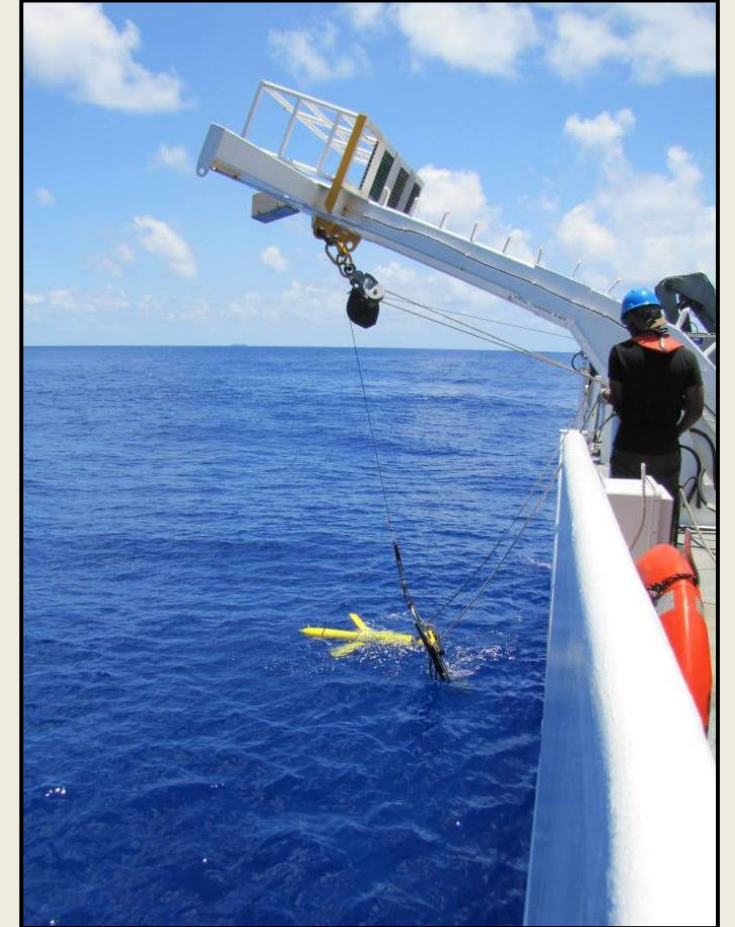


Image Courtesy of U.S. Navy

Goal 4 Safeguard Human Health

- 1) Prevent and Reduce Plastic Pollution
- 2) Improve Forecasts of Marine Contaminants and Pathogens
- 3) Combat Harmful Algal Blooms
- 4) Discover Natural Products



Microplastics. Image Courtesy of NOAA

Goal 5 Develop Resilient Coastal Communities

- 1) Prepare for Natural Disasters and Weather Events
- 2) Reduce Risk and Vulnerabilities
- 3) Empower Local and Regional Decision-Making



Satellite photos of Ortle Beach, New Jersey, before (left) and after (right) Hurricane Sandy. (Images courtesy of NOAA and Google)

Cross-Cutting Topics

- 1) The modernization and management of ocean-related infrastructure
- 2) An educated, diverse, and dynamic “blue” workforce

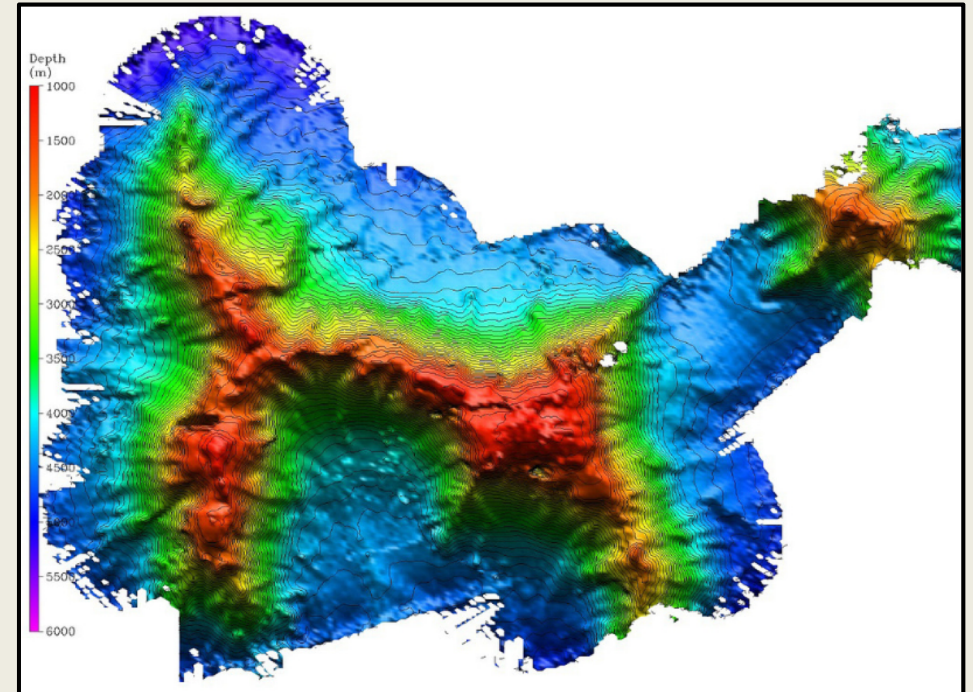


Image Courtesy of NSF

Image Courtesy of NOAA

5 Areas of Immediate Ocean Research & Technology Opportunities

- 1) Fully integrate Big Data approaches in Earth system science
- 2) Advance monitoring and predictive modeling capabilities
- 3) Improve data integration in decision-support tools
- 4) Support ocean exploration and characterization
- 5) Support ongoing research & technology partnerships



No. 4 includes improved seafloor mapping to better inform maritime transportation operations
3-D view of Astoria Canyon

Image Courtesy of NOAA

Thank You

Questions?

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