

An aerial photograph of a coastal area. In the foreground, there is a wide, sandy beach with some tire tracks. A road runs along the coastline, leading to a building complex on a small island or peninsula. The water is a deep blue, and the sky is a lighter blue with some clouds. The text is overlaid on the image.

# NATIONAL ASSOCIATION OF MARINE LABORATORIES

Biennial Meeting

**Craig McLean**

NOAA Research Assistant Administrator

October 26, 2021

# UNDERSTANDING OUR OCEAN



# NOAA Priorities

Science, Service and Stewardship



## Climate

Establish that NOAA is the primary authoritative source for climate products and services that can be applied to a diverse range of missions, just as we are for weather.

**FOCUS TODAY**



## Balance

Advance NOAA's complementary work on environmental stewardship and economic development with a particular focus on the New Blue Economy.

[noaa.gov/our-mission-and-vision](https://noaa.gov/our-mission-and-vision)



## Equity

Exhibit equity in how we build and provide services. Within NOAA, we will promote diversity, equity, inclusion and accessibility in the workforce. Externally, we will provide equitable access to our products and services.

# NOAA's data & services

More than 200 water level stations measure water level in real-time, updated every 6 mins (NOS/CO-OPS)

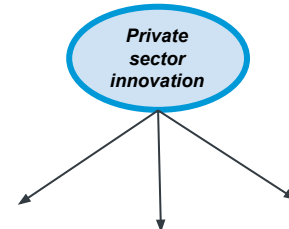
NOAA's NCEI is the long-term archive for all NOAA coastal water level data

Using water level data, NOAA scientists (& partners) developed models for tide predictions for up to 2 years in the future in 3,000+ locations in the U.S.

The NOAA Tide Predictions interface provides tide predictions daily, weekly, & monthly in specific locations with advanced capabilities to further customize the predictions generated

NOAA issues a High Tide Flooding Bulletin each season; the NWS issues flood watches & warnings

NOAA's official tidal predictions are essential for safe navigation & protection of coastal infrastructure, & are used by state/local govts, emergency managers, shipping industry, offshore wind companies, etc.



## Data collection

## Processing & storage

## Research & modeling

## Product development

## Dissemination

## Application

From the bottom of the ocean to the surface of the sun, NOAA's robust network of satellites, weather radars, buoys, ships, aircraft, water level stations, etc. are **observing & collecting data 24/7**

4 National Centers for Environmental Information (NCEI) host the **authoritative archives** of the Nation's **climate and historical weather data & information**

NOAA's 6,000 scientists & engineers at our labs, science centers, modeling centers, & our partners, are **analyzing the data, conducting research, & producing world-class predictive models**

Our scientists, in partnership with universities, private sector, other federal agencies, etc., **create products, tools, & educational resources** that integrate historical weather & climate data, observations, & our world-class models predict future conditions

- NWS issues life-saving weather **forecasts & warnings**
- Monthly **climate reports**
- National Climate Assessment with future **predictions & projections** of impacts from climate change
- We provide **maps & other data visualization tools** to understand projected impacts of climate-related events (hurricanes, extreme heat, drought, etc.)

Stakeholders at all levels - private sector, local/state govts, the general public - **utilize our information & tools to make decisions** in both the short-term (weather) and long-term (climate)



# NOAA's data & services by the numbers



15 Weather satellites in operation



122 Weather Forecast Offices



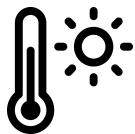
16 ships & 9 aircraft engaged in research and survey operations



\$3.4B total economic value of coral reefs NOAA supports each year through conservation



160,000 sq. miles of underwater parks protected in 15 national marine sanctuaries and 2 marine monuments



6.3 billion weather observations collected each day



224 terabytes of oceanic, atmospheric, and geophysical data archived per month



\$1.5T value of shipped goods NOAA's navigation services supports each year



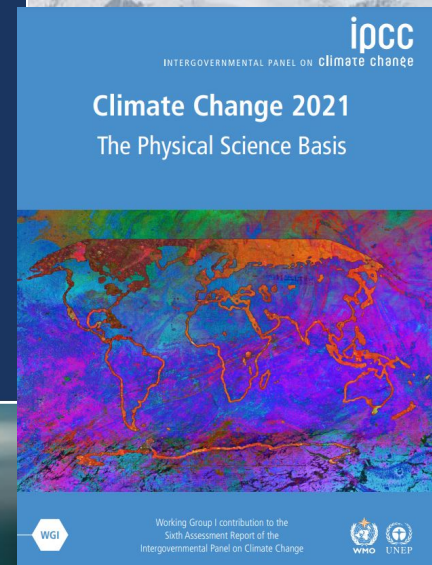
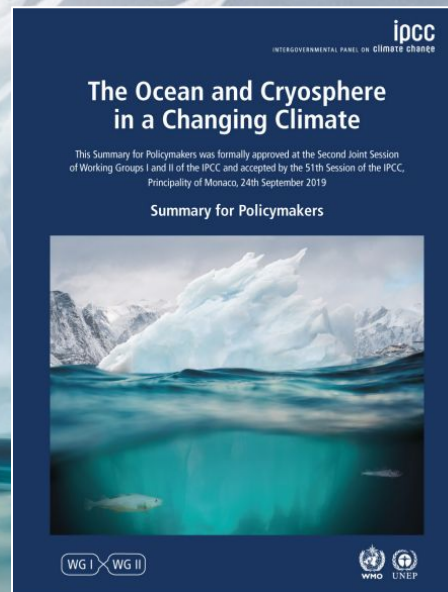
**The ocean**

is having a moment...

# STATE OF THE OCEAN

“The world’s ocean and cryosphere have been ‘taking the heat’ from climate change for decades.

Consequences for nature and humanity are sweeping and severe.”



# CONFLUENCE OF PRIORITIES

Common themes emerging at recent international conferences

- Climate Change
- Marine Protected Areas
- Sustainable Fisheries
- IUU Fishing
- Marine Pollution, Plastics
- Sustainable Blue Economy
- Mapping
- Maritime Security
- Corals
- Ocean Acidification





# NOAA PRIORITY AREAS

- Climate Crisis
- LMR, America the Beautiful (30x30)
- Ocean/Climate Nexus; extremes
- Sustained Ocean Obs
- Coastal Resilience & Adaptation
- Arctic Monitoring
- Marine Heat, Corals, OA
- Climate & Fisheries Initiative
- Precipitation Grand Challenge
- Diversity & Inclusion
- Scientific Integrity



Are you involved with the

**UN Ocean Decade?**



# OCEAN DECADE LOGIC

**Transform business-as-usual science, technology, & policy**  
**Facilitate new partnerships, discoveries & benefits**

**THE OCEAN  
WE HAVE**

.....

Ocean  
Decade

**335 Endorsed Decade Actions**

.....

**THE OCEAN  
WE WANT**

- **Organizing Tool**
- **Collaboration Mechanism**
- **Builds Momentum**

<https://www.oceandecade.org/>

# SUSTAINABLE DEVELOPMENT GOALS



# OCEAN DECADE CHALLENGES

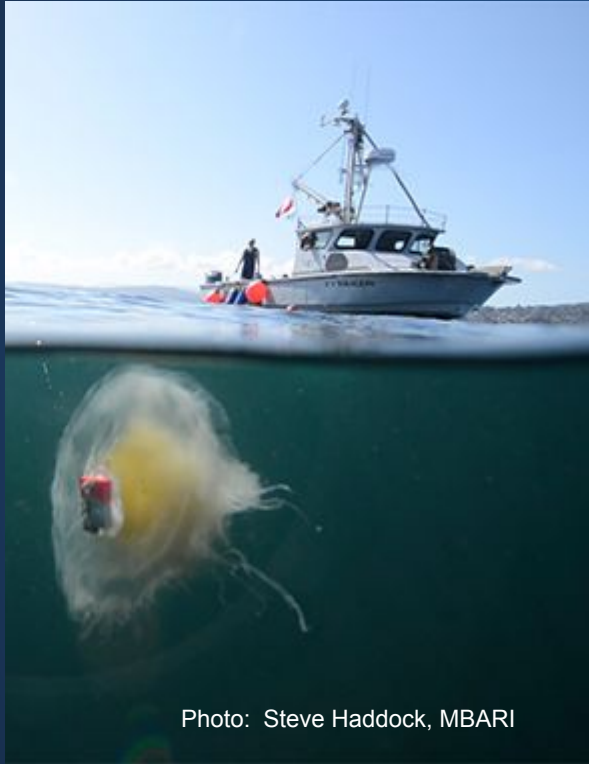


Photo: Steve Haddock, MBARI

- 1) Pollution and Marine Debris
- 2) Ecosystem Protection, Restoration
- 3) Food Security, Sustainable Seafood
- 4) Economic development
- 5) Ocean-Climate Nexus
- 6) Multi-Hazard Warnings
- 7) Ocean Observing Systems
- 8) Digital Ocean Map and Data Portal
- 9) Capacity Development
- 10) Social & Behavioral Barriers to Change

# Ocean Decade OPPORTUNITIES

- Coordination of ocean S&T
- Collective messaging
- Leveraging the power of the network
- Data sharing and governance
- Diversity, Equity, and Inclusion
  - Early Career Ocean Professionals
- Actionable knowledge
- Social science
- Raise ocean literacy
- Use the Ocean Decade as a vehicle



If not now...

**WHEN?**



An aerial photograph of a coastal landscape. In the foreground, a wide, sandy beach stretches across the frame, showing some tire tracks. To the left, there's a body of water with several small islands or peninsulas covered in green vegetation. In the center, a narrow strip of land with more greenery and a small pond runs parallel to the beach. To the right, the ocean waves are breaking onto the shore. The sky is a clear, vibrant blue with a few wispy clouds near the horizon. A semi-transparent blue horizontal band is overlaid across the middle of the image, containing the text "THANK YOU" in white, bold, sans-serif capital letters.

THANK YOU



# UN Decade

Broad international and national interest as reflected by submissions to the first Call to Action.

Per SOST Workplan, NOAA leading federal efforts to build partnerships among actions, working with the U.S. National Committee.

Seeking high-level U.S. spokesperson for the June 1st (virtual) Decade launch event.



# Congressional Authorizations & Mandates

## General

**NOAA innovative and transformational research:** Ocean and Atmospheric Research and Development, 33 U.S.C. §§ 893-893c; The America COMPETES Reauthorization Act of 2010, 42 U.S.C. § 1861 note.

**Cooperative Institutes:** Agreements to Aid and Promote Scientific and Educational Activities, 15 U.S.C. § 1540

## High Performance Computing

**High-Performance computing for applied research in weather prediction, ocean sciences, and computational fluid dynamics:** High-Performance Computing Act of 1991, 15 U.S.C. §§ 5501-5528

## Weather Research

**Weather research:**

- **Weather Research and Forecasting Innovation Act of 2017,** 15 U.S.C. § 8501 note
- **Weather Service Modernization Act,** Title VII, 15 U.S.C. § 313 note, §§ 701-709;
- **National Oceanic and Atmospheric Administration Authorization Act of 1992,** Title I, § 108, 15 U.S.C. § 313 note

**Water prediction research activities:** Inland Flood Forecasting and Warning System Act of 2002, 15 U.S.C. § 313c

**Tsunami research:** Tsunami Warning, Education, and Research Act of 2017, Title V, 33 U.S.C. § 3201 note

**Air chemistry and air quality research:** Clean Air Act as amended, 42 U.S.C. §§ 7401-7431

## Ocean and Coastal Research

**National Sea Grant College Program:** National Sea Grant College Program Act, 33 U.S.C. §§ 1121-1131 & National Sea Grant College Program Act Amendments of 2008 & 2020, 33 U.S.C. § 1121 note.

**Aquaculture competition:** National Aquaculture Act of 1980, 16 U.S.C. §§ 2801-2810

**Ocean Exploration and Research Program:** Ocean Exploration, 33 USC § 3401

- **Titanic site activities:** R.M.S. Titanic Maritime Memorial Act of 1986, 16 U.S.C. §§ 450n-450n-6
- **Exploration and mapping of sanctuaries:** National Marine Sanctuaries Act, 16 U.S.C. § 1431-1445e-1
- **Exploration and mapping of areas of commercial recovery:** Deep Seabed Hard Mineral Resources Act, 30 U.S.C. §§ 1401-1473
- **Mapping activities:** Ocean and Coastal Mapping Integration Act, 33 U.S.C. §§ 3501-3507
- **Unmanned Maritime Systems:** Commercial Engagement Through Ocean Technology (CENOTE) Act of 2018, 33 U.S.C. §§ 4101-4106

**Ocean Acidification Program:** Federal Ocean Acidification Research and Monitoring Act of 2009, 33 U.S.C. §§ 3701-3708

**Ocean observations:** Integrated Coastal and Ocean Observation System Act of 2009, 33 U.S.C. §§ 3601-3611

**Great Lakes Environmental Research Laboratory:** Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1387

**Harmful Algal Bloom and Hypoxia research:** Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2014, 16 U.S.C. § 1451 note)

**Coral research activities:** Magnuson-Stevens Fishery Conservation and Management Act, as amended, 16 U.S.C. §§ 1801-1891d & Reef Conservation Act of 2000, 16 U.S.C. §§ 6401-6409

## Climate Research

**National Climate Program Act,** 15 U.S.C. §§ 2901-2908;

**Global Change Research Act of 1990,** 15 U.S.C. §§ 2921-2961

**International climate research:** International Cooperation in Global Change Research Act of 1990, PL 101-606, 15 U.S.C. §§ 2951-2953

**Drought research:** National Integrated Drought Information System Reauthorization Act of 2018, P.L. 115-423, 15 U.S.C. § 313d

**Arctic research:** Arctic Research and Policy Act of 1984, as amended, PL 101-609, 15 U.S.C. §§ 4101-4111



# First Call to Action: USG Programs

## NASA (2)

- Sea Level Change Science Team
- Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) Mission (NASA)

## NOAA (7)

- World Ocean Database Program - NESDIS NCEI Hernan Garcia
- CEOS-COAST - NESDIS STAR Paul DiGiacomo
- SUPREME Marine Ecosystem Forecasting - NMFS SWFSC Steve Bograd
- Coastal Aquaculture Siting Strategy (CASS) - NOS NCCOS James Morris
- Seabed Mapping and Characterization - NOS OCS Trisha Bergman
- MPA Sentinel Sites - NOS ONMS Gonzalo Cid
- Global Ocean Acidification Observation Network (GOA-ON) - OAR OAP Meredith Kurz

## NSF (5)

- GEOTRACES (also a SCOR initiative)
- Navigating the New Arctic (NNA)
- Global Ocean Biogeochemistry Array (GO-BGC)
- Coastlines and People (CoPe)
- International Ocean Discovery Program (IODP)

## Subcommittee on Ocean Science and Technology (SOST) IWG Ocean Sound and Marine Life (1)

- United Nations Research Programme on the Maritime Acoustic Environment (UN-MAE)

**Smithsonian (1):** Marine Life 2030, submitted in collaboration with the Marine Biodiversity Observation Network ([MBON](#))

**Department of State (1):** Integrating Coastal Wetlands Data

*Does not include a full account of proposals submitted by a non-USG party in which a USG agency was partner.*

*Seventeen actions, involving all ocean basins, all 7 Outcomes, all 10 Challenges, 11/17 of the SDGs!*

# Overview of Submissions Received

- 214 program submissions
  - Diversity of proponents, geographies, themes
- 27 contribution submissions

