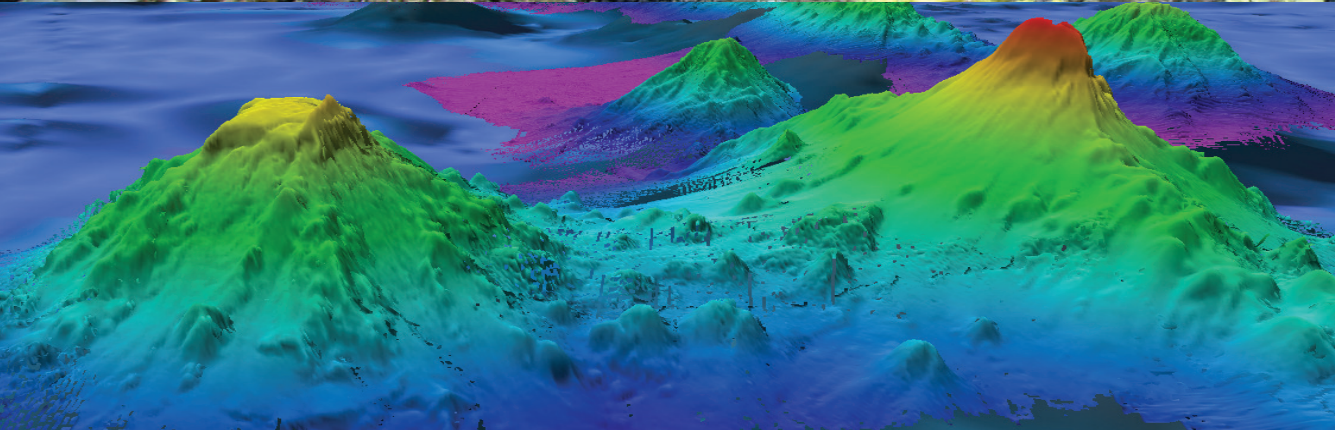





OCEAN EXPLORATION STRATEGIC PLAN

FY 2023 – 2027





**DESPITE THE FACT THAT WE
LIVE ON A BLUE PLANET,
THE OCEAN IS
LARGELY UNKNOWN,
PARTICULARLY
THE DEEP OCEAN.**

MESSAGE FROM THE DIRECTOR

The deep ocean touches many crucial aspects of our everyday lives.

It provides life-changing pharmaceuticals and food, supports transportation and shipping, and it has implications for the climate, the emerging Blue Economy, and national security. Yet, for most of us, this vast, dark, and distant region of our planet remains out of sight and out of mind. **NOAA Ocean Exploration bridges the gaps** between discovery and the unknown; between data and its users; and ultimately it helps reveal the secrets of our submerged planet.

Just over 20 years ago, the United States embraced an opportunity and a challenge: **to strategically explore the ocean for national benefit**. Out of this charge, NOAA Ocean Exploration was formed. In the intervening years, NOAA Ocean Exploration has grown to meet the challenge of exploring and understanding our deep ocean and sharing what we learn with the scientific community, policymakers, decision-makers, and the public alike. As the mantle of deep-sea exploration has moved from a largely governmental charge to one that cuts broadly across all sectors, NOAA Ocean Exploration has adapted accordingly:



Through the development of partnerships to broaden the reach and scope of our activities.

NOAA Ocean Exploration proactively partners with other NOAA Labs and Programs, federal, state, tribal, and local government agencies; academia; industry and nonprofit, and philanthropic organizations to further ocean exploration



Through mapping and exploratory expeditions aboard NOAA Ship *Okeanos Explorer*.

From the planning of large-scale campaigns to the selection of individual remotely operated vehicle dive sites, collaborative and community-driven exploration is a hallmark of our work. Data collected during expeditions establish a foundation for scientific research in numerous fields and impact countless lives.



Through the development of operational, technological, and data collection standards for expeditions around the globe.

NOAA Ocean Exploration supports the development of community consensus standards that support mission operations and data accessibility.



Through far-reaching grants supporting a wide range of ocean exploration-related topics.

Our annual federal grant competition and ocean educational mini-grants program enable us to support interdisciplinary and diverse projects from across the ocean science community.



Through investing in new technologies that act as force-multipliers for ocean exploration.

Technology demonstrations aboard *Okeanos Explorer* and other platforms offer a rare opportunity to test and augment ocean technologies in real-world conditions, while partnerships, grants, and other forms of collaboration can support their development.



Through publicly available, freely accessible data.

NOAA Ocean Exploration provides the scientific community, natural resource managers, and decision-makers with the information they need to advance our collective understanding of the ocean and its implications for the health, security, and well-being of the nation. Data and any data products collected, funded, produced, or archived by NOAA Ocean Exploration are in the public domain.



Through education and outreach efforts, including live streaming of remotely operated vehicle dives.

The use of telepresence enables broader scientific participation and real-time public engagement. By informing, inspiring, and educating the general public and the next generation of ocean explorers and stewards, NOAA Ocean Exploration encourages long-term investment and support in the ocean and its resources.



Through investing in and expanding the diversity of thought, background, and discipline.

NOAA Ocean Exploration has the opportunity to explore the unknown reaches of our planet, test cutting-edge technologies under the most demanding of conditions, and expand the bounds of scientific understanding. NOAA Ocean Exploration applies that same curiosity and scientific rigor toward testing new approaches for increasing equity and representation within the ocean science community, for actively introducing more diversity into that community, and for ensuring those voices are included and heard throughout all scientific and educational activities.



Our work also supports the broader mission of our line office, NOAA Research (OAR), which focuses on the relationship between the atmosphere and the ocean, as well as NOAA's overall charge of **science, service, and stewardship**.

By broadly defining our goals and objectives for fiscal years 2023-2027, this plan will act as a roadmap for how we will make progress toward a future of collaboration and innovation. Ultimately, our success is driven by a diverse and forward-thinking workforce whose collective expertise will allow us to fund and conduct ocean exploration; discover and document new species, features, and phenomena; and communicate about our work for the good of the nation. The goals we've included here are achievable and enhanced by our concerted investment in the very foundation of our office: **our people**.



WHO: EXPLORERS OF THE UNKNOWN

We are scientists and engineers. We are educators and administrators. But our true calling is to be explorers. By closing the gaps in our basic understanding of the ocean, particularly the deep-sea environment, we are strengthening the economy, the health, and the security of our nation and the world.

WHY: UNDERSTAND THE OCEAN

The ocean is the defining feature of our planet. We depend on it to regulate our weather and our climate, to provide our food and our energy, and to support our economy and our national defense. **America's future is dependent on understanding the ocean and our relationship with it.**

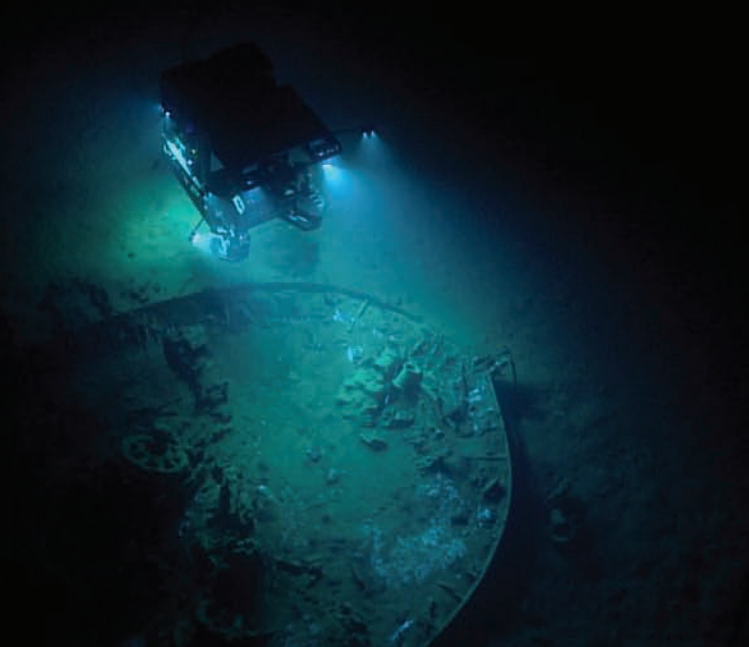
Mission: Explore the ocean for national benefit.

Vision: Ocean exploration, rigorous scientific discovery, and advancements in undersea technologies inform decision-makers and help them strengthen the economy, health, and security of the United States and the global community.



HOW: EXPLORE TO DISCOVER, DISCOVER TO UNDERSTAND, AND UNDERSTAND TO INFORM

NOAA Ocean Exploration coordinates, funds, and conducts expeditions around the globe that feed the essential research and scientific inquiry necessary to understand the features and phenomena of the ocean to support informed resource management decisions.



WHAT: EMPLOY OUR CORE PRINCIPLES TO MEET OUR GOALS

Treat Data As a Strategic Asset

Among NOAA Ocean Exploration's most valuable assets are the data we collect through ocean exploration, and the value of that data only increases as they are used by stakeholders to inform scientific research agendas, policy decisions, classroom instruction, and more.

Uphold Scientific Integrity

NOAA Ocean Exploration maintains an unwavering commitment to providing valid, clear, easily accessible, and reproducible data and science to the public.

Demonstrate Our Commitment to Diversity

NOAA Ocean Exploration takes the broadest possible view of diversity, including seen and unseen qualities, to foster a culture that exemplifies teamwork, embraces innovation, and values equity and inclusion to achieve mission excellence.

Engage from Local to Global

NOAA Ocean Exploration actively cultivates relationships with a broad and diverse portfolio of partners, nationally and internationally, to integrate our expertise and capabilities into our mission and enhance our ability to inform, educate, and inspire the public.

GOAL 1



EXPAND NOAA OCEAN EXPLORATION'S CAPACITY FOR GLOBAL EXPEDITIONS TO ENABLE SCIENTIFIC DISCOVERY

NOAA Ocean Exploration has a unique opportunity; we can plan, coordinate, and conduct ambitious expeditions around the world.

NOAA Ocean Exploration will amplify our exploration capacity by employing an approach of systematic exploration that will **focus on expanding the exploration footprint** within smaller regional campaigns. This approach allows expeditions to build upon each other over time and to contribute more fully to understanding a specific region. To meet this goal, NOAA Ocean Exploration will **actively diversify** our suite of partnerships, vessels, platforms, and systems and deploy the most appropriate and impactful operating modality to best address the mission objectives for each expedition.

GOAL 1: EXPAND NOAA OCEAN EXPLORATION'S CAPACITY FOR GLOBAL EXPEDITIONS TO ENABLE SCIENTIFIC DISCOVERY

Objective 1.1: Employ an approach to expedition and campaign planning that builds upon the foundation of systematic exploration.

Objective 1.2: Diversify the range of platforms, vehicles, and mechanisms used to accomplish NOAA Ocean Exploration's mission to ensure a consistent level of data collection and operational capacity is available, accessible, and reliable.

Objective 1.3: Migrate routine operations to shore-based centers to free up ship-based exploration resources, capitalize on bandwidth-expanding capabilities of satellite communications, and increase the accessibility of exploration through the use of telepresence.

Objective 1.4: Develop and disseminate a catalog of proven standard operating procedures for conducting deep-ocean expeditions that can be readily adopted by NOAA's ocean exploration partners.

Objective 1.5: Understand the full scope of the operational capabilities, technological specifications, and exploration requirements necessary to inform the design and buildout of NOAA's next generation of ocean exploration vessels.



INDICATORS OF SUCCESS:

- ★ Campaigns and expeditions are planned with the goal of expanding the exploration footprint within a region in a systematic and comprehensive manner.
- ★ NOAA Ocean Exploration maintains a cumulative total of 365 at-sea exploration operation days per year across our entire portfolio of available platforms, vehicles, and mechanisms.
- ★ Remote watchstanding and data processing by key personnel working onshore is a routine and regular practice.
- ★ NOAA Ocean Exploration maintains and enhances our current expedition and exploration tempo beyond the end-of-life for the *Okeanos Explorer*.
- ★ NOAA Ocean Exploration maintains a repository of data collection standards and standard operating procedures that are recognized by the ocean community as the model of excellence for conducting deep-ocean exploration.



GOAL 2

STRENGTHEN NOAA OCEAN EXPLORATION'S NETWORK OF PARTNERS TO BETTER UNDERSTAND THE MARINE ENVIRONMENT

Fully exploring, mapping, and characterizing the ocean requires collective effort from federal agencies, state and Tribal governments, private industry, academia, and nonprofit organizations.

It also requires a level of **community consensus** about shared priorities that guide and inform expedition planning, technological investments, and stakeholder outreach efforts. In addressing this challenge, NOAA Ocean Exploration is committed to a course of **coordinated action** and **collaborative planning** that incorporates scientific inquiry, entrepreneurial enterprise, philanthropic endeavor, and public and private investment.

GOAL 2: STRENGTHEN NOAA OCEAN EXPLORATION'S NETWORK OF PARTNERS TO BETTER UNDERSTAND THE MARINE ENVIRONMENT

Objective 2.1: Expand NOAA Ocean Exploration's partnerships through the use of formal agreements (e.g., cooperative agreements, federal financial assistance, reimbursable agreements, contracts, etc.) to expand collaborations with industry, academia, and the philanthropic and nonprofit communities.

Objective 2.2: Prioritize partnerships with tribal nations and Indigenous communities to better understand their culture, requirements, and capabilities and to identify opportunities to support their ocean exploration interests and priorities.

Objective 2.3: Encourage the development of community consensus standards and protocols for ocean exploration, mapping, and characterization through domestic and international partnerships.

Objective 2.4: Plan, coordinate, and execute multi agency and multisector expeditions and campaigns to contribute to the mapping of 100% of the deepwater U.S. Exclusive Economic Zone (EEZ) by 2030.



INDICATORS OF SUCCESS:

- ★ Organizations conducting expeditions within the U.S. EEZ use consistent operational, technological, and data collection standards.
- ★ NOAA Ocean Exploration routinely collaborates with a broad cross-section of tribal nations and Indigenous communities throughout the entire expedition cycle to plan and conduct relevant ocean exploration operations and to make the best use of data and data products post-expedition.
- ★ The international ocean exploration community has a shared vision of operational, technological, and data collection standards that inform how we collectively map and explore the ocean.
- ★ NOAA Ocean Exploration maintains a robust portfolio of agreements (e.g., contracts, grants, memorandums of understanding, cooperative research and development agreements, etc.) with partners from industry and academia and the nonprofit and philanthropic communities.

GOAL 3

DEVELOP AND FIELD TEST THE EMERGING SCIENCE AND TECHNOLOGIES NECESSARY TO EXPLORE THE OCEAN

The rapid pace of advancement in ocean science, data collection, and technological refresh provides unprecedented opportunities to explore, map, and characterize the ocean.

These leaps in capability result in **new discoveries** that improve our understanding of fundamental ocean phenomena. By investing in **emerging technologies and ambitious science**, NOAA Ocean Exploration is driving the introduction of new capabilities for the ocean exploration community. NOAA Ocean Exploration will build on our **history of high-risk investments** by using our grant and contract authorities, to drive innovation around scientific and technological priorities across the ocean exploration community.

GOAL 3: DEVELOP AND FIELD TEST THE EMERGING SCIENCE AND TECHNOLOGIES NECESSARY TO EXPLORE THE OCEAN

Objective 3.1: Build a robust pipeline of research and development projects, focused on the demonstration phase of the readiness continuum, to accelerate the development and transition of emerging marine observing technologies and applications into ocean exploration operations.

Objective 3.2: Develop an authoritative catalog of NOAA's current operational, technological, and data collection requirements for ocean exploration to guide future NOAA investments.

Objective 3.3: Expand NOAA Ocean Exploration's understanding of the state of science and technology within the ocean exploration community to improve collaboration and coordination across disciplines, sectors, entities, and locations.

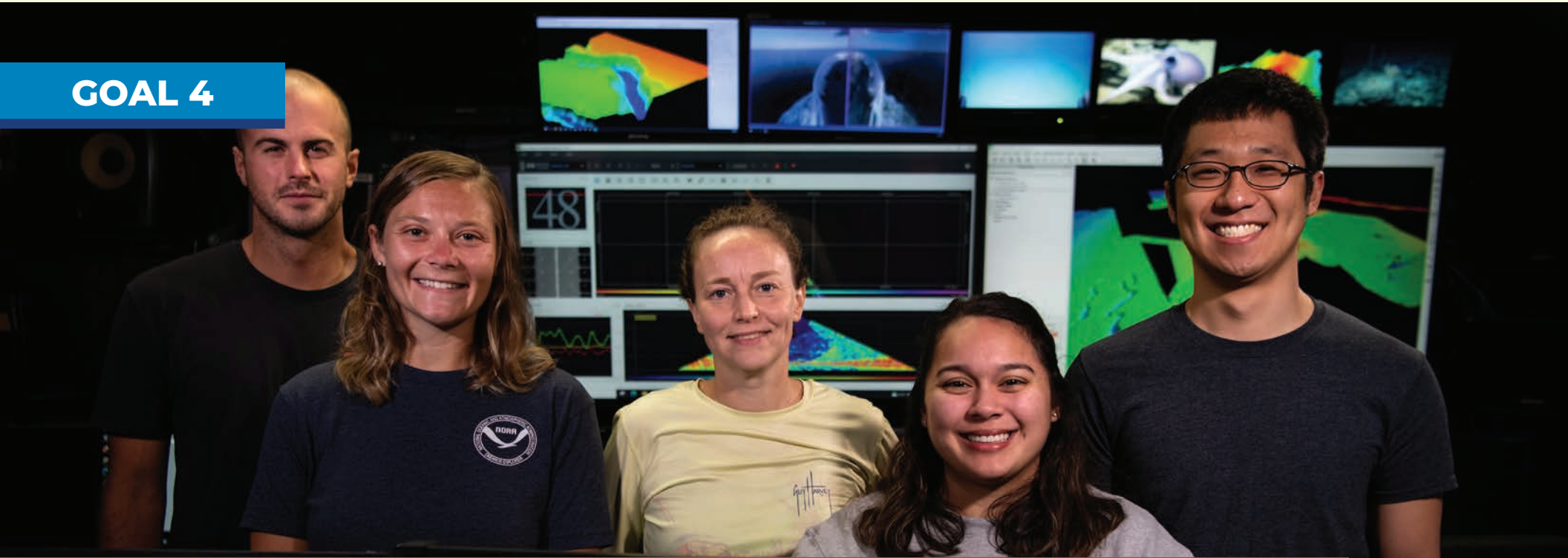
Objective 3.4: Demonstrate a return on investment philosophy that embraces possibility of failure by seeking out high-risk projects, activities, and initiatives that provide newfound experiences and gained insights..



INDICATORS OF SUCCESS:

- ★ NOAA Ocean Exploration routinely reports on the state of emerging scientific and technological capabilities within the ocean exploration community.
- ★ NOAA Ocean Exploration's sponsored activities, especially the competitive grant program, are recognized as incubators of ambitious, unconventional, and high-risk technologies and projects.
- ★ NOAA Ocean Exploration is recognized as a trusted partner within the ocean exploration community and is regularly consulted regarding investments in emerging technologies, innovative tools, and operational procedures.

GOAL 4



INVEST IN DIVERSITY AND INCLUSION TO UNLOCK INNOVATION

NOAA Ocean Exploration embraces diversity, equity, inclusion, and accessibility (DEIA) and understands them to be the foundation upon which we all stand.

Our interdisciplinary team includes **scientists, explorers, administrators, and students** who apply their unique talents, skills, and perspectives to exploring and understanding the marine environment. All NOAA Ocean Exploration employees contribute to the evolving face of the broader ocean exploration community. We will use our status as **leader of the national program** to highlight the importance of DEIA and boldly experiment with **new ideas and new approaches** for making the ocean exploration community reflect the nation as a whole.

GOAL 4: INVEST IN DIVERSITY AND INCLUSION TO UNLOCK INNOVATION

Objective 4.1: Use NOAA Ocean Exploration’s contract and agreement authorities to make intentional investments in the development of a diverse, inclusive, and equitable ocean exploration community, with a special emphasis on supporting opportunities for individuals and organizations from underrepresented communities.

Objective 4.2: Test new methods and best practices that remove barriers and promote equitable and fair participation in federal funding opportunities, including grants and vessel time.

Objective 4.3: Champion a diverse workforce that values an array of talents and backgrounds, seeks a diversity of perspective, ensures equity in all spaces, and supports NOAA’s overall DEIA vision.

Objective 4.4: Foster an office culture that promotes mindfulness, meaningful self-care, effective productivity, and a healthy work-life balance for all members of the workforce.



INDICATORS OF SUCCESS:

- ★ DEIA values are promoted and incorporated as core elements throughout the entire life-cycle of NOAA Ocean Exploration operations and activities.
- ★ NOAA Ocean Exploration is recognized as a leader in the ocean community for pioneering new ways to expand fair and transparent participation in federal funding opportunities and collaborations.
- ★ The composition of NOAA Ocean Exploration’s workforce, partnerships, and collaborations more closely reflect the demographics of the nation as a whole.
- ★ NOAA Ocean Exploration staff have the work-related resources and support systems necessary to maximize their effectiveness and to achieve their goals.

GOAL 5



EDUCATE, INSPIRE, AND PROMOTE THE VALUE OF THE OCEAN

The ocean impacts everyone, yet it is not often recognized for the resources it provides or its role in making our planet hospitable.

Reaching “everyone” and inspiring them to **care about the ocean**, and more specifically the deep ocean, is a herculean task. By identifying specific audiences, NOAA Ocean Exploration can invest in the tools and resources needed to deliver the data and educational materials those audiences need and do it in a way that is impactful, accessible, and useful. NOAA Ocean Exploration will develop **innovative and accessible content**, powerful messaging, and strong partnerships to engage and inform audiences about the **value, importance, and excitement of deep-ocean exploration**.

GOAL 5: EDUCATE, INSPIRE, AND PROMOTE THE VALUE OF THE OCEAN

Objective 5.1: Build awareness for NOAA Ocean Exploration’s mission and publicly available data to improve our contributions to national objectives.

Objective 5.2: Increase the use of visual storytelling by combining images, videos, graphics, and data displays with engaging text delivered through a range of traditional and emerging media platforms to craft a compelling narrative about the value and importance of ocean exploration.

Objective 5.3: Strengthen the scientific literacy and baseline understanding of key ocean phenomena among nonscientific audiences.

Objective 5.4: Invest in education and outreach programs and grants that encourage the advancement and participation of underrepresented groups in ocean science and engineering.

Objective 5.5: Expand opportunities for undergraduate students, graduate students, and early career professionals to participate in NOAA Ocean Exploration-sponsored activities and programs, with a special emphasis on opportunities for individuals from underrepresented communities.



INDICATORS OF SUCCESS:

- ★ Scientists and researchers have a working knowledge of NOAA’s ocean exploration data holdings and are able to access the data they need in a timely and effective manner.
- ★ Ocean exploration data and information are available to inform decision-making by government and industry leaders, nonprofit organizations, and academic institutions.
- ★ The ability to engage with high-quality ocean exploration and ocean science-related educational content is not limited by the location of an educator, student, or member of the public.
- ★ The audiences participating in NOAA Ocean Exploration outreach and education activities and programs reflect the broad spectrum of regions, communities, beliefs, and backgrounds of the nation as a whole.



GOAL 6

EMBRACE THE VOLUME, VELOCITY, AND VARIETY OF OCEAN EXPLORATION DATA TO DRIVE DISCOVERIES

NOAA Ocean Exploration's envisions a community with a clear understanding of its collective data assets, shared agreements regarding data collection and standardization, and a commitment to investing in the software, tools, and expertise needed to manage such extensive integrated datasets.

A central challenge for the ocean exploration community is to **effectively connect data** from a variety of locations and collection points into **interoperable and accessible datasets** that can be used by scientists, researchers, educators, and policymakers to inform and support their work. NOAA Ocean Exploration will enable discovery and innovation by **managing data as strategic assets** and ensuring data are findable, accessible, interoperable, and reusable by all current and future stakeholders.

GOAL 6: EMBRACE THE VOLUME, VELOCITY, AND VARIETY OF OCEAN EXPLORATION DATA TO DRIVE DISCOVERIES

Objective 6.1: Ensure metadata and data collected via NOAA Ocean Exploration mechanisms are easy to find for humans and computers with a focus on interoperability, replicability, and accessibility.

Objective 6.2: Use NOAA Ocean Exploration agreement authorities (e.g., grants, contracts, memorandums of understanding, etc.) and our position of leadership to inform consensus standards for data collection, transmission, and accessibility across the ocean exploration community.

Objective 6.3: Test and expand new data management tools and methodologies across NOAA Ocean Exploration's data pipeline, from collection to archiving, that use and access ocean data in innovative ways and lead to the creation of new products or deliverables.

Objective 6.4: Invest in analytical tools and data products that can be used by non-NOAA Ocean Exploration users to visualize NOAA data.



INDICATORS OF SUCCESS:

- ★ The data assets held in the NOAA National Centers for Environmental Information's archive are interoperable with similar data repositories across the entire ocean exploration community.
- ★ A data management maturity index of ocean exploration data is finalized and applied to existing NOAA holdings.
- ★ Consistent data visualization standards for GIS platforms are commonly used across the ocean exploration community.
- ★ Investments in innovative technologies like machine learning, artificial intelligence, cloud computing, and other emerging capabilities are demonstrably expanding the use of NOAA data assets by scientists, industry, and decision-makers.

EVALUATION OF THIS PLAN

At the end of each fiscal year, covered by this strategic plan, NOAA Ocean Exploration will assess the progress made toward achieving the goals and objective described in this document. Several mechanisms of evaluation will be used to track organizational performance and to report on the status of exploration, scientific, and outreach activities within the Program. These mechanisms include:

1. Annual progress reviews
2. Internal performance reports
3. OAR's Annual Operating Plan
4. Ocean Exploration Advisory Board oversight
5. An NOAA Ocean Exploration program review process conducted in a manner consistent with NOAA and OAR requirements.

