

FY24-FY28 NCEI Strategic Plan

May 2024

Letter from the Director



Our daily work is wonderfully diverse, but the thing we all share is this: we work diligently to draw lasting value from the Nation’s—and the world’s—investments in environmental observations and models. We *all* do that, and as a result, we help inform our Nation to be more prosperous, more resilient, and more just.

In this plan, you will find a distillation of the unique lenses and initiatives that will drive our work over the next three to five years. Some of the more immediate initiatives will pave the way for, and inform, the longer-term goals.

You’ll notice that *our near-term priorities are in different stages of conceptual maturity*, and so their implementation will differ significantly. At one end of the spectrum, we have a clear external direction toward supplemental work funded through the 2022 Inflation Reduction Act (IRA) and the 2021 Bipartisan Infrastructure Law (BIL). At the other end is the internally-driven need to prioritize constituent outcomes, recognizing that, if we measure and improve ourselves by the outcomes we foster, we can be even more effective at what we do.

The *near-term priorities are inextricably linked to each other*. The supplemental work will support some of the cloud migration, through resource support and lessons learned. The cloud will yield tools to scale our services to constituents, and get us technical wins for the highly-visible supplemental work. Finally, serving constituent outcomes meets the intent of the supplemental funding, and helps organize our approach—and insist on the value to the constituent—for cloud migration.

The *near-term priorities are also inextricably linked to our longer-term priorities*, which will build on their foundations. We will improve the processes, engagement, and training to realize the full value of the Cloud Archive for constituents. We will enable more sophisticated use of our information by those who can leverage Artificial Intelligence/Machine Learning (AI/ML) approaches. We will create a more resilient and sustainable business model.



Threading through it all are our supporting activities: investing in our people, sustaining core services, and cultivating continuous improvement. Our vision for a resilient, prosperous, and equitable world should also be reflected internally, in continuing to foster a workplace where the dignity of every individual is valued. Through continuous improvement and technological advances, we are securing the breathing room and capacity to do the next big thing.

By pursuing the initiatives laid out here, we will grow smarter and more efficient, with an expanded set of tools and capacities at our disposal. We will be better equipped to meet both the size and importance of the challenges ahead and to advocate for ourselves to secure the resources we need. We are trading hard work today to position us for a better tomorrow.

Again, our work is building a more informed country. Our work is helping people build smarter infrastructure, take more calculated risks, and understand who is most vulnerable. In this endeavor, we are agents of lasting good.

Deke Arndt, NCEI Director

Table of Contents

Letter from the Director	2
NCEI’s Vision & Mission	5
The NCEI Triad.....	6
Strategic Priority 1: Prioritize Constituent Outcomes	7
Long-Term Outcomes.....	8
Strategic Priority 2: Migrate Mission Systems to the NESDIS Common Cloud Framework (NCCF), Leveraging Cloud Capabilities That Enhance and Scale NCEI Data, Products, and Services	9
Long-Term Outcomes.....	10
Strategic Priority 3: Execute/Leverage Inflation Reduction Act (IRA)/Bipartisan Infrastructure Law (BIL): Demonstrate Industry Use of Authoritative Climate Data and Services	12
Long-Term Outcomes.....	13
Dependent Strategic Priorities:	14
A. Improve Archive and Access Service Delivery - Leveraging the migration of archive data into the Cloud in order for NCEI to improve the processes, engagement, and training to realize the full value of the Cloud Archive for constituents.....	14
B. Grow Data Science Capabilities Using AI/ML - Leveraging the NOAA Center for Artificial Intelligence to proliferate the use of responsible AI at NOAA to benefit its mission.....	14
C. Establish a Modern Business Model - Transforming business policies, practices, and agreements in a sustainable and equitable way that underpin the NCEI mission going into the future.....	15
Supporting Activities	16
Supporting Activity: Investing in our People and Advancing Organizational Health.....	16
Supporting Activity: Sustaining Core Authoritative Data, Products, and Services.....	16
Supporting Activity: Continuing to Cultivate a Continuous Improvement Mindset.....	17



NCEI's Vision & Mission

Vision

A tenacious and trusted leader in environmental information for a rapidly changing world with a focus on driving lasting good across our partnerships, our economy, around the U.S and the world through generations.

Mission

NCEI provides environmental data, products, and services covering the depths of the ocean to the surface of the sun to drive resilience, prosperity, and equity for current and future generations.

NCEI Values

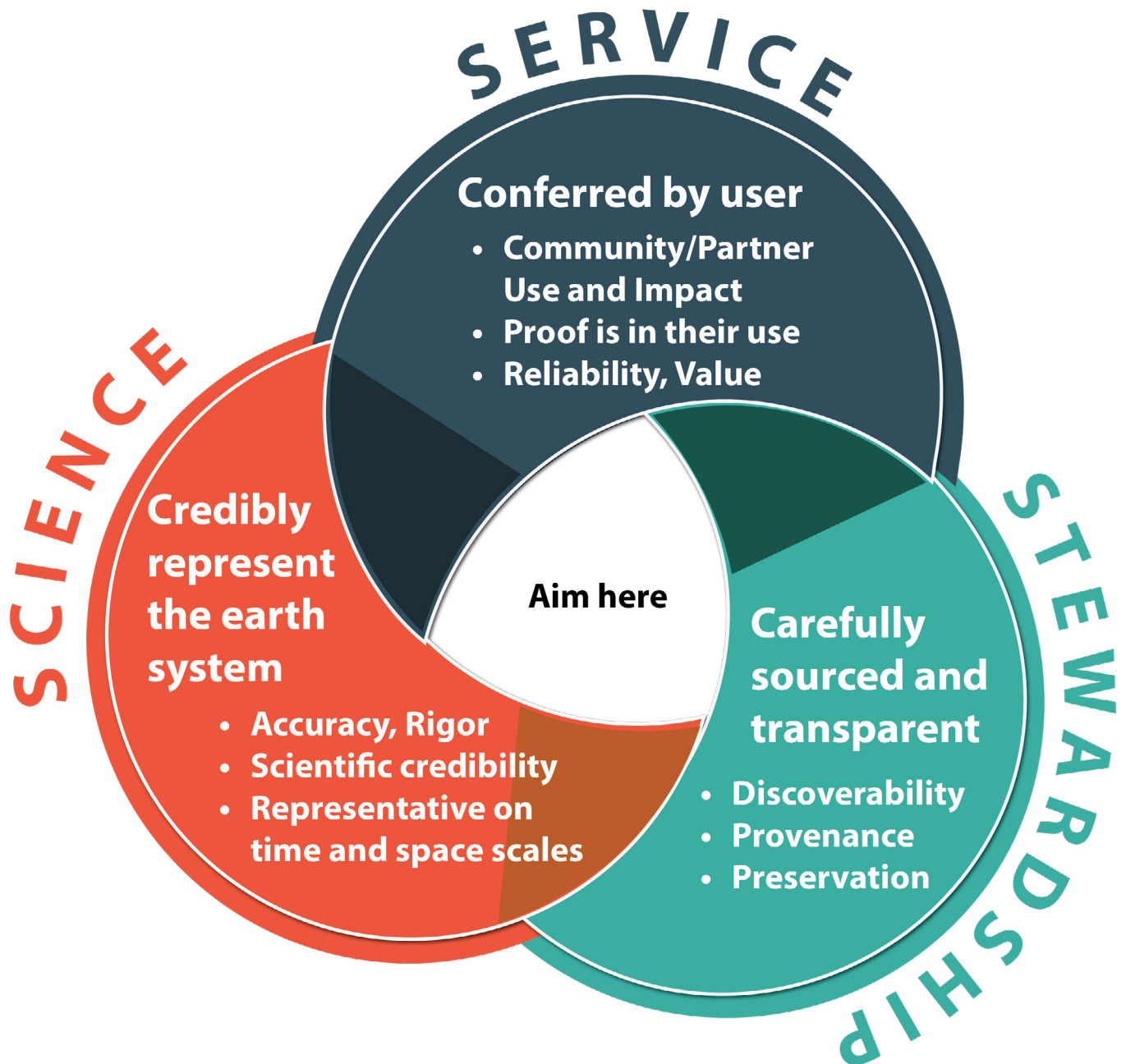
Values are evergreen. NCEI will continue to meet its priorities and goals set forth here by relying on a culture around three values: Courage, Agility, and Teamwork. Our values guide behavior at all levels and across all of the institutions and companies that make NCEI work. This helps attract and retain employees and strengthen the culture we continue to grow. The common vocabulary that flows from these values serves as a shortcut to referring to the way we need to interact, operate, and make decisions aligned with the NESDIS Operating Principles.

- **Courage** – We empower each other to choose courage over comfort to do what is best for the organization.
- **Agility** – We constantly assess and adapt what we are doing and how we are doing it.
- **Teamwork** – We work together to build cohesive, highly functioning teams.



The NCEI Triad

Authoritative information means:





Strategic Priority 1: Prioritize Constituent Outcomes

NCEI will intentionally leverage its enterprise investments to deliver stronger value as defined by our constituents¹. NCEI will align around a culture that sets priorities from the outside, so that constituents drive our efforts, and the outcomes of these efforts define our successes.

The Nation's information landscape has changed dramatically in recent years. NCEI's data and information are now available on a sea of platforms, with some of them managed with our partners, and others completely beyond our control. Moreover, in many situations, NCEI information is combined with other information sources—even other disciplines—in the complex decision spaces of the Information Age.

This shapes our future in two ways. First, while traditional metrics like downloads, volumes stored or served, as well as publications and engagements remain important business metrics, they no longer capture the full essence of NCEI's work. We must develop a new and richer understanding of the impact of our work. We need to assess our value by the outcomes we support, and improve our performance with those in mind. Second, limited resources dictate that we can't push in all directions for all cases at once. Doing so would further stress our workforce and resources with unattainable scope. We must make wise choices about evolving our organization by being selective about the partner and community outcomes we choose to prioritize at any given time, and be purposeful about allocating resources accordingly.

These factors mean a major shift in philosophy, and a challenge: We have to learn how to better understand, measure, and advocate for this aspect of our value. We have to learn the whys and hows of best gauging the price and payoff of prioritizing particular constituents.

Ultimately, elevating NCEI's value proposition through constituent outcomes brings us closer to a more precise assessment of our worth as well as the return on investment NCEI provides to the American taxpayer. Fostering shared understanding of priorities will improve coordination, can improve NCEI's resources management, and will definitely amplify NCEI's impact. This new focus will ensure that our personnel roles are in sync with common goals, an important component of organizational health, and reinforce our collective effectiveness and commitment to national objectives.

¹ NCEI has priority constituents both inside and outside agency boundaries (NOAA, DOC, interagency, international), along with academia, the private sector, Non-Governmental Organizations, and the general public.

Long-Term Outcomes:

- NCEI measures its worth and charts its investments by its role in improving the Nation’s and/or our constituents’ *prosperity, resilience, and/or equity*.
- NCEI operates in a conscious balance between investing in priority areas and opportunities, and sustaining core data, products, and services.
- All staff clearly understand the function of each section and how this connects from upstream constituents to downstream users.

Objective 1: Actively prioritize and annually reassess NCEI’s constituent outcomes, and drive enterprise investments and priorities accordingly.

Initiative 1: Identify and productively engage with NCEI’s priority constituents at multiple levels of NCEI to understand their outcomes from most impactful to least impactful.

Initiative 2: Develop, refine, and integrate a meaningful rubric for prioritizing constituent outcomes that can be applied across the full breadth of NCEI constituents.

Initiative 3: Develop, refine, and integrate an understanding of the price and payoff of servicing an NCEI constituent toward their most impactful outcomes.

Initiative 4: Use this shared understanding to prioritize decisions and applications for architecture, stewardship engagement, product development, and service delivery on a routine (planning cycle) basis.

Objective 2: Drive a comprehensive transformation of NCEI’s culture that builds the organization’s value by elevating constituent outcomes as the ultimate metric of NCEI’s worth.

Initiative 1: Develop, refine, and use meaningful outcomes-based metrics to evaluate NCEI’s success.

Initiative 2: Improve internal (workforce, agency) and external (partner, public) communications to reflect, reinforce, and support NCEI’s commitment to this approach.

Initiative 3: Cultivate and recognize cross-organizational teams that innovate and coordinate toward achievement of prioritized outcomes.

Initiative 4: In employee/affiliate recognition, emphasize the value of these integrated responses that enable achievement of superior results.



Strategic Priority 2:

Migrate Mission Systems to the NESDIS Common Cloud Framework (NCCF), Leveraging Cloud Capabilities That Enhance and Scale NCEI Data, Products, and Services

NCEI is shifting its mission capabilities to the NESDIS Common Cloud Framework (NCCF) for a more streamlined and effective delivery of outcomes to constituents. This move aims to address the growing demand for data, information, products, and services, while also mitigating risks to existing on-premise systems by harnessing the scalability of cloud technologies.

The expanding need for integrated earth systems data, especially in understanding and managing climate change impacts and natural disasters, underscores the importance of integrating NOAA data into decision support systems. As partners increasingly embrace the Cloud and AI-based approaches, NOAA must expedite the migration of its extensive data holdings, products, and services to the Cloud, while simultaneously building its expertise in AI/ML.

In a bid to enhance public access, foster data innovation, and tap into the economic potential of its offerings, NESDIS is planning to shift all product areas, associated data, and applications to cloud-based platforms. This transformation aims to transfer operational stewardship and scientific services to the cloud, improving consumer services for both the public and economic sectors. The focus will be on developing enterprise software, optimizing metadata workflows, integrating operations with common services, and increasing automation to efficiently manage larger and more complex data sets. This foundational work is crucial for a seamless transition to the cloud, facilitating the efficient scaling of data, products, and services. The ultimate goal is to empower data-driven decision-making through the provision of accessible, customizable, and reusable tools, applications, and visualizations, with a long-term focus on elevating operational data, information, and science services for customers.

Long-Term Outcomes:

- The NCEI mission is fully sustained in the Cloud, realizing the benefits associated with the Cloud to better and more reliably serve our constituents.
- NCEI efficiently and effectively delivers scalable, tailorable, and efficient tools and services to meet constituent needs.
- NCEI’s data, products, and services are analysis-ready in formats and delivery systems that facilitate broad use and reuse, particularly by AI/ML.
- NCEI’s science development and information delivery can leverage increased IT scalability and automation to provide enhanced customer experience.
- NCEI has made a generational change in technology aimed at realizing its vision of a tenacious and trusted leader in environmental information for a rapidly changing world.

Objective 1: Migrate all NCEI data and applications to the NESDIS Common Cloud Framework (NCCF).

Initiative 1: Complete development of the NCCF Archive Service and other enterprise capabilities in the Common Services required for the NCEI mission.

Initiative 2: Migrate all mission capabilities from FISMA² 5011 to NCCF.

Initiative 3: Migrate all mission capabilities from FISMA 5009 to NCCF.

Objective 2: Develop workforce and business practices to meet cloud transformation.

Initiative 1: Establish an education and training program to prepare our workforce.

Initiative 2: Build a financial framework to support operations in NCCF .

Initiative 3: Create a concept of operations to maintain and sustain NCEI core operational services in NCCF.

Objective 3: Exploit NCCF and cloud technologies to deliver improved products and services.

Initiative 1: Transform NCEI data holdings to be AI-ready where most impactful.

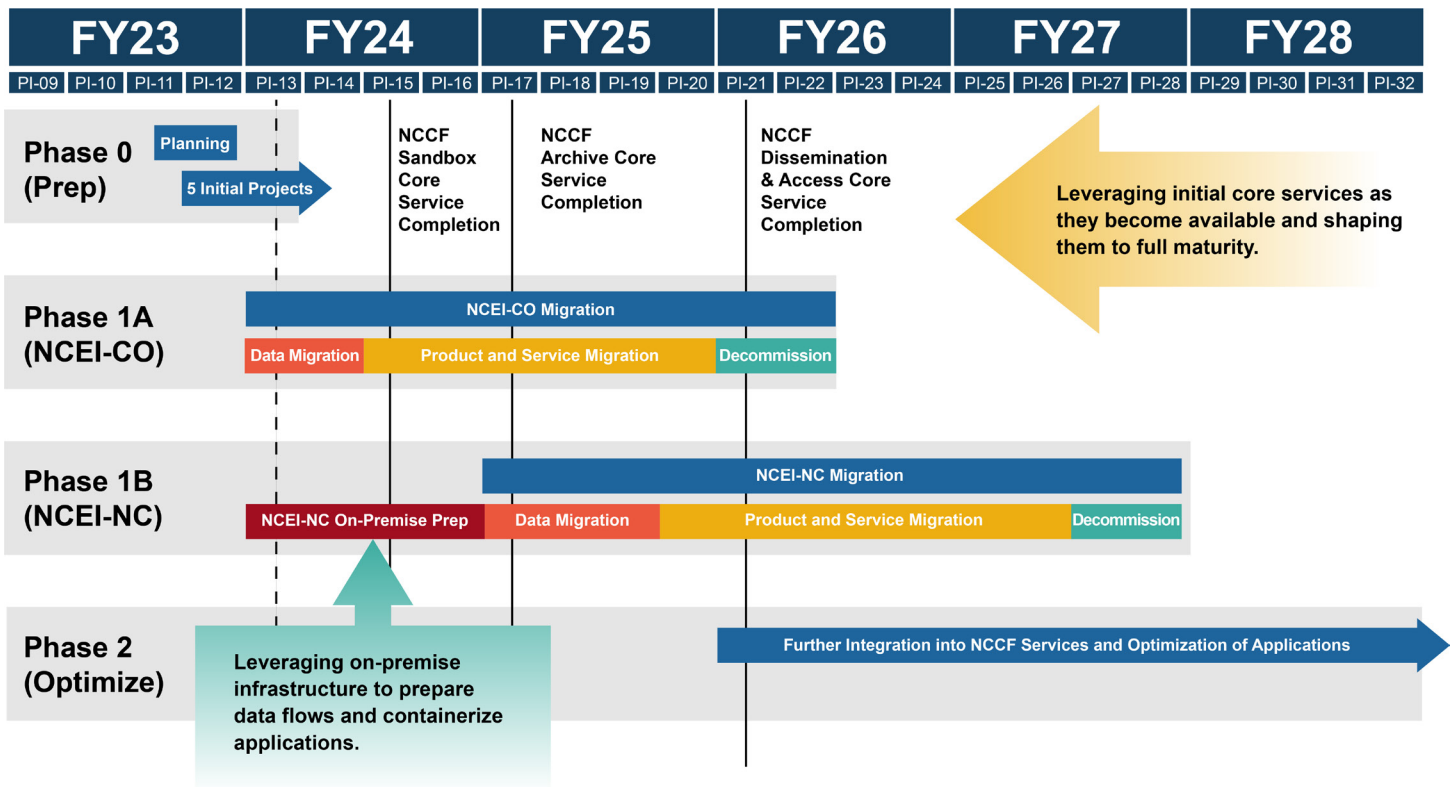
Initiative 2: Manage and sustain the NCCF Archive Service and integration with the other NCCF Services to improve data stewardship.

Initiative 3: Capture and share product and service innovations/improvements made possible by the migration to the NCCF.

² IT boundaries established in compliance with Federal Information Security Modernization Act (FISMA) of 2002.



Cloud Migration Roadmap:





Strategic Priority 3: **Execute/Leverage Inflation Reduction Act (IRA)/Bipartisan Infrastructure Law (BIL):** **Demonstrate Industry Use of Authoritative Climate Data and Services**

Through the 2022 Inflation Reduction Act (IRA) and the 2021 Bipartisan Infrastructure Law (BIL), NCEI has a unique opportunity to greatly increase support for users, including key industry sectors, and to enhance our products, services, and delivery to help build a Climate Ready Nation.

NCEI will focus on improving the capacity of a few sectors at a time to better incorporate climate and environmental information into their research, operations, and business processes. In this way, NCEI will partner to improve the resilience of the Nation and the economy to climate, climate change, extremes, and impacts.

A multifaceted approach will ensure success. We will pursue quick, known, durable wins to improve the ability of industry and government to address climate across the entire value chain. We will build and maintain partnerships across geographic scales (national, regional, state/tribal, local, and international), across industry sectors, and across different environmental phenomena. We will use the supplemental resources to make quantum leaps by transforming our delivery mechanisms, developing methods to improve overall constituent uptake, and buttressing our role as the Nation's source for authoritative climate data and information, along with ancillary supporting data. NCEI will leverage a continuous user engagement and service delivery model to rapidly modify products and delivery tools to make them applicable to specific problems. We will partner with other agencies and even private-sector innovators to create high-risk, high-reward incubator experiences where government and industry data can be blended to solve multiple issues. Industry will take an active role in addressing their problems and sharing the solution space.

Improving the equitable delivery of climate information is key to building a Climate Ready Nation. Building on successes of climate and equity listening sessions, NCEI will help NOAA deliver value to those who are disproportionately impacted by climate and will provide focus for NCEI's future as it delivers these services to support equitable futures. Through all these roles, NCEI will find quick, durable wins and reduce its cost for operations by leveraging cloud technologies and reduced maintenance costs.

These efforts, while highly focused and temporary, are vital to NCEI's strategy. They jumpstart us toward realizing our companion strategic priorities of Cloud migration, and embracing an outcomes-based assessment of our work.



Long-Term Outcomes:

- Continuous, targeted, and coordinated engagement between NOAA programs and industry partners.
- Prototypes enable and illustrate sustainable, pervasive use of NOAA authoritative data and information across trial sectors.
- Barriers are lowered and facilitate increased interaction with industry for provision of NOAA authoritative data and information.
- Key industry sectors can speak to the successes of the IRA/BIL investments as to their increased use of authoritative climate data and information and may advocate for more going forward.
- These investments significantly lower long-term operational costs for production, stewardship, and service of many existing NCEI products.

Objective 1: Establish Industry Proving Grounds.

Improve delivery of NOAA climate data and services to American industries and enhance broad use of NOAA's trusted and authoritative information as well as risk modeling to support decisions.

Initiative 1: Quickly respond to key industry sector needs with climate data and services. Initial key industry sectors are insurance/reinsurance, engineering/architecture, and retail.

Initiative 2: Conduct targeted work with underserved communities and sectors with less sophistication in the risk modeling space.

Objective 2: Leverage IRA/BIL funding to the lasting benefit of NCEI's constituents.

Initiative 1: Expand future capacity by aggressively using supplemental programs to drive operational costs down.

Initiative 2: Capture and operationalize innovations in data presentation and visualization. Exploit supplemental programs to the lasting benefit of NCEI and its constituents.

Dependent Strategic Priorities:

The specific objectives, initiatives, and measures of success will be determined as we have made substantive progress on the top three strategic priorities, particularly the migration to the Cloud.

A. Improve Archive and Access Service Delivery - Leveraging the migration of archive data into the Cloud in order for NCEI to improve the processes, engagement, and training to realize the full value of the Cloud Archive for constituents.

This will entail:

- Streamlining processes and workflows to optimize in the Cloud Archive.
- Ensuring data integrity and security in the Cloud.
- Developing and implementing staff, partner, and stakeholder training for the Cloud.
- Improving feedback mechanisms to collect and document feedback from users to understand their needs and expectations.

The end results will be:

- Timely and trusted delivery of archive and access services to support use and reuse through FAIR³ and open data/open science principles.
- Increase in archival capacity (storage and process) and reduction of the archive backlog.
- Establishment of an open archival framework to increase contributions by partners across NCEI and beyond to the archive/access workflow.

B. Grow Data Science Capabilities Using AI/ML - Leveraging the NOAA Center for Artificial Intelligence to proliferate the use of responsible AI at NOAA to benefit its mission.

This will entail:

- Developing the skills of NCEI's existing workforce as well as integrating AI/ML, data science, and Cloud requirements into contracts and grants, as well as position descriptions for future new hires.
- Creating diverse communities of practice through partnerships representing constituent weather, climate, and ecosystem needs that can advance the NCEI mission by tailoring, adapting, and integrating AI/ML capabilities.
- Prioritizing the harvesting of Data Science tools for mission application toward principal IRA constituent outcomes.
- Ensuring that Data Science tools are developed, procured, and sustained to be ethically used, understandable, and supportive of equity issues.

³ FAIR data meet principles of findability, accessibility, interoperability, and reusability.



The end results will be:

- NCAI Tech Hub center of excellence is robustly established and managed.
- AI-ready environmental data standards are internationally standardized and adopted.
- NCEI's data are fully AI-ready and Cloud accessible, and therefore capable of advancing data management, analysis, exploration, and new information product development.
- New resource libraries of reusable open science cloud environment tools and workflows, contract and grant language, and human expertise that provides foundational benefit.
- NOAA's workforce and workflows are optimized with AI generative and other automation tools.
- NCEI has integrated responsible AI into new information products for positive IRA constituent impacts.

C. Establish a Modern Business Model - Transforming business policies, practices, and agreements in a sustainable and equitable way that underpin the NCEI mission going into the future.

This will entail:

- Understanding and determining how Cloud operations will impact the way NCEI manages its financial management and execution.
- Anticipating the future operating environment (telework/remote posture, office footprint, etc.) and mission needs (Uncrewed Systems (UxS), Increasing Data Volumes, Projection Services) that will need to be reflected in the new business framework.
- Engaging with our constituents so that they better understand how our support to them is changing with the migration to the Cloud and with other changes in technology (AI and UxS). Our goal is not to pass these costs on to our constituents and partners, but to garner their support—particularly that of our priority constituents—in advocating for increasing NCEI's base budget request to reflect our new reality.

The end results will be:

- A NCEI business model for the future that reflects the reality of Cloud operations, growing data volumes, and the increased need in society for authoritative information.
- Policies, practices, and agreements that are equitable and reflect decision-making based on value to our constituents and ensure financial sustainability amidst their evolving requirements.
- Constituent understanding and respect for NCEI's transparent business practices even if they do not necessarily agree with them, and advocacy for NCEI's mission and resourcing.
- NCEI's management framework has advanced to a level of maturity where the appropriate level of control and risk are taken, where we optimize how we are organized to do our work, and where collaboration across divisional lines for the achievement of NCEI goals is valued by all.

Supporting Activities

The priorities above will be dependent upon three key supporting activities:

- Investing in our people and advancing organizational health.
- Sustaining core authoritative data, products, and services.
- Implementing a continuous process improvement mindset.

Supporting Activity: Investing in our People and Advancing Organizational Health

Building off the tremendous gains in people and culture aims over the past few years, we will continue to implement strategies and plans to optimize positive outcomes such as job satisfaction, staff engagement, and organizational advocacy, and minimize negative outcomes such as burnout and intent to leave.

Utilizing the results from the most recent FEVS, as well as the focus groups, pulse checks, and listening sessions, we will implement strategies to address the identified areas for improvement. This will include implementing an NCEI-specific DEIA Strategic Plan that addresses identified challenges around diversity, mentoring/early career support, equity, and accessibility.

Long-Term Outcomes:

- Improved Total Worker Health, as measured by FEVS.
- Improved diversity and inclusion in supervisory and leadership ranks and across the organization.
- All NCEI staff have full awareness of the contribution and needs of their fellow staff members in the full NCEI workflow from upstream constituents to downstream users.

Supporting Activity: Sustaining Core Authoritative Data, Products, and Services

NCEI will maintain leadership domestically (including across NOAA) and internationally through the routine and high-quality provision of core authoritative environmental data, products, information, and services. NCEI will harmonize its concept of “core” across its diverse array of users and data providers, and understand how this concept overlaps, complements, and is informed by NCEI’s priorities, resource constraints, and technical capacity.

NCEI core environmental data, products, information, and services includes archival data and scientific data products. These core NCEI products and services will be reviewed, maintained, and sustained according to community best practices through established and continuously improved readiness review processes. Core archival data will be managed effectively to ensure provenance, safe storage, and accessibility according to laws, policies, and regulations. Core products will be managed to ensure scientific integrity, accuracy, and rigor. Core services will be managed to ensure reliable, valuable communication and collaboration with partners and stakeholders.



Long-Term Outcomes:

- Through improvements and changes, NCEI maintains support of “core” data, products, information, and services to serve constituents across NOAA, other agencies, and across all sectors of the economy with authoritative environmental data, products, information, and services.
- A definition of “core” is developed and matured, aiming at a common understanding across NCEI and its constituents as well as better informing improvements and changes.

Supporting Activity: Continuing to Cultivate a Continuous Improvement Mindset

As we have done over the past several years, we will continue to leverage our agility to examine how to better our organization and mission delivery. We routinely assess organizational policies, processes, practices, and tools for efficiency and effectiveness, to include their removal when the risk can be accepted. We will continue to gather input via regular surveys like the FEVS, but also more informally through CEC and DEIA listening sessions, etc. We will conduct retrospective discussions within our various teams, such as Scaled Agile Framework (SAFe) Agile Inspect and Adapt Ceremonies, and undertake process improvement initiatives based on this input. We want to continue to emphasize the importance of this mindset going forward, affirming that we will continue to improve. Perfect is to be strived for, but less than perfect can still effectively meet our mission. This strategic supporting activity underpins all the rest, where we seek to continuously improve in all our priority areas. Failing with lessons learned can sometimes be just as important as succeeding, particularly when the lessons enable colleagues to succeed with less effort.

Long-Term Outcomes:

- Improvements are regularly made and can be easily traced back to input gathered from surveys, retrospectives, audits, etc.
- The workforce trusts that input and feedback are considered and incorporated into future improvements.
- Internal controls and practices are of the appropriate complexity and scope for Center activities and targeted mission risk.



 @NOAANCEI  @NOAAData  @NOAANCEI