



**NATIONAL CENTERS
FOR ENVIRONMENTAL PREDICTION**
STRATEGIC PLAN
2015-2019

VERSION 4
FEBRUARY 27, 2015

MISSION

NCEP delivers national and global operational weather, water and climate products and services essential to protecting life, property and economic well-being.

VISION

The trusted source for environmental predictions from the sun to the sea, when it matters most.

UNIQUE VALUE PROPOSITION

NCEP science-based operational products and services are essential to public safety and foundational to the national and global weather, water and climate enterprises.

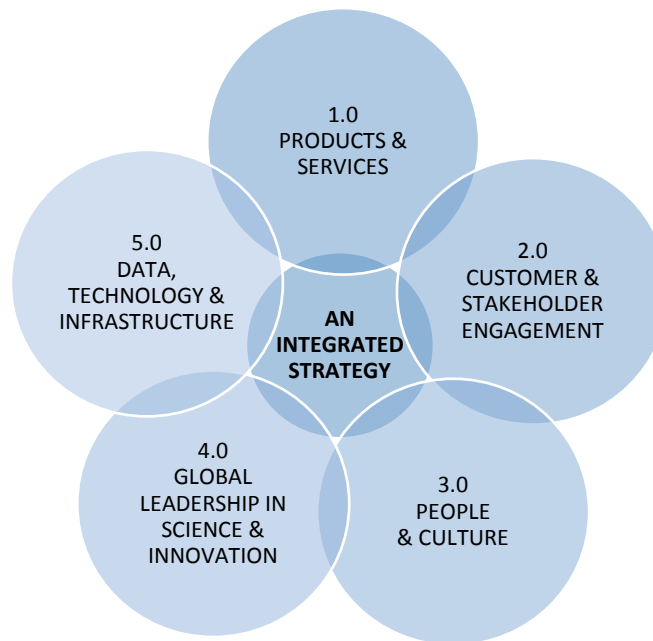
CORE VALUES

Personal Accountability
Scientific Integrity
Honesty
Trust

NATIONAL CENTERS

- Aviation Weather Center
- Climate Prediction Center
- Environmental Modeling Center
- National Hurricane Center
- NCEP Central Operations
- Ocean Prediction Center
- Space Weather Prediction Center
 - Storm Prediction Center
- Weather Prediction Center

GOALS



1.0 FOCUSED, CUSTOMER-DRIVEN PRODUCTS & SERVICES

- Advance and focus NCEP decision support products and services, driven by customer priorities and supported by partner capabilities.

2.0 CUSTOMER & STAKEHOLDER ENGAGEMENT

- Achieve open and transparent engagement and collaboration with customers and stakeholders to understand needs and leverage partner capabilities and expertise.

3.0 PEOPLE & CULTURE

- Retain a highly skilled and satisfied workforce which demonstrates a culture of collaboration and adaptability to changing conditions and customer needs.

4.0 GLOBAL LEADER IN SCIENCE & INNOVATION

- Demonstrate global leadership in modeling and forecasting with innovative, collaborative science and applied research to support effective decision making.

5.0 DATA, TECHNOLOGY & INFRASTRUCTURE

- Strengthen the IT infrastructure, tools, and capabilities to integrate data streams, improve access, display, and timely dissemination and availability of data and information.

1.0 FOCUSED, CUSTOMER-DRIVEN PRODUCTS & SERVICES

Advance and focus NCEP decision support products and services, driven by customer priorities and supported by partner capabilities.

WEATHER READY NATION DECISION SUPPORT SERVICES

- 1.1 Provide actionable Impact-Based Decision Support Services to reduce weather related deaths by 10% over 5 years.
- 1.2 Guide real-time operational collaborative efforts to achieve consistent and accurate services within the NWS integrated field structure.
- 1.3 Reduce inconsistencies in probabilistic definitions, display, and communications of hazards across all Centers.
- 1.4 Increase the number of NCEP forecasts with an underlying probabilistic foundation by 50% by the end of FY19 against an FY15 baseline.
- 1.5 Integrate social science into new public products and services.
- 1.6 Extend the lead time of skillful forecasts of high-impact environmental events by at least 10%.
- 1.7 Modernize product and service formats to enable personalized delivery of life-saving alerts for a mobile society.
- 1.8 Partner with a wide spectrum of national and regional decision makers to translate hazard information into quantifiable forecasts to mitigate adverse economic impacts.
- 1.9 Collaborate with partners in social science, media, emergency management and the private sector to develop a communications strategy for rapidly changing hazard information.
- 1.10 Provide specialized decision support services to meet validated OCONUS requirements.

PRODUCTS & SERVICES

- Forecasts
- Watches and Warnings
- Guidance
- Analyses and Assessments
- Technical Advice and Consultation

WEATHER, WATER, CLIMATE, ECOSYSTEMS & SECTOR SPECIFIC PRODUCTS & SERVICES

NWS GOAL 1: IMPROVE WEATHER DECISION SERVICES FOR EVENTS THAT THREATEN LIVES AND LIVELIHOODS.

- 1.11 Extend probabilistic daily temperature and precipitation forecasts out to 10 days
- 1.12 Establish forecasts of the arrival of tropical storm force winds.
- 1.13 Issue text, graphical and gridded public and marine forecast products, watches and warnings for tropical cyclone threats *before* storm formation.
- 1.14 Extend probabilistic forecasts of individual severe weather hazards to day 2.
- 1.15 Establish high temporal resolution probabilistic severe weather outlooks to support national decision making on hourly time scales.

1.16 Extend marine graphical forecasts from 4 days to 7 days.

1.17 Issue probabilistic marine warnings out to 10 days.

NWS GOAL 2: DELIVER A BROAD SUITE OF IMPROVED WATER FORECASTING SERVICES TO SUPPORT MANAGEMENT OF THE NATION'S WATER SUPPLY.

1.18 Partner with River Forecast Centers, Weather Forecast Offices, and the National Water Center to improve flash flood forecast lead-time by 10%.

1.19 Partner with River Forecast Centers and the National Water Center to provide new drought and flood guidance for water resource services.

NWS GOAL 3: ENHANCE CLIMATE SERVICES TO HELP COMMUNITIES, BUSINESSES, AND GOVERNMENTS UNDERSTAND AND ADAPT TO CLIMATE-RELATED RISKS.

1.20 Complete the seamless suite of NCEP weather and climate products by filling the week 3-4 gap.

1.21 Develop and issue Arctic sea-ice melt and freeze outlooks.

NWS GOAL 4: IMPROVE SECTOR-RELEVANT INFORMATION IN SUPPORT OF ECONOMIC PRODUCTIVITY.

1.22 Establish regional space weather forecast capability.

1.23 Improve aviation ceiling and visibility forecasts skill by 10%.

1.24 Implement an integrated impact decision support service that drives the NWS' common operating picture to the Federal Aviation Administration, airlines and General Aviation community, resulting in faster and smarter decisions, increased economic benefit and enhanced aviation safety.

1.25 Partner with Weather Forecast Offices, Department of Transportation, and Emergency Managers to provide predictive guidance for snow and ice on untreated roads.

1.26 Improve accuracy of monthly and seasonal drought outlooks by 10% for the agricultural community.

1.27 Convert from text only to gridded high seas forecasts.

1.28 Partner with the Department of Health and Human Services to improve predictions in areas that impact human health (i.e. water quality, food, and pathogens).

1.29 Provide forecast and nowcast information on the solar radiation environment for commercial aviation and space transportation and tourism sectors.

NWS GOAL 5: ENABLE INTEGRATED ENVIRONMENTAL FORECAST SERVICES SUPPORTING HEALTHY COMMUNITIES AND ECOSYSTEMS.

- 1.30 Partner with NOS and NOAA Regional Associations to expand hypoxia, harmful algae blooms, pathogens, and habitat ecological models from regional to national scale to enable the forecast of high impact biological events.

PRODUCT DELIVERY

- 1.31 Provide real-time access to NOAA products and services through an integrated enterprise-wide dissemination service.
- 1.32 Align and standardize NCEP web services across all Centers to improve the user experience.
- 1.33 Partner to expand access to NCEP products and services via mobile devices with an NCEP app.

2.0 CUSTOMER & STAKEHOLDER ENGAGEMENT

Achieve open and transparent engagement and collaboration with customers and stakeholders to understand needs and leverage partner capabilities and expertise.

CUSTOMER REQUIREMENTS & FEEDBACK SYSTEM

- 2.1 Implement a transparent customer requirements process to systematically engage customers in collecting, assessing, prioritizing, and anticipating requirements.
- 2.2 Annually publish a summary of customer requirements to support a culture of transparency and enhance partner understanding of user demand for NCEP products and services.
- 2.3 Eliminate any and all products and services which do not align with validated customer requirements.
- 2.4 Continuously solicit product feedback from the user community to drive improvement and new product development decisions.
- 2.5 Establish sector-specific success indicators by Center and annually assess customer satisfaction against indicators.

PRODUCT PRIORITIZATION CRITERIA

- Numbers/types of users
- Impact on users
- Resource needs (cost/benefit analyses)
- Scientific needs (downstream dependencies)

COMMUNICATIONS & OUTREACH

- 2.6 Implement a five year strategic communications and outreach plan to promote an accurate understanding of NCEP capabilities and offerings.
 - 2.6.1 Host annual roundtable meetings with stakeholders on strategic topics to improve planning and service outcomes.

2.6.2 Publish an NCEP annual report highlighting strategic plan accomplishments and things on the next year's horizon.

2.6.3 Implement community outreach events at each Center annually.

USER TRAINING & EDUCATION

- 2.7 Establish two user training sessions per year at professional meetings on NCEP products and plans.
- 2.8 Develop an online training program on the use of NCEP products and services, modeled after COMET modules.
- 2.9 Collaborate with the International Association of Emergency Managers to implement an accredited training program.

PARTNERSHIPS

- 2.10 Establish a transparent process and criteria for engaging in partnerships to augment resources and capabilities.
- 2.11 Add 100 Weather Ready Nation Ambassadors to strengthen the nation's readiness, responsiveness, and overall resilience for extreme weather, water, and climate events.

3.0 PEOPLE & CULTURE

Retain a highly skilled and satisfied workforce which demonstrates a culture of collaboration and adaptability to changing conditions and customer needs.

NWS GOAL 6: SUSTAIN A HIGHLY-SKILLED, PROFESSIONAL WORKFORCE EQUIPPED WITH THE TRAINING, TOOLS, AND INFRASTRUCTURE TO ACCOMPLISH OUR MISSION.

PEOPLE

FUTURE SKILLS & ROLES

- 3.1 Develop the necessary skills and expertise to match mission requirements over the next 5 years.
- 3.2 Define the future role of the forecaster through the labor-management relations partnership.

STAFFING & DEVELOPMENT

RECRUITMENT

- 3.3 Develop a diverse NCEP workforce to foster innovative ideas and products.
- 3.4 Develop staffing and recruitment plans through the Labor Management Relations process for all Centers and the OD to fill all vacancies in the NCEP organization.
- 3.5 Support at least 5 new academic student internships annually NCEP-wide.

TRAINING

- 3.6 Implement a multi-year training plan and designate a coordinator to sustain commitment, visibility, and coordination for all professional development activities.
 - 3.6.1 Provide team members with tools and techniques for effective collaboration.

WORKFORCE SATISFACTION & WELL-BEING

- 3.7 Increase employee satisfaction scores on the Federal Employee Viewpoint Survey to 80% by the end of FY19.
- 3.8 Work with the NWS Employees Organization to involve employees in AOP processes in all Centers.
- 3.9 Increase individual flexibility with alternative work schedules and the telework policy.
- 3.10 Explore the Department of Commerce Job Sharing Program for an NCEP pilot.
- 3.11 Strengthen Labor Management Relations to achieve a “green light” status at all Centers.

LEADERSHIP & SUCCESSION PLANNING

- 3.12 Implement a National Center Leadership Development Program to build strong NCEP leaders with interpersonal, communication, and mentor skills.
- 3.13 Leverage existing NOAA mentoring programs and support the participation of at least 4 managers and 10 employees annually.
- 3.14 Produce Center level succession plans by the end of FY19.

CULTURE

- 3.15 Promote a culture of collaboration with a focus on strategic plan priorities.
- 3.16 Build a culture of trust with Weather Forecast Offices, River Forecast Centers, Center Weather Service Units, and Service Centers to foster collaboration to improve consistency and accuracy of products and services.
 - 3.16.1 Influence model development based on expertise and sector specific knowledge.
 - 3.16.2 Improve high-impact forecasts by leveraging expertise and sector specific knowledge of Service Centers.
- 3.17 Commit resources to encourage, recognize, and reward innovation.
- 3.18 Partner with external organizations to develop methods to infuse and measure innovation.

4.0 GLOBAL LEADER IN SCIENCE & INNOVATION

Demonstrate global leadership in modeling and forecasting with innovative, collaborative science and applied research to support effective decision making.

SCIENTIFIC FOUNDATIONS

- 4.1 Partner to strengthen science foundations for operational model and forecast improvement.
- 4.2 Host a collaborative symposium bi-annually to enable the identification of specific research targets within foundational areas.

- 4.3 Collaborate with partners to define metrics for model performance that are appropriate across Service Centers.
- 4.4 Strengthen the relationships between NCEP developers, Service Science Divisions, and Science Operations Officers to address agency development needs.
- 4.5 Assimilate new satellite observations to improve NCEP products and services, including Geostationary Operational Environment Satellite – R (GOES-R), Joint Polar Satellite System (JPSS), Deep Space Climate Observatory (DSCOVR), and Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC II).
- 4.6 Acquire existing or nontraditional, nonfederal data with high potential to enhance the analysis in data sparse areas, including drones, subsurface gliders, Mesonets, TAMDAR, UAV, and IOOS.
- 4.7 Advance data assimilation methods with Joint Centers, OAR, NASA, and others to improve analyses.
- 4.8 Strengthen the verification process across NCEP, WFOs, partners, and HQ to promote trust and provide a common starting point for skill assessment.

STRATEGIC SCIENCE INVESTMENTS

- 4.9 Develop a centralized framework for planning and executing scientific targets of opportunities.
 - 4.9.1 Appoint chief scientist in NCEP to ensure full integration of science across the organization.
 - 4.9.2 Develop an NCEP Strategic Science Plan in collaboration with partners and stakeholders.
 - 4.9.3 Establish an annual science summit.
 - 4.9.4 Establish criteria for external participation in planning and partnerships in execution.
- 4.10 Establish Center-specific science advisory groups to guide improvement in the quality of analyses and forecasts and overall scientific foundations.
- 4.11 Expand the international training desks to all Centers by 2019.
- 4.12 Establish an NCEP visiting scientist program with resources to support six visits per year (to or from NCEP) including international opportunities.

MODELS

- 4.13 Implement a new unified global coupled data assimilation and modeling suite.
 - 4.13.1 Couple the atmosphere to the ionosphere, ocean, sea ice, waves, land, and chemistry.
 - 4.13.2 Develop scale-aware physics to enable unified approach to modeling.
 - 4.13.3 Implement Next Generation Global Prediction System dynamic core.
- 4.14 Implement the North American Multi-Model Ensemble system.
- 4.15 Implement an operational space weather modeling capability.

- 4.16 Eliminate 3 significant bottle necks in the model implementation process.
- 4.17 Partner with OAR and Academia to implement a dedicated, rapidly updating short-range (12-15 hours) storm-scale ensemble to support emergency management and National Aerospace System decision-making on hourly time scales.
- 4.18 Implement a robust, multi-day convection-allowing ensemble system for US high resolution impact based decision support.

POST PROCESSING

- 4.19 Partner with the Meteorological Development Lab and NWS regions to develop an innovative ensemble post-processing strategy.
- 4.20 Support and leverage service center post-processing efforts for specialized applications, including a sustainable dissemination infrastructure

MODEL QUALITY & PERFORMANCE

- 4.21 Expand scope and better define processes and procedures to evaluate major modeling systems in partnership with the NWS SSDs and National Centers.
- 4.22 Reduce forecast outliers by 20% (frequency of busted forecast occurrence).
- 4.23 Improve ensemble spread and reliability appropriate to forecast lead times.

RESEARCH TO OPERATIONS & OPERATIONS TO RESEARCH

- 4.24 Increase the capacity of testbeds to enable more R2O and O2R.
 - 4.24.1 Double the investment in testbed infrastructure.
 - 4.24.2 Establish well defined metrics to measure the efficiency of the R2O process.
 - 4.24.3 Publish the end-to-end R2O process, including implementation guidelines.
- 4.25 Leverage test beds to share knowledge and best practices among Centers.
- 4.26 Ensure operational priorities are captured in OAR announcement of opportunities.
- 4.27 Supply NCEP code in an easily available form to our partners to contribute to innovation and product development.

PROCESS IMPROVEMENT TARGETS

1. Needs are prioritized within the big picture and take into account funding
2. Implementable partner deliverables
3. Efforts are not redundant or conflicting
4. Culture encourages collaboration

5.0 DATA, TECHNOLOGY & INFRASTRUCTURE

Strengthen the IT infrastructure, tools, and capabilities to integrate data streams, improve access, display, and timely dissemination and availability of data and information.

NCEP AS A DATA PROVIDER

- 5.1 Provide earlier access to pre-implementation parallel and test models prior to the NCO 30 day parallel.

- 5.2 Implement NOAA’s Integrated Dissemination Program (IDP) system in College Park, MD and Boulder, CO to unify dissemination systems providing one easily accessible location to retrieve data.
- 5.3 Provide hourly Global Forecast model output to 5 days.

USER ENGAGEMENT & DATA AVAILABILITY

- 5.4 Utilize the NCEP user requirement collection process to identify format and data needs
- 5.5 Increase engagement with standards group to maintain supply and demand of Big Data to standardize data formats.
- 5.6 Promote innovation and collaboration between NCEP and partners by sharing all non-restricted data and code.

Big Data is an all-encompassing term for any collection of data sets so large and complex that it becomes difficult to process them using traditional data processing applications.

AWIPS II

- 5.7 Complete the transition to a unified production system (e.g., AWIPS II) to meet NCEP’s customer needs and increase collaboration.
 - 5.7.1 Ensure an integrated field structure by assuring AWIPS II meets forecaster requirements to gain universal NCEP-wide acceptance.
 - 5.7.2 Establish an effective process to enable specialized scientific tool development to sustain Center innovation, and scientific forecast leadership.
- 5.8 Expand and sustain effective real-time interactive forecaster displays to visualize and analyze next generation forecast data.
- 5.9 Provide a full Alternative Processing Site in Boulder, CO in the event of a loss of the NOAA Center for Weather and Climate Prediction or remote Center facility.

NETWORK & COMPUTING CAPACITY

- 5.10 Increase operational computing capacity to 8 Pflop per cluster to ensure NCEP is the world leader in operational numerical weather prediction by the end of FY19.
- 5.11 Invest in network storage and computing to ensure the NCEP remote Centers are fully utilizing Big Data, as measured by a 10X increase in the percentage of data available on the network.
- 5.12 Ensure that networks and storage are scaled to centralized computing.

OPTIMIZATION OF CODE & COMPUTING CAPABILITIES

- 5.13 Enhance system capacity by 25% by maximizing system efficiencies and eliminating unused code.
- 5.14 Consolidate data dissemination services and eliminate unused data to increase efficiency and eliminate conflicts.

NEW TECHNOLOGY, BIG DATA & NEW DATA

- 5.15 Explore the use of accelerators in high performance computing to optimize numerical modeling capabilities.
- 5.16 Invest in developing government cloud services to reduce costs by 10%, reduce security incidents, and sustain a level of reliability of 99.9%.
- 5.17 Maintain leadership in high performance computing and a top 100 global ranking by adapting to new technologies and capabilities.
- 5.18 Establish processes within R2O to ensure the IT Infrastructure is able to support new capabilities (i.e. data) and ensure they are available on day one of operations.