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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

Strategic Plan

A Vision for 2005

EXECUTIVE SUMMARY

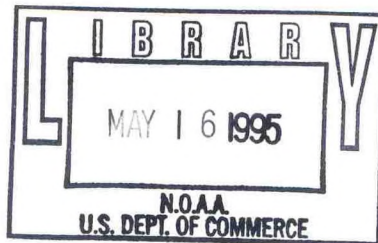


NOAA Strategic Plan

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U.S. DEPARTMENT OF COMMERCE

Ronald H. Brown, Secretary

National Oceanic and Atmospheric Administration

D. James Baker, Under Secretary for Oceans and Atmosphere
and Administrator

Foreword from the Administrator

For the year 2005, the National Oceanic and Atmospheric Administration envisions a world in which societal and economic decisions are coupled strongly with a comprehensive understanding of the environment. NOAA provides science, technology and services for the Nation in support of this vision. Our mission is to describe and predict changes in the Earth's environment, and conserve and manage wisely the Nation's coastal and marine resources to ensure sustainable economic opportunities.

NOAA's plan for the future is a handbook for sustainable development. Economic growth, maintenance of environmental quality, and wise use of resources must go hand in hand to assure a rising standard of living for all Americans. The health of the economy depends on the health of the environment. NOAA is promoting sustainable development by:

- Protecting life and property. NOAA provides environmental warnings, forecasts and other services, which are a unique public good.
- Integrating environmental stewardship and economic development. For instance, NOAA is restoring the wealth of America's fisheries while working with other bureaus in the Department of Commerce to assist communities during rebuilding.
- Redefining the relationship among the Federal government, state and local governments and stakeholders. Our Coastal Zone Management and Sea Grant programs are examples of effective partnerships with our customers. We are reviewing and reworking the way we address our responsibilities to improve service delivery and effectiveness.
- Reinventing the way government does business. NOAA is committed to creating a government that works better and costs less. We are streamlining the workforce, cooperating with other agencies to prioritize federal R&D spending, converging weather satellite programs with the Department of Defense, modernizing weather services and creating partnerships to acquire data.
- Providing the environmental information needed by policy makers for decisions. NOAA's foundation of environmental information services forms an important link in the chain leading to informed policy decisions.

The steps necessary to implement our vision are outlined in this Executive Summary to NOAA's Strategic Plan for 1995-2005. The strategic plan has been developed by Teams comprised of representatives from throughout the agency. It reaffirms and builds upon previous efforts which produced our seven strategic goals, and incorporates extensive internal and external input, review and comment from our employees, customers and stakeholders.

The strategic plan defines and validates NOAA's business activities, guides the development of implementing and operating plans, and forms the basis for our management and resource decisions. I am proud to present this Executive Summary, and would like to congratulate the women and men of NOAA, and our academic and industry partners, who have made the strategic plan a working reality. I encourage your comments on the plan and your participation in NOAA's exciting future.



D. James Baker

NOAA Strategic Plan

A Vision for 2005

Vision

For the year 2005, NOAA envisions a world in which societal and economic decisions are coupled strongly with a comprehensive understanding of the environment.

The National Oceanic and Atmospheric Administration's mission is to describe and predict changes in the Earth's environment, and conserve and manage wisely the Nation's coastal and marine resources to ensure sustainable economic opportunities. Through strategic planning, NOAA evaluates how best to accomplish this mission. The strategic plan provides a framework for articulating program goals and builds to these goals through consensus. The planning process promotes synergy, innovation and efficiency. It represents a better way of doing business.

NOAA envisions a 21st century in which environmental stewardship, assessment, and prediction serve as keystones to enhancing economic prosperity and quality of life, better protecting lives and property, and strengthening the U.S. balance of trade. This vision depends on actions now that:

- ❑ Create and disseminate reliable assessments and predictions of weather, climate, space environment, ocean and living marine resources, nautical, aeronautical and geodetic phenomena and systems.
- ❑ Implement integrated approaches to environmental management and ocean and coastal resources development for economic and social health.
- ❑ Ensure continuous operational observing capabilities -- from satellites to ships to radars.
- ❑ Build and use new information networks.
- ❑ Develop public-private and international partnerships for the expansion and transfer of environmental knowledge and technologies.
- ❑ Invest in scientific research and the development of new technologies to improve current operations and prepare for the future.
- ❑ Improve NOAA's abilities to serve its customers and forge stronger ties with its partners and stakeholders.

The Challenge to NOAA

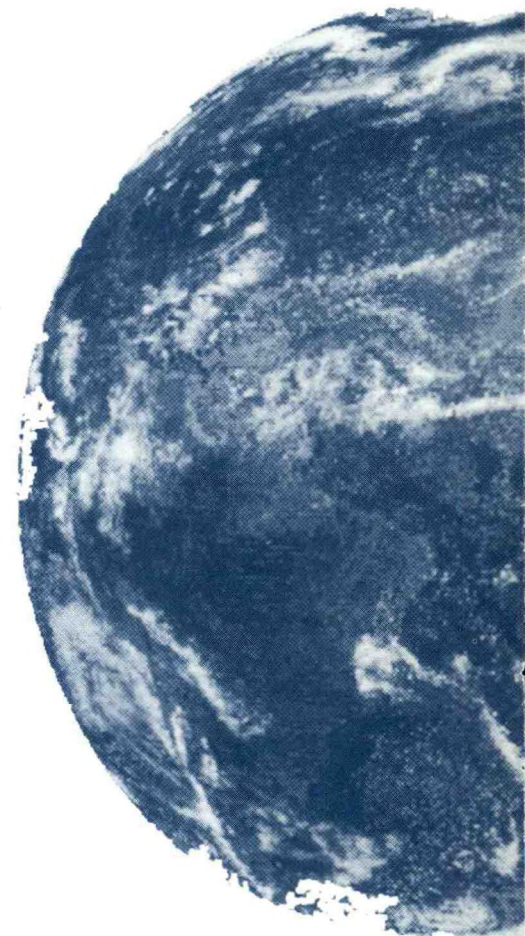
NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship. Our goals and programs today reflect a commitment to these basic responsibilities in the service of our customers and the Nation.

Over the past 25 years, technology and scientific insights have allowed the U.S. to make important strides in understanding and predicting the behavior of natural systems, in managing resources more effectively, and in improving environmental quality. NOAA's sciences and services have been fundamental to these accomplishments. Although we are better prepared to address the environmental challenges of the 21st century, we must recognize the unremitting and increasingly complex nature of these challenges. For instance:

- Our dynamic natural surroundings affect life, property and human actions on a daily basis. Short-term environmental events, particularly severe weather, can be socially and economically devastating. The ability to prepare for emergencies and to extend planning horizons for general activities depends on the quality and timeliness of our observations, assessments, and information delivery. The challenge is to improve our understanding of the environment so that we can minimize its effects on human activities. Expanding population and economic development are driving the need for a comprehensive system of environmental observations, assessments, predictions and information delivery.
- Many marine species are under stress from a combination of habitat degradation, overexploitation and competing economic concerns. Of the U.S. fishery resources for which population status is known, 43% are overutilized and 39% are fully utilized.¹ Some marine mammals, turtles and fish

currently are threatened with extinction. These endangered species are critical to the maintenance of biodiversity and the stability of natural ecosystems. The challenge is to return our living marine resources to healthy population levels to enhance opportunities for future generations.

- Dramatic seasonal to interannual climate variations in the U.S. have been linked to the El Niño-Southern Oscillation (ENSO) phenomenon in the tropical Pacific. ENSO-related effects include severe drought, ocean warming and regional flooding. NOAA has begun issuing seasonal outlooks of



Reflectance measured by GOES-5 and METEOSAT-2

climate variability based on ENSO research. However, the ability to improve the accuracy and reliability of ENSO outlooks is limited by the extent of observations and the need for enhanced process understanding and modeling. On the decadal-to-centennial time scale, human-induced and natural changes in the global environment may alter the capacity of the Earth to sustain life. Atmospheric pollution and the thinning of the ozone layer are human-induced changes affecting societies and governments. The challenge is to forecast seasonal through centennial changes with predictions of sufficient scientific credibility to support action.







- U.S. coastal counties are growing in population at a faster rate than inland counties. Coastal areas provide essential habitats for over 75% of U.S. commercial fisheries landings,² and serve as the foundation for billions of dollars in economic activity, including maritime commerce. In fact, 98% of our international trade by bulk leaves our shores through coastal ports. Rapid growth and development in coastal areas also has contributed to resource degradation and declines in environmental quality and economic productivity. For instance, portions of the Nation's shellfish beds have been closed repeatedly for some or all of recent harvest seasons due to water quality concerns. In 1992, beaches were closed or advisories issued against swimming on almost 3,000 occasions because of pollution.³ Utilization of positioning technologies and information has not kept pace with an expanding volume of maritime traffic, leading to reduced efficiency and increased risk of accidents. The challenge is to enable sustainable development in the coastal zone by maintaining healthy ecosystems, balancing resource use and protection, and providing the information and technologies needed to support economic growth.

By addressing environmental challenges, NOAA works as an integral part of the Department of Commerce to further the Nation's capabilities for sustainable development. As Secretary Ronald Brown has stated, "Economic growth can—and must—go hand in hand with environmental stewardship. The development of policies that strengthen the links between environmental stewardship and economic growth is central to the Administration's agenda and is a core concern of the Department of Commerce."⁴ Embracing this linkage between economic and environmental goals has been a guiding principle for NOAA. *Such a bond is critical to preserve national and economic security in a constantly changing world.* NOAA's planning and mission evaluation efforts help define the goals and programs necessary to address these challenges.




Achieving NOAA's Vision for 2005

NOAA's Strategic Plan for 1995-2005 describes the goals and objectives that have been established to fulfill its vision. The strategy consists of seven interrelated goals. Each goal is a coherent unit, but there also are important crosscutting relationships which enable the implementation and advancement of national, Department of Commerce, and NOAA objectives. The goals are grouped within the two primary missions of *Environmental Assessment and Prediction* and *Environmental Stewardship*.

Environmental Assessment and Prediction Mission

-  Advance Short-Term Warning and Forecast Services
-  Implement Seasonal to Interannual Climate Forecasts
-  Predict and Assess Decadal to Centennial Change
-  Promote Safe Navigation

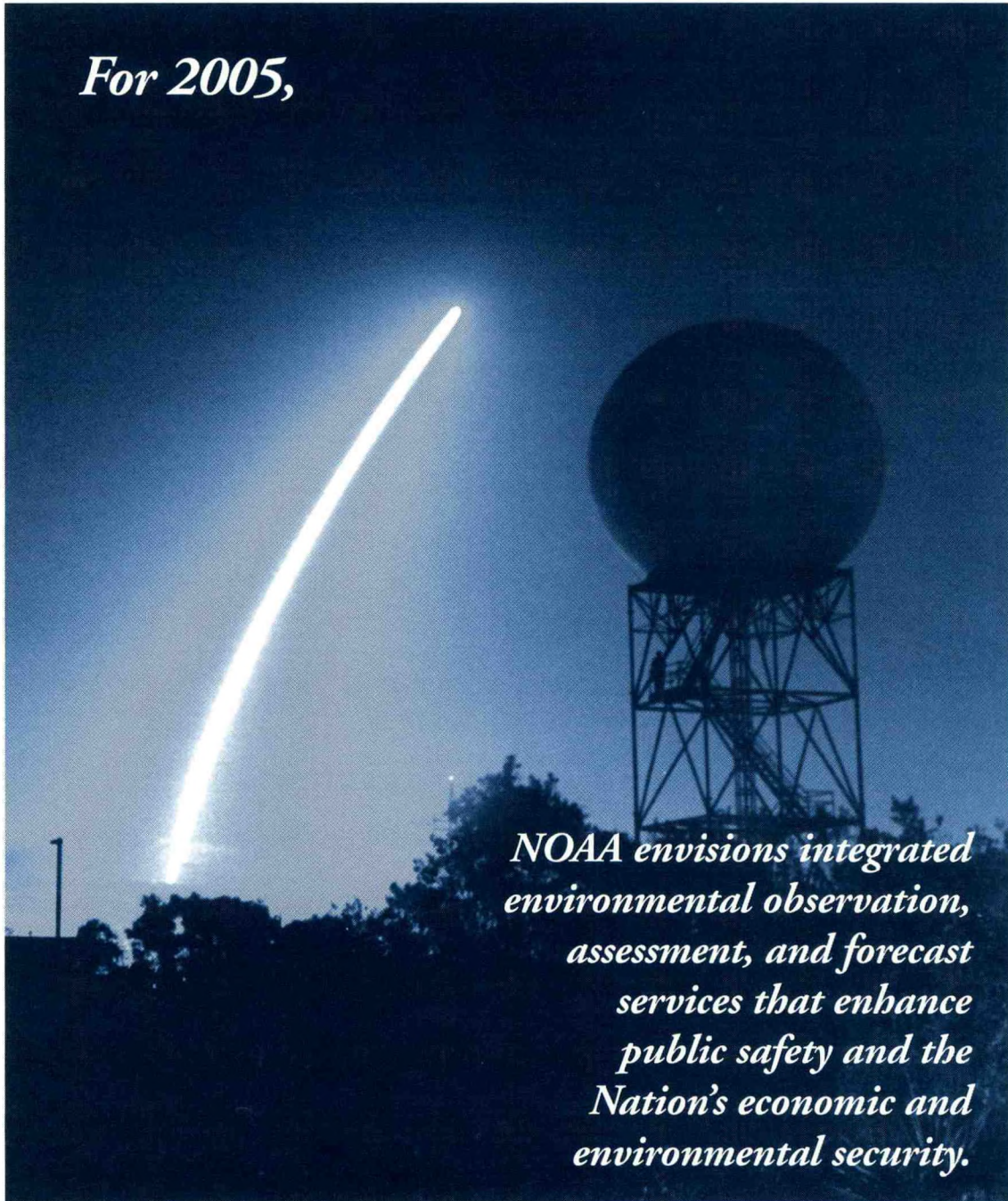
Environmental Stewardship Mission

-  Build Sustainable Fisheries
-  Recover Protected Species
-  Sustain Healthy Coastal Ecosystems

The execution of NOAA's goal-based strategy depends strongly on a stable infrastructure and administrative and human resources, as well as on the underlying capabilities of the agency as a national resource for research, observing systems, and environmental data and information services.

Each mission, the seven strategic goals, and NOAA's national capabilities are summarized in the following pages.

Environmental Assessment and Prediction Mission



NEXRAD radar adjacent to 1994 GOES launch. Credit Steve Hodanish, NWS, Melbourne, FL.



Advance Short-Term Warning and Forecast Services

Vision. NOAA's vision for 2005 is to provide significantly improved short-term warning and forecast products and services that enhance public safety and the economic productivity of the Nation. NOAA will enhance its ability to observe, understand, and model the environment, and effectively disseminate products and services to users.

Challenge. Our environment has profound effects on human welfare and economic well being. Each year, hundreds of lives and billions of dollars are lost due to severe storms, floods and other natural events that could be predicted minutes to months in advance. NOAA's current ability to predict short-term change is restricted by observations that are incomplete in time and space. This limits the ability to improve basic understanding and predictive modeling of weather and other natural phenomena. Although we can do nothing to prevent natural disturbances, we must do everything possible to minimize their human impact. NOAA must improve its observing systems, develop a better understanding of natural processes, and enhance predictive models and dissemination systems.

Implementation Strategy. The objectives of this goal are to:

- ❖ Complete the modernization and restructuring of the National Weather Service (NWS) to ensure the continuation of effective services.
- ❖ Maintain continuous operational satellite coverage critical for warnings and forecasts.
- ❖ Strengthen observing and prediction systems through scientific, technological and programmatic advances, and international cooperation. This objective will be achieved in cooperation with the U.S. Weather Research Program (USWRP) by incorporating the scientific and technologic advances from the USWRP into service improvements.

- ❖ Improve customer service to the public, emergency managers, the media, and private forecast planners through effective communication and utilization of NOAA's products.

Benefits. Increasing our understanding of the environment through research and investing in new technologies will provide more accurate and timely warnings and forecasts required by the Nation. Improved forecasts will support management of water resources,

and help avoid flood damage. Extended forecasts of solar and geo-magnetic disturbances will increase efficiencies for space operations, and power generation and satellite communications networks. Advanced modeling techniques and more complete observations will reduce uncertainties in hurricane track prediction,

saving millions of dollars through evacuation costs avoided. Accurate outlooks of future conditions will provide better information for planning weather sensitive activities over land and ocean.

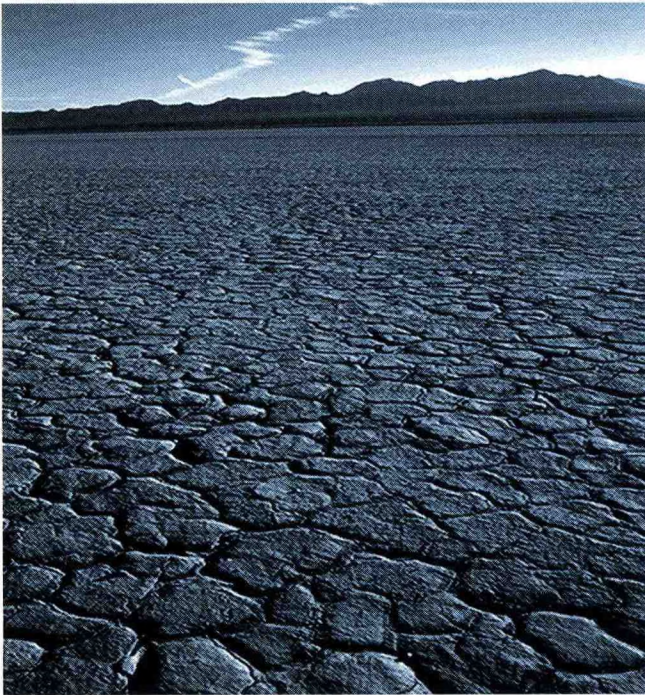
Improvements associated with the NWS modernization will more than pay for themselves. A National Institute of Standards and Technology cost-benefit analysis for the modernized NWS estimates that economic benefits to the Nation will be about eight times greater than the costs involved. Once modernization is completed, the Nation should realize annual benefits beginning at \$7 billion.⁵





Implement Seasonal to Interannual Climate Forecasts

Vision. NOAA, working with academic and multinational partners, will provide one-year lead-time forecasts of known skill of global climate variability, especially El-Niño and the consequent precipitation and surface temperature distributions. These forecasts will increase society's ability to mitigate economic losses and social disruption.



Challenge. The largest interannual climate variability that has a degree of predictability is caused by the El Niño-Southern Oscillation (ENSO) phenomenon in the Pacific Ocean. Temperature and precipitation patterns, changes in ocean circulation, and changes in storm frequency caused by ENSO have global effects on economies and planning. Based on the application of ENSO-related research, NOAA has begun issuing monthly and seasonal probability outlooks for temperature and rainfall for up to a year in advance. The immediate challenge is to introduce an operational program for the systematic production and application of regionally-tailored climate forecasts. Planned actions represent an end-to-end integrated

approach to establishing such a system, including the multinational infrastructure needed to generate and transfer useful climate information and forecasts.

Implementation Strategy. The objectives of this goal are to:

- ❖ Deliver useful seasonal to interannual climate forecasts for the U.S. and collaborate in a multinational effort to generate and use similar forecasts.
- ❖ Enhance global observing and data systems required to provide data for the initialization and validation of model predictions of seasonal to interannual climate variations.
- ❖ Invest in process and modeling research that leads to improved predictability of temperature and rainfall distributions.
- ❖ Assess the impacts of climate variability on human activity and economic potential, and improve public education so that climate forecasts are understood and acted upon.

Benefits. We now can predict El Niño events to a level of skill and with enough lead time that hundreds of millions of dollars a year can be saved both in the U.S. economy and abroad. ENSO forecasts will improve fisheries management, as warm ENSO events have been associated with reduced marine catches from Peru to Alaska. Global forecasts of climate variability will enhance agricultural, water resources, and other economic and social response planning. An estimate of the averaged value of an ENSO forecast approaches \$1 billion annually across all economic sectors.⁶ These forecasts will be a major contribution to U.S. commitments to the United Nations Conference on Environment and Development (UNCED).



Predict and Assess Decadal to Centennial Change

Vision. NOAA will provide science-based options for decisions regarding decadal-to-centennial changes in the global environment, specifically for: climate change and greenhouse warming; ozone layer depletion; and air quality improvement.

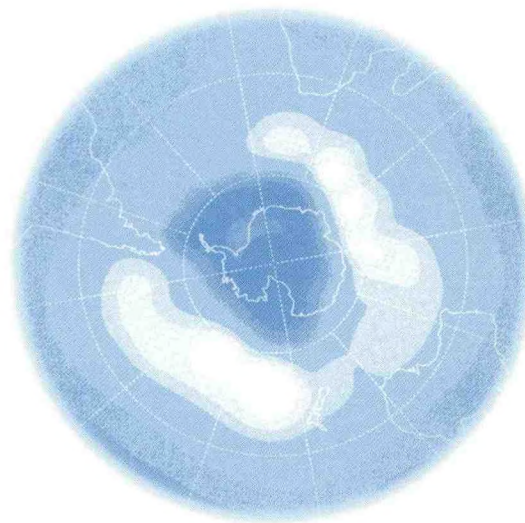
Challenge. Our planet is naturally a place of change, often with severe impacts on humans. Human activities now are inducing additional changes, with potential impacts of comparable magnitude. Human-induced changes already are evident, including atmospheric pollution and thinning of the stratospheric ozone layer. Greenhouse gases being added to the atmosphere will reside there for decades to centuries and are predicted to increase average global surface temperatures. These changes create critical prediction and assessment needs for the world community. Global models providing predictions must be strengthened through implementing global observing systems. The challenge is to understand and foresee the natural and human-induced variations of approaching decades in order to make sound economic and social decisions.

Implementation Strategy. The objectives of this goal are to:

- ❖ Characterize the agents and processes that force decadal to centennial climate change.
- ❖ Examine the role of the ocean as a reservoir of both heat and carbon dioxide to address a major source of uncertainty in climate models.
- ❖ Ensure a long-term climate record by enhancing domestic and international weather networks,

observing procedures, and information management systems.

- ❖ Guide the rehabilitation of the ozone layer by providing the scientific basis for policy choices associated with ozone-depleting compounds.
- ❖ Provide the scientific basis for improved air quality by investigating high surface ozone episodes in rural areas and establishing a monitoring network to detect cleaner air quality.
- ❖ Develop models for the prediction of long-term climate change, carry out scientific assessments, and provide human impacts information.



Antarctic ozone distribution.

mitigate and adapt to climate change, to assess the utility of investments to reduce greenhouse gas emissions, and to improve air quality. Performing research, presenting results in assessments and describing the implications in policy-relevant terms to government and industrial leaders are cornerstones of environmental stewardship. The benefits can be enormous. The value of reducing climate-related uncertainty in the implementation of policies on stabilizing anthropogenic greenhouse gas emissions is estimated to be \$100 billion for the U.S. alone between now and the year 2020.⁷ Assisting industry to choose the most “ozone-layer friendly” substitutes for chlorofluorocarbons will promote protection of the stratospheric ozone layer while continuing economic development. Scientific findings will assist Clean Air Act decisions to reduce surface ozone, with benefits to human health and agriculture.



Promote Safe Navigation

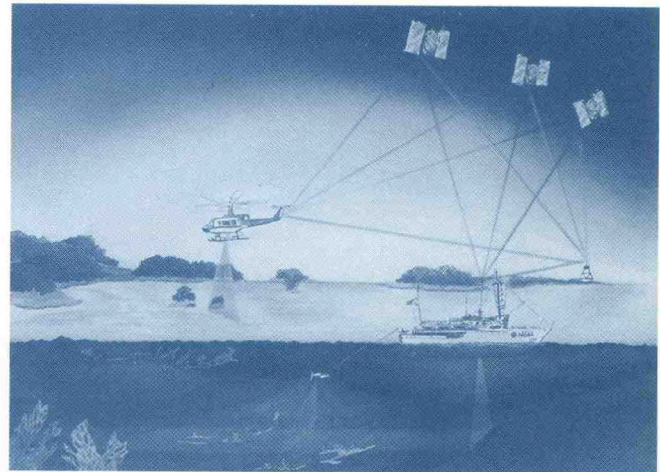
Vision. By 2005, merchant ships, fishing vessels and recreational boats will safely ply our coastal waters, electronically guided by space-based navigation and advanced information technologies. NOAA will revolutionize U.S. marine and air navigation, mapping and surveying and assist commercial shipping in moving increased cargoes safely and efficiently. NOAA will provide a precise satellite derived reference system as the basis for the Nation's nautical data and geographical positioning needs.

Challenge. Ships have doubled in length, width and draft in the last fifty years and seagoing commerce has tripled, leading to increased risk in the Nation's ports. Greater dependence on foreign oil has increased the potential for disaster due to spills. From 1980 to 1988, tankers in the U.S. were involved in 468 groundings, 371 collisions, 97 rammings, 55 fires and explosions, and 95 deaths.⁸ Navigation tools must be modernized. For instance, 60% of NOAA's nautical charting data were obtained before 1940. Two-thirds of the data used for tidal predictions are more than 40 years old, and NOAA has withdrawn the tidal current tables for New York and San Francisco due to inaccuracies. The existing coordinate reference system must be renovated to provide the higher accessibility and accuracy available from the Global Positioning System (GPS). Nautical charting, coastal zone geographic information systems, high precision agriculture, intelligent highway vehicle systems, and other uses of the Nation's annual investment of \$7 billion in spatial data depend on access to a GPS-based reference system.

Implementation Strategy. The objectives of this goal are to:

- ❖ Build, maintain and deliver a digital nautical charting database to underpin new electronic navigation systems which integrate satellite positioning, tidal heights and currents, radars and sonars, and navigational aids.
- ❖ Update nautical surveys of the Nation's coastlines and coastal areas using full-bottom coverage technologies.

- ❖ Install measurement and communication systems to provide mariners with real-time observations and forecasts of water levels, tides and currents, and weather conditions in major ports.
- ❖ Transform the obsolete geodetic reference frame into a GPS-based system of monumented marks and continuously-operating reference stations to support the digital revolution in mapping, charting and surveying.
- ❖ Provide modern aeronautical navigation information and explore moving this function to the Federal Aviation Administration.

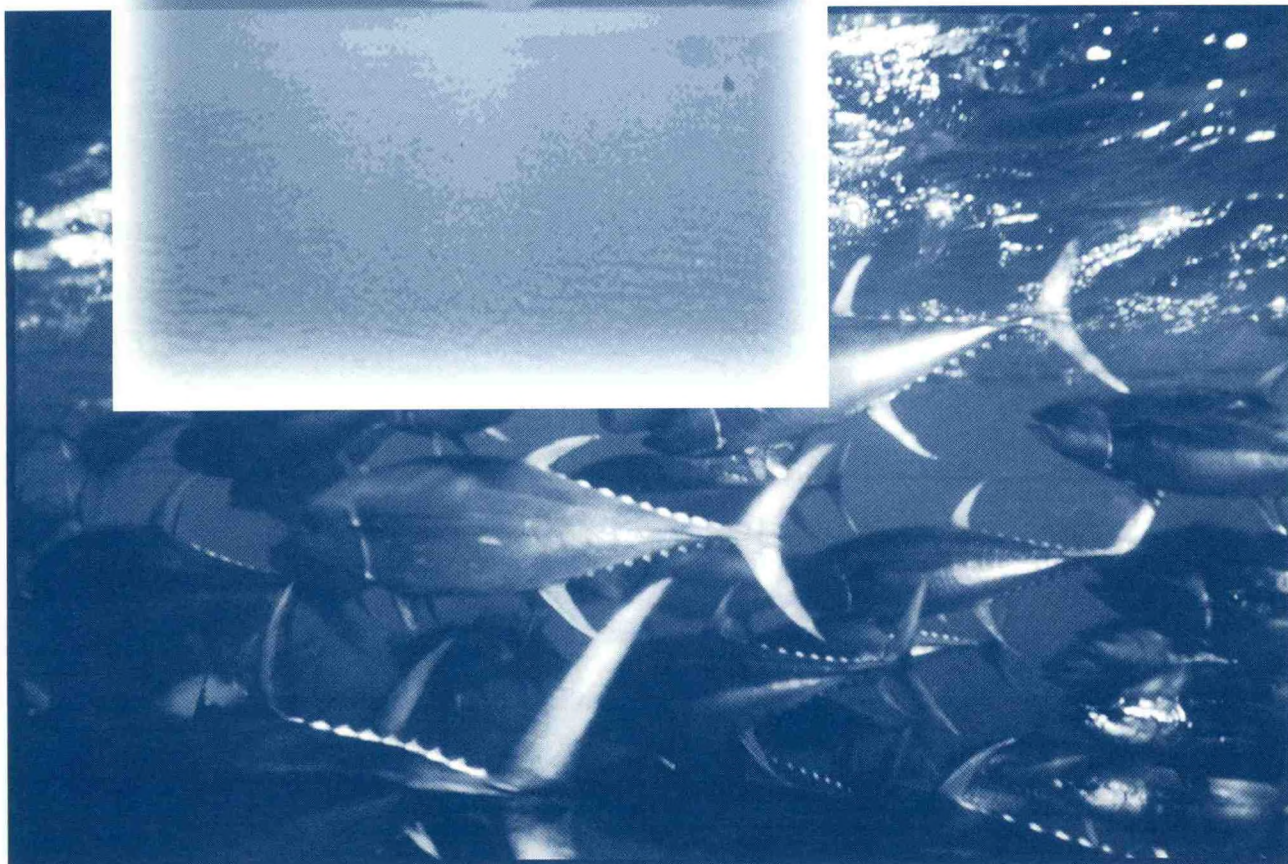


Benefits. New electronic technologies promise to reduce maritime transportation risks. Overhauling America's marine transportation infrastructure will heighten the competitiveness of the U.S. shipping industry. A modernized GPS-based geodetic reference network using federal standards will maximize the economic benefit of positioning investments and provide a foundation for the success of U.S. firms abroad. These technologies also will support the needs of coastal zone planners, regulatory officials and researchers as they work to ensure the safe, sustainable and efficient development of our coastal and ocean resources.

Environmental Stewardship Mission

For 2005,

*NOAA envisions U.S. ocean
and coastal areas with
healthy ecosystems and the
wise human use and
development of ocean,
coastal and living marine
resources.*





Build Sustainable Fisheries

Vision. NOAA's vision for the next decade is to increase greatly the Nation's wealth and quality of life through sustainable fisheries that support fishing industry jobs, safe and wholesome seafood and recreational opportunities.

Challenge. Billions of dollars in economic growth, thousands of jobs and countless recreational fishing opportunities are being wasted as a result of overfishing and overcapitalization in commercial and recreational fisheries. While many fisheries are well managed and producing positive benefits, others are severely depleted, and must be restored to realize their long-term potential. For example, the historically important New England groundfish fishery closed in 1994 due to the collapse of stocks. Transboundary resources can be especially vulnerable as they require international cooperation to achieve effective conservation and management. U.S. fisheries are troubled by bycatch, including juvenile and protected marine species, and by controversial allocation decisions among elements of fishing industries. Uncertainty in scientific information makes management decisions difficult.

Implementation Strategy. The objectives of this goal are to:

- ❖ Assess the status of fishery resources, through stock assessments and population dynamics research, to improve the scientific basis for policy decisions.
- ❖ Advance fishery predictions through research and applications.
- ❖ Manage for economic growth and sustainable fisheries by working with Fishery Management Councils, foreign nations and others to develop plans for reducing excessive fishing and capital investment.

- ❖ Ensure adequate compliance with fishery regulations.
- ❖ Provide research and services for fishery-dependent industries to maximize the potential benefits from the Nation's marine resources.

Benefits. Rebuilding and maintaining fisheries will promote the economic and biological sustainability of U.S. fishing resources, and assist the commercial fishing industry in becoming more competitive internationally. NOAA estimates that restoring fisheries may add as much as \$2.9 billion in potential net value to the U.S. economy as overfished stocks recover and overharvesting is reduced. A potential \$25 billion total impact on the national economy (direct, indirect and induced) will develop thousands of new jobs.⁹ Along with economic gains, this activity will enhance recreational opportunities, reduce our seafood trade deficit, improve the federal oversight and management of fisheries, and save lives by eliminating the dangerous and wasteful race for the fish.





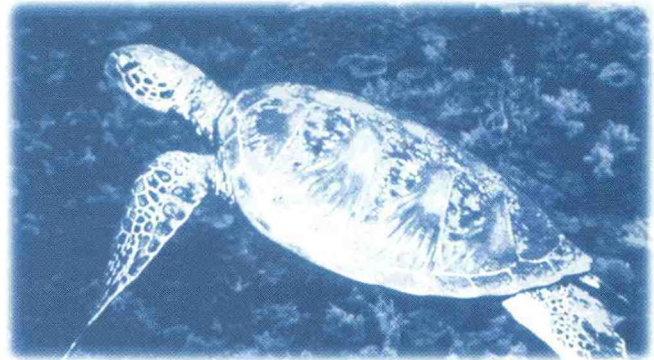
Recover Protected Species

Vision. NOAA's vision is to conserve marine species and to recover those in danger of extinction. By 2005, NOAA will be on the road to recovering every marine species at risk and maintaining healthy marine ecosystems upon which they depend.

Challenge. Marine resources contribute billions of dollars to the Nation's economy. However, many commercial and recreational activities contribute to stress on marine species. Many populations of marine organisms are depleted or declining due to human activity in marine ecosystems or to unknown causes. For example, west coast salmon populations are at risk due to a combination of factors including habitat loss and commercial overexploitation. Despite protective measures, fishing related mortality continues to threaten marine turtles in U.S. waters. Several sea lion and seal populations in Alaska are declining rapidly and the causes are uncertain. While many recovery plans have been developed, none have been implemented fully and plans still are needed for many species. The desired outcome is to recover protected species in danger of extinction in a manner compatible with the sustainable use of marine resources.

Implementation Strategy. The objectives of this goal are to:

- ❖ Assess the status of, and impacts to, protected species. Information is needed to focus management actions, limit the scope of restrictions, and promote the recovery of all protected species.
- ❖ Develop and implement conservation and recovery plans for depleted marine mammals and endangered and threatened species. This will be done in part through developing new partnerships with state and private sectors. Technologies and measures will be developed to reduce or avoid detrimental interactions between marine species and human activities.



Benefits. Through conservation of the Nation's living marine resources, NOAA will enhance economic and cultural opportunities for future generations. The existence of the Marine Mammal Protection Act, the Endangered Species Act and other legislation provides a clear indication of public support for strong efforts to conserve living marine resources. This effort will enable the preservation of



marine biodiversity by balancing the utilization of natural resources with the management of protected species. Recovering species, and avoiding the further decline of others, will contribute to the overall health and understanding of marine ecosystems. Improved science will lead to better long-term conservation and management strategies.



Sustain Healthy Coastal Ecosystems

Vision. NOAA's vision for the next decade is one in which improved environmental indicators and integrated coastal management promote ecosystem health and economic prosperity in coastal zones. NOAA will help ensure that development and conservation of the Nation's coastal ecosystems is managed in ways that maintain their biodiversity and productivity for sustained use.

Challenge Over half (54%) of the U.S. population lives on the 10% of land area defined as coastal.¹⁰ Between one-third and one-half of U.S. jobs are located in coastal



areas. About one-third of the nation's Gross National Product is produced there through fishing, transportation, recreation and other industries dependent on healthy coastal ecosystems for growth and development. Rapid population growth and increasing demand for recreation and economic development in many coastal areas have degraded natural resources and led to declines in both environmental integrity and general productivity. Coastal areas provide essential habitats for the majority of commercially valuable marine species. But habitat loss, pollution and overfishing have reduced populations of coastal fish and other species to historically low levels of abundance and diversity. The closure of beaches and harvesting areas is evidence that such conditions threaten busi-

nesses and human health. Maintaining coastal ecosystems health and biodiversity is essential to the sustainable development of coastal resources and economies, and to the future welfare of the Nation.

Implementation Strategy. The objectives of this goal are to:

- ❖ Protect, conserve and restore coastal resources and promote environmentally-responsible coastal development in cooperation with federal, tribal, state and local partners.
- ❖ Monitor, assess and predict the status and trends of natural, social, economic and management systems.
- ❖ Explore and develop new approaches and technologies for sustaining coastal ecosystems.



Benefits. The fabric of our coasts is as fragile as it is beautiful. Improved understanding of the way coastal ecosystems function, coupled with an ability to predict responses of ecosystems to human activities, are keys to an approach that ensures that the Nation's coastal ecosystems are managed for long term

benefit. This goal addresses the practical needs and concerns of resource managers, as well as strengthening the watershed and regional management frameworks provided by state Coastal Zone Management programs. An integrated program of monitoring, process research, modeling, assessments and information dissemination will provide the scientific basis for measures designed to prevent harm to ecosystems while allowing sustainable development.

National Capabilities and Supporting Infrastructure

The successful execution of NOAA's missions and goals depends on our capabilities as a national resource for research, observing systems, and environmental data and information services; and on our supporting infrastructure.

NOAA must continue to invest in these capabilities, which serve as the foundation of our programs.

NOAA's assets include:

■ Research

NOAA conducts research to support its management and service goals and to provide the basic knowledge that underpins decisions and analyses. A strong research capability is necessary to: ensure continuity and improvements to existing services; provide the knowledge and technical base to integrate scientific data in support of applications and management; and to enable the agency to meet emerging national needs and anticipate future needs and opportunities.

NOAA's research activities have, for decades, enabled improvements to operational capabilities.

NOAA laboratories and program efforts also support research on natural processes, populations, and environments. The challenge of prediction, a primary NOAA business, requires the integration of observations, modeling, and process knowledge. These capabilities enable others to make credible and cost-effective decisions regarding a host of environmental issues both of national and global scope.

The long-term view and direct management responsibilities impel NOAA to continue to improve its connections between applied research and operations, to incorporate new technology, and to

adopt a systems perspective in integrating traditional disciplines in the study and management of ecosystems.



■ Observing Systems

The most fundamental NOAA activity is the description of the physical, chemical, and biological properties of the Earth and its environments. A sound observational and monitoring capability is vital to the success of NOAA and the Nation. NOAA's vision for the 21st century is of a modern, integrated and comprehensive system of observing platforms and networks to provide the quality data and information needed to support NOAA and national goals. For example, NOAA's investment in weather service modernization is resulting in dramatic improvements in capabilities and services.

NOAA obtains observations in locations ranging from outer space to the ocean bottom, and places a high priority on the continuity of observations. Observing *platforms* include satellites, aircraft, ships, buoys, submersibles and platforms of opportunity. During 1994, NOAA, the Department of Defense and the National Aeronautics and Space Administration agreed to combine resources and expertise to develop a national polar-orbiting environmental satellite capability. This collaborative program will result in significant long-term savings to the U.S. taxpayer through the elimination of redundant effort and the wise leveraging of research and development dollars.

Observing *networks* include weather radars, radiosonde stations, tide gauge and water level stations, volunteer weather observers, and numerous systems monitoring a broad spectrum of oceanic and atmospheric variables. NOAA constantly is designing, developing, testing and deploying new observing systems to improve its ability to monitor the environment.

NOAA finds it advantageous and cost-effective to cooperate with other agencies, with scientists and institutions in other nations, and with relevant interna-



tional organizations. NOAA depends on other nations for access to their Earth-systems data and observations; for use of research facilities; for access to people and geographic areas; and for two-way transfer of technology.

■ Environmental Data and Information Services

Services involving the acquisition, archiving, integration, and dissemination of environmental data and information are critical to the fulfillment of NOAA's strategic goals. NOAA maintains the largest environmental data archives in the world. New observational systems now coming on line will result in an exponential increase in the rate at which data is acquired, and will require sophisticated handling to ensure timely and useful data availability. NOAA must convey observations to many destinations for analysis and integration, process the observations into useful information products, and acquire and disseminate these products to users.

There hardly is a sector of the U.S. economy that does not rely to some extent on NOAA data and information services. By the year 2005, all NOAA data and information products will be readily available to the Nation. NOAA information will be disseminated as part of the National Information Infrastructure. Products and services will be made available by nationwide networking connectivity at high data exchange rates using advanced information technology. NOAA's system of environmental information services will form an important link in the chain leading to informed policy decisions.

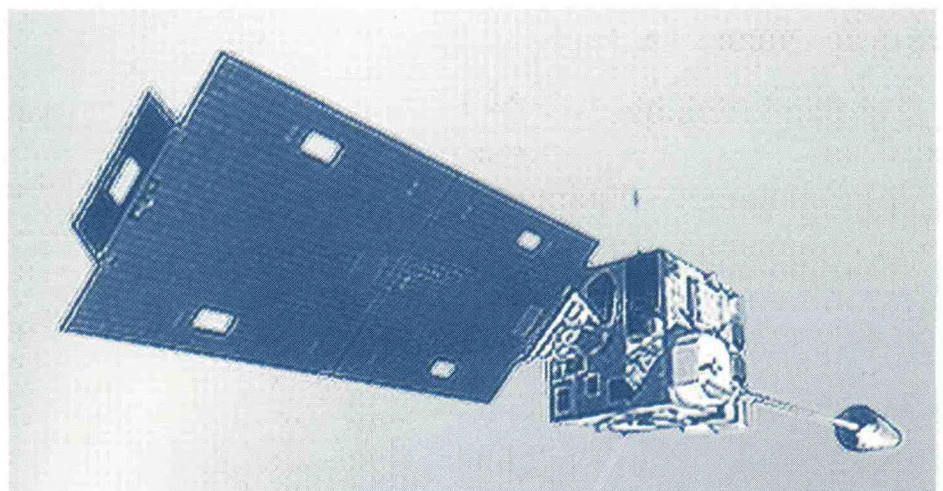
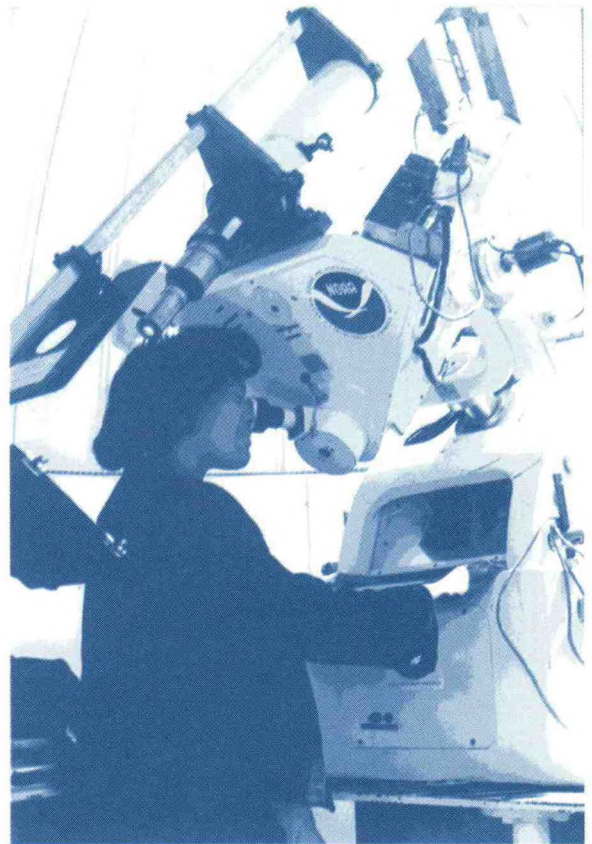
■ Supporting Infrastructure

NOAA's supporting infrastructure consists of its workforce, facilities, administrative services, and public and educational services. All of these resources are essential to furthering the agency's strategic goals.

NOAA's greatest assets are its people. NOAA is committed to being the model employer of a talented, dedicated and effective workforce that reflects the Nation's diversity. This includes the creation of a supportive work environment that encourages a respect for, and appreciation of, individual differences.

As all Government agencies streamline operations, workforce skill mix becomes increasingly crucial. By 1999, NOAA will have reduced its workforce by 16% from the 1993 level. To ensure quality and performance, while improving efficiency, NOAA must continue to invest in the training and education of its employees, make strategic hires, and implement innovative management practices.

Finally, NOAA must build and maintain facilities that are safe, energy efficient and in compliance with applicable laws and regulations. Facilities and sites requiring environmental remediation must be restored to a healthy and usable status.



The Strategic Planning and Budgeting Process

NOAA conducts its strategic planning and budgeting activities according to an annual cycle. The cycle ensures the alignment of NOAA's strategic and programmatic objectives. It directs activities that allow the agency to plan, budget, and continuously verify and validate performance.

Planning involves Teams comprised of representatives from all parts of the agency. The Teams are active throughout the strategic planning and budgeting cycle. From the Strategic Plan, the Teams create a 5-Year Implementation Plan. The Implementation Plan is updated yearly to maintain a realistic, yet challenging transitional course toward our vision for 2005. Programmatic priorities, level of accomplishments, and performance throughout the year are taken into consideration in developing policy guidelines, and in establishing key milestones and performance measures. NOAA's leadership, Line Administrators, and Program and Staff Office Directors utilize the milestones and performance measures to track progress toward meeting strategic goals and to formulate and update annual budget requests, one-year Operating Plans, and performance plans.

NOAA updates its Strategic Plan as required. Goals and objectives are reaffirmed or modified based on changing national needs, scientific and technological advances, and customer input. NOAA seeks extensive internal and external participation in reviewing and updating the Strategic Plan. This helps ensure that our goals, objectives and performance reflect the needs and expectations of the customers we serve.

There are, and will continue to be, significant returns on investments made by NOAA. Our products and services pervade the daily personal and business life of every American. Our research and technology development ensures a continuing national capacity to solve problems and respond to change.

No other agency working in the natural environment has NOAA's responsibility for the measurement, monitoring and understanding of our atmospheric and marine systems. These are core businesses of Government, including functions which have highly concentrated costs and widely-dispersed benefits -- such as the provision of weather warnings and forecasts.

The goals we have set for the future will enhance opportunities for our citizens, the health of the U.S. economy, the protection of our environment, and the sustainable use of our natural resources.

Appendix I. Primary Line/Program Office participation mapped to strategic goals.

Goal

Advance Short-Term Warning and Forecast Services
Implement Seasonal to Interannual Climate Forecasts
Predict and Assess Decadal to Centennial Change
Promote Safe Navigation
Build Sustainable Fisheries
Recover Protected Species
Sustain Healthy Coastal Ecosystems

Line/Program Office

NWS, NESDIS, OAR, NOS, COP
NWS, OAR, OGP, NESDIS
OAR, OGP, NESDIS
NOS, OAR, NESDIS
NMFS, NOS, OAR, COP
NMFS, OAR, COP
NOS, COP, NMFS, OAR, NESDIS

Key:

NESDIS — National Environmental Satellite, Data and Information Service

NMFS — National Marine Fisheries Service

NWS — National Weather Service

COP — Coastal Ocean Program

NOS — National Ocean Service

OAR — Oceanic and Atmospheric Research

OGP — Office of Global Programs

Appendix II. Citations

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Copies of this document are available from:

Office of Policy and Strategic Planning
National Oceanic and Atmospheric Administration
Room 5805, Herbert C. Hoover Building
14th & Constitution Avenue, N.W.
Washington, D.C. 20230

Telephone (202) 482-5916
Fax: (202) 501-3024
Internet Electronic Mail: StrategicPlan@PSP@NOAA



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