STRATECIG GOAL 3

Observe and manage the Earth's environment to promote sustainable growth


DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

National Oceanic and Atmospheric Administration

Mission Statement

The National Oceanic and Atmospheric Administration's (NOAA) mission is to describe and predict changes in the Earth's environment, and conserve and manage wisely the nation's coastal and marine resources so as to ensure sustainable economic opportunities.

NOAA is a future minded environmental science agency whose mission is to describe and predict changes in the Earth's environment, and conserve and manage the nation's coastal and marine resources to ensure sustainable economic opportunities. Known as the oceans and atmosphere agency, NOAA is also an Earth sciences and space agency. Understanding ocean and atmosphere is essential to sustaining U.S. environmental and economic health. As an agency, NOAA provides products that form a critical part of the daily decisions made across the United States. From satellite imagery to tornado warning, navigational charts to fishery stock assessments, hurricane tracking to El Niño and harmful algal bloom predictions, severe weather forecasts to coastal zone management—every day NOAA's science, service, and stewardship are essential to the lives of millions of people in the United States. Accurate predictions of severe weather safeguard both lives and economic structure of communities. A deeper understanding of long-term climate and environmental trends can impact daily activities from the strategic planting of crops to better management of water and energy resources. Coastal communities depend heavily on sustaining healthy marine habitats and a robust ocean ecosystem. With effective partnerships among governments, universities, non-governmental organizations, and communities, NOAA helps to manage the critical issues along the U.S. coasts and the Great Lakes. A healthy coastal environment is intrinsic to American economic prosperity.

Priorities/Management Challenges

In FY 2003, NOAA continued to enhance the scientific understanding of the oceans and atmosphere in order to sustain both the environmental and economic health to the nation. NOAA completed its new Strategic Plan for FY 2003–FY 2008, wherein more than 1,000 stakeholders—internal and external-helped to shape the plan's goals, strategies, and performance measures. The NOAA Strategic Plan promises major improvements in the agency's capability to best serve the United States and its citizens in three critical areas: the environment, the economy, and public safety. Through published performance measures and a continuing dialogue on the plan's progress and need for revisions, NOAA will be accountable for moving the new plan forward. The plan contains four mission goals, namely:

- Protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management;
- Understand climate variability and change to enhance society's ability to plan and respond;
- Serve society's needs for weather and water information; and
- Support the nation's commerce with information for safe, efficient, and environmentally sound transportation.

In addition, the plan contains six crosscutting priorities and core capabilities, each supportive of NOAA's mission goals.

- Integrated global environmental observation and data management system;
- Environmental literacy, outreach and education;
- Sound, state-of-the-art research;
- International cooperation and collaboration;
- Homeland security; and
- Organizational excellence.

Starting with the FY 2005 Annual Performance Plan (APP), NOAA will group its performance measures based on the four mission goals contained in the new NOAA Strategic Plan. However, for purposes of this report, the performance measures are presented under the seven strategic planning goals (performance goals) as reported in the FY 2004 APP.

FY 2003 Performance

Overall, NOAA continued to improve its business processes in the areas of grant management, facilities planning, and capital improvement. NOAA has greatly improved the grants processing time by reducing the number of processing days from between 60 to 30, depending on the type of grant. Reductions in processing time contribute to a streamlined grants management system and facilitate NOAA's ability to provide funding to grant recipients in a timely manner. In addition, NOAA completed an agency-wide five-year facilities plan.

In FY 2003, NOAA also continued to implement the recommendations made by the Program Review Team (PRT). The PRT was formed in FY 2002 and performed a bottom-up review of NOAA's organization, operation, and resource utilization. To date, NOAA has completed 80 percent of the total number of actions mandated by the PRT.

One of the actions taken is the enhancement of a more corporate NOAA with the infusion of a shared system of principles, processes, and support structures. NOAA has implemented a new Strategic Management Process that integrates planning, programming, and budgeting which will enable NOAA to more effectively and efficiently achieve its mission by leveraging intra-agency synergies and increasing total efficiencies by standardizing business processes throughout the agency. The NOAA Strategic Management Process will serve as the foundation for a pragmatic yet flexible corporate deliberation and decision process.

In the area of safety, NOAA is in the midst of completing a concentrated safety training upgrade for all NOAA leadership, managers, and employees. In addition, a NOAA Safety Plan is scheduled for completion by October 2003, which raises the bar to the "Best in Class" level. As a result, the NOAA Safety Program is a top priority demanding a heightened awareness of a safety culture and increased investment over the next several years.

In terms of performance measures relating to the seven strategic planning goals, NOAA met 78 percent, or 18 out of 23 targets for FY 2003 for which data are available. Nearly all of these results are estimates based on third quarter data, because NOAA works on a calendar year to track performance. For six measures, preliminary data are not available and thus are not included when computing the percentage of met/not met.

Generally, however, there were some significant achievements in FY 2003 relating to the seven strategic planning goals. Regarding climate-related activities, NOAA played a major role in developing the new Climate Change Science Program Strategic Plan (CCSPS). Underscoring the scientific aspects of a 10-year strategic plan that couples science and technology,

the plan is built on four pillars: research, observations, decision support, and communications. The goals of the CCSPS are: (1) advance science by studying changes in climate and related systems via an interdisciplinary approach; (2) advance Earth observation and data management systems; (3) develop decision-support resources as a basis of sound policy; and (4) emphasize two-way communications by engaging the U.S. and international scientific and stakeholder communities. In addition, NOAA hosted an Earth Observation Summit in Washington, DC. The summit resulted in 34 nations, plus the European Commission, to adopt a declaration calling for action in strengthening global cooperation on Earth observations. The summit was conceived by NOAA and approved by the White House and included White House participation.

In the case of the Advanced Short-term and Weather Forecast goal, the NOAA National Weather Service (NWS) utilized the benefits of investments in modern weather technologies and new science, as exemplified during the Midwest tornado outbreak from May 4-10, 2003. With approximately 400 tornadoes reported over this seven-day period, NWS issued tornado warnings with an average lead time of 18 minutes. For its performance, NWS was praised by the governors of Missouri and Oklahoma and several news organizations. In terms of the President's Management Agenda, NWS was recognized both within and outside the government as a leader in performance-based management. In FY 2003, NWS was one of a handful of programs rated effective by the Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART). The NWS continues to link budgeting and investment review to performance through the establishment and tracking of key service improvement goals.

In the Build Sustainable Fisheries area, NOAA Fisheries over the past three years has pursued a multifaceted effort to revitalize the oyster resource of the Chesapeake Bay. Once the basis for a million dollar industry and an ecological keystone species, Chesapeake oysters have dwindled to less than one percent of their historic abundance. NOAA's work to reverse the decline includes physical habitat restoration, supplementation of natural populations with hatchery reared oysters, and applied scientific research. NOAA Fisheries has also provided over $16 million in funding for over 600 grass-roots habitat restoration projects including dam removal, culvert replacement and mangrove, salt marsh, stream bank, and native oyster restoration projects. The geographic scope and rate at which restoration can be accomplished have been expanded through national and regional habitat restoration partnerships established with nine organizations. Tens of thousands of volunteer and community service hours are logged on these projects, resulting in heightened stewardship for and awareness of the importance of fishery habitats to the sustainability of the nations living marine resources. NOAA's investment in these projects has leveraged over $34 million in matching contributions of cash, services, and in-kind donations.

Regarding the Sustain Healthy Coasts goal, NOAA National Ocean Service (NOS) moved closer to its FY 2007 goal of mapping all U.S. shallow water coral reefs by completing a major benthic habitat mapping project of American Samoa. The new maps help conservation groups better identify critical habitat and commercial interests and meet economic objectives while remaining sensitive to environmental concerns. Additionally, the mapping gives researchers a framework to conduct future habitat studies. Also in FY 2003, NOAA and the U.S. Geological Society completed the first ever 1:25,000, 10meter resolution contour interval mapping project for the Pribilof Islands of Alaska. The maps were prepared to support the islands' environmental restoration along with identifying and protecting sensitive habitat areas. The data are also being shared with the Native communities on the islands for land use, economic development analysis, and natural resource management.

In terms of the Promote Safe Navigation goal, NOAA implemented the new Port of New York and New Jersey Operational Forecast System (NYOFS) to provide improved predictions of water levels in the New York harbor. NYOFS can produce hourly nowcasts and four-times-daily forecasts of water levels and currents in the harbor to be used by commercial and recreational mariners. The system provides an increased margin of safety and maximizes the efficiency of maritime commerce throughout the harbor. Also, the NOAA Electronic Navigational Chart (ENC) was launched in FY 2003 as an official product for navigation. The ENCs support real-time navigation as well as the collision and grounding avoidance needs of the mariner, and accommodate a real-time tide and current display capability that is essential for large vessel navigation. NOAA ENCs, which are the first ENCs to be released free and open on the Internet, will allow domestic and international mariners to download the most up-to-date navigation information and safely navigate U.S. waters.

Targets and Performance Summary

See individual Performance Goal sections for further description of each measure.

Performance Goal 1: Build Sustainable Fisheries

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Reduce the number of overfished major stocks of fish from 46 to 35 by FY 2007	56	46	45	43[1]	43[2]	X	
Reduce the number of major stocks with an "unknown" stock status to no more than 73 by FY 2007	120	120	88	88[3]	88[2]	X	
Increase the percentage of plans to rebuild overfished major stocks to sustainable levels	93%	93%	90%	96%	Available in calendar year 2004		

Performance Goal 2: Sustain Healthy Coasts

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Number of acres of coastal habitat restored (cumulative)	New	New	New	2,829	5,200	X	
Reduce introductions and effects of invasive species in a total of six regions within the United States	1	2	2	2	2	X[4]	
Percentage of U.S. shoreline and inland areas that have improved ability to reduce coastal hazard impacts	8%[5]	8%[5]	8%[5]	17%[6]	17%	X	

Performance Goal 3: Recover Protected Species

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Reduce by 10 (from a FY 2000 baseline of 27) by FY 2007, the number of threatened species at risk of extinction	New	2	7	5	Available in calendar year 2004		
Increase the number of commercial fisheries that have insignificant marine mammal mortality	New	2	3	6	Available in calendar year 2004		
Reduce by 11 (from a FY 2000 baseline of 29) by FY 2007, the number of endangered species at risk of extinction	New	3	5	6	Available in calendar year 2004		

Performance Goal 4: Advance Short-term Warnings and Forecasts

Measure		FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Lead time (minutes), accuracy (%), and false alarm rate (FAR)(%) for severe weather warnings for tornadoes	Lead Time Accuracy FAR	10 63% 76%	10 67% 73%	12 76% 73%	12 72%[7] 72%[7]	14[7] 81%[7] 76%[7]	X X	 X
Lead time (minutes) and accuracy (%) for severe weather warnings for flash floods	Lead Time Accuracy	43 86%	47 86%	53 89%	47 87%	44[7] 90%[7]	 X	X
Accuracy of hurricane track forecasts (48 hour)	Nautical Miles (nm)	New	New	122	130[8]	Available in calendar year 2004		
Accuracy (percent) (threat score) of day 1 precipitation forecasts		New	New	New	25	29[7]	X	
Lead time (hours) and accuracy (%) for winter storm warnings	Lead Time Accuracy	9 85%	13 90%	13 89%	13 88%	14[7] 90%[7]	X X	
Accuracy (%) and FAR (%) of forecasts of ceiling and visibility (aviation forecasts)	Accuracy FAR	15% 53%	18% 51%	13% 58%	45% 71%	47%[7] 64%[7]	X X	
Accuracy (%) of forecast for winds and waves (marine forecasts)	Wind Speed Wind Height	New New	New New	New New	54% 66%	57%[7] 71%[7]	X X	

Performance Goal 5: Implement Seasonal to Interannual Climate Forecasts

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
U.S. temperature — skill score	27	20	18	20	17[7]		X
New climate observations introduced	New	132	192	275	Available in calendar year 2004		

Performance Goal 6: Predict and Assess Decadal to Centennial Change

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Assess and model carbon sources and sinks throughout the U.S.	New	New	Identified five new pilot atmospheric profiling sites and four new oceanic carbon tracks.	Reduce uncertainty of atmospheric estimates of U.S. carbon balance to =/- 50%.	Established five pilot atmospheric profiling sites. Established one oceanic carbon track; identified two additional oceanic carbon tracks.[9]		X
Assess and model carbon sources and sinks globally	New	New	Established three new global background sites as part of the Global Flask Network.	Complete a working prototype of a coupled carbon-climate model.	Completed a model that can look at effects of climate change on particular carbon sinks with feedback to the atmosphere.	X	
Determine actual long-term changes in temperature and precipitation over the U.S.	New	New	Captured more than 85% of true contiguous U.S. temperature trend and captured more than 55% of true contiguous U.S. precipitation trend.	Capture more than 70% of true contiguous U.S. temperature trend and capture more than 40% of true contiguous U.S. precipitation trend.	Captured 95% of the true contiguous U. S. national annual temperature trend and captured 84% of the true contiguous U.S. national annual precipitation trend.	X	

Performance Goal 7: Promote Safe Navigation

Measure	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Target	FY 2003 Actual	FY 2003 Met	FY 2003 Not Met
Reduce the hydrographic survey backlog within navigationally significant areas (in square nautical miles [snm] surveyed per year)[9]	1,557	2,963	1,514	2,100	1,762		X
Percentage of National Spatial Reference System (NSRS) completed (cumulative)	71%	75%	83%[10]	84%[11]	84%	X	

1 *This number was originally reported as 55 in the FY 2003 Annual Performance Plan (APP). However, due to the reclassification of 10 major stocks as not being subject to overfishing as defined in the Fisheries Management Plan, the target for FY 2003 was adjusted and reported in the FY 2004 APP to reflect a more accurate number.*

2 *Preliminary estimates.*

3 *The original figure reported in the FY 2003 APP was 118. NOAA is developing new outyear targets based on the result of FY 2002 actual number.*

4 *Based on the Office of Inspector General (OIG) Audit Report, No. FSF-14998/November 2002, this performance measure will be replaced but will not be reported as an APP measure. The future measure will be more specific in terms of scope and regional areas covered by the work.*

5 *This figure was reported as 6 percent in the FY 2003 APP. However, based on OIG Audit Report, "No. FSF-14998/November 2002," NOAA understated the results for FY 2000 and FY 2001 and should have reported 8 percent (instead of 6 percent) of shoreline as having improved ability to reduce impacts from coastal hazards.*

6 *The change also resulted in an increase of the target for FY 2002 and 2003 from 15 percent to 17 percent.*

7 *These actuals reflect preliminary information from the third quarter and estimates for the remaining year.*

8 *This target was originally reported in the FY 2003 APP as 138.*

9 *Please refer to narrative section for explanation.*

10 *This figure was reported as 81 percent in the FY 2002 PAR. As a result of OIG Audit Report No. FSD-14998-3-001 dated February 2003, the FY 2002 Actual reported previously has been revised to 83 percent in this document.*

11 *This figure was reported as 82 percent in the FY 2004 APP.*

Resource Requirements Summary

(Dollars in Millions, funding amounts reflect total obligations.)

Information Technology (IT)

Full-Time Equivalent (FTE)

Performance Goal 1: Build Sustainable Fisheries	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Operations, Research, and Facilities				
National Ocean Service	9.1	0.0	9.8	1.6
National Marine Fisheries Service	309.1	439.1	400.4	521.0
NOAA Research	37.1	93.0	44.0	74.1
Program Support	21.6	18.7	42.2	0.2
Procurement, Acquisition, and Construction	61.8	0.0	0.0	0.0
National Marine Fisheries Service	0.0	62.5	14.8	13.5
Program Support	0.0	3.7	4.8	46.1
Other Accounts	2.9	0.0	0.0	136.7
Discretionary—National Marine Fisheries Service	0.0	2.4	0.4	170.0
Mandatory—National Marine Fisheries Service	0.0	6.9	16.4	20.6
Mandatory—Program Support	0.0	3.5	0.0	0.0
Total Funding	441.6	629.8	532.8	938.8
IT Funding[1]	13.5	17.9	5.2	9.2
FTE	2,205	2,053	2,158	1,688

Performance Goal 2: Sustain Healthy Coasts	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Operations, Research, and Facilities				
National Ocean Service	165.0	275.8	275.3	306.5
National Marine Fisheries Service	17.3	23.0	28.4	40.4
NOAA Research	58.4	28.3	80.0	54.7
National Weather Service	0.0	0.0	0.0	0.1
NESDIS	6.2	4.0	4.8	0.7
Program Support	7.9	14.9	28.9	47.9
Procurement, Acquisition, and Construction	16.3	0.0	0.0	0.0
National Ocean Service	0.0	53.9	61.7	69.3
NOAA Research	0.0	14.0	0.0	0.0
Program Support	0.0	3.5	3.2	7.5
Other Accounts	7.5	0.0	0.0	0.0
Discretionary—National Ocean Service	0.0	152.9	142.7	6.9
Mandatory—National Ocean Service	0.0	0.0	9.0	0.0
Mandatory—Program Support	0.0	2.6	0.0	3.9
Total Funding	278.6	572.9	634.0	537.9
IT Funding[1]	2.1	16.2	1.6	1.2
FTE	509	1,047	1,144	1,588

Performance Goal 3: Recover Protected Species	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Operations, Research, and Facilities				
National Ocean Service	0.3	0.0	2.8	0.0
National Marine Fisheries Service	90.2	172.0	157.9	194.2
NOAA Research	0.3	0.0	0.4	0.0
Program Support	4.6	8.5	21.7	0.1
Procurement, Acquisition, and Construction	0.0	0.0	0.0	0.0
National Marine Fisheries Service	0.0	0.0	0.0	0.0
Program Support	0.0	9.8	5.6	0.0
Other Accounts	58.0	0.0	0.0	0.0
Discretionary—National Marine Fisheries Service	0.0	109.8	154.1	0.0
Mandatory—Program Support	0.0	1.2	0.0	0.0
Total Funding	153.4	301.3	342.5	194.3
IT Funding[1]	7.2	7.0	1.9	3.3
FTE	519	813	824	655

Performance Goal 4: Advance Short-term Warnings and Forecasts	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Operations, Research, and Facilities				
NOAA Research	61.6	49.7	48.7	69.1
National Weather Service	587.0	629.0	674.1	743.6
NESDIS	54.0	56.2	73.0	67.9
Program Support	41.2	49.0	51.6	27.3
Procurement, Acquisition, and Construction	517.1	0.0	0.0	0.0
NOAA Research	0.0	3.0	2.0	0.0
National Weather Service	0.0	63.4	71.9	60.3
NESDIS	0.0	515.0	517.1	634.6
Program Support	0.0	8.5	7.4	1.8
Other Accounts	0.0	0.0	0.0	0.0
Mandatory—Program Support	0.0	2.2	0.0	2.2
Total Funding	1,260.9	1,376.0	1,445.8	1,606.8
IT Funding[1]	290.3	241.1	210.9	230.7
FTE	5,812	5,997	5,859	5,118

Performance Goal 5: Implement Seasonal to Interannual Climate Forecasts	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Operations, Research, and Facilities				
NOAA Research	70.5	58.5	77.8	27.3
National Weather Service	4.7	0.4	1.0	2.2
NESDIS	41.6	61.8	64.2	109.4
Program Support	4.3	4.0	13.0	43.4
Procurement, Acquisition, and Construction	0.0	0.0	0.0	0.0
Program Support	0.0	0.8	0.8	2.6
Other Accounts	0.0	0.0	0.0	0.0
Mandatory—Program Support	0.0	1.4	0.0	0.0
Total Funding	121.1	126.9	156.8	184.9
IT Funding[1]	22.8	35.8	42.6	44.8
FTE	350	323	399	1,187

Performance Goal 6: Predict and Assess Decadal to Centennial Change

	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Operations, Research, and Facilities				
NOAA Research	69.2	97.8	95.4	191.7
National Weather Service	9.7	0.0	0.0	0.0
NESDIS	6.3	3.0	0.5	0.1
Program Support	5.2	3.5	12.8	19.7
Procurement, Acquisition, and Construction	4.9	0.0	0.0	0.0
NOAA Research	0.0	6.0	11.6	10.3
NESDIS	0.0	0.0	0.0	0.0
Program Support	0.0	0.7	0.6	1.2
Other Accounts	0.0	0.0	0.0	0.0
Mandatory—Program Support	0.0	0.9	0.0	1.6
Total Funding	95.3	111.9	120.9	224.6
IT Funding[1]	22.1	18.9	15.8	17.6
FTE	127	370	487	820

Performance Goal 7: Promote Safe Navigation

	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Operations, Research, and Facilities				
National Ocean Service	98.4	114.4	118.6	131.8
NOAA Research	0.4	0.0	0.9	0.0
National Weather Service	0.0	0.0	0.0	0.1
Program Support	5.7	5.5	23.7	54.9
Procurement, Acquisition, and Construction	0.0	0.0	0.0	0.0
Program Support	0.0	12.6	15.4	25.6
Other Accounts	0.0	0.0	0.0	0.0
Mandatory—Program Support	0.0	3.5	0.0	4.5
Total Funding	104.5	136.0	158.6	216.9
IT Funding[1]	9.7	22.8	10.3	11.2
FTE	807	870	734	1,537

Grand Total	FY 2000 Actual	FY 2001 Actual	FY 2002 Actual	FY 2003 Actual
Operations, Research, and Facilities				
National Ocean Service	272.8	390.2	406.5	439.9
National Marine Fisheries Service	416.6	634.1	586.7	755.6
NOAA Research	297.5	327.3	347.2	416.9
National Weather Service	601.4	629.4	675.1	746.0
NESDIS	108.1	125.0	142.5	178.1
Program Support	90.5	104.1	193.9	193.5
Procurement, Acquisition, and Construction	600.1	0.0	0.0	0.0
National Ocean Service	0.0	53.9	61.7	69.3
National Marine Fisheries Service	0.0	62.5	14.8	13.5
NOAA Research	0.0	23.0	13.6	10.3
National Weather Service	0.0	63.4	71.9	60.3
NESDIS	0.0	515.0	517.1	634.6
Program Support	0.0	39.6	37.8	84.8
Other Accounts	68.4	0.0	0.0	136.7
Discretionary				
National Ocean Service	0.0	152.9	142.7	6.9
National Marine Fisheries Service	0.0	112.2	154.5	170.0
Mandatory				
National Ocean Service	0.0	0.0	9.0	0.0
National Marine Fisheries Service	0.0	6.9	16.4	20.6
Program Support	0.0	15.3	0.0	12.2
Total Funding	2,455.4	3,254.8	3,391.4	3,979.2
Direct	2,455.4	3,254.8	3,391.4	3,949.2
Reimbursable[2]	290.6	204.0	197.0	194.6
IT Funding[1]	367.7	359.7	288.3	318.0
FTE	10,329	11,473	11,605	12,593

[1] IT funding included in total funding. For FY 2002-2003, the total IT dollars include the figures for four additional categories (infrastructure, architecture and planning, grants management, and financial management) which were not included in the total IT dollars for each of the seven strategic planning goals.

[2] Reimbursable funding is included in total funding.

Notes:

NOAA changed its methodology for allocating support costs by Performance Goal to more accurately reflect the distribution of the budget across performance goal.

Other Accounts/andatory/Program Support is a breakout of the Civil Service Retirement System funds.

PAC/Program Support includes the distribution of Commerce Administrative Management System.

FY 2003 Performance Goals

Performance Goal 1: Build Sustainable Fisheries

Corresponding Strategic Goal

Strategic Goal 3: Observe, protect, and manage the Earth's resources to promote environmental stewardship.

Rationale for Performance Goal

Billions of dollars in economic growth, thousands of jobs, and countless commercial and recreational fishing opportunities are not realized as a result of overfishing and overcapitalization in commercial and recreational fisheries. While many fisheries are well managed and produce positive benefits, others are severely depleted or overcapitalized and must be restored and managed to realize their long-term potential. Rebuilding and reducing overcapitalization in existing fisheries will promote the economic and biological sustainability of U.S. fishing resources. Building sustainable fisheries will greatly increase the nation's wealth and quality of life.

The basis for the suite of performance measures is the sequence of events associated with sustaining or rebuilding fisheries over time. In concept, these events occur in the following order: (1) The first task is to identify if a stock is overfished; the performance measure on stock assessment and reducing the number of unknown stocks addresses this step. (2) Once a stock has been classified as overfished, the NOAA National Marine Fisheries Service (NMFS) is mandated to create a rebuilding plan by statute; the rebuilding performance measure addresses this outcome. (3) Each rebuilding plan will have a trajectory and timeframe to achieve the rebuilding objective of recovering the stock to sustainable levels; the performance measure describing the number of overfished stocks measures how closely this target and trajectory is being met and other measures for this goal that are important indicator measures of these influences. An additional important area of concern that NOAA will address through its performance measures in the future is the issue of bycatch and its effect on fish stocks and protected species.

FY 2003 Performance

The time line for producing the Performance and Accountability Report (PAR) precludes NOAA NMFS from providing actual FY 2003 data for this measure since complete data will not be available until calendar year 2004. However, NOAA continues the task of building sustainable fisheries, and is providing FY 2003 estimates in this report, where available.

The following were FY 2002 activities:

In FY 2002, NOAA implemented harvest specifications for the groundfish fisheries of the Bering Sea, Aleutian Islands, and Gulf of Alaska. The 2002 harvest limits and associated management measures became effective in January 2002 under an emergency rule that also implemented Stellar sea lion production measures. NOAA also proposed annual specifications and management measures, which include many new protective management measures to reduce and eliminate directed or incidental catch of overfished Pacific groundfish stocks. In addition, NOAA declared that certain Pacific groundfish species were overfished. NOAA expected the Pacific Fishery Management Council to recommend large-scale closures for 2003 of the continental shelf off Washington, Oregon, and California to groundfish fishing. Some of the overfished species that are most severely depleted are continental shelf species. Rebuilding plans for all these species will be crafted in at least two

amendments to the Fishery Management Plan (FMP). Regarding the east coast, the New England Fishery Management Council approved a new Deep-sea Red Crab FMP. The plan would put in place measures to prevent overfishing, provide better management information, and control effort in this fishery. Also, NOAA completed Amendment 6 to the FMP for the salmon fisheries in federal waters off Alaska. Amendment 6 brings the FMP into compliance with the requirements of the Magnuson-Stevens Act by specifying objective and measurable criteria for identifying when fisheries are overfished. Conservation and management measures are also included to prevent overfishing or end overfishing and rebuild fisheries.

Measure 1a: Reduce the Number of Overfished Major Stocks of Fish from 46 to 35 by FY 2007				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	55	43[2]
Actual	56	46[1]	45	43[3]
Met/Not Met			Met	Met

[1] *The original baseline was 56 of which 10 were later reclassified as not being subject to overfishing requirements as defined in the Fisheries Management Plan.*

[2] *The original figure reported in the FY 2003 Annual Performance Plan (APP) was 55.*

[3] *Preliminary estimates.*

Explanation of Measure

This measure focuses on the total number of overfished stocks defined as major stocks for which status is known. A major stock is defined as a stock that yields annual catches of more than 200,000 pounds (90.7 metric tons). There are approximately 905 stocks overall (as reported in the Annual Report to Congress), of which more than 600 are either unknown or undefined. Currently, the population status of 167 major stocks is known. The criteria for a reduction in the number of overfished stocks are when stocks are rebuilt. A fisheries stock is expected to be rebuilt in the year after a rebuilding program is expected to meet its target, i.e., spiny dogfish is in the fifth year of a five-year rebuilding program in 2003, so it should be declared rebuilt in 2004. The information for this metric is from the Status of Stocks Report. The original baseline was 56 of which 10 were later reclassified as not being subject to overfishing requirements as defined in the FMP.

The term overfishing means that the harvest rate is above a prescribed threshold. Overfished means that the biomass of a given fishery's stock is below a prescribed threshold. Overfished stocks are defined in the FMP.

FY 2003 Performance

The time line for producing the PAR precludes NOAA from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003. FY 2003 actuals are preliminary. However, NOAA NMFS continues to carry out activities to address overfishing.

South Atlantic yellowtail snapper has been rebuilt in FY 2003. In addition, the skate FMP was implemented in July 2003. Winter skate has been declared rebuilt. The other three skate stocks, barndoor, thorny, and smooth, have rebuilding plans in effect. The plans place the maximum restrictions possible on these species and do not allow any fishing or possession. This will remain the case until the target is reached.

Measure 1b: Reduce the Number of Major Stocks with an "Unknown" Stock Status to No More Than 73[1] by 2007				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	120	88[2]
Actual	120	120	88	88[3]
Met/Not Met			Met	Met

1 *The original figure reported in the FY 2003 Annual Performance Plan (APP) was 98.*

2 *The original figure reported in the FY 2003 APP was 118. NOAA is developing new outyear targets based on the result of FY 2002 actual number.*

3 *Preliminary estimates.*

Explanation of Measure

The purpose of this measure is to track progress in improving knowledge about the population status of major stocks as defined in the Annual Report to Congress. In many cases the current status of stocks under NMFS authority remains unknown.

Not all unknown stocks are of equal importance; parameters, such as the value and quantity of catches or known role in the ecosystem as key predators or prey, determine a stock's level of importance. This measure takes into account the outcome of investments in staff and data acquisition, such as charter and research vessel days-at-sea and stock assessment methodological research.

It is worth noting that the status of a large number of stocks continues to be classified as either unknown or undefined, which means that an overfishing definition is not possible. Of the 932 stocks mentioned in the 2002 Annual Report to Congress, the status of more than 642 was either unknown or was classified as undefined. Of these unknown or undefined stocks, 88 are major stocks and 554 are classified as minor stocks. Minor stocks, in fact, accounted for 86 percent of the stocks whose status were either unknown or undefined, while only 14 percent of the unknown and undefined stocks were categorized as major.

FY 2003 Performance

The time line for producing the PAR precludes NOAA NMFS from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003. However, to both fulfill its mandated responsibilities and to expand its understanding of the resources, NOAA continues to conduct between seven and nine stock assessments annually.

The following were FY 2002 activities that accounted for the significant drop in number of unknown stocks in FY 2002:

In FY 2002, NOAA Fisheries researchers began cooperative research with tuna scientists from Japan and Taiwan on a new stock assessment model for North Pacific albacore. The research represents the first attempt to explore length-based modeling for albacore in the North Pacific. Length-based catch, size, frequency, and fishing effort statistics have been compiled for some 26 international albacore fisheries across the North Pacific, and a preliminary modeling framework has been established.

NOAA completed a stock assessment for Pacific sardine with estimates indicating the stock biomass remains at a relatively high abundance level, nearly 1.1 million metric tons. The population had been increasing at a rate of about 30 percent per year since the mid-1980s, but the rate of increase now appears to be more moderate.

NOAA's Northwest Fisheries Science Center completed full stock assessments for Pacific whiting and canary rockfish. The Center provides the Pacific Fishery Management Council with stock assessments that are used to help determine the portion of the fish stock that may be harvested, given certain management objectives.

Also in FY 2002, NOAA completed a survey that provides the only fishery-independent estimate of juvenile pelagic shark abundance off the west coast. Some declines in catch per unit of effort and size of catch have been observed. Concurrent studies are providing valuable information on the life histories of these shark populations.

Measure 1c: Increase the Percentage of Plans to Rebuild Overfished Major Stocks to Sustainable Levels

	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	94%	96%
Actual	93%	93%	90%	Available in calendar year 2004
Met/Not Met			Not Met	

Explanation of Measure

This measure relates directly to the statutory requirements in the Magnuson-Stevens Act that require Regional Councils to develop rebuilding plans for stocks of fish that have been identified as overfished. Section 304(e) outlines the specific parameters and time frames required for rebuilding. At this point in time, major and minor stocks have been differentiated to highlight the relative priorities and complexities of producing a rebuilding plan, and the consequent impact on performance measurement. Measurement of this metric will occur in the annual status of stocks report to Congress.

FY 2003 Performance

The time line for producing the PAR precludes NOAA NMFS from providing final FY 2003 data for this measure since complete data will not be available until calendar year 2004, however, NOAA continues its task of rebuilding fisheries.

The following were FY 2002 activities:

NOAA declared that certain Pacific groundfish species were overfished. NOAA expects the Pacific Fishery Management Council to recommend large-scale closures for year 2003 of the continental shelf off Washington, Oregon, and California to groundfish fishing. Some of the overfished species that are most severely depleted are continental shelf species. Rebuilding plans for all these species will be crafted in at least two amendments to the FMP.

Regarding the east coast, the New England Fishery Management Council approved a new Deep-sea Red Crab FMP. The plan would put in place measures to prevent overfishing, provide better management information, and control effort in this fishery.

As of 2002, management measures for the directed fisheries for king mackerel in the Gulf of Mexico had been also successful in reducing the average fishing mortality rate and increasing the biomass of king mackerel. The king mackerel is a migratory coastal pelagic species found in the western Atlantic Ocean from New England to Brazil and in the Gulf of Mexico. King mackerel eat voraciously and are relatively fast growing fish that form large schools. They mature quickly, as early as two years, and can live up to 20 years, although the majority of catches are younger than six years old. Their large size, appealing taste, and strong fighting ability make them a target for both commercial and recreational fishermen. Two groups of these fish

are currently recognized for management in U.S. waters: the Atlantic group and the Gulf of Mexico group. Large catches by both commercial and recreational fishermen in the late 1970s and early 1980s, along with perceived declines in catch rates, were part of the reason for inclusion of these fish in the Coastal Migratory Pelagics Resources FMP in 1985. The Gulf of Mexico has mandated several regulatory measures designed to promote rebuilding.

NOAA also completed Amendment 6 to the FMP for the salmon fisheries in federal waters off of Alaska. Amendment 6 brings the FMP into compliance with the requirements of the Magnuson-Stevens Act by specifying objective and measurable criteria for identifying when fisheries are overfished. Conservation and management measures are also included to prevent overfishing or end overfishing and rebuild fisheries.

Program Evaluation

Virtually every aspect of NMFS fisheries science program is peer reviewed, either internally within NMFS or outside the agency by, for example, the National Academy of Sciences or the National Science Foundation. NMFS also relies on extensive informal networks of university partnerships and laboratories throughout the United States. Moreover, reviews often occur by opposing parties' scientists in the court system when fisheries management decisions are litigated.

Evaluation efforts include peer reviews of proposals and internal and external reviews of programs. The Center for Independent Experts is an established pool of experts from outside of NMFS that the agency can call on to review the stock assessments, new management methods, scientific programs, grant proposals, and to participate in the design of those enterprises. Constituent input is an important part of the evaluation process and is solicited regularly through constituent workshops.

For this performance goal, the NOAA NMFS Regulatory Program was reviewed using OMB's Program Assessment Rating Tool (PART). Within the federally controlled U.S. Exclusive Economic Zone, NOAA NMFS is responsible for the management and conservation of the nation's living marine resources and their habitats. The regulatory programs under NMFS promote sustainable use of living marine resources and the recovery of threatened and endangered species.

Performance Goal 2: Sustain Healthy Coasts

Corresponding Strategic Goal

Strategic Goal 3: Observe, protect, and manage the Earth's resources to promote environmental stewardship.

Rationale for Performance Goal

NOAA has three primary objectives to sustain healthy coastal ecosystems and the communities and economies that depend on them. These are to (1) protect, conserve, and restore coastal habitats and their biodiversity; (2) promote clean coastal waters; and (3) foster well-planned and revitalized coastal communities. To meet these objectives, NOAA integrates a broad range of research, assessment, and management activities from four of NOAA's five line offices: NOS; the Office of Oceanic and Atmospheric Research (OAR); NMFS; and the National Environmental Satellite, Data, and Information Service. NOAA works with many governmental and nongovernmental partners at local, state, national, and international levels to address the critical challenges facing coastal areas. NOAA measures its performance in meeting these objectives by tracking key outcomes, such as the acres of coastal habitat restored, changes in coastal water quality, number of coastal states with effective nonpoint pollution control programs, and the percentage of U.S. shoreline covered by improved ability to identify and mitigate the impacts of natural hazards.

FY 2003 Performance

In FY 2003, NOAA's Habitat Restoration Program was formed as a joint and coordinated effort among NOAA Line Offices. The core and collaborating components of the program have worked to restore degraded habitats through a variety of complimentary efforts. This work is geared to restoring ocean, coastal, and Great Lakes habitats, advancing the science underlying habitat restoration and developing improved tools, and transferring restoration information, technology, and results to the private and public sectors through technical guidance, education, and outreach. The program settled two major damage assessment cases in FY 2003, one of which involved the *Westchester* oil spill in Louisiana, where over 500,000 gallons of crude oil were released from a tanker, resulting in one of the largest oil spills in gallons of oil in the lower 48 states. The spill injured birds, fish, and critical habitat and affected fishing and hunting. NOAA worked cooperatively with the responsible parties and co-trustees for rapid resolution and achieved settlement in less than three years. The settlement includes wetland restoration that will result in 20-100 acres of new marsh growth, and constructing a boat dock to improve access to fishing and hunting. The restoration projects accomplished through the settlement were implemented in August and September 2003. The natural resource value of the restoration is approximately $4.3 million, with an additional $2.3 million for the boat dock, bringing the total value of the restoration of that area to nearly $6.6 million.

NOAA's Hazardous Materials Response Division coordinated with federal, state, and local agencies in responding to more than 130 events in FY 2003, including oil and chemical spills, search and rescue efforts, and other emergencies.

NOAA and the Environmental Protection Agency granted full approval to five new state coastal nonpoint pollution programs, bringing the total number of fully approved programs to 15. The American Samoa, Commonwealth of Northern Marinas Islands, and the states of Maine, North Carolina and Wisconsin joined previously approved coastal states and territories. States and territories with approved coastal nonpoint programs are eligible to receive federal funds intended to improve water quality by building local capacity to manage pollution, and targeting sources such as marinas and failing septic systems.

NOAA and the state of California dedicated more than 3,700 acres on San Francisco Bay as a National Estuarine Research Reserve (NERR), the third in California. The San Francisco Bay NERR, established to restore tidal marshes and protect estuarine habitat through research, monitoring and educational programs, includes coastal habitats in two sites: China Camp State Park in San Rafael (1,640 acres in Marin County) and the Rush Ranch Open Space Preserve (2,070 acres in Solano County). The Reserve is the 26th in the national federal-state partnership and the first addition since 1999.

Measure 2a: Number of Acres of Coastal Habitat Restored (Cumulative)

	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	New	2,829
Actual				5,200
Met/Not Met				Met

Explanation of Measure

This performance measure replaces the discontinued performance measure, "Number of Habitat Acres Benefited." This performance measure reflects a more precise measure of the actual and direct consequences of restoration actions with the recognition that indirect beneficial impacts may occur that cannot be precisely measured at present. With the revised performance measure, a new baseline for tracking progress has been established.

At one point, NMFS formerly tracked "acres benefited" as a measure of performance for actions undertaken through its various restoration programs. This was erroneously changed to "acres restored" in the FY 2001 budget documents as part of the editorial, rather than scientific review, process. The error was identified and corrected in succeeding budget documents. Those events, however, engendered a discussion of methods used to calculate the precise number of acres that would or could benefit from any particular restoration action. It was determined that scientific models to identify and count the actual number of acres benefiting from a restoration action did not exist and that such estimates were subject to human error and exaggeration. As a consequence, the performance measure has been changed once again to "acres restored."

FY 2003 Performance

This performance measure has been revised to show "Number of Habitat Acres Restored." The performance measure has been changed to reflect a more precise measure of the actual and direct consequences of restoration actions.

NOAA's Habitat Restoration Program restores habitat acres and services lost or degraded as a result of development and other human activities, as well as specific pollution incidents and sources. The program's objectives and activities are targeted to NOAA's trust resources found across ocean, coastal, and Great Lakes habitat areas. NOAA Fisheries over the past three years has pursued a multifaceted effort to revitalize the oyster resource of the Chesapeake Bay. Once the basis for a million dollar industry and an ecological keystone species, Chesapeake oysters have dwindled to less than one percent of their historic abundance. NOAA's work to reverse the decline includes physical habitat restoration, supplementation of natural populations with hatchery reared oysters, and applied scientific research.

In response to current and ongoing habitat degradation and loss occurring at the national level, in FY 2003, NOAA provided approximately $7.5 million in funding for 215 grass-roots habitat restoration projects. Types of projects included: improvements to migratory fish access and a variety of restoration efforts focused on submerged aquatic vegetation, tidal wetlands, shellfish, riparian, and coral habitat areas. The geographic scope and rate at which restoration can be accomplished have been expanded through national and regional habitat restoration partnerships established with 17 organizations. In addition, in FY 2003, community members devoted approximately 60,000 hours to these projects, through participation in volunteer opportunities and educational programs. This involvement resulted in heightened stewardship for and awareness of the importance of fishery habitats to the sustainability of the nation's living marine resources. NOAA's investment in these projects has been leveraged by factors of 3-5 through matching contributions of funding and in-kind services.

Measure 2b: Reduce Introductions and Effects of Invasive Species in a Total of Six Regions within the United States

	FY 2000	FY 2001	FY 2002	FY 2003
Target	1	2	2	2
Actual	1	2	2	2
Met/Not Met	Met	Met	Met	Met

Explanation of Measure

Executive Order 13112, dated February 3, 1999, defines invasive species as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." Many such species displace native species, disrupt the ecological integrity of ecosystems, and threaten the economic and recreational value of coastal resources. NOAA's Sea Grant Program divides the country into six regions (Great Lakes, Northeast, Mid-Atlantic, Southeastern Atlantic and Gulf of Mexico, Pacific, and Northwest) for its activities related to invasive species.

Primarily through research and education, this measure covers the two components that result in an overall reduction in the number of invasive species introductions in the six regions around the country: (1) a decrease in the number of new non-indigenous species that become established in U.S. coastal regions from other countries, when compared to a base period and (2) a decrease in the spread of new non-indigenous species out of the region where they originally became established. Basically, this measure means that in any given period of time, NOAA is continually working towards the reduction of invasive species in at least two of the six regions, although the activities may also have positive effects on the other regions as well.

Based on the Office of Inspector General (OIG) Audit Report, No. FSF-14998/November 2002, this measure will be replaced by a measure more specific in terms of scope and regional areas covered by the work.

FY 2003 Performance

The target number does not rise because it is not intended to be a cumulative figure. In other words, in each year, steps are taken to reduce the impacts in the given number of regions and the next year steps can be taken in another region. There are literally thousands of nonindignous species that can either be introduced or spread and dozens of methods by which this could happen.

Measure 2c: Percentage of U.S. Shoreline and Inland Areas that have Improved Ability to Reduce Coastal Hazard Impacts

	FY 2000	FY 2001	FY 2002	FY 2003
Target	14%	6%	17%[2]	17%
Actual	8%	8%[1]	8%	17%
Met/Not Met	Not Met	Met	Not Met	Met

[1] *This figure was reported as 6 percent in the FY 2003 Annual Performance Plan (APP). However, based on Office of the Inspector General (OIG) Audit Report, No. FSF-14998/November 2002, NOAA understated the results for FY 2000 and FY 2001 and should have reported 8 percent (instead of 6 percent) of shoreline as having improved ability to reduce impacts from coastal hazards.*

[2] *sThe change also resulted in an increase of the target for FY 2002 and 2003 from 15 percent to 17 percent.*

Explanation of Measure

This measure tracks improvements in NOAA's ability to estimate the risks of natural hazards in U.S. coastal regions. Activities are underway to develop a coastal risk atlas that will enable communities to evaluate the risk, extent, and severity of natural hazards in coastal areas. The risk atlas will help coastal communities make more effective hazard mitigation decisions to reduce the impacts of hazards to life and property. Currently, many coastal communities make major decisions on land use, infrastructure development, and hazard responses without adequate information about the risks and possible extent of natural hazards in their area. Through the coastal risk atlas, NOAA NOS, with other federal and state agencies, will provide a mechanism for coastal communities to evaluate their risks and vulnerabilities to natural hazards for specific U.S. coastal regions and improve their hazard mitigation planning capabilities. Annual percentages are calculated by dividing the total amount of U.S. shoreline (97,128 miles) into the cumulative amount of shoreline addressed by projects in support of this measure.

FY 2003 Performance

The target for this performance measure was met by completing the states of Florida and Mississippi to the Coastal Risk Atlas project. The addition of Florida (8,436 miles of shoreline) and Mississippi (359 miles of shoreline) combined with the previous miles of shoreline (Alabama – 607; Part of Hawaii (Maui county) – 325; North Carolina – 3,375; Ohio – 262; part of Oregon – 53; Rhode Island – 420; and South Carolina- 2,876) brings the cumulative total to 16,713 of the total shoreline 97,128, or 17 percent of the total shoreline.

Discontinued Measure in FY 2003

Based on recommendations from OIG General Audit Report, No. FSD-14998/November 2002, NOAA discontinued the following performance measure and replaced it with "Number of Habitat Acres Restored."

Number of Acres of Coastal Habitat Benefited (Cumulative)				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	108,531	132,000
Actual		83,002	108,531	Discontinued
Met/Not Met			Met	

Explanation of Measure

NOAA replaced this performance measure with "Number of Habitat Acres Restored." The new performance measure reflects a more precise measure of the actual and direct consequences of restoration actions with the recognition that indirect beneficial impacts may occur that cannot be precisely measured at present. With the revised performance measure, a new baseline for tracking progress has been established.

Program Evaluation

NOAA's goal to sustain healthy coasts is the product of more than 25 years of experience helping to understand and manage coastal resources so that their ecological and economic productivity can be fully realized and sustained. Evaluation efforts exist at a variety of levels, from peer reviews of proposals and evaluations of individual projects, to internal and external reviews of entire programs and quarterly reviews of NOAA's overall performance in coastal stewardship areas. Constituent input is an important part of the evaluation process and is solicited regularly through constituent workshops.

OIG regularly conducts reviews of NOAA programs relating to performance and on occasion provides recommendations. The most recent OIG review related to this goal focused on "acres of habitat restored" and "improved U.S. shoreline and inland areas." The recommendations are reflected in this report.

For this performance goal, the Coastal Zone Management (CZM) Program under the CZM Act (CZMA) is being reviewed using the OMB's PART.

The CZMA of 1972, as amended, creates federal-state partnerships to support effective management, beneficial use, protection, and development of the coastal zone. The NOAA NOS CZM Program addresses competing demands for economic development and environmental protection through an integrated approach to protecting, restoring, and developing the natural, cultural, and economic resources of the coastal zone.

As a result of NOAA's efforts on the FY 2005 PART for the CZM Program, NOAA will continue to develop meaningful long-term outcome measures.

Performance Goal 3: Recover Protected Species

Corresponding Strategic Goal

Strategic Goal 3: Observe, protect, and manage the Earth's resources to promote environmental stewardship.

Rationale for Performance Goal

To recover protected species, the NOAA NMFS aims to prevent the extinction of protected species, recover protected species, and to maintain the status of healthy species. NOAA measures its performance in meeting these objectives by focusing on the agency's ability to manage protected species through conservation programs and recovery plans and through constant monitoring of and research into the status of species and the stresses that affect their mortality.

FY 2003 Performance

The time line for producing the PAR precludes NOAA NMFS from providing FY 2003 data for this measure since complete data will not be available until calendar year 2004. However, NOAA continued in FY 2003 its work to recover protected species.

During the year, NOAA NMFS convened an International Technical Expert Workshop on Marine Turtle Bycatch in Longline Fisheries. Participants came from 19 countries and four inter-governmental organizations (Food and Agriculture Organization of the United Nations, Inter-American Tropical Tuna Commission, Convention on Migratory Species , Secretariat of The Pacific Community). The Workshop objectives were to: (1) evaluate existing information on turtle bycatch in longline fisheries, (2) facilitate and standardize collection of data from longline fisheries, (3) exchange information on experimentation with longline gear, (4) identify and consider solutions to reduce turtle bycatch in longline fisheries, and (5) exchange information and gain a comprehensive understanding of the fishing methodologies and operations of global longline fleets.

Numerous recovery teams were convened in FY 2003 to develop or revise recovery plans for a variety of species. These include teams for the two distinct population segments of Steller sea lion (revision), white abalone (new), Hawaiian monk seal (revision), loggerhead sea turtle (revision), Kemp's Ridley sea turtle (revision), and eight technical recovery teams for the 26 species of Pacific salmon (new). Some of these teams, such as the Hawaiian monk seal team, will also be used to implement the plans. Other recovery plans, specifically the Atlantic salmon and North Atlantic right whale plans, have been written with input from states and other stakeholders.

In 2003, NOAA NMFS Office of Protected Resources got a first time line item in the budget to be used for Endangered Species Act Section 6 grants to states. With this funding, 16 projects are being funded to conduct research toward the conservation of species along the Atlantic coast. These grants are only available to states with Section 6 agreements with NOAA. In 2003, three agreements were completed with Florida, Puerto Rico and the U.S. Virgin Islands to add to the six already in existence. In 2004, the Office of Protected Resources hopes to develop agreements with more states to enable them to access Section 6 funds.

On the international front, NOAA NMFS completed an eight-year-long effort to promote sustainable management of queen conch fisheries by working simultaneously with the Convention on International Trade in Endangered Species (CITES) and the International Queen Conch Initiative. CITES, which regulates international trade in this species, completed a review of the species and imposed import restrictions on countries that do not have sustainable fisheries. The International Queen Conch Initiative is working in the Wider Caribbean region to develop support for a cooperative management regime for this species.

Measure 3a: Reduce by 10 (From a FY 2000 Baseline of 27) by FY 2007, the Number of Threatened Species at Risk of Extinction

	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	2	2	5
Actual		2	7	Available in calendar year 2004
Met/Not Met		Met	Met	

Explanation of Measure

The measure addresses 10 of the 27 threatened species that have been identified as the threatened species most in danger of becoming endangered with extinction. The authority to list species at "threatened" or "endangered" is shared by the NMFS, which is responsible for listing most marine species, and the Fish and Wildlife Service of the Department of the Interior, which administers the listing of all other plants and animals. There are two classifications under which a species may be listed:

- Species determined to be in imminent danger of extinction throughout all of a significant portion of their range are listed as "endangered."
- Species determined likely to become endangered in the foreseeable future are listed as "threatened."

The 2003 target for the number of species with reduced threats for 2003 was already exceeded in 2002, with the actual species number of seven. This reflects the stable or increasing status of Johnson's sea grass, the eastern distinct population segment (DPS) of Steller sea lions, Snake River fall-run chinook, Oregon coast coho, Hood Canal summer chum, Lower Columbia steelhead, and Upper Willamette steelhead.

Strategies to accomplish this performance measure include enforcing existing conservation measures, conducting priority research as identified in species recovery plans, developing partnerships with states and others to implement conservation programs, and building the tools and technology to improve the effectiveness of conservation actions.

Because this measure reflects only general trends in status of threatened species, it does not capture the impact of work that NOAA undertakes on an annual basis to improve our understanding of protected species, build partnerships to address the conservation needs of those listed species, or the development of new tools and technology to address conservation needs. This performance measure is being reviewed and will be modified to more accurately address NOAA-controlled activities.

FY 2003 Performance

The time line for producing the PAR precludes NOAA NMFS from providing FY 2003 data for this measure since complete data will not be available until calendar year 2004. However, NOAA undertook several activities in FY 2003 relevant to this performance measure.

Increases in several salmon populations can be attributed in part to management actions such as restricted harvest (e.g. Oregon Coast coho salmon, Hood Canal summer chum salmon), and improvements in survival through hydroelectric dams on the Columbia River (e.g. Upper Columbia River Spring-run chinook, Upper Columbia River steelhead). Although some of the increases in abundance and productivity for threatened and endangered Pacific salmon may be attributed to favorable conditions in the marine environment, the initial indications that management actions are exhibiting results are encouraging.

Permanent regulations were passed implementing Steller sea lion conservation measures. The 2002 survey indicated that the eastern DPS, just the southeast portion (U.S.) was up 0.9 percent. This was not a DPS-wide survey, but this DPS is considered stable.

In 2003, NOAA NMFS enacted a temporary final rule to protect sea turtles from further entanglement and impingement in Virginia pound net leaders. NOAA NMFS has also funded several projects aimed at promoting the recovery of sea turtles, including (1) research projects that tag and assess the health and status of sea turtle populations; and (2) projects that support the recovery, transfer, and rehabilitation of cold stun sea turtles from Cape Cod.

In FY 2002, NMFS exceeded the target because of better than expected results in the status of five ESUs of Pacific salmon—Snake River fall run chinook, Oregon Coast coho, Hood Canal summer run chum, Lower Columbia River steelhead and Upper Willamette River steelhead. The improvement in these species' status was related to better than expected ocean conditions (over which NMFS has no control) that improved survivability, as well as actions to reduce takes in the river and to improve in-river spawning and migratory habitat.

Measure 3b: Increase the Number of Commercial Fisheries that Have Insignificant Marine Mammal Mortality

	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	2	6	6
Actual		2	3	Available in calendar year 2004
Met/Not Met		Met	Not Met	

Explanation of Measure

This measure tracks the number of commercial fisheries where marine mammal deaths are substantial and where deaths will be reduced to insignificant levels by 2007. By definition, insignificant levels mean that total mortality or rate of death is no more than 10 percent of the maximum number of marine mammals that could die from human-caused mortality. For this measure, 15 out of 32 fisheries have been targeted.

One of the most significant impacts on marine mammal stocks is death from entanglement and drowning in fishing gear. Certain marine mammal species are particularly vulnerable to interactions with fisheries because of the location and type of fishing gear used. There are 15 fisheries and marine mammal stocks targeted in this measure. For the Western North Atlantic stock of coastal bottlenose dolphins, the fisheries are the Mid-Atlantic coastal gillnet, North Carolina inshore gillnet, Southeast Atlantic gillnet, Southeast Atlantic shark gillnet, Atlantic blue crab trap or pot, Mid-Atlantic haul or beach seine, North Carolina long haul seine, North Carolina roe mullet stop net, and Virginia pound net. For the Gulf of Main/Bay of Fundy stock of harbor porpoise, the fishery is the Northeast sink gillnet. For the Atlantic large whale (ALW), the fisheries are the Northeast and Mid Atlantic American lobster trap or pot, Northeast sink gillnet, Mid Atlantic coastal gillnet, and Southeast

Atlantic shark gillnet. Finally, for the Pacific new fishing technologies to reduce gear impacts need to be developed, and strategies to reduce offshore cetaceans. It is the California and Oregon fishery for thresher shark and swordfish. Interactions between fishing gear and marine mammals need to be devised. NOAA also needs to educate fishermen about how they can avoid marine mammals while still being able to catch fish.

A successful program to reduce mortality of marine mammal stocks will require research on marine mammal behavior, assessment of marine mammal populations, reductions of interactions in problem fisheries, and monitoring and analysis via the observer program.

FY 2003 Performance

The time line for producing the PAR precludes NOAA NMFS from providing FY 2003 data for this measure since complete data will not be available until calendar year 2004. However, NOAA undertook several activities in FY 2003 relevant to this performance measure.

NOAA NMFS has convened six take reduction teams (TRT) to date and implemented four take reduction plans (TRP). Most successful to date are the Pacific Offshore Cetacean TRP and the Harbor Porpoise TRPs, which have resulted in takes below the Potential Biological Removal (PBR). A PBR is defined as the maximum number of animals that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The Bottlenose Dolphin TRP has not gone into effect yet, but modeling suggests it will be effective at reducing takes below PBR once implemented. Substantial progress has been made in reducing takes of marine mammals in commercial fisheries toward insignificant levels in three of these fisheries – the California/Oregon drift gillnet fishery for thresher shark/swordfish, Northeast sink gillnet fishery, and the Mid-Atlantic coastal gillnet fisheries. Although the target for 2002 was not met, progress was made toward the 2007 target.

The Pacific Offshore Cetacean TRP addresses incidental mortality and serious injury of beaked whales, pilot whales, pygmy sperm whales, sperm whales, and humpback whales in the swordfish/shark drift gillnet fishery off California and Oregon. The final rule, published on October 3, 1997, and effective October 30, 1997, implemented the team's TRP, which requires that the top of the nets be set at a minimum depth of 36 feet below the water surface, that pingers be used on all nets, that the states of California and Oregon reduce the number of "inactive" permit holders, and that vessel operators be required to attend educational workshops if requested to educate them about marine mammals and the take reduction plan. The plan has achieved the Marine Mammal Protection Act's short-term goal of reducing incidental takes in the California/Oregon drift gillnet fishery below the PBR levels for all species covered under the plan.

The Gulf of Maine Harbor Porpoise TRP addresses incidental mortality and serious injury of Gulf of Maine harbor porpoise in the Northeast sink gillnet fishery. The final rule, published December 2, 1998 (63 FR 66464) and effective January 1, 1999, implemented the team's TRP, which instituted several time-area closures, some of which are complete closures, and required the use of pingers on sink gillnets. Takes of harbor porpoise in the sink gillnet fishery have been reduced below PBR since the TRP was implemented.

The Mid-Atlantic Harbor Porpoise TRP addresses incidental mortality and serious injury of harbor porpoise in Mid-Atlantic coastal gillnet fisheries. The final rule, published on December 2, 1998 (63 FR 66464) and effective January 1, 1999, implemented the team's TRP, which instituted time and area closures to gillnet fishing unless the gear meets certain specifications. The plan also includes some time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. Takes of harbor porpoise in Mid-Atlantic coastal gillnet fishery have been reduced to below PBR since the TRP was implemented.

The Atlantic Large Whale (ALW) TRP addresses incidental mortality and serious injury of right whales, humpback whales, fin whales, and minke whales in the shark gillnet fishery, the Northeast/Mid-Atlantic mixed species trap/pot fishery, Mid-Atlantic gillnet fishery, Southeast shark gillnet fishery, and Northeast sink gillnet fishery. The first rule implementing the ALWTRP went into effect in 1997 when it was published in the *Federal Register* as an Interim Final Rule. The regulations contained in that rule were updated in February 1999, and again in December of 2000. In January 2002, NOAA Fisheries published three rules that (1) make further modifications to commercial fishing gear, (2) establish a system for restricting fishing in areas where unexpected aggregations of right whales are observed, and (3) establish restricted areas based on the annual, predictable congregations of right whales. The ALWTRP consists of restrictions on where and how gear can be set; research into whale populations, whale behavior, and fishing gear; outreach to inform fishermen of the problem and to seek their help in understanding and solving the entanglement problem; and a program to disentangle whales that do get caught in gear. The ALWTRT met at the end of April 2003 and is in the process of organizing regional sub-group meetings within the next two months to further develop and discuss proposals for additional gear modifications to decrease the likelihood of large whale entanglements.

The Bottlenose Dolphin TRT was convened in 2001 to address incidental mortality and serious injury of Western North Atlantic coastal bottlenose dolphins in Mid-Atlantic and Southeast gillnet, beach seine, stop net, and trap/pot fisheries. The team wrapped up their final meeting in April 2003 and recently submitted their final recommendations to NOAA Fisheries to reduce bycatch of the seven management units of bottlenose dolphins in this stock complex to levels below PBR. The recommendations include temporal restrictions, proximity and gear-marking requirements, gear length restrictions, mesh size restrictions, and mandatory training. NOAA Fisheries is currently drafting a proposed rule incorporating the team's recommendations. The proposed rule is expected to be published by winter 2003 for 90 days of public comment and to complete the final rule implementing the team's TRP by the end of November 2003. Modeling efforts suggest these measures will reduce takes of bottlenose dolphins to levels below PBR.

In FY 2002, NMFS did not meet the target because of the delay in proposing conservation measures to benefit the mid-Atlantic bottlenose dolphin until this year. NMFS had established this take reduction team in late 2001, but as the team was working through the issues, it became clear that the abundance estimates for the species were inadequate for the purposes of negotiating reductions in dolphin takes by a number of mid-Atlantic coastal fisheries. NMFS conducted a new abundance survey last year, which is the basis of a draft plan and regulations that is intended to be implemented in spring 2004.

Measure 3c: Reduce by 11 (from a FY 2000 Baseline of 29) by FY 2007, the Number of Endangered Species at Risk of Extinction

	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	3	6	6
Actual		3	5	Available in calendar year 2004
Met/Not Met		Met	Not Met	

Explanation of Measure

The term "endangered species" is defined in the Endangered Species Act as any species that is in danger of extinction. Of the 29 endangered species under the authority of NOAA NMFS, 11 have been identified as the most critically in danger of extinction. These 11 species include the Pacific leatherback turtle, Kemp's Ridley turtle, hawksbill turtle, Hawaiian monk seal, Western Steller sea lion, shortnose sturgeon (SNS), and five species of Pacific salmonids. The number of species with reduced risk of extinction is on target as of 2002, with an actual species number of five. This reflects the stable or increasing status of the Kemp's Ridley sea turtle, Snake River sockeye, Sacramento River winter-run chinook, Upper Columbia spring-run chinook, and Upper Columbia steelhead.

Efforts to prevent extinction will focus on identifying the factors that contribute to extinction and developing and implementing recovery plans to address these factors. Reducing the probability of extinction requires a reduction in human activities that are detrimental to the survival of protected species, that is, reducing incidental and direct catch (takes), increasing species habitat, decreasing negative interactions, and mitigating natural phenomena.

Because this measure reflects only general trends in status of endangered species, it does not capture the impact of work that NOAA undertakes on an annual basis to improve our understanding of protected species, build partnerships to address the conservation needs of those listed species, or the development of new tools and technology to address conservation needs. This performance measure is being reviewed and will be modified to more accurately address NOAA-controlled activities.

FY 2003 Performance

The time line for producing the PAR precludes NOAA NMFS from providing FY 2003 data for this measure since complete data will not be available until calendar year 2004. However, NOAA undertook several activities in FY 2003 relevant to this performance measure.

NOAA Fisheries continued to monitor and assess wild Atlantic salmon populations in cooperation with the Maine Atlantic Salmon Commission. NOAA Fisheries provided funding and staff support for habitat restoration projects in Maine, and led U.S. participation in international efforts to manage Atlantic salmon through NASCO. NOAA NMFS also led efforts to develop and publish a draft Recovery Plan for the Gulf of Maine DPS of Atlantic Salmon, and have been engaged in formal Endangered Species Act Section 7 consultations with the Army Corps of Engineers to reduce the threats posed by commercial salmon.

Permanent regulations were passed implementing Steller sea lion conservation measures. In addition, FY 2002 surveys exhibited the first signs that the western DPS may be stabilizing (although this determination cannot be certain at this time).

NOAA NMFS is working with the owners/operators of the Holyoke Dam to minimize and mitigate potential adverse impacts from the dam to the Connecticut River SNS population, through improved upstream and downstream passage of SNS. NOAA NMFS is also funding several studies on SNS, including (1) a study to identify sonar technology that may be utilized to remotely locate/identify and study SNS behavior; (2) a study to obtain information using sonic telemetry on the abundance and distribution of SNS in the lower tidal Delaware River and Bay; (3) a study to determine over-wintering and spawning locations, movements, and stock structure of SNS in the Potomac River.

With regard to North Atlantic right whales, NOAA NMFS supported gear research efforts through the Endangered Species Act Section 6 funds in support of state whale conservation plans as well as gear research to minimize the risks associated with entanglements; added new trap/pot fishery representatives to the ALWTRT for fisheries including, but not limited to, black sea bass, red crab, hagfish, and conch; implemented the Dynamic Area Management (DAM) Program by establishing

two DAM zones from October 2002-December 2002 and four DAM zones from January 2003-August 2003; and conducted numerous outreach efforts, which included the distribution of a special message to gillnet and trap/pot fishermen regarding measures fishermen can take to reduce the risk of serious injury and mortality of large whales and expanding outreach efforts in the mid-Atlantic by adding new Mid-Atlantic Liaison.

In July of 2003, a 10-day cruise to Cortes Bank, 120 miles off the coast of San Diego, California, was mounted to map potential white abalone habitat and to census surviving individuals on the Bank. The new estimates of available habitat and total abundance will likely exceed those reported in the white abalone status review (Hobday and Tegner 2000), however, density estimates for Cortes Bank may be similar to those reported in the status review (approximately three to eight per hectare depending on the depth stratum).

On August 20, 2003, NOAA NMFS completed the Mid-Columbia Habitat Conservation Plan (HCP) for the operation of three hydroelectric projects located on the Columbia River in the State of Washington. This HCP provides for operation of the hydroelectric projects while also protecting Endangered Upper Columbia River steelhead and Upper Columbia River spring-run chinook salmon.

In FY 2002, NMFS did not meet the target because of continued declines for critically endangered species that interact with fisheries in the Western and North Pacific ocean (Steller sea lions and Pacific leatherback turtles). In addition, nesting sites for leatherback turtles showed a steep decline in nests produced, despite efforts to protect these areas. NMFS continues to work with domestic and foreign fisheries to reduce at sea incidental capture of turtles by limiting fishing gear use until mitigation measures can be demonstrated effective and implemented in the fishery. NMFS has had several years of successful development of alternative gear and will be requiring their use domestically in spring 2004. NMFS will "export" these successful measures to other nations through various means, including treaties and fishery and conservation fora. NMFS anticipates that it will be able to demonstrate improvement with SNS based on increased cooperation with Atlantic coastal states and federal agencies responsible for riverine habitat, including the U.S. Army Corps of Engineers. NMFS is supporting mitigation measures for sturgeon and more comprehensive surveys for this species which, is found in limited numbers, but throughout the Atlantic seaboard.

Program Evaluation

Evaluation efforts include peer reviews of proposals, internal and external reviews of programs, and quarterly reviews of NOAA's overall performance in protected species recovery. Constituent input is an important part of the evaluation process and is solicited regularly through constituent workshops.

For this performance goal, the Pacific Coastal Salmon Recovery Program was reviewed using OMB's PART.

The Pacific Coastal Salmon Recovery Fund is authorized for salmon habitat restoration, salmon enhancement, salmon research, and salmon supplementation activities. The program provides grants to states and tribes to assist state, local, and tribal salmon conservation and recovery efforts. Using PART, this program received a total score of 80 percent out of 100 percent.

Performance Goal 4: Advance Short-term Warnings and Forecasts

Corresponding Strategic Goal

Strategic Goal 3: Observe, protect, and manage the Earth's resources to promote environmental stewardship.

Rationale for Performance Goal

The 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 hazards. NOAA's current ability to predict short-term change is restricted by observations that are incomplete. 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 impact on humans. NOAA must improve its observing systems, develop a better understanding of natural processes, and enhance numerical weather prediction models and dissemination systems.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data. Therefore the following information is preliminary and subject to change.

NWS is currently expected to meet the FY 2003 targets for tornado lead time, accuracy and false alarm rate (FAR); flash flood accuracy, heavy precipitation forecasts; winter storm warnings and accuracy; aviation forecasts; and marine forecasts. Based on the preliminary verification, NWS is not expected to meet the FY 2003 target for flash flood lead time. Presently, there is not enough data available to determine the expected outcome of the hurricane track error measure.

Measure 4a: Lead Time (Minutes), Accuracy (%), and False Alarm Rate (FAR) (%) for Severe Weather Warnings for Tornadoes

		FY 2000	FY 2001	FY 2002	FY 2003
Lead time (min)	Target	12	13	11	12
	Actual	10	10	12	14[1]
	Met/Not Met	Not Met	Not Met	Met	Met
Accuracy	Target	70%	68%	69%	72%
	Actual	63%	67%	76%	81%[1]
	Met/Not Met	Not Met	Not Met	Met	Met
FAR	Target	65%	73%	71%	72%
	Actual	76%	73%	73%	76%
	Met/Not Met	Not Met	Met	Not Met	Not Met

[1] *These actuals reflect preliminary information from the third quarter and estimates for the remaining year.*

Explanation of Measure

The lead time for a tornado warning is the difference between the time the warning was issued and the time the tornado affected the area for which the warning was issued. The lead times for all tornado occurrences throughout the year are averaged to get this statistic. The accuracy of the warnings is the percentage of times a tornado actually occurred in an area that was covered by a warning. The FAR is the percentage of times a tornado warning was issued but no tornado occurrence was verified. The FAR was added as a reportable measure in FY 2000, although it had been collected and used internally previously. NOAA is exploring how best to represent events where the public is not provided warning in time to take action.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003. The data as stated in the table reflects estimates based on third quarter actuals.

However, as of July 2003, NWS exceeded the performance targets for both tornado warning lead time and accuracy. The target for tornado FAR was not met as of this date. Improved performance in FY 2003 can be attributed to improved training for NOAA field forecasters through use of a weather event simulator, implementation of best practice procedures during storm events, and providing improved resolution of precipitation data to forecasters through the NEXRAD Open System Radar Product Generator processor retrofits. NWS performance during the May 4-10 tornado outbreak contributed to the improved performance to date: NWS average lead time for this outbreak was 19 minutes for 375 tornado events.

Improved tornado warning accuracy can come at the expense of FAR. As more tornados are detected and warnings are issued, the probability of additional false alarms increases. Finer resolution radar data through improved radar signal acquisitions (Open Systems Radar Data Acquisition and Dual Polarization) will reduce false alarms while further improving the accuracy.

Measure 4b: Lead Time (Minutes) and Accuracy (%) for Severe Weather Warnings for Flash Floods

		FY 2000	FY 2001	FY 2002	FY 2003
Lead time (min)	Target	55	45	45	47
	Actual	43	47	53	44[1]
	Met/Not Met	Not Met	Met	Met	Not Met
Accuracy (%)	Target	86%	86%	86%	87%
	Actual	86%	86%	89%	90%[1]
	Met/Not Met	Met	Met	Met	Met

[1] *These actuals reflect preliminary information from the third quarter and estimates for the remaining year.*

Explanation of Measure

The lead time for a flash flood warning is the difference between the time the warning was issued and the time the flash flood affected the area for which the warning was issued. The lead times for all flash flood occurrences throughout the year within the continental United States are averaged to get this statistic. This average includes all warned events with zero lead times and all unwarned events. The accuracy of the warnings is measured by the percentage of times a flash flood actually occurred

in an area that was covered by a warning. The difference between the accuracy percentage figure and 100 percent represents the percentage of events without a warning. NOAA's actions include data collection and verification, and new performance measures will be reported in future years. NWS expects steady improvement in both flash flood lead time and accuracy leading into FY 2003. The steady improvement is linked to the implementation of new flash flood decision assistance tools in FY 2002 and NEXRAD retrofits in FY 2003. The NEXRAD retrofits allow NWS forecasters to run new algorithms for improved rainfall estimates.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003.

However, as of July 2003, NWS met the accuracy goal but fell two minutes short of the goal for lead time. When conditions are dry, the ground soaks up the initial rain and the runoff from precipitation events takes longer to begin, typically resulting in longer lead times. When conditions are wet, precipitation occurs on top of saturated soil and the runoff begins immediately, yielding shorter lead times. Through July of FY 2003, the western half of the United States has been extremely dry to the point of having almost no reports of flash flood events, while the majority of flash flood events have occurred in the eastern U.S. which has been unusually wet. This has created the condition of having most flash flood events this past year occurring on wet ground, hence the shorter lead times.

Measure 4c: Accuracy of Hurricane Track Forecasts (48 Hours)

	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	142	130[1]
Actual			122	Available in calendar year 2004
Met/Not Met			Met	

[1] *This target was originally reported in the FY 2003 Annual Performance Plan (APP) as 138.*

Explanation of Measure

The public, emergency managers, government institutions at all levels in this country and abroad, and the private sector use NOAA hurricane and tropical storm track forecasts to make decisions on life and property. This goal measures the difference between the projected location of the center of these storms and the actual location in nautical miles (nm). The goal is computed by averaging the differences (errors) for all the 48-hour forecasts occurring during the calendar year. This measure can show significant annual volatility. Projecting the long-term (30-year) trend, and basing outyear goals on that trend, is preferred over making large upward or downward changes to the goals each year. The average track error is projected to decrease due to improvements in hurricane forecast models, aircraft upgrades, supporting data, and computer infrastructure, and by conducting research within the U.S. Weather Research Program (USWRP) that will be transferred to NOAA forecast operations.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data for this measure since complete data will not be available until calendar year 2004. Hurricane season does not end until November 30th. Through the third quarter of FY 2003, there had only been two, short-lived tropical storms (48-50 hours), which did not provide enough data to produce preliminary verification. However, in the fourth quarter there was increased activity with Hurricanes Claudette, Fabian, and Isabel. The preliminary track errors for the hurricanes are the following: Claudette, 117 nm; Fabian, 85 nm; and Isabel, 61 nm. All of these preliminary track errors are far below the NWS FY 2003 goal of 130 nm. For Hurricane Isabel, watches were issued approximately 50 hours prior to landfall and Hurricane Warnings were posted 38 hours prior to the eye coming ashore. Isabel, which had been at Category 5 on the Saffir-Simpson Hurricane Scale several days earlier, made landfall at Category 2 strength.

Measure 4d: Accuracy (Percent) (Threat Score) of Day 1 Precipitation Forecasts				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	New	25
Actual				29[1]
Met/Not Met				Met

[1] *This actual reflect preliminary information from the third quarter and estimates for the remaining year.*

Explanation of Measure

This measure replaced the discontinued measure, "Accuracy (percent) of 3-day Forecast of Precipitation." The original measure reflected the ability to accurately forecast a precipitation event three days in advance. The new measure reflects a more representative and accurate means of measuring the performance for this strategic goal. The measure reflects the ability to forecast accuracy of precipitation events one day in advance. Through this measure, the Hydrometeorological Prediction Center (HPC) focuses on relatively heavy amounts of precipitation, usually a half inch or more in a 24-hour period (short-term flash flood warnings), because of the major safety and economic impacts such heavy precipitation can have in producing flooding, alleviating drought, and affecting river navigation.

The HPC of the NOAA NWS began providing quantitative precipitation forecasts (QPF) in 1961. These forecasts indicate how much precipitation is expected, not just whether it will rain or snow. HPC has focused on relatively heavy amounts of precipitation, usually a half inch or more in a 24-hour period, because of the major safety and economic impacts such heavy precipitation can have in producing flooding, alleviating drought, and affecting river navigation. The HPC began making QPFs through two days into the future in 1965 and through three days in 2000.

The HPC has tracked the accuracy of these forecasts very carefully over the years using a metric that is very challenging. This accuracy metric ranges from zero percent, indicating no skill, to 100 percent for a perfect forecast. In verifying the accuracy of a one-inch precipitation forecast for day 1, for example, the HPC first determines everywhere in the United States where an inch or more actually fell and was observed by rain gauges. On a given day this occurs only over a very small percentage of the country, although wherever it falls is a significant event for the people and nature existing in that particular area. The HPC then compares these observed one-inch areas with the one-inch areas it had forecasted counting only those points in the United States where HPC forecasted and observed at least an inch as being an accurate forecast (these points are called "hits"). Thus, if HPC forecasts one inch to fall at the point representing Washington, DC, and it observed only three-quarters of an inch actually had fallen in that specific area, the forecast is then rated as a "miss," even if an inch of rain was

observed to have fallen at the points nearby representing the area of Fairfax City, Virginia, or the area of Upper Marlboro, Maryland. The overall accuracy score for the country for that particular day 1 forecast is then determined by dividing the total number of correctly forecast points (hits) by the total number of points where HPC had either forecast it would rain an inch or it had actually rained an inch. In summary, to earn a high accuracy score, HPC has to forecast the time, place, and amount of precipitation very well.

Two important points should be noted. First, although the accuracy scores are low with respect to perfection, the accuracy is clearly sufficiently high to be of major utility to U.S. decisionmakers. As indicated by the numerous requests for HPC's precipitation products, especially in times of hardship, the Federal Emergency Management Agency (FEMA), Army Corps of Engineer, the media, and farmers among others all rely heavily on NOAA forecasts to decide how to proceed. Second, the scores are continuing to improve in accuracy. The metrics from the last 40 years indicate the day 2 forecasts of at least one inch of precipitation in 2002 had more skill than the day 1 forecasts in 1994, and HPCs day 3 forecasts in 2002 were as accurate as our day 2 forecasts in 1997.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003.

The skill through the third quarter of FY 2003 is higher than the annual target. Consistent with performance in FY 2002, the higher scores can be attributed to the following factors: (1) higher resolution regional weather models run on the new weather and climate supercomputer, (2) a focused training effort for forecasters, (3) new collaborative forecasts approach between HPC and the River Forecast Centers, and (4) a higher number of intense rainfall events in the later half of the year that were easier to forecast.

Measure 4e: Lead Time (Hours) and Accuracy (%) of Winter Storm Warnings

		FY 2000	FY 2001	FY 2002	FY 2003
Lead time (hrs)	Target	12	13	13	13[1]
	Actual	9	13	13	14[1]
	Met/Not Met	Not Met	Met	Met	Met
Accuracy (%)	Target	85%	86%	86%	88%
	Actual	85%	90%	89%	90%[1]
	Met/Not Met	Met	Met	Met	Met

[1] *These actuals reflect preliminary information from the third quarter and estimates for the remaining year.*

Explanation of Measure

A winter storm warning provides NOAA customers and partners advanced notice of a hazardous winter weather event that endangers life or property, or provides an impediment to commerce. Winter storm warnings are issued for winter weather phenomena like blizzards, ice storms, heavy sleet, and heavy snow. This performance indicator measures the accuracy and advance warning lead time of winter storm events. Improving the accuracy and advance warnings of winter storms enables the public to take the necessary steps to prepare for disruptive winter weather conditions.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003.

Preliminary data indicates that NWS met both performance measure targets for Winter Storm Warnings. In FY 2003, NOAA NWS continued the use of higher resolution (i.e., 12 km) regional weather forecast models and shorter-range ensemble forecasts to improve skill. In addition, NOAA NWS conducted intense field training sessions to leverage best practices processes and improve multi-office coordination during storm events.

Measure 4f: Accuracy (%) and FAR (%) of Forecasts of Ceiling and Visibility (Aviation Forecasts)

		FY 2000	FY 2001	FY 2002	FY 2003
Accuracy (%)	Target	20%	21%	18%	45%
	Actual	15%	18%	13%	47%[1]
	Met/Not Met	Not Met	Not Met	Not Met	Met
FAR (%)	Target	50%	51%	52%	71%
	Actual	53%	51%	58%	64%[1]
	Met/Not Met	Not Met	Met	Not Met	Met

[1] *These actuals reflect preliminary information from the third quarter and estimates for the remaining year.*

Explanation of Measure

This measure originally covered "1/4 mile/200 feet." Conditions of a 200-foot ceiling and one quarter mile visibility are components of the FY 2002 and earlier performance measure accuracy and FAR percentages. However, these conditions are rare events. Because of the infrequency of these conditions, the performance measure poorly captured the operational impact of NWS aviation forecasts. The NWS decided that a better criterion of performance is an aviation performance measure based on a 1,000-foot ceiling and three miles of visibility for both accuracy and false alarm rate, and is related to Instrument Flight Rules (IFR) conditions. A revised performance measure was reported in the FY 2004 APP and included a new FY 2003 baseline with future targets.

In accordance with the NOAA Weather Service strategic plan, this measure was added in FY 2000 to reflect a segment of customers that had not been represented in other performance measures. Visibility and cloud ceiling forecasts are critical for the safety of aircraft operations.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003.

Preliminary FY 2003 data indicate NWS exceeded the target(s) for accuracy and FAR. Accuracy increased approximately five percent over historical averages, while FAR decreased nearly 10 percent. NOAA launched a new aviation training program for meteorologists, while also releasing new forecast assistance software "tools," which have contributed to NOAA's improved performance. NWS replaced its aviation performance target in the FY 2004 APP with aviation forecasts related to IFR conditions. This new goal is more relevant to key users, provides better skill targets, and occurs more often, reducing the impact of seasonal weather variation.

Measure 4g: Accuracy (%) of Forecast for Winds and Waves (Marine Forecasts)

		FY 2000	FY 2001	FY 2002	FY 2003
Winds and waves accuracy (%)	Target	49%	51%	53%	N/A
	Actual	51%	52%	53%	N/A
	Met/Not Met	Met	Met	Met	
Wind speed accuracy (%)	Target	New	New	New	54%
	Actual				57%[1]
	Met/Not Met				Met
Wave height accuracy (%)	Target	New	New	New	66%
	Actual				71%[1]
	Met/Not Met				Met

[1] *These actuals reflect preliminary information from the third quarter and estimates for the remaining year.*

Explanation of Measure

In accordance with the NOAA and NWS strategic plans, this measure was added in FY 2000 to reflect another segment of customers that had not been represented in other performance measures. This measure was originally a "combined accuracy forecast for marine wind and wave." The measure was revised in FY 2002 into two separate measures to reflect the individual wind speed and wave height components, which are important for marine commerce.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003.

Based on preliminary skill scores for NWS marine wind speed and wave height forecasts through August 2003, NWS appears to be on target for FY 2003 for wave height but not for wind speed. Meanwhile, NWS marine forecasting skill continues to improve slightly due to focused training for NWS forecasters improving models.

Discontinued Measure in FY 2003

The following measure was discontinued during FY 2003 and replaced by a different measure (4d) that better reflected NOAA programs and performance.

Accuracy (Percent) of Three-day Forecast of Precipitation				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	20%	22%	17%	Discontinued
Actual	16%	19%	26%	Discontinued
Met/Not Met	Not Met	Not Met	Met	

Explanation of Measure

This measure has been replaced by the measure "Accuracy (%) (Threat Score) of Day 1 Precipitation Forecasts." The original measure reflects the ability to accurately forecast a precipitation event three days in advance. The new measure reflects a more representative and accurate means of measuring the performance for this strategic goal. The measure reflects the ability to forecast accuracy of precipitation events one day in advance. Through this measure, the HPC focuses on relatively heavy amounts of precipitation, usually a half inch or more in a 24-hour period (short-term flash flood warnings), because of the major safety and economic impacts such heavy precipitation can have in producing flooding, alleviating drought, and affecting river navigation.

Program Evaluation

NOAA's vision for the future is to provide significantly improved short-term warning and forecast products and services that enhance public safety and the economic productivity of the United States. While it is difficult to see the improvements on an annual basis because of the scientific nature and seasonal variations of weather events, historical trends have shown that NOAA continues to improve the accuracy and advance warning lead time of severe weather hazards.

Program evaluations at NWS Field Offices are conducted annually. Quality control procedures are followed to ensure the highest reliability of gathered data and weather products. The National Academy of Sciences is also involved in program analysis and evaluation processes on a national level.

For this performance goal, the programs under NOAA NWS were reviewed using OMB's PART. NWS provides the public with weather, water, and climate warnings and forecasts. The information is critical for public safety, and protecting lives and property. The data is also critical for business planning and decisions. The NWS is the only national provider of daily warnings and forecasts, storm and severe warning tracking, and flood forecasting. NWS is also the only entity with an established national infrastructure for collecting weather observations and disseminating information. Using PART, NOAA NWS was rated as an effective program.

Performance Goal 5: Implement Seasonal to Interannual Climate Forecasts

Corresponding Strategic Goal

Strategic Goal 3: Observe, protect, and manage the Earth's resources to promote environmental stewardship.

Rationale for Performance Goal

NOAA works with academic and international partners to provide one-year lead time forecasts of global climate variability, especially that result from El Niño/Southern Oscillation (ENSO), and consequent precipitation and surface temperature distributions. These forecasts increase society's ability to mitigate economic losses and social disruption resulting from such events.

FY 2003 Performance

The time line for producing the PAR precludes NOAA from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003.

Regarding the temperature skill score, NOAA missed the goal for the year. The El Niño pattern experienced in FY 2002 was less severe than anticipated, impacting the overall accuracy of climate forecasts for the year.

For the new climate observation measure, U.S. deployments of the Argo profiling float system increased substantially during FY 2002 and continued above target. This system is the largest new climate observing system currently being deployed with NOAA support.

Measure 5a: U.S. Temperature — Skill Score

	FY 2000	FY 2001	FY 2002	FY 2003
Target	20	20	20	20
Actual	25	20	18	17[1]
Met/Not Met	Met	Met	Not Met	Not Met

[1] *The actual number reflects preliminary information from the third quarter and estimates for the remaining year.*

Explanation of Measure

The verification of seasonal prediction of U.S. temperatures is done based on the Heidke Skill Scores (HSS). HSS is one of several accepted verification standards for measuring forecast skill, and is based on a comparison of observed temperatures with forecasted temperatures. For the areas of the United States where a temperature forecast is made, this score measures how much better the prediction is than just being correct by a random chance. Areas where no forecast for surface temperature is made (i.e., areas designated as "equal chance [or EC]" on the Climate Prediction Center seasonal forecast maps) are not included in the computation of HSS.

HSS varies between –50 to +100. If forecasters match a random prediction, the skill score is zero. HSS above zero shows skill in forecasting. Given the difficulty of making seasonal temperature forecasts for specific locations, a skill score of 20 is considered quite good. Seasonal forecasts will likely be better in El Niño years than in non-El Niño years.

Reported skill score is a cumulative average over past 48 consecutive three-month seasons. For example, skill score of 18 reported at the end of FY 2002 is the HSS averaged over previous 48 surface temperature forecasts from October 1998 to September 2002. Prior to FY 2001, the HSS reported by NOAA was averaged only over the past 36 seasons. A decision to change to an average over 48 seasons was based on following considerations: (1) A longer average reduces the influence of natural unpredictable variability on the skill score, and (2) a cumulative average over four years tends to better capture transitions from El Niño to neutral, and then to La Niña conditions. After the definition for the reported scores was changed in FY 2001, NOAA recomputed the skill scores for FY 1999 and FY 2000, and these numbers, based on 48 season cumulative average, appear in the table above. Temperatures across the United States will be measured using NOAA's cooperative network maintained by volunteers across the nation. Temperature data will be collected and analyzed by NOAA.

FY 2003 Performance

The time line for producing the PAR precludes NWS from providing final FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003.

The U.S. Seasonal Temperature Skill Score was lower than the goal of 20 for FY 2003 at the end of the third quarter. The primary reason is the state of the science and predictive skill does not yet permit NOAA to predict the unusually cooler than normal conditions, which have occurred in the eastern half of the United States throughout most of FY 2003. These conditions were due to circulation regimes driven by the Pacific North America (PNA) pattern and the North Atlantic Oscillation (NAO), which are not predictable a season in advance at this time. HSS targets were set at 20-25 during a period when NOAA had limited experience (in the late 1990s), when there were unusually high scores (the strong El Niño and La Niña winters of 1997-2000), and when the PNA and NAO patterns had less influence on the United States.

NWS is working with the research and modeling communities to help improve its skill and consistency, but it may take several years to show improvement. NWS is also working with the same communities to develop and propose a new/improved GPRA skill measure for seasonal outlooks.

Measure 5b: New Climate Observations Introduced				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	120	174	275
Actual		132	192	Available in calendar year 2004
Met/Not Met		Met	Met	

Explanation of Measure

NOAA is undertaking new efforts to better describe the atmosphere-ocean-land system to improve its climate monitoring and prediction capability. As a part of this effort, OAR and National Environmental Satellite, Data, and Information Service (NESDIS) will expand their existing observation systems, that is, data buoys and new satellites.

The oceans provide the largest source of potential predictability for the climate system as well as the potential to produce large climatic surprises, and yet they are currently critically underobserved for certain variables and in many regions. This measure will continue NOAA's long-term and sustained effort to improve ocean observational capabilities, and to increase the usefulness of observations for this critical part of the Earth's climate system. NOAA will complete an annual report detailing how these new climate observations increased data density and coverage and how they will be used in climate analysis and prediction.

NOAA's actions include, as resources permit, expanding its ocean observing systems, focusing on the highest priority variables for climate monitoring and prediction, and addressing critical oceanic data voids. NOAA will also place high priority on improving the assimilation and optimal use of ocean observations in climate models that are used for climate analyses and forecasts. NOAA will also estimate the reduction in analysis error that accompanies increases in data quality, density, and coverage.

FY 2003 Performance

The time line for producing the PAR precludes NOAA from providing FY 2003 data for this measure since complete data will not be available until the end of calendar year 2003.

U.S. deployments of the Argo profiling float system, the largest new climate observing system currently being deployed with NOAA support, increased substantially during FY 2002 and continued above target. As of October 2002, the United States contributed 33 percent of the global Argo array and was the largest international contributor. The profiling floats provide report measurements of the upper ocean temperature and salinity in real time. This is a critical measure for climate, as heat storage in the ocean will largely determine the rate of climate change. Current description of the global Argo array can be found online at *http://argo.jcommops*.

Discontinued Measures in FY 2003

Based upon recommendations from OIG Audit Report No. FSD-15643-3-0001/September, NOAA discontinued the following measures:

Determine the Accuracy of the Correlation Between Forecasts of the Southern Oscillation Index and El Nino/La Nina Events				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	0.85	0.85	0.85	0.85
Actual	0.84	0.85	0.85	Discontinued
Met/Not Met	Not Met	Met	Met	

Explanation of Measure

This measure has been discontinued due to its complexity. NWS acknowledges that this measure is too technical and is working with the broader NOAA climate community to develop more meaningful measures.

The atmosphere is tightly linked to ocean temperatures and circulation patterns. The pattern of warming of the tropical Pacific over periods of three to seven years known as ENSO has a tremendous impact on U.S. and global climate. This measure specifically assesses the correlation between forecasts of Pacific sea surface temperatures (based on models) and actual sea surface temperature (based on satellite and on site observations).

Number of New Monitoring or Forecast Products that Become Operational Per Year (cumulative)				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	4	8	12
Actual		4	8	Discontinued
Met/Not Met		Met	Met	

Explanation of Measure

This performance measure was discontinued in FY 2003. NOAA will consider the development of new procedures to verify new climate products and develop a definition of a "new climate product." When this action is completed, the performance measure will be reevaluated.

Program Evaluation

A number of NOAA line offices participate in the seasonal-to-interannual goal. The OAR conducts periodic reviews of the activities of its Environmental Research Laboratories. NESDIS holds management performance reviews several times a year. NWS conducts reviews of the National Centers for Environmental Prediction. In addition, the National Science Foundation and the National Research Council also evaluate programs. NOAA holds annual constituent workshops where NOAA's seasonal climate forecasts efforts are discussed with the community of seasonal-to-interannual climate forecast users and where NOAA solicits input to shape future efforts.

Performance Goal 6: Predict and Assess Decadal to Centennial Change

Corresponding Strategic Goal

Strategic Goal 3: Observe, protect, and manage the Earth's resources to promote environmental stewardship.

Rationale for Performance Goal

NOAA scientists provide policymakers with the scientific information and expert assessments necessary to make decisions on long-term global and regional environmental issues. NOAA research, conducted in conjunction with its national and international partners, contributes significantly to the understanding of these issues. Experts in these fields periodically compile, summarize, and evaluate the current state of scientific knowledge and report their findings in assessment documents. NOAA's research, authors, and review of these documents are essential to ensure the highest quality science is available to support important decisions on long-term climate issues. Additionally the national effort in climate research increasingly focuses on reducing uncertainty in projections of climate change and on building the research, modeling, and observational systems to further this objective. Central to the issue of climate change are descriptions of the greenhouse gases that influence how radiation is absorbed by the planet. Knowledge of how carbon dioxide is stored and released and how this will change in the future is essential. Other greenhouse gases and aerosols with shorter atmospheric lifetimes may offer the chance to influence climate change over a shorter period, as well as provide benefits for other environmental issues.

FY 2003 Performance

NOAA performance measures in long-term climate focused on observing system development. Substantial advances took place in deployment of an observing system for tracking carbon storage in North America and in the ocean. For monitoring of the global carbon cycle, expanded carbon measurements allow more precise characterization of global trends in greenhouse gases. In addition, early deployments of the highly accurate U.S. Climate Reference Network (USCRN) are resulting in reduced uncertainty in the U.S. average measures of surface air temperature and precipitation.

Measure 6a: Assess and Model Carbon Sources and Sinks Throughout the United States

	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	Establish five new pilot atmospheric profiling sites and four new oceanic carbon tracks.	Reduce uncertainty of atmospheric estimates of U.S. carbon balance to +/– 50%.
Actual			Identified five pilot carbon profiling sites and four new oceanic carbon tracks.	Established five pilot atmospheric profiling sites. Established one oceanic carbon track; identified two additional oceanic carbon tracks.
Met/Not Met			Not Met	Not Met

Explanation of Measure

Carbon dioxide is the most important of the greenhouse gases that are undergoing change due to human activity. On average, about one half of all the carbon dioxide emitted by human activity is taken up by the oceans and the terrestrial biosphere (trees, plants, and soils). These reservoirs of carbon are known as carbon "sinks." However, the variation in the uptake from year to year is very large and not understood. A large portion of the variability is believed to be related to the terrestrial biosphere in the Northern Hemisphere, and quite likely North America itself. NOAA needs to understand the source of this variability if it is to provide scientific guidance to policymakers who are concerned with managing emissions and sequestration of carbon dioxide. This can only be done by making regional-scale measurements of the vertical profile of carbon dioxide across the United States, which, combined with improved transport models, can be used to determine carbon dioxide sources and sinks on a regional (about 600 mile) scale. This will provide a powerful tool to gauge the effectiveness of carbon management and enhanced sequestration efforts.

This performance measure will reduce the uncertainties in climate projections and depends on major advances in understanding and modeling radiative forcings (atmospheric concentrations and radiative roles of greenhouse gases and aerosols) and climate feedback mechanisms. In addition, these data will provide the advanced climate-modeling community with the capability to project future climate under a range of potential scenarios.

This measure also ensures a long-term climate observing system that provides an observational foundation to evaluate climate variability and change, and provides the mechanism to support policy and management decisions related to climate variability and change at national and regional scales.

FY 2003 Performance

Reducing the uncertainty of atmospheric estimates of the U.S. carbon balance to +/– 50 percent is a long-term target and not expected to be achieved until after the full network of 36 stations has been established and monitored. The current goal for achieving this target is FY 2007.

Establishment of the five pilot atmospheric profiling sites, planned for FY 2002, was delayed until FY 2003 due to receipt of funds late in the fiscal year. These five sites are not yet operational.

One oceanic carbon track is in operation from Los Angeles to New Zealand. Two others have been identified: (1) from New Zealand to South America, and (2) from New York to Cape Town.

Measure 6b: Assess and Model Carbon Sources and Sinks Globally

	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	Establish three new global background sites as part of the Global Flask Network.[1]	Complete a working prototype of a coupled carbon-climate model.
Actual			Established three new global background sites as part of the Global Flask Network.[1]	Completed a model that can look at effects of climate change on particular carbon sinks with feedback to the atmosphere.
Met/Not Met			Met	Met

[1] *The Global Flask Network is an observational network of monitoring stations with headquarters in Boulder, Colorado.*

Explanation of Measure

The research community is moving toward monthly mean maps, but it is hampered by data that are not at the appropriate temporal resolution. In addition, carbon models are only partially coupled to computer models that account for a changing ocean, atmosphere, and land.

Preliminary work suggests that feedbacks between the land and ocean and the atmospheric carbon dioxide concentration can be strong and result in release of carbon to the atmosphere from the stored pools on land and in the ocean.

Activities planned to assess and model carbon sources and sinks in both the North American and global programs are similar but vary in scale with the North American network having a finer spatial scale. These activities consist of increasing the observing network by establishing new sampling sites, and completing and improving computer models to simulate atmospheric transport of carbon. Both cases will result in more accurate estimates of the atmospheric carbon balance.

The carbon atmospheric observing system over North America has been designed to develop regional (about 600 mile) scale estimates of carbon dioxide sources and sinks, especially within the United States. It requires vertical profiling over terrestrial ecosystems using aircraft and tall towers.

The global atmospheric observing system is designed to determine carbon dioxide sources and sinks for global continental-scale regions and involves additional surface measurements at background (clean air) sites such as coastal regions. The current lack of data results in large variations in carbon source-sink estimates at this scale.

FY 2003 Performance

The NOAA Geophysical Fluid Dynamics Laboratory (GFDL) is currently running atmospheric models coupled to prognostic carbon/land surface models, and is evaluating the results of these simulations. The coupling is fully two-way, in that changes in vegetation can affect evapotranspiration and atmospheric circulation. This is a huge step forward for the laboratory. The laboratory is planning to do runs with this model and a mixed layer ocean, which will be used to calculate "permitted emissions," accounting for changes in the biosphere resulting from changes in carbon dioxide. This meets the target; in this model, changes in climate affect the carbon budget of the terrestrial biosphere, and changes in the carbon budget can affect the atmosphere.

The GFDL also has a prototype ocean biosphere model coupled to an ice-ocean physical model. This model is being tuned and evaluated. This model will also be used to evaluate the ability of the oceans to take up anthropogenic carbon dioxide.

The ultimate goal of this work is a fully coupled atmosphere-ocean-sea ice-biosphere model, which will involve combining the two components that have already been developed. This has not yet been done in part because NOAA is only in the process of settling on a coupled model.

Measure 6c: Determine the Actual Long-term Changes in Temperature and Precipitation Over the United States				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	New	New	Capture more than 60% of true contiguous U.S. temperature trend and capture more than 25% of true contiguous U.S. precipitation trend.	Capture more than 70% of true contiguous U.S. temperature trend and capture more than 40% of true contiguous U.S. precipitation trend.
Actual			Captured more than 85% of true contiguous U.S. temperature trend and captured more than 55% of true contiguous U.S. precipitation trend.	Captured 95% of true contiguous U. S. national annual temperature trend and captured 84% of true contiguous U.S. national annual precipitation trend.
Met/Not Met			Met	Met

Explanation of Measure

This measure is designed to address the significant shortcomings in past and present observing systems by capturing at least 96 percent of the true contiguous U.S. national annual temperature trend and at least 94 percent of the true contiguous U.S. national annual precipitation trend by FY 2006.

Inadequacies in the present observing system increase the level of uncertainty when government and business decisionmakers consider long-range strategic policies and plans. USCRN, a benchmark climate-observing network, will provide the nation with long-term (50–100 years) high quality climate observations and records with minimal time-dependent biases affecting the interpretation of decadal to centennial climate variability and change. The fully deployed network will ensure that NOAA can measure more than 90 percent of the variance in monthly trends of surface air temperature and precipitation at the national level. NOAA will deploy instrument suites in a combination of single and nearby paired sites.

Deployment of USCRN is continuing, with stations added over the next several years. However, due to funding limitations, the full implementation has been scaled back to ensure that funds are allocated to maintain the operational performance of the network and that the quality of the data are the highest possible, given the current state of technologies. While national trends will still be captured, as noted in the performance measure, the smaller sized network will not be able to achieve the level of monitoring and evaluation of climate variations and trends at the regional scale.

FY 2003 Performance

The intended target for this performance measure was achieved in FY 2003. A total of 43 stations were operational across the contiguous United States and two in Alaska by the end of fiscal year 2003. These stations collectively account for approximately 95 percent of the explained variance in the true contiguous U.S. national annual surface air temperature time series and 84 percent in the true contiguous U.S. national annual precipitation time series. This exceeds the FY 2003 targets of 70 percent and 40 percent, respectively.

Program Evaluation

NOAA's programs are routinely evaluated by a variety of outside reviewers. The NOAA Science Advisory Board, made up of private sector, university, and other federal agency scientists, provides input on climate and air quality research. NOAA's Office of Global Programs, funded in OAR's Climate and Global Change research line item, receives review from international science agencies, universities, and private sector scientists, as well as the National Research Council and the National Science Foundation. The NOAA Research Laboratories are reviewed on a regular basis. The Sea Grant Colleges are visited at least every two years by a review panel.

Performance Goal 7: Promote Safe Navigation

Corresponding Strategic Goal

Strategic Goal 3: Observe, protect, and manage the Earth's resources to promote environmental stewardship.

Rationale for Performance Goal

NOAA serves commercial and recreational mariners by providing these customers with nautical charts, tides and currents data, and geographic positioning data for safe navigation. Geodetic services are vital to the mapping and surveying industry nationwide because they provide integrity to geographic coordinates obtained from global positioning system (GPS) signals for accurate positioning in support of numerous applications, including land surveying, navigation, mapping, and infrastructure development such as 911 emergency response and scientific applications. Shoreline data and real-time tides and currents information also serve the coastal resource management and oil spill and disaster response communities. NOAA continues to explore innovative ways to modernize its services in a cost-efficient manner to meet customer needs.

FY 2003 Performance

Several offices within NOAA contributed to the Promote Safe Navigation Goal in FY 2003. NOAA produced 120 new ENCs for the year, and now maintains a suite of 335 ENCs. Built to international standards, NOAA ENCs are an accurate and detailed chart database that can be displayed on electronic charting systems aboard ships. In partnership with local sponsors, NOAA dedicated one new PORTS® (Physical Oceanographic Real-Time System)—in Delaware Bay– bringing the total number of PORTS® to ten. PORTS® supports safe and cost-efficient navigation by providing shipmasters and pilots with accurate real-time information required to avoid groundings and collisions. NOAA's second real-time nowcast/forecast model system for water levels and currents was implemented for the Port of New York and New Jersey. NYOFS was created by NOAA/NOS to provide the maritime community with improved predictions of water level in the New York Harbor. NYOFS provides hourly nowcasts and four-times-daily forecasts of total water level and current velocity in the Harbor to be used by the commercial and recreational maritime community. NYOFS nowcasts and forecasts will provide an increased margin of safety and maximize the efficiency of maritime commerce throughout the harbor. In the aftermath of Hurricane Isabel, NOAA responded to requests from the U.S Coast Guard and Army Corps of Engineers by conducting side-scan sonar surveys designed to detect submerged obstructions in intercoastal waterways and ports. The aim was to determine whether storm-related shoaling reduced water depth or caused other threats. Verifying that the bottom was clear of obstructions ensured timely resumption of safe navigation. NOAA also delivered over 1,000 digital images of the damage caused by Isabel to FEMA and the state of North Carolina within 24 hours of landfall. These images supported the damage assessment and reconstruction efforts conducted by several local, state, and federal agencies.

Measure 7a: Reduce the Hydrographic Survey Backlog Within Navigationally Significant Areas (in Square Nautical Miles [SNM] Surveyed Per Year)				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	1,550	1,505	1,602	2,100
Actual	1,557	2,963	1,514	1,762
Met/Not Met	Met	Met	Not Met	Not Met

Explanation of Measure

This measure replaces the measure "Reduce the Hydrographic Survey Backlog (Square Nautical Miles) for Critical Navigation Areas (Cumulative Percentage)," reflecting the recommendation made by OIG Audit Report No. FSD-14998-3-001 dated February 2003.

NOAA conducts hydrographic surveys to determine the depths and configurations of the bottoms of water bodies, primarily for U.S. waters significant for navigation. This activity includes the detection, location, and identification of wrecks and obstructions with side scan and multi-beam sonar technology and GPS. NOAA uses the data to produce traditional paper, raster and ENCs for safe and efficient navigation. In addition to the commercial shipping industry, other user communities that benefit include recreational boaters, the commercial fishing industry, port authorities, coastal zone managers, and emergency response planners. Ships traversing our coastal waters rely on charts based on sounding data that are more than 50 years old in many places. In 1994, NOAA identified approximately 537,000 snm of the U.S. Exclusive Economic Zone as navigationally significant and in need of resurvey. Since that time, NOAA has focused primarily on surveying and reporting its accomplishments in the highest priority areas, many of which carry heavy commercial traffic, are less than 30 meters deep, and change constantly. However, this critical area constitutes only a small portion (8 percent) of the entire navigationally significant area used by large commercial vessels and recreational boaters. The square nautical miles reported in the table above reflect data collected within all areas designated as navigationally significant. NOAA's surveying activities balance in-house resources with contracts and use the latest full bottom coverage sounding technologies to survey the nation's coastal areas for navigation. NOAA's hydrographic fleet supporting in-house surveying capabilities consist of the NOAA Ship *Rude*, the *Rainer*, and the *Thomas Jefferson*, which replaced the NOAA Ship *Whiting* on July 8, 2003. These assets are supplemented by contracts with the private sector for hydrographic survey data collection. Weather, mechanical failure, and level of surveying difficulty are variables for both NOAA and its contractors, and therefore variances from the targets of +/– 50 snm are to be expected in a normal field season.

FY 2003 Performance

This measure has been revised to reflect the recommendations made by OIG. The new measure is now reported in terms of square nautical miles surveyed per year. Also in response to the OIG recommendations, NOAA has adopted a new method of calculating survey areas. The new method is more precise, but requires additional time to gather the necessary date. As of October 2003, the numbers reported are accurate to within +/– five percent.

NOAA's in-house and contract resources collected a total of 1,762 snm in FY 2003. Of this total, 1,686 fall into the critical backlog category. The remaining 76 snm are in other navigationally significant areas. NOAA's FY 2003 target included the performance of a vessel time charter, which was expected to come online as a new survey asset in FY 2003. Complications with contracting process delayed activation of the time charter until sometime in FY 2004. The rapid assimilation of the NOAA Ship *Thomas Jefferson*, which required significant effort to transfer equipment and personnel from the NOAA Ship *Whiting*, also decreased the expected production in the short term. As a result, NOAA fell short of its performance goal in FY 2003.

In addition to the miles reported in the table above, NOAA vessels surveyed approximately 708 snm of other areas, which are not included within navigationally significant waters. The NOAA Ship *Thomas Jefferson* also verified 1,216 snm (265 navigationally significant; 951 other) of survey data collected by the U.S. Geological Survey. While not planned for by NOAA's Hydrographic Survey Program, or collected with NOAA assets, this data has been verified by the NOAA Ship *Thomas Jefferson*, and has been certified using new quantitative methods to ensure it as meeting NOAA's nautical charting standards.

Measure 7b: Percentage of National Spatial Reference System (NSRS) Completed (Cumulative)

	FY 2000	FY 2001	FY 2002	FY 2003
Target	64%	75%	78%	84%[2]
Actual	71%	75%	83%[1]	84%
Met/Not Met	Met	Met	Met	Met

[1] *This figure was reported as 81 percent in the FY 2002 Performance and Accountability Report (PAR). As a result of the Office of Inspector General (OIG) Audit Report No. FSD-14998-3-001 dated February 2003, the FY 2002 Actual reported previously has been revised to 83 percent in this document.*

[2] *This figure was reported as 82 percent in the FY 2004 Annual Performance Plan (APP).*

Explanation of Measure

This measure was added in FY 2000 to replace the Physical Oceanographic Real Time System measure, which was discontinued due to lack of funding increases in 1999 and 2000. The National Spatial Reference System (NSRS) performance measure is effective because it integrates the different components of the geodesy program (spatial earth measurements) into a product more useful to customers rather than measuring individual components of horizontal and vertical positioning.

In order to meet U.S. navigation and other positioning needs, NOAA is enhancing the NSRS to provide the higher accuracy and accessibility needed for use with the space-based GPS, whose satellites transmit signals that allow determination of position, height, velocity, and time. NSRS, a system of reference stations and monuments across the United States, provides integrity to geographic coordinates obtained from GPS satellite signals for accurate positioning in support of numerous applications, including land surveying, navigation, mapping, and infrastructure development, such as 911 emergency response and scientific applications. New uses for GPS are being found every day, and many of them involve precision heights.

NSRS has evolved over time in response to technological changes, growth in geodetic networks, and changes in ownership/responsibility. The primary technological change was the introduction of GPS and subsequently, the use of GPS for measuring accurate heights.

FY 2003 Performance

In FY 2003 NOAA added 112 new stations to the National Continuously Operating Reference Station (CORS) network, a record annual increase. Ninety-seven percent of the coterminous United States is now within 200 km of a National CORS station. Accurate heights were connected to the North American Vertical Datum of 1988 for 124 National Water Level Observation Network (NWLON) sites, bringing this element of the system to 70 percent completion. This is one element of the vertical component of the NSRS.

The percentage completion of NSRS is equal to the sum of the percentages complete of the horizontal, vertical, and CORS components divided by three or:

((% of Horizontal) + (% of Vertical) + (% of CORS))/3 = ((100%) + (56%) + (97%))/3 = 84%

Discontinued Measure in FY 2003

Reduce the Hydrographic Survey Backlog (Square Nautical Miles [SNM]) for Critical Navigation Areas (Cumulative)				
	FY 2000	FY 2001	FY 2002	FY 2003
Target	24.3%	27.8%	35.0%	38.3%
Actual	24.3%	31.2%	34.3%	Discontinued
Met/Not Met	Met	Met	Not Met	

Explanation of Measure

Based on a recommendation made by OIG Audit Report No. FSD-14998-3-001 dated February 2003, NOAA replaced this measure with "Reduce the Hydrographic Survey Backlog Within Navigationally Significant Areas (in square nautical miles surveyed per year)."

Program Evaluation

NOAA's goal to promote safe navigation is evaluated at a variety of levels, from peer reviews of products, papers, and projects, to internal and external reviews of entire programs and quarterly reviews of NOAA's overall performance in navigation products and services. Constituent input is an important part of the evaluation process and is solicited regularly through constituent workshops.

From 1992 to 1996, a number of National Research Council Marine Board studies examined the nautical charting program and its transition into the digital era. NOAA incorporated study recommendations on areas such as reducing the survey backlog, implementing new digital production techniques, and delivering new electronic chart products to the program. The Hydrographic Services Improvements Act of 1998 provided Congress and NOAA an opportunity to evaluate NOAA's capabilities for acquisition and dissemination of hydrographic data, develop standards and formats for hydrographic services, and contract for the acquisition of hydrographic data. NOAA now contracts out over 50 percent of its annual critical area

hydrographic survey requirements while maintaining federal competence and expertise with existing and developing surveying technologies. A 2001 KPMG Consulting cost analysis of survey platform options supported NOAA's concept of a time charter for continuous survey operations. Pending FY 2003 appropriations, NOAA plans to contract for a time charter to test its effectiveness in real-world applications.

In 1998, Congress authorized the Height Modernization study to evaluate the technical, financial, legal, and economic aspects of modernizing the national height system with GPS. The study demonstrated the significant benefits to the United States in terms of dollars and lives saved associated with GPS technology, and it led to current development of the vertical component of the NSRS. In 1999 NOAA completed an assessment of its tidal currents program to develop guidelines for future current surveys to update U.S. reference stations for the Tidal Current Tables. Finally, the September 1999 Report to Congress that assessed the U.S. Marine Transportation System (MTS) further articulated the need for coordinated federal leadership to achieve the MTS vision of becoming the world's most technologically advanced, safe, efficient, globally competitive, and environmentally responsible system for moving goods and people. NOAA's navigation safety support functions underwent substantial review to identify opportunities for greater integration among federal agencies.

OIG regularly conducts reviews of NOAA programs relating to performance and on occasion provides recommendations. A recent OIG review related to this goal focused on hydrographic survey. The recommendation is reflected in this report.

For this performance goal, the Nautical Charting Program of NOS is being reviewed using OMB's PART. The NOAA Nautical Charting Program is responsible for charting U.S. and territorial waters to the limits of the U.S. Exclusive Economic Zone, an area of 3.4 million snm. The program provides the necessary chart tools to all mariners in U.S. waters for safe navigation. The NOAA nautical charts support the U.S. MTS and the U.S. economy in moving goods efficiently through U.S. coastal waters, ports, and waterways. This program is still under review.

As a result of PART, NOAA's mapping and charting program is developing a new long-term outcome measure. Specifically, NOAA has initiated a project with the U.S. Merchant Marine Academy to analyze U.S. Coast Guard accident data for navigation-related events to determine a baseline and targets for accident reduction via improved utility of NOAA navigational products and services.

NOAA Data Validation and Verification

NOAA's Office of Finance Administration/Budget Office coordinates an annual review of the performance data to ensure that it is complete and accurate. During this process, significant deviations from projected targets, if any, are discussed with the appropriate NOAA line office so that changes or corrections can be made to help meet NOAA's performance goals. The actual validation process is conducted by individual NOAA line offices. The verification aspects depend on individual line office. For oceans and fisheries-related measures, stock assessments and reviews (internal, and/or peer) are common. For weather-related measures, the verification process is, among other things, through comparison of predicted weather to the actual event. For the climate-related measures, verification is through, among other things, quality control of data. Satellite data are compared with on site data to help validate data accuracy.

The NOAA Data Validation and Verification table can be found starting on the following page.

NOAA Data Validation and Verification

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 1a: Reduce number of overfished major stocks of fish from 46 to 35 by FY 2007 **Measure 1b:** Reduce the number of major stocks with an "unknown" stock status to no more than 73 by 2007 **Measure 1c:** Increase the percentage of rebuild plans to rebuild overfished major stocks to sustainable levels	NOAA's National Marine Fisheries Service (NMFS) report to Congress, *Status of Fisheries of the United States*.	Annual	NOAA/NMFS Office of Sustainable Fisheries.	Stock assessments and peer reviews (internal and outside the agency).	None	None
Measure 2a: Number of acres of coastal habitat restored (cumulative)	Primary source is the NOAA Habitat Restoration Program and its core components.	Annual	The NOAA Habitat Restoration Program and its core component parts follow a formal quality assessment and quality control system to ensure that data standards are met. All information meets Data Quality Act standards.	None	None	None
Measure 2b: Reduced introductions and effects of invasive species in a total of six regions within the United States	Office of Oceanic and Atmospheric Research (OAR).	Annual	OAR will collect data, conduct assessments, and store data.	Original research data verified through peer review; OAR obtains quality-controlled data from other sources to ensure criteria are being met for inclusion in performance calculations.	Reaching these targets depends on activities of other federal and state agencies with management responsibilities in this area.	None

NOAA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 2c: Percentage of U.S. shoreline and inland areas that have improved ability to reduce coastal hazard impacts	National Ocean Service (NOS), other federal and state agencies.	Annual	NOS will collect information, conduct assessments, and store data.	All data used in coastal hazard risk assessments are quality controlled; risk assessment models are tested for accuracy and coverage (amount of shoreline covered). Shoreline in the states of NC, SC, AL, RI, OH, and parts of OR and HI were counted under earlier projects, and could potentially be double-counted if a coastal risk atlas is generated for those states.	This measure tracks development and implementation of coastal hazard risk atlases as an indicator of improved ability to identify the extent and severity of coastal hazards. Reaching these targets will depend on the activities of other federal and state agencies with management responsibilities in this area.	None
Measure 3a: Reduce by 10 (from a FY 2000 baseline of 27) by FY 2007, the number of threatened species at risk of extinction **Measure 3b:** Increase the number of commercial fisheries that have insignificant marine mammal mortality **Measure 3c:** Reduce by 11 (from a FY 2000 baseline of 29) by FY 2007, the number of endangered species at risk of extinction	NMFS	Annual	NMFS's Office of Protected Resources.	Audits and internal peer review within NOAA and external peer review by regional fishery councils, the National Science Foundation, the National Academy of Science, and other organizations.	None	None

NOAA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 4a: Lead time (minutes), accuracy (%), and false alarm rate (FAR) (%) for severe weather warnings for tornadoes	National Weather Service (NWS) field offices.	Monthly	NWS headquarters and the Office of Climate, Water, and Weather Services (OCWWS).	Verification is the process of comparing the predicted weather to the actual event. The process begins with the collection of warnings from every NWS office across the nation. The severe weather event program includes extensive quality control procedures to ensure the highest reliability of each report. The data in each report are entered into a database that contains severe weather warnings where the warnings and events are matched and appropriate statistics are calculated and made available to all echelons of the NWS.	There are limitations of scientific verification in assessing data. The fundamental purpose of scientific verification is to objectively assess program performance through the use of standard statistical analysis. However, a number of factors unique to the atmospheric sciences must be considered to ensure proper interpretation of objectively derived statistics. The primary factor to consider is the natural variation of this performance measure related to annual fluctuations in meteorological conditions associated with severe weather.	Review the storm data from individual events to pinpoint the causes and take corrective actions.
Measure 4b: Lead time (minutes) and accuracy (%) for severe weather warnings for flash floods	NWS field offices.	Monthly	NWS headquarters and OCWWS.	Verification is the process of comparing the predicted weather to the actual event. The process begins with the collection of warnings from every NWS office across the nation. The severe weather event program includes extensive quality control procedures to ensure the highest reliability of each report. The data in each report are entered into a database that contains severe weather warnings where the warnings and events are matched and appropriate statistics are calculated and made available to all echelons of the NWS.	There are limitations of scientific verification in assessing data. The fundamental purpose of scientific verification is to objectively assess program performance through the use of standard statistical analysis. However, a number of factors unique to the atmospheric sciences must be considered to ensure proper interpretation of objectively derived statistics. The primary factor to consider is the natural variation of this performance measure related to annual fluctuations in meteorological conditions associated with severe weather.	NOAA will continue to collect data while reporting additional measures in the future.

NOAA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 4c: Accuracy of hurricane track forecasts (48 hours)	NWS/Tropical Prediction Center (TPC).	Annual	TPC	Hurricane storm verification is performed for hurricanes, tropical storms, and tropical depressions regardless of whether these systems are over land or water. The TPC issues track and intensity forecast throughout the life of a hurricane. The actual track and intensity are verified through surface and aircraft measurements. NOAA calculates the average accuracy of the TPC track and intensity forecasts for the Atlantic basin at the end of each hurricane season.	Verification of actual track and intensity versus forecast is very accurate. However, actual annual scores vary up to 20 percent in some years due to the type and location of the hurricane events. Some types of systems can be more accurate forecasted than others. For example, hurricanes that begin in the northern sections of the hurricane formation zone tend to be much harder to accurately forecast. Outyear measures depend on a stable funding profile and take into account improved use of the Weather Service Radar (WSR-88D), new satellites, improved forecast models, new and continued research activities of the U.S. Weather Research Program (USWRP), and investments in critical observing systems.	NOAA will report on the tracking of forecasts at 24-, 48-, and 72-hour intervals.
Measure 4d: Accuracy (percent) (threat score) of day–1 precipitation forecasts	The Hydrometeorological Prediction Center (HPC).	Annual	World Weather Building.	HPC has produced the Quantitative Precipitation Forecast since the early 1960s and has kept verification statistics related to the Quantitative Precipitation Forecast program since that time. All data are examined for accuracy and quality control procedures are applied.	The NWS routinely prepares and distributes to internal and external customers predictions of heavy rainfall. HPC has the responsibility to prepare both graphical and text products depicting the areas threatened by heavy precipitation in the contiguous United States. There will be a significant amount of variability, and the improvements may not be achieved exactly as predicted. Outyear measures depend on a stable funding profile and take into account improved use of the WSR-88D, new satellites, improved forecast models, new and continued research activities of the USWRP, investments in critical observing systems, and continued support of the Advanced Weather Interactive Processing System (AWIPS).	NOAA will implement planned weather model improvements along with ongoing research projects.

NOAA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 4e: Lead time (hours) and accuracy (%) of winter storm warnings	NWS field offices.	Daily	NWS headquarters and OCWWS.	Verification is the process of comparing the predicted weather with the actual event. The process begins with the collection of forecasts and observations from each NWS office across the nation. The quality-controlled, collated data are transmitted to the National Centers for Environmental Prediction in Camp Springs, Maryland, where the data are stored as computer files. The data files are retrieved by the NWS headquarters' Office of Science and Technology. Following additional quality control the data are stored on an Office of Science and Technology workstation and used to generate semi-annual statistics on forecast accuracy.	Documentation for heavy snowfall is printed annually. Due to the relatively few number of cases each year, the projections assume a three-year average (current plus two previous years, all equally weighted). Due to the large volume of data gathered and computed, a document for lead time and accuracy of winter storm warnings cannot be finalized until well into the following fiscal year. Outyear measures depend on a stable funding profile and take into account improved use of the WSR-88D, new satellites, improved forecast models, new and continued research activities of the USWRP, investments in critical observing systems, and continued support of AWIPS.	Introduce high-resolution regional models.
Measure 4f: Accuracy (%) and FAR (%) of forecasts of ceiling and visibility (aviation forecasts)	NWS field offices.	Daily	NWS headquarters and OCWWS.	Verification is the process of comparing the predicted weather with the actual event. The process begins with the collection of forecasts and observations from each NWS office across the nation. The quality-controlled, collated data are transmitted to the National Centers for Environmental Prediction in Camp Springs, Maryland, where the data are stored as computer files. The data files are retrieved by the NWS headquarters' Office of Science and Technology. Following additional quality control the data are stored on an Office of Science and Technology workstation and used to generate semi-annual statistics on forecast accuracy.	Due to the large volume of data gathered and computed, documentation for this measure cannot be finalized until well into the following fiscal year. Outyear measures depend on a stable funding profile and take into account improved use of the WSR-88D, new satellites, improved forecast models, new and continued research activities of the USWRP, investments in critical observing systems, and implementation of AWIPS.	NOAA will improve and expand its training program and work with the National Aeronautics and Space Administration and the Federal Aviation Administration to develop new software tools and forecast techniques.

NOAA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 4g: Accuracy (%) of forecast for winds and waves (marine forecasts)	NWS field offices.	Daily	The NWS and the National Centers for Environmental Prediction's Ocean Modeling Branch.	Verification is the process of comparing the predicted weather with the actual event. The process begins with the collection of forecasts and observations from each NWS office across the nation. The quality-controlled, collated data are transmitted to the National Centers for Environmental Prediction, where they are stored as computer files. The data files are retrieved by the NWS, and the National Centers for Environmental Protection's Ocean Modeling Branch. Following additional quality control the data are used to generate quarterly statistics on forecast accuracy.	Due to the large volume of data gathered and computed, documentation for the accuracy of forecast for wind and waves cannot be finalized until well into the following fiscal year. Outyear measures depend on a stable funding profile and take into account improved use of the WSR-88D, new satellites, improved forecast models, new and continued research activities of the USWRP, investments in critical observing systems, and implementation of AWIPS.	NOAA will deploy enhanced versions of AWIPS (Build 5), implement new wave forecast models, and improve communication and dissemination techniques to marine users.
Measure 5a: U.S. temperature — skill score	Forecast data, observations from U.S. Weather Forecast Offices, and from a cooperative network maintained by volunteers across the nation.	Annual	NWS's National Centers for Environmental Prediction.	NOAA performs quality assurance analysis of the data (for example, error checking, elimination of duplicates, and interstation comparison) both at the national and U.S. Weather Forecast Office level.	Given the difficulty of making advance temperature and precipitation forecasts for specific locations, a skill score of 20 is considered quite good and means the forecast was correct in almost 50 percent of the locations forecasted. Forecasts will likely be better in El Niño years than in non-El Niño years.	None
Measure 5b: New climate observations introduced	Observations from data buoys, ships, satellites, and so on.	Annual	OAR laboratories, National Environmental Satellite, Data, and Information Service (NESDIS), and NOAA National Climatic Data Center (NCDC)	NOAA performs quality assurance analysis and data processing.	Percentages of observing platforms operational at a given time and analyses of data quality and errors; observations received in time to be incorporated in operational climate analyses and forecasts.	None

NOAA Data Validation and Verification *(cont.)*

Performance Measure	Data Source	Frequency	Data Storage	Verification	Data Limitations	Actions to be Taken
Measure 6a: Assess and model carbon sources and sinks throughout the United States	Observations from atmospheric profiling sites in North America and shipboard ocean carbon sampling.	Annual	Climate Monitoring and Diagnostics Laboratory.	Quality assurance and calibration against known standards performed by NOAA.	Number of profiling/ocean sites and our ability to incorporate these data into advanced carbon models.	None
Measure 6b: Assess and model carbon sources and sinks globally	Flask samples taken from a global network and analyzed by NOAA.	Annual	Climate Monitoring and Diagnostics Laboratory.	Quality assurance and calibration against known standards performed by NOAA.	Number of flask sites and our ability to incorporate these data into advanced carbon models.	None
Measure 6c: Determine the Actual Long-term Changes in Temperature and Precipitation Over the United States	NCDC	Annual	NCDC	Monte Carlo simulations based on operation stations.	None	None
Measure 7a: Reduce the hydrographic survey backlog within navigationally significant areas (in square nautical miles [snm] surveyed per year)	Progress reports on data collected from hydrographic survey platforms.	Annual	NOS will store data and publish nautical charts.	NOS applies established verification and validation methods.	Progress in reducing the backlog is measured against a baseline value of 43,000 snm as determined in 1994. Weather can affect scheduled surveys.	None
Measure 7b: Percentage of National Spatial Reference System (NSRS) completed (cumulative)	NOS and the National Geodetic Survey define and manage NSRS, the foundation for the nation's spatial data infrastructure.	Ongoing, annual reporting.	Automated database at NOS.	NOS applies standard verification and validation methods.	Weather conditions, security, employment, and funding issues can affect field operations. The National Geodetic Survey also works cooperatively with state organizations; accommodating partners can also impact activities to some extent.	None