

GAO

Report to the Chairman, Committee on
Finance, U.S. Senate

June 2006

NOAA

Next Steps to
Strengthen Its
Acquisition Function





Highlights of [GAO-06-594](#), a report to the Chairman, Committee on Finance, U.S. Senate

Why GAO Did This Study

The National Oceanic and Atmospheric Administration (NOAA) accounts for about half of the Department of Commerce's (Commerce) acquisition spending, over \$851 million in fiscal year 2005 alone. In recent years however, NOAA has experienced instances of poor contract management.

GAO was asked to determine if NOAA is positioned to effectively carry out its acquisition function. Specifically, GAO assessed the extent to which NOAA has structured an acquisition organization that provides appropriate oversight; established policies and processes that promote, among other things, a knowledge-based acquisition process for development and production of complex systems; and planned and managed its contracting workforce to address future retirement challenges.

What GAO Recommends

GAO recommends establishment of policies for using a knowledge-based approach for complex developmental acquisitions and other actions to strengthen oversight of NOAA contracting activities and build capacity of NOAA's contracting workforce to address the agency's retirement challenges. After reviewing a draft of this report, Commerce concurred with our findings and recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-06-594.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Lisa Shames, 202-512-4841, shamesl@gao.gov.

NOAA

Next Steps to Strengthen Its Acquisition Function

What GAO Found

NOAA has yet to structure all of its field acquisition activities under the direct oversight of its acquisition organization, increasing the risk that taxpayers are not getting the best value for their dollars. To improve oversight of its acquisition function, NOAA reorganized in 2005 by having all acquisition divisions report to the NOAA Director of Acquisition and Grants. However, NOAA's acquisition director still lacks direct line authority to oversee a National Weather Service field office that is responsible for one of the agency's contracts worth up to half a billion dollars. Also, without appropriate oversight from the acquisition organization, collateral duty field staff who are not career contracting officers have bought millions of dollars in goods and services. Our work has shown that a well-functioning acquisition organization has direct lines of oversight between the head of acquisition and various components to help enforce policies that enable efficient and effective contract spending.

Although NOAA has established clear and consistent policies for some key areas, such as advance acquisition planning, the agency lacks a knowledge-based process for developing and producing complex systems—a situation that can increase the risk of cost increases and schedule delays. NOAA is missing key elements that promote successful outcomes for complex developmental systems because it must adhere to Commerce's acquisition policies that do not support a knowledge-based approach. Without such an approach, the multibillion-dollar satellite investment that NOAA is in the early stages of acquiring is at a higher risk of not meeting program requirements.

NOAA has yet to focus on succession planning and management for its contracting workforce, although the agency is pursuing hiring flexibilities to recruit new contracting employees in anticipation of an impending wave of retirements. NOAA is facing a human capital challenge because of its aging contracting workforce and has reported that about 43 percent of contracting employees are now eligible to retire or will be eligible to retire by 2009. While senior acquisition managers are concerned with the loss of a high percentage of their contracting staff to retirement and other attrition, NOAA has not specifically addressed such contracting workforce challenges in its strategic human capital plan. Also, it is unclear whether human capital planning under way by Commerce will determine the gaps in numbers and skills in the contracting workforce. Unless the future retirement and workforce capacity challenges are strategically addressed, NOAA could soon lose a significant portion of its contracting knowledge base.

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Abbreviations

CPDF	Central Personnel Data File
GOES-R	Geostationary Operational Environmental Satellite
GS	general series
NOAA	National Oceanic and Atmospheric Administration
OPM	Office of Personnel Management

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United States Government Accountability Office
Washington, DC 20548

June 7, 2006

The Honorable Charles E. Grassley
Chairman
Committee on Finance
United States Senate

Dear Mr. Chairman:

The National Oceanic and Atmospheric Administration (NOAA) is one of the largest agencies within the Department of Commerce (Commerce) and accounts for 45 percent of the department's dollars spent on acquisition. In fiscal year 2005 alone, NOAA's acquisition organization contracted for over \$851 million in goods and services in support of the agency's mission. NOAA's mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet the nation's economic, social, and environmental needs. To accomplish this mission, NOAA acquires goods including ships, satellites, aircraft, and high-performance computers as well as services such as hydrographic surveys, fisheries analyses, and buoy maintenance. For the first time, NOAA is managing an expected \$6.2 billion acquisition investment for developing a complex geostationary environmental satellite.

NOAA relies more and more on contractor support to conduct its mission-critical work. However, in recent years, NOAA has experienced instances of poor contract management that prompted the Commerce Inspector General to designate management of Commerce's acquisition processes as one of the top 10 departmental management challenges. The Commerce Inspector General identified a lack of effective oversight and management controls over acquisition processes as a contributing factor to the poor contract management.

In response to your request, we examined whether NOAA is positioned to effectively carry out its acquisition function. Specifically, we assessed the extent to which NOAA has (1) structured an acquisition organization that provides appropriate oversight; (2) established clear and consistent acquisition policies and processes that promote, among other things, a knowledge-based acquisition process for development and production of complex systems; and (3) planned and managed its contracting workforce

to address future retirement challenges. See appendix I for additional details on scope and methodology.

To conduct this work, we assessed information from NOAA headquarters and acquisition divisions and compared this information against what our previous work has shown to be best acquisition practices. We reviewed agency directives, memorandums, and other documentation; interviewed agency officials; and analyzed agency systems and processes. We conducted our review from August 2005 to April 2006 in accordance with generally accepted government auditing standards.

Results in Brief

NOAA has yet to structure all of its field acquisition activities under the direct oversight of its acquisition organization, increasing the risk that taxpayers are not getting the best value for their dollars. To improve oversight over its acquisition function, NOAA reorganized its acquisition divisions nationwide under the single authority of a headquarters office, headed by the Director of Acquisition and Grants. Yet NOAA's acquisition director still lacks direct line authority to oversee the National Data Buoy Center, which is responsible for one of the agency's largest contracts—worth up to half a billion dollars. In addition, field staff who are not contracting officers but whose collateral responsibility is to acquire millions of dollars in goods and services annually manage contract actions without appropriate oversight from the acquisition organization. Our best practices work has shown that a well-functioning acquisition organization has direct lines of authority and oversight between the head of acquisition and various components of the organization in order to enforce acquisition policies effectively.

Although NOAA has established clear and consistent acquisition policies and processes in some key areas such as advance acquisition planning, the agency still lacks a knowledge-based acquisition process for development and production of complex systems. NOAA acquires a number of high-cost systems and is in the early acquisition stages of developing a new multibillion-dollar geostationary environmental satellite. However, it must adhere to Commerce's policies for development and production of major systems and does not support a knowledge-based approach to acquiring such complex developmental systems. Senior Commerce and NOAA officials believe that NOAA program managers remain uncertain about the information they must provide to senior leaders for each key decision point. We have found that a knowledge-based approach enables program managers to be reasonably certain, at critical junctures, or "knowledge points," in the acquisition life cycle, that complex developmental systems

are likely to meet established cost, schedule, and performance targets, and therefore they will be able to provide senior leaders with information needed to make sound investment decisions.

NOAA has yet to focus on succession planning and management for its contracting workforce, although recognition of an impending wave of retirements prompted the agency to obtain approval to use more flexible direct hire authority to recruit new contracting employees. NOAA is facing a human capital challenge because of its aging contracting workforce and could soon lose a significant portion of its contracting knowledge base. For example, almost 52 percent of its contracting specialists are more than 49 years old, and 66 percent have served at least 20 years with the agency. Senior NOAA acquisition managers expressed concern about the looming retirements and other attrition of a high percentage of the contracting workforce. However, while NOAA completed a strategic human capital plan to help ensure it has the expertise necessary to achieve its mission, the plan does not address potential gaps in the agency's contracting workforce. Also, while Commerce's acquisition management office is developing a human capital plan to address challenges facing the contracting workforce, it is too early to determine if it will address the gaps in numbers and skills.

We are making a recommendation to the Secretary of Commerce to incorporate a knowledge-based approach for complex developmental systems in revising the department's acquisition policies and processes. We are also recommending that the Under Secretary of Commerce for Oceans and Atmosphere (1) take the necessary steps to provide oversight authority for NOAA's acquisition director over field acquisition activities and (2) conduct an assessment of the contracting workforce needed to help achieve NOAA's mission-critical work. After reviewing a draft of this report, Commerce concurred with our findings and recommendations. The full text of Commerce's comments may be found in appendix III.

Background

The NOAA acquisition function is carried out by the headquarters acquisition office, headed by the Director of Acquisition and Grants, as well as 10 divisions, of which 6 are located at NOAA headquarters in Silver Spring, Maryland, and 4 in regions throughout the country (see table 1). In 2005, NOAA employed 123 contracting and acquisition support staff in its acquisition function across headquarters and regional locations.

Table 1: NOAA's Acquisition Divisions and Locations

Acquisition division	Location
National Environmental Satellite, Data, and Information Service	Silver Spring, Md.
National Ocean Service/National Marine Fisheries Service/Oceanic and Atmospheric Research	Silver Spring, Md.
National Weather Service	Silver Spring, Md.
Staff Offices and External Clients	Silver Spring, Md.
High Performance Computing	Silver Spring, Md.
Satellite Program	Silver Spring, Md.
Eastern Region	Norfolk, Va.
Central Region	Kansas City, Mo.
Mountain Region	Boulder, Colo.
Western Region	Seattle, Wash.

Source: NOAA.

NOAA's acquisition function also provides procurement services to several other Commerce components, including the International Trade Administration, the Bureau of Economic Analysis, and the Economic Development Administration. In fiscal year 2005, NOAA administered over 15,000 contract actions with total awards over \$851 million.

In recent years, NOAA has experienced problems in acquiring goods and services. For example, NOAA's inadequate negotiations and oversight, and lack of proper review, led the National Weather Service to pay for defective equipment and execute a contract modification without adequate negotiation for the transition power source for a high-resolution Doppler weather radar system jointly designed, acquired, and operated by Commerce, the Department of Defense, and the Department of Transportation.¹ As a result, contract costs increased by approximately \$4.5 million. Similarly, the Commerce Inspector General reported that NOAA had insufficient management controls to ensure adequate oversight

¹Department of Commerce Inspector General, *National Oceanic and Atmospheric Administration: Acquisition of NEXRAD Transition Power Source Marred by Management, Technical, and Contractual Problems*, Final Inspection Report OSE-15676 (Washington, D.C.: September 2003).

of the procurement of over \$65 million in new fisheries research vessels.² For example, NOAA did not have the information required to effectively monitor the schedule and cost of the vessels and failed to implement an effective award fee plan on a timely basis to encourage superior performance by the contractor.

NOAA Lacks Oversight of Some Field Acquisition Activities

Although NOAA has taken some actions, the agency has yet to structure all of its field acquisition activities under the appropriate oversight of its acquisition organization, increasing the risk that taxpayers are not getting best value for their dollars. After the Commerce Inspector General criticized the lack of effective oversight and management controls over acquisition processes, NOAA changed the structure of its acquisition organization in 2005 to have acquisition divisions report to the Director of Acquisition and Grants. Yet the acquisition director lacks direct line authority over a field acquisition office in Mississippi. In addition, some NOAA field operations rely on staff who are not career contracting officers but whose collateral responsibilities are to procure goods and services without appropriate oversight from the acquisition organization. Our work has shown that a well-functioning acquisition organization has direct lines of oversight between the head of acquisition and various components of the organization to help enforce acquisition policies that enable the agency to get the best value on goods and services.³

Acquisition Office Reorganization Was Not Comprehensive

In some respects, NOAA's reorganization has fallen short in providing comprehensive authority to the NOAA acquisition director to provide appropriate oversight to field acquisition activities. After the Commerce Inspector General faulted NOAA's contracting oversight, in an effort to better ensure oversight and management of acquisition across the agency, NOAA established an Acquisition and Grants Office in headquarters in 2005. The reorganization elevated the office, formerly part of the NOAA Office of Finance and Administration, as a new staff office reporting

²Department of Commerce Inspector General, *National Oceanic and Atmospheric Administration: Program for Acquiring Fisheries Research Vessels Needs Stronger Management Controls*, Final Inspection Report STD-14428-2-0001 (Washington, D.C.: June 2002).

³GAO, *Homeland Security: Successes and Challenges in DHS's Efforts to Create an Effective Acquisition Organization*, [GAO-05-179](#) (Washington, D.C.: Mar. 29, 2005), and *Transportation Security Administration: High-Level Attention Needed to Strengthen Acquisition Function*, [GAO-04-544](#) (Washington, D.C.: May 28, 2004).

directly to the Deputy Under Secretary for Oceans and Atmosphere. Also, the NOAA regional acquisition divisions—which previously were separate entities reporting to the directors of the regional service centers in which they were located—all now report directly to the Director of the Acquisition and Grants Office as part of the reorganization. By elevating its acquisition office to a level that reports directly to an Under Secretary and having the divisions as direct reports to the acquisition director, NOAA has positioned itself to appropriately oversee agencywide acquisition activities and enforce acquisition policies.

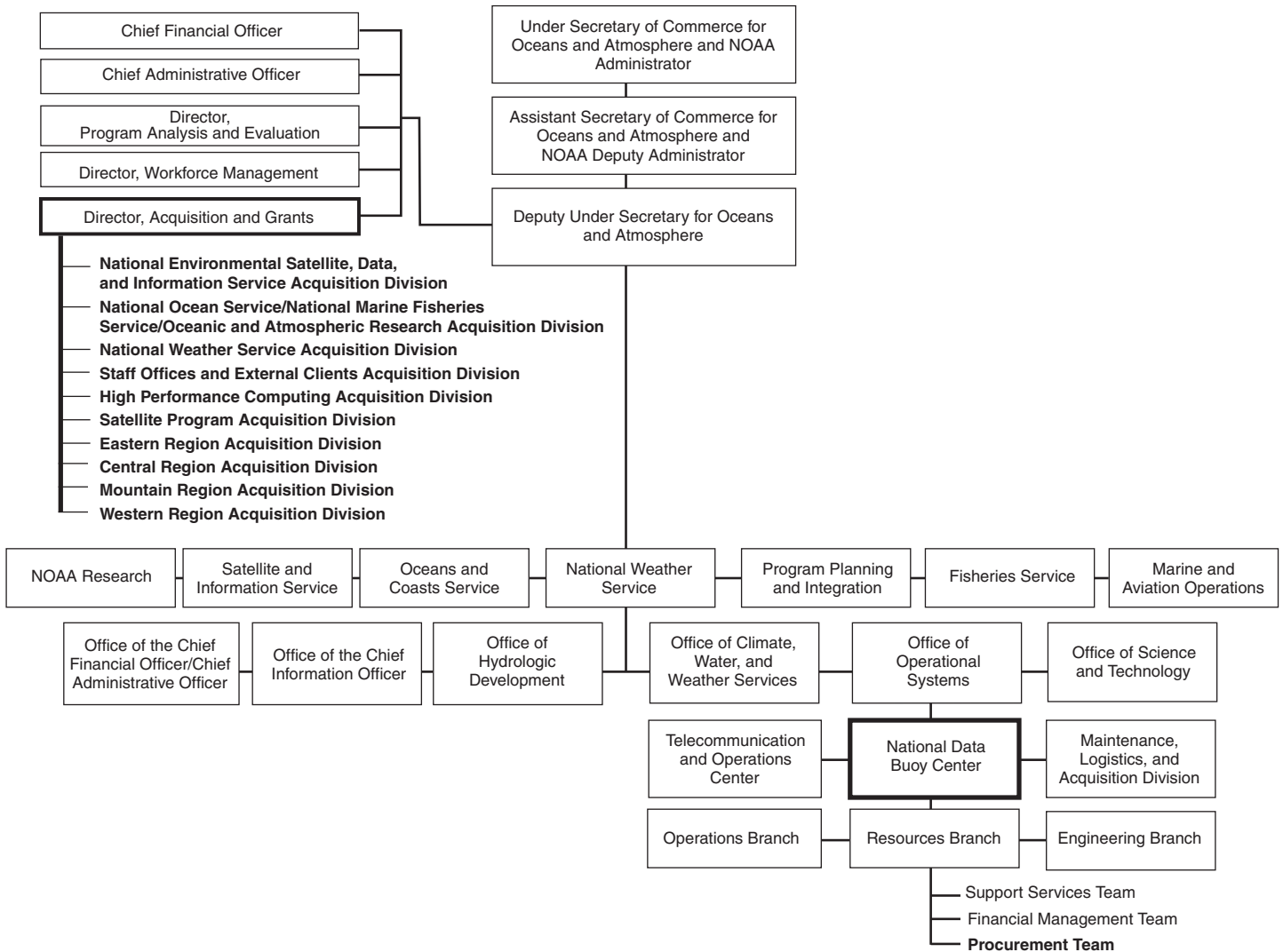
However, the reorganization was not comprehensive because it did not include the National Weather Service’s National Data Buoy Center acquisition office at the Stennis Space Center, Mississippi. Specifically, the Buoy Center does not report to the NOAA acquisition director (see fig. 1), even though this acquisition office is responsible for administering multiple contracts, including one of NOAA’s largest contracts, worth up to \$500 million.⁴ While contracting officers in the Buoy Center acquisition office derive their contracting authority from headquarters, they report through the Buoy Center chain of command, not to NOAA’s acquisition director.

This reporting relationship was first established more than 20 years ago in a Commerce appropriation act,⁵ which created the Buoy Center acquisition office, and was stipulated in each subsequent appropriations act through 1988, but not since. During the recent reorganization, NOAA officials believed these laws prohibited NOAA from changing the reporting relationship to one where the Buoy Center acquisition office would report directly to the NOAA Acquisition and Grants Office. However, an analysis by our general counsel found no law requiring the Buoy Center acquisition office to report to the Director of the Buoy Center or prohibiting NOAA from making this change. Commerce’s General Counsel agreed with our assessment. Although we did not identify any inefficiencies resulting from this current reporting relationship, we believe NOAA runs the risk of poor outcomes of contracts.

⁴In 2005, the National Data Buoy Center awarded a 10-year (5-year base with 5 option years) technical services contract to provide life cycle support for NOAA’s Marine Observation Network; other buoy programs, including the network of Deep Ocean Assessment and Reporting of Tsunami stations; and its Data Assembly Center.

⁵Department of Commerce and Related Agencies Appropriation Act, 1984, Pub. L. No. 98-166, November 28, 1983.

Figure 1: Organizational Placement of NOAA Acquisition Function



Source: NOAA.

NOAA Relies on Staff Who Have Collateral Contracting Responsibilities

Certain NOAA field offices rely on “collateral duty” contracting officers who perform contracting duties in addition to their mission-related responsibilities but who are not career contracting officers. In these locations, collateral duty contracting officers have authority to make individual purchases of up to \$25,000 for such day-to-day needs as provisions for ships. While NOAA relies on collateral duty contracting staff for a relatively small share of total agency procurement spending, these staff administered about 6,400 contract actions worth over \$36 million alone in fiscal year 2005.

NOAA’s acquisition director as well as senior field division contracting officers expressed concern about how well they can monitor the actions by staff with collateral duty contracting responsibilities to ensure that they follow NOAA acquisition policies. For example, unlike with their own contracting staff, some NOAA regional acquisition divisions provide only sporadic oversight over collateral duty contracting officers through occasional audits, either performed in person or through contract file samples sent by these staff for review. One regional acquisition division is only able to audit work by staff with collateral contracting responsibilities once every 2 to 3 years. NOAA acquisition managers attributed their inability to provide regular oversight to limited time and resources, given other responsibilities.

Our review of contracting weaknesses at a Department of Homeland Security agency found challenges similar to NOAA’s with regard to providing appropriate oversight to collateral duty contracting officers.⁶ In view of such situations, we have found that an agency needs to explore ways of making collateral duty contracting officers in field locations accountable through the acquisition function for the contracting work.

⁶GAO, *Contract Management: INS Contracting Weaknesses Need Attention from the Department of Homeland Security*, [GAO-03-799](#) (Washington, D.C.: July 25, 2003).

Advances in Day-to-Day Acquisition Policies Not Matched in Policies for Complex Developmental Systems

Although NOAA has established clear and consistent acquisition policies and processes for day-to-day acquisitions of goods and services, the agency lacks a knowledge-based acquisition process for development and production of complex systems. For example, NOAA has implemented planning processes intended to improve opportunities to achieve savings and reduce administrative burden in acquiring goods and services. However, NOAA has experienced difficulties in acquiring more complex developmental systems such as lacking sufficient management controls when it acquired its new fisheries research vessels. NOAA is missing key elements that promote successful outcomes because it must adhere to Commerce's acquisition policies that do not promote a knowledge-based approach to acquiring complex developmental systems. Our work has shown that a knowledge-based approach would enable decision makers to be reasonably certain, at critical investment decision junctures in the acquisition life cycle, that the system is likely to meet cost, schedule, and performance targets.

New NOAA Policies and Processes Intended to Improve Acquisition Outcomes

To facilitate effective planning, award, and administration of contracts that help to ensure the best value on goods and services, NOAA recently implemented new policies and processes to guide the agency's acquisition activities. For example, to ensure consistency of the NOAA acquisition process, a new acquisition handbook establishes standard operating procedures, which the agency previously lacked, such as required reviews and approvals, and quality assurance of acquisition activities within the agency. To ensure that contracting employees are adhering to proper procedures, NOAA instituted periodic acquisition management reviews. Under these reviews NOAA's acquisition director (or a senior contracting officer appointed by the director) personally inspects a sample of completed contract files from an acquisition division in order to identify and remedy any systemic problem areas and identify best practices to share with other divisions. In the last few years, reviews in several divisions found a lack of proper contract file management, as required in part 4.8 of the Federal Acquisition Regulation. The acquisition director consequently instructed the division heads to take steps with their staff to correct this problem.

Recognizing that NOAA lacked effective acquisition planning and that this lack was hindering effective workload management, the Acquisition and Grants Office in fiscal year 2005 implemented new advance acquisition planning requirements. For example, all staff offices and programs must develop annual acquisition plans that include acquisitions that are over \$100,000 or expected to result in new contracts. To support these new

planning requirements and provide real-time data, the acquisition office deployed an online strategic acquisition management tool in fall 2005, in which NOAA staff offices and programs enter their annual acquisition plans for the upcoming fiscal year. Although the tool is new and still requires occasional modifications, NOAA officials generally agreed that it provides considerable benefits for the acquisition process to better plan the agency's use of resources and reduce the administrative burden previously experienced with managing unscheduled contracting requirements.

NOAA's Acquisition Process for Development of Complex Systems Lacks a Knowledge-Based Approach

Because of the high dollar value and risk associated with acquiring complex developmental systems, Commerce requires that its subordinate organizations, including NOAA, adhere to departmentwide policy and processes regarding such acquisitions. However, Commerce policies and processes do not promote a knowledge-based approach for acquiring these systems, increasing the risk that Commerce will make decisions to commit the government to major investments without knowing that NOAA's systems can be developed at estimated costs, according to planned schedules, and with expected performance. Commerce officials acknowledged that their acquisition policy for developing major systems is outdated and said they are revising it.⁷ While the current policy identifies key decision points that a program must complete while acquiring a complex developmental system, it still lacks key features of a knowledge-based acquisition framework—specific criteria and metrics—that can be used to measure whether a program is ready to move through each key decision point.

Our work has shown that leading developers in industry and government organizations use a knowledge-based approach to deliver high-quality products on time and within budget. An acquisition policy that requires such a framework for complex developmental systems enables program managers to be reasonably certain, at critical junctures, or knowledge points, in the project's acquisition life cycle, that their products will meet established cost, schedule, and performance targets. Such an acquisition policy also enables program managers to provide senior leaders with the information necessary to make sound project investment decisions for their agencies. Highlights of an acquisition policy that incorporates best

⁷U.S. Department of Commerce, *Major Systems Acquisitions for the Department of Commerce*, Department Administrative Order 208-3 (Washington, D.C.: Dec. 9, 1997).

practices for the development of complex systems include the equivalent of

- Knowledge point 1: Resources and needs match. This point occurs when a match is made between the customer's requirements and the product developer's available resources in terms of knowledge, time, money, and capacity.
- Knowledge point 2: Product design is stable. This point occurs when a program determines that a product's design will meet customer requirements, as well as cost, schedule, and reliability targets.
- Knowledge point 3: Production processes are mature and the design is reliable. This is demonstrated when the product can be manufactured within cost, schedule, and quality targets.

(See app. II for additional information on the knowledge-based acquisition framework for complex developmental systems.)

Having a knowledge-based framework to guide acquisitions of complex developmental systems is especially critical given that NOAA is in the early acquisition stages of developing a geostationary environmental satellite at a projected investment cost of about \$6.2 billion.⁸ According to a Commerce official, in the past NOAA relied on agencies outside of Commerce to acquire such systems, but experienced cost and schedule problems.⁹ To maintain management control over contractor performance, NOAA chose to manage the acquisition of its new satellite—the Geostationary Operational Environmental Satellite (GOES-R), which the agency plans to launch in 2012.

⁸NOAA's geostationary satellites analyze data to detect and track severe weather conditions such as tornadoes, flash floods, hailstorms, and hurricanes. They orbit the earth at a speed matching the earth's rotation, allowing them to hover over one position on the surface.

⁹GAO, *Polar Orbiting Operational Environmental Satellites: Technical Problems, Cost Increases, and Schedule Delays Trigger Need for Difficult Trade-off Decisions*, [GAO-06-249T](#) (Washington, D.C.: Nov. 16, 2005); *Space Acquisitions: Stronger Development Practices and Investment Planning Needed to Address Continuing Problems*, [GAO-05-891T](#) (Washington, D.C.: July 12, 2005); *Polar Orbiting Environmental Satellites: Information on Program Costs and Schedule Changes*, [GAO-04-1054](#) (Washington, D.C.: Sept. 30, 2004); and *Military Space Operations: Common Problems and Their Effects on Satellite and Related Acquisitions*, [GAO-03-825R](#) (Washington, D.C.: June 2, 2003).

Amplifying the need for clear guidance, NOAA officials told us the agency is “feeling its way” through the GOES-R acquisition by relying on existing Commerce and NOAA policies, but also learning from lessons drawn from previous satellite acquisitions at other agencies. According to senior officials directly involved, NOAA was forced to prepare for the most recent key decision point in 2005—authorizing program definition and risk reduction activities in the GOES-R acquisition—with vague guidance from Commerce over what specific criteria and metrics were required for the program to pass through the key decision point.

In order to be ready for the next key decision point, NOAA officials said that clearer guidance from Commerce is needed on the information required. The next key decision point is scheduled for fiscal year 2007 and will commit the agency to development and production of the GOES-R series. Commerce acquisition management officials told us they are briefing NOAA officials and developing a plan for necessary documentation on the requirements for the project’s next key decision point. It remains to be seen whether these steps will provide sufficient clarity not only for what NOAA is expected to do to prepare for the remaining key decision points but also sufficient knowledge to make a well-informed decision on proceeding with the GOES-R acquisition.

NOAA Has Taken Limited Actions to Address Contracting Workforce Retirement Challenges

NOAA is facing a human capital challenge because of its aging contracting workforce, and senior acquisition managers are concerned about the loss of a high percentage of their contracting staff to retirement and other attrition. However, NOAA has yet to focus on succession planning and management for its contracting workforce, even though the agency has approval to use flexible direct hire authority in anticipation of an impending wave of retirements.

NOAA relies on contract specialists and procurement analysts to carry out its acquisition function.¹⁰ However, NOAA’s acquisition director is worried about the near-term retirements of experienced contracting employees. Our analysis of Office of Personnel Management’s (OPM) personnel data for NOAA confirms there is cause for this sense of urgency, given that almost 52 percent of the agency’s contract specialists and procurement analysts are more than 49 years old and that 66 percent had at least 20

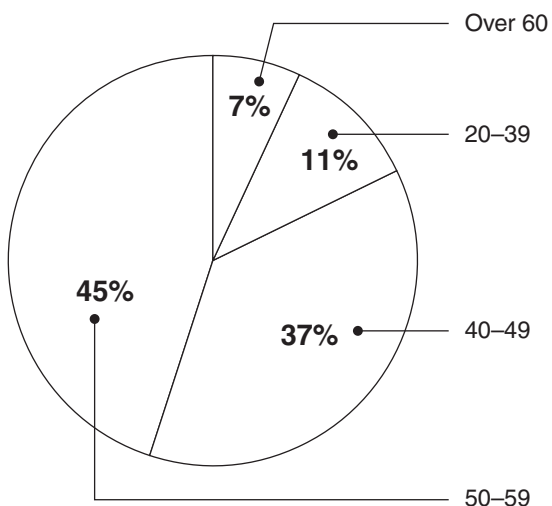
¹⁰Under the Office of Personnel Management’s general series (GS) of federal occupations, GS-1102 (contracting series) employees are contract specialists and procurement analysts.

years of service (see fig. 2). Moreover, NOAA reported in January 2006 that about 43 percent of its contracting employees are already eligible to retire or will become eligible to retire between now and fiscal year 2009. Given that NOAA has historically found that 50 percent of employees who are eligible to retire do so within 3 years, it could lose a significant portion of its contracting workforce within the next few years.

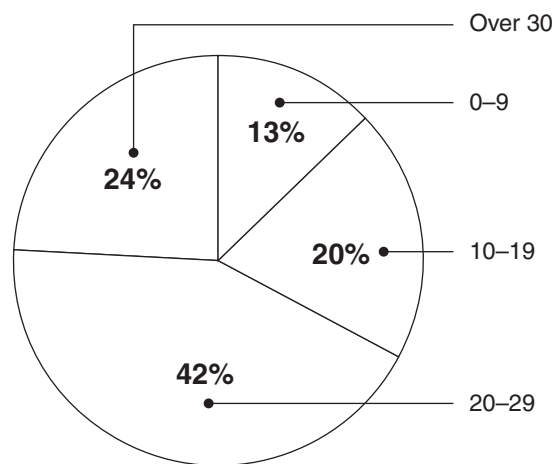
In addition to being concerned about retirements, senior acquisition managers are very concerned about the significant acceleration in contracting staff turnover as well as what they view as “fierce” competition for federal contract specialists that prompts many to accept jobs outside of NOAA. For example, NOAA reported in January 2006 that over 12 percent of headquarters contracting positions are vacant. Moreover, NOAA’s acquisition organization is concerned that the risk of continuing losses is high, given that governmentwide, Commerce had the highest reported agency attrition rate of 19 percent for contracting employees as recently as fiscal year 2004. Our analysis of OPM’s fiscal year 2005 personnel data affirms their concern, since about half of the contracting specialists and procurement analysts that separated that year from NOAA transferred to jobs in other agencies (6 of the 13 employee separations).

Figure 2: Demographics of the NOAA Contracting Specialists and Procurement Analysts as of September 2005

Age in years



Service in years



Source: OPM.

Notes: GAO analysis of data from OPM’s Central Personnel Data File. Percentage may not add to 100 because of rounding.

In 2006 NOAA's workforce management office completed a strategic human capital management plan intended to respond to recognized challenges and to help ensure the agency has the scientific, technical, and administrative expertise necessary to accomplish NOAA's mission. However, the plan does not specifically address the potential gaps in NOAA's contracting workforce even though NOAA is responsible for executing up to 25 percent of the Department of Commerce's budget on acquiring goods and services. Furthermore, because contracting expertise was not recognized as mission-critical, the acquisition director said she was not asked and did not provide input about the challenges to the workforce management office. Involving senior management, employees, and other stakeholders in strategic human capital planning is an important step toward its successful implementation.

In addition, Commerce has taken some initial steps to address this retirement challenge in its contracting workforce. The Secretary of Commerce's Office of Acquisition Management and Financial Assistance hired a contractor to develop a human capital plan for the department's contracting workforce. However, it is too early to determine if this Commerce-wide plan will determine the gaps in numbers and skills in the contracting workforce to achieve mission-critical work and develop strategies to address these gaps. Until this assessment of the contracting workforce is completed at the departmental level, NOAA will be hard pressed to make its own assessment. Also recognizing a critical staffing shortage, in January 2006, Commerce approved NOAA's use of flexible direct hire authority to recruit qualified individuals.¹¹ Civilian agency heads are authorized to determine if a shortage exists in certain federal acquisition positions so that persons with high qualifications can be recruited and directly hired. Direct hire authority allows an agency the flexibility to appoint individuals to positions without adherence to certain competitive examination requirements. According to a NOAA official, to date, NOAA has not implemented this authority.

The prospect of many retirements in experienced staff make NOAA's need for contracting workforce planning more significant, and NOAA stands to benefit greatly by planning strategically for its contracting workforce. Our work has shown that to recruit, develop, and retain the right number of people with the right skills to support mission needs, leading organizations go beyond a succession planning approach that focuses on simply

¹¹Section 1413 of the Services Acquisition Reform Act of 2003 (Public Law 108-136).

replacing individuals and engage in broad, integrated succession planning and management efforts that focus on strengthening both current and future organizational capacity.¹² A key part of succession planning and management is to identify the talent required to achieve organizational goals. To that end, effective human capital planning involves (1) identifying the gaps in skills and competencies that need to be filled to achieve current and future mission-critical work, (2) developing strategies that are tailored to address these gaps, and (3) monitoring and evaluating the progress toward closing the gaps, and adjusting strategies accordingly. Unless the future retirement and workforce capacity challenges are strategically addressed, NOAA could soon lose a significant portion of its contracting knowledge base.

Conclusions

Effectively and efficiently acquiring goods and services will continue to play a major role in enabling NOAA to accomplish its mission. Therefore, NOAA's success depends greatly on how well it manages its acquisition function. While NOAA has taken initial steps intended to put in place an efficient, effective, and accountable acquisition function, more can be done. NOAA can improve oversight of its field acquisition operations by requiring direct reporting of all of its acquisition offices and developing an oversight process for collateral duty contracting officers; adopting a knowledge-based acquisition process to help ensure that complex developmental systems meet cost, schedule, and performance targets; and addressing the imminent retirements of its contracting workforce to ensure it has a solid knowledge base to carry out its acquisition function. These next steps can facilitate achieving successful acquisition outcomes and enable NOAA to responsibly and prudently manage its investments to help meet the nation's economic, social, and environmental needs.

Recommendations for Executive Action

To close the gaps between NOAA's current acquisition process and best practices for the development of complex systems, we recommend that the Secretary of Commerce take the following actions:

- Incorporate a knowledge-based framework in the revision of Commerce's policy for acquiring complex developmental systems. This

¹²GAO, *Human Capital: Selected Agencies Have Opportunities to Enhance Existing Succession Planning and Management Efforts*, [GAO-05-585](#) (Washington, D.C.: June 30, 2005), and *Human Capital: Key Principles for Effective Strategic Workforce Planning*, [GAO-04-39](#) (Washington, D.C.: Dec. 11, 2003).

framework should identify requirements for major system projects to attain specific product knowledge at significant stages in the acquisition life cycle. Demonstration of this knowledge should be used as a basis for decision making by departmental leadership at the following key points:

- Before projects are approved to move from concept and technology development to start the acquisition program, the policy should require that customer requirements and product developers' resources match, as indicated by achieving a high level of technology maturity.
- Before projects are approved to move from integration to demonstration, the policy should require that the product design is stable and performs as expected.
- Before projects are approved to move from demonstration into production, the policy should require that its design is reliable and can be manufactured within cost, schedule, and quality targets.

To provide appropriate oversight of NOAA's field acquisition operations, we recommend that the Under Secretary of Commerce for Oceans and Atmosphere take the following two actions:

- take steps to ensure that NOAA's Director of Acquisition and Grants has direct authority over all acquisition entities within the agency by realigning the National Data Buoy Center's Acquisition Office to report directly to NOAA's acquisition director and
- provide for regular monitoring of collateral duty contracting officers in field offices to help ensure they are accountable to senior acquisition officials for their contracting work.

To address the future retirement challenges of NOAA's contracting workforce, we recommend that the Under Secretary of Commerce for Oceans and Atmosphere take the following action:

- conduct a data-driven assessment of NOAA's contracting workforce to (1) identify skill gaps, develop strategies to address these gaps, evaluate progress toward closing these gaps, and adjust strategies accordingly and (2) involve relevant stakeholders in the development of this assessment.

Agency Comments and Our Evaluation

In written comments on a draft of this report signed by the Deputy Secretary of Commerce, the department agreed with our findings and recommendations. Commerce stated that the report presented an accurate assessment of the major issues NOAA faces and described current or planned actions to address the recommendations. The department's comments are reprinted in appendix III.

As we agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution of it until 30 days from the date of this letter. We will then send copies to other interested congressional committees, the Secretary of Commerce, and the Under Secretary for Oceans and Atmosphere. We will make copies available to others on request. In addition, the report will be available at no charge on GAO's Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-4841 or shamesl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IV.

Sincerely yours,



Lisa Shames
Acting Director, Acquisition
and Sourcing Management

Appendix I: Scope and Methodology

To determine if the National Oceanic and Atmospheric Administration (NOAA) has structured an acquisition organization that provides adequate oversight, we interviewed NOAA's Director of Acquisition and Grants, the acquisition division heads, and Commerce acquisition management executives regarding NOAA's acquisition function. We reviewed pertinent NOAA and Commerce organizational, management, and policy documents pertaining to the oversight of its acquisition activities. We also performed a legislative analysis of the establishment of the National Data Buoy Center in Mississippi to determine if there was a legal basis for not having its acquisition office report directly to NOAA's Director of Acquisition and Grants. In addition, we reviewed reports from Commerce's Office of the Inspector General to obtain an understanding of relevant Commerce and NOAA acquisition management challenges.

To determine if NOAA has established clear and consistent acquisition policies and processes that promote, among other things, a knowledge-based acquisition approach for development and production of complex systems, we reviewed acquisition policies, processes, and guidelines. We interviewed NOAA's acquisition and grants director and acquisition division heads and reviewed information regarding new acquisition policies, handbook guidance, quality assurance, and planning processes. To determine if NOAA has established policies and processes that promote a knowledge-based review process for complex developmental systems acquisitions, we compared and discussed with NOAA and Commerce acquisition officials their policies for major acquisitions to our knowledge-based acquisition approach. Specifically, we compared and contrasted Commerce and NOAA's major system acquisition review process with criteria contained in GAO best practices work on systems acquisition and space system acquisitions.

Finally, to determine the extent to which NOAA has planned and managed its contracting workforce to address future retirement challenges, we interviewed NOAA and Commerce officials responsible for contracting workforce and strategic human capital planning. We also analyzed and compared NOAA's contracting workforce and strategic human capital planning efforts with principles of effective human capital management. In addition to obtaining Commerce and NOAA officials' views and concerns regarding future human capital challenges, we analyzed data from Office of Personnel Management's (OPM) Central Personnel Data File (CPDF), which is its database of federal civilian employees. Specifically, to assess the potential for retirements in the next few years in NOAA's contracting workforce, the CPDF data we used reflected information on NOAA employees—as of September 30, 2005—working in the general series

(GS) 1102 contracting series of contract specialists and procurement analysts. We limited our analysis to focus on contract specialists and procurement analysts because NOAA's Acquisition and Grants Office workforce mainly consists of this occupational category. We analyzed CPDF's separations and demographic data (on the ages and years of service) and NOAA information for contract specialists and procurement analysts in order to identify the extent to which NOAA's experienced contracting workforce is eligible for and thus has the potential for retiring in the near future. We did not independently verify the CPDF data on NOAA's contracting series employees for the year we reviewed. However, we previously reported that data from the CPDF for key variables in another study—occupation, agency/subagency, birth date, and service computation date—were 99 percent accurate.¹

We conducted our review from August 2005 through April 2006 in accordance with generally accepted government auditing standards.

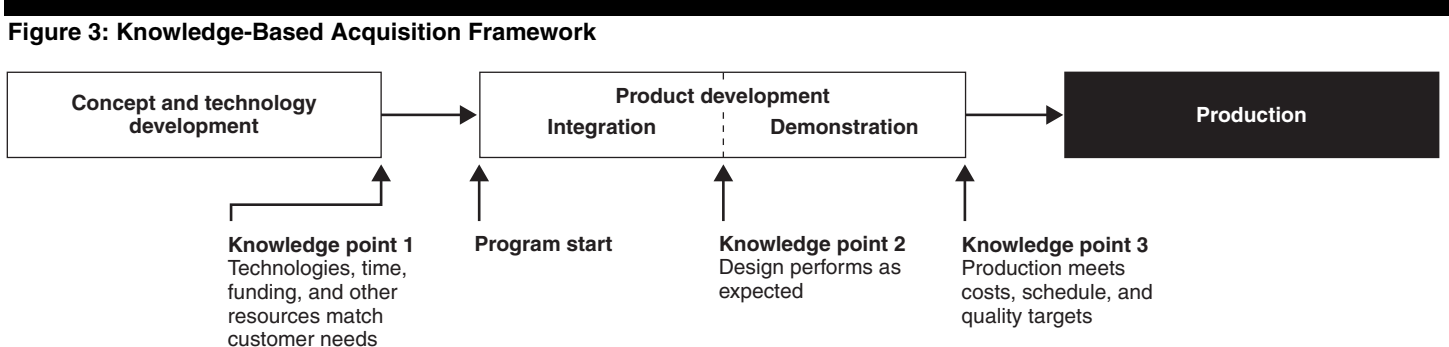
¹See GAO, *OPM's Central Personnel Data File: Data Appear Sufficiently Reliable to Meet Most Customer Needs*, [GAO/GGD-98-199](#) (Washington, D.C.: Sept. 30, 1998).

Appendix II: Knowledge-Based Acquisition Framework for Complex Developmental Systems

The federal government spends billions annually to research, develop, and produce large custom projects, such as satellites, space projects, weapon systems, air traffic control systems, and information technology systems. However, undesirable acquisition outcomes often occur because agency officials proceed further into development or production without obtaining sufficient knowledge that the product will be able to meet established cost, schedule, performance, and quality targets.

The risk of undesirable acquisition outcomes can be significantly reduced. All product development acquisition projects, whether for a ship, airplane, missile, or satellite, go through a complex process of building knowledge. Ultimately, across the acquisition life cycle, this process brings together and integrates the technology, components, and subsystems needed for the product to work and be reliably manufactured. Over the past decade, we have undertaken a body of best practices work that draws upon lessons learned from product development practices of leading commercial firms, which expect their program managers to deliver high-quality products on time and within budget.

Our work has identified three discrete points in the process for complex developmental systems at which obtaining certain levels of knowledge promote successful project outcomes. These knowledge points, depicted in figure 3, are defined in the following manner.



Source: GAO.

- **Knowledge point 1:** Resources and needs match. This point occurs when a sound business case is made for the system—that is, a match is made between customer requirements and the product developer’s available resources in terms of knowledge, time, money, and capacity. Achieving a high level of technology maturity at the start of system development acquisition is an important indicator of whether this match has been made such that the technologies needed to meet

essential product requirements have been demonstrated to work in their intended environment.

- **Knowledge point 2:** Product design is stable. This point occurs when a program determines that a product's design will meet customer requirements and cost, schedule, and reliability targets. A best practice is to achieve design stability at the system-level critical design review usually held midway through development. Completion of at least 90 percent of engineering drawings at the system design review provides tangible evidence that the design is stable.
- **Knowledge point 3:** Production processes are mature and the design is reliable. This is demonstrated when a product can be manufactured within cost, schedule, and quality targets. A best practice is to ensure that all key manufacturing processes are in statistical control—they are repeatable, sustainable, and capable of consistently producing parts within the product's quality tolerances and standards—at the start of production.

The attainment of each successive knowledge point builds on the preceding one. While the knowledge itself builds continuously without clear lines of demarcation, the attainment of knowledge points is sequential. In other words, production maturity cannot be attained if the critical technologies are not mature.

This knowledge-based approach is not just applicable to improving how the Department of Defense manages the acquisition of weapon systems. As we have recently reported, utilizing a knowledge-based approach to manage complex developmental system acquisitions can likewise help civilian agencies reduce risk by ensuring high levels of knowledge are attained on individual acquisitions at key decision points, thereby enabling senior leaders to make informed investment decisions.¹ A knowledge-based approach can also provide inexperienced program managers the necessary guidance to implement good management practices and ensure

¹GAO, *NASA: Implementing a Knowledge-Based Acquisition Framework Could Lead to Better Investment Decisions and Project Outcomes*, [GAO-06-218](#) (Washington, D.C.: Dec. 21, 2005), and *Homeland Security: Successes and Challenges in DHS's Efforts to Create an Effective Acquisition Organization*, [GAO-05-179](#) (Washington, D.C.: Mar. 29, 2005). See also GAO, *Defense Acquisitions: Assessments of Selected Major Weapon Programs*, [GAO-06-391](#) (Washington, D.C.: Mar. 31, 2006) and *Defense Acquisitions: Major Weapon Systems Continue to Experience Cost and Schedule Problems under DOD's Revised Policy*, [GAO-06-368](#) (Washington, D.C.: Apr. 13, 2006).

**Appendix II: Knowledge-Based Acquisition
Framework for Complex Developmental
Systems**

that the correct data are on hand for decision makers. Further, the methodology used by successful program managers to acquire complex developmental systems does not differ based upon each individual system being acquired. Notwithstanding the type of system being acquired, these managers follow a regimented process that uses common and consistent criteria for decision making.

Appendix III: Comments from the Department of Commerce



THE DEPUTY SECRETARY OF COMMERCE
Washington, D.C. 20230

June 5, 2006

Ms. Lisa Shames
Acting Director, Acquisition
and Sourcing Management
U.S. Government Accountability Office
441 G Street, NW
Washington, D.C. 20548

Dear Ms. Shames:

Thank you for the opportunity to review and comment on the Government Accountability Office's draft report entitled *NOAA: Next Steps to Strengthen Its Acquisition Function* (GAO-06-594). I enclose the Department of Commerce's comments on this draft report.

Sincerely,

A handwritten signature in black ink, appearing to read "DAS", is written over the word "Sincerely,". The signature is stylized and includes a long horizontal stroke extending to the right.

David A. Sampson

Enclosure

**Department of Commerce Comments
on the Draft GAO Report Entitled
“NOAA: Next Steps to Strengthen Its Acquisition Function”
(GAO-06-594/June 2006)**

General Comments

The report on the acquisition function in NOAA presents an accurate assessment of the major issues facing NOAA, and many other agencies, as they impact the agency’s ability to execute its mission.

Response to GAO Recommendations

The draft GAO report states, “To close the gaps between NOAA’s current acquisition process and best practices for the development of complex systems, we recommend that the Secretary of Commerce take the following actions:

Recommendation 1: “Incorporate a knowledge-based framework in the revision of Commerce’s policy for acquiring complex developmental systems. This framework should identify requirements for major system projects to attain specific product knowledge at significant stages in the acquisition life cycle. Demonstration of this knowledge should be used as a basis for decision making by departmental leadership at the following key points:

- Before projects are approved to move from concept and technology development to start the acquisition program, the policy should require that customer requirements and product developers’ resources match, as indicated by achieving a high level of technology maturity.
- Before projects are approved to move from integration to demonstration, the policy should require that the product design is stable and performs as expected.
- Before projects are approved to move from demonstration into production, the policy should require that its design is reliable and can be manufactured within cost, schedule, and quality targets.”

Response: The Department of Commerce (DOC) concurs with this recommendation and NOAA will continue to work with the DOC Senior Procurement Executive to develop and implement policy and process for effectively managing major systems acquisitions.

The draft GAO report provides three recommendations for the Undersecretary of Commerce for Oceans and Atmosphere to (1) “provide appropriate oversight of NOAA’s field acquisition operations” (Recommendations 2 and 3 below) and (2) “to address the future retirement challenges of NOAA’s contracting workforce” (Recommendation 4 below):

Recommendation 2: “Take steps to ensure that NOAA’s Director of Acquisition and Grants has direct authority over all acquisition entities within the agency by realigning the National Data Buoy Center’s Acquisition Office to report directly to NOAA’s acquisition director.”

Response: NOAA agrees with this recommendation and will undertake the steps necessary to move the organizational placement of the three acquisition professionals from the National Weather Service to NOAA's Acquisition and Grants Office (AGO), including transfer of the FTEs and associated funding. NOAA AGO will continue to physically locate the three acquisition specialists at the National Data Buoy Center to provide the acquisition support necessary to effectively implement and execute their mission.

Recommendation 3: "Provide for regular monitoring of collateral duty contracting officers in field offices to help ensure they are accountable to senior acquisition officials for their contracting work."

Response: NOAA agrees with this recommendation and will develop and implement a formal delegated procurement authority oversight process and program recognizing the resource limitations (both dollars and personnel) that exist within the organization. NOAA AGO will work with NOAA program offices which have delegated procurement authority to establish that process and to identify means to share the financial burden for this oversight program.

Recommendation 4: "Conduct a data-driven assessment of NOAA's contracting workforce to (1) identify skill gaps, develop strategies to address these gaps, evaluate progress toward closing these gaps, and adjust strategies accordingly and (2) involve relevant stakeholders in the development of this assessment."

Response: NOAA agrees with this recommendation and will work with the DOC Office of Acquisition Management and Financial Assistance to develop and conduct the workforce assessment. Recognizing the limitations on resources (people and dollars), NOAA AGO will utilize, to the extent possible, free training available from the Defense Acquisition University, eLearning tools, and on-the-job training, reserving limited training funds for those training requirements that cannot be obtained through other sources. NOAA is exploring the feasibility of instituting an outreach program to colleges and universities designed to encourage applications for entry-level 1102 positions. NOAA AGO will utilize the recently approved Direct Hire Authority to expedite the hiring of qualified acquisition professionals.

Appendix IV: GAO Contact and Staff Acknowledgments

GAO Contact

Lisa Shames, (202) 512-4841 or shamesl@gao.gov.

Staff Acknowledgments

In addition to the individual named above, Carolyn Kirby, Assistant Director; Ian Jefferies; Jose Ramos; Sylvia Schatz; Bob Swierczek; and Greg Wilmoth made key contributions to this report.

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