

November 2012

INFORMATION MANAGEMENT

National Technical Information Service's Dissemination of Technical Reports Needs Congressional Attention



G A O

Accountability * Integrity * Reliability

Why GAO Did This Study

NTIS was established by statute in 1950 to collect scientific and technical research reports, maintain a bibliographic record and repository of these reports, and disseminate them to the public. NTIS charges fees for its products and services and is required by law to be financially self-sustaining to the fullest extent possible.

GAO was mandated by Congress to update its 2001 report on aspects of NTIS's operations and the reports in its collection. Specifically, GAO's objectives were to determine (1) how NTIS is currently organized and operates, including its functions, current staffing level, reported cost of operations, and revenue sources; (2) the age of and demand trends for reports added to NTIS's repository; and (3) the extent to which these reports are readily available from other public sources. To do this, GAO reviewed agency documentation, analyzed a sample of reports added to NTIS's collection from fiscal years 1990 through 2011 (reports from the period since GAO's last study and other older reports), and interviewed relevant agency officials.

What GAO Recommends

GAO is suggesting that Congress reassess the appropriateness and viability of the fee-based model under which NTIS currently operates for disseminating technical information to determine whether the use of this model should be continued. In comments on a draft of this report, the Department of Commerce stated that NTIS believes GAO's conclusions do not fully reflect the value that the agency provides. However, GAO maintains that its conclusions and suggestion to Congress are warranted.

View [GAO-13-99](#). For more information, contact Valerie C. Melvin at (202) 512-6304 or melvinv@gao.gov

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National Technical Information Service's Dissemination of Technical Reports Needs Congressional Attention

What GAO Found

As a component of the Department of Commerce, the National Technical Information Service (NTIS) is organized into five primary offices that offer the public and federal agencies a variety of products and services. As of late October 2012, NTIS was supported by 181 staff, all except 6 of which held full-time positions. NTIS reports its progress toward agency goals to the Deputy Secretary of Commerce, and the Director of NTIS reports to the Director of Commerce's National Institute of Standards and Technology. In addition, NTIS receives oversight of its functions and strategic direction from an advisory board with members appointed by the Secretary of Commerce. NTIS's product and service offerings include, among other things, subscription access to reports contained in its repository in both print and electronic formats, distribution of print-based informational materials to federal agencies' constituents, and digitization and scanning services.

NTIS revenues are generated exclusively from direct sales or subscriptions for its products and services. NTIS reported that net revenues from all its functions (products and services) totaled about \$1.5 million in fiscal year 2011. However, over most of the last 11 years, its costs have exceeded revenues by an average of about \$1.3 million for its products. While NTIS has not recovered all of its costs for products through subscriptions and other fees, it has been able to remain financially self-sustaining because of revenues generated from its services such as distribution and order fulfillment, web hosting, and e-training. The NTIS strategic plan states that the electronic dissemination of government technical information by other federal agencies has contributed to reduced demand for NTIS's products. As a result, the agency is taking steps to reduce its net costs, such as improving business processes and increasing the breadth and depth of its collection.

NTIS's repository has been growing with mostly older reports, but the demand for more recent reports is greater. Specifically, NTIS added approximately 841,500 reports to its repository during fiscal years 1990 through 2011, and approximately 62 percent of these had publication dates of 2000 or earlier. However, the agency was more likely to distribute (by direct sale or through a subscription) reports published more recently. For example, GAO estimated that 100 percent of the reports published from 2009 through 2011 had been distributed at least once, while only about 21 percent of reports published more than 20 years ago had been.

Of the reports added to NTIS's repository during fiscal years 1990 through 2011, GAO estimates that approximately 74 percent were readily available from other public sources. These reports were often available either from the issuing organization's website, the federal Internet portal (<http://www.USA.gov>), or from another source located through a web search. Reports published from 1990 to 2011 were more likely to be readily available elsewhere than those published in 1989 or earlier. Further, GAO estimated that 95 percent of the reports available from sources other than NTIS were available free of charge. NTIS's declining revenue associated with its basic statutory function and the charging for information that is often freely available elsewhere suggests that the fee-based model under which NTIS currently operates for disseminating technical information may no longer be viable and appropriate.

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Abbreviations

Commerce	Department of Commerce
NASA	National Aeronautics and Space Administration
NIST	National Institute of Standards and Technology
NTIS	National Technical Information Service
SSA	Social Security Administration

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Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

November 19, 2012

The Honorable Barbara Mikulski
Chairwoman
The Honorable Kay Bailey Hutchison
Ranking Member
Subcommittee on Commerce, Justice,
Science, and Related Agencies
Committee on Appropriations
United States Senate

The Honorable Frank Wolf
Chairman
The Honorable Chaka Fattah
Ranking Member
Subcommittee on Commerce, Justice,
Science, and Related Agencies
Committee on Appropriations
House of Representatives

The Department of Commerce's National Technical Information Service (NTIS) serves as a permanent repository and disseminator of scientific, technical, engineering, and business-related information.¹ NTIS acquires such information—largely in the form of research reports—primarily from federal agencies and their contractors and grantees, as well as from other domestic and foreign sources. NTIS estimates that it maintains in its central repository more than 2.5 million records² covering 378 technical and business-related subject areas. In addition, NTIS performs various fee-based information services for other federal agencies. The legislation

¹In the remainder of this report, we use the term “technical information” to refer collectively to these types of information.

²These 2.5 million records contain, among other things, the metadata that identify all of the reports held by NTIS, such as the report's author, publication date, and the agency where the report originated. These records link to the actual reports, which NTIS maintains elsewhere in hardcopy or as electronic documents or microfiche. According to the agency, these records represent all reports that have been catalogued in the electronic repository since 1964. As part of our further discussion in this report, we use the term “reports” in referring to the repository holdings.

that established NTIS³ requires all of the services and functions it provides to be financially self-sustaining, to the extent feasible.

In May 2001, we reported on NTIS's operations,⁴ noting among other things, the availability of many of the reports maintained in its repository from other sources, such as the originating agencies' websites. House Report 112-169, accompanying the Consolidated and Further Continuing Appropriations Act, 2012,⁵ directed GAO to update aspects of its prior study. Our specific objectives were to determine (1) how NTIS is currently organized and operates, including its various functions, current staffing level, reported costs of operations, and revenue sources; (2) the age of and demand trends for reports added to NTIS's repository; and (3) the extent to which these reports are readily available from other public sources.

To determine how NTIS is organized and operates, we reviewed the agency's strategic plan and documentation on its organizational and reporting structure, office staffing level and assigned responsibilities, and types of products and services offered. We also reviewed cost data contained in the agency's financial reports.⁶ In addition, we analyzed relevant laws and regulations describing NTIS's authority and responsibilities,⁷ and reviewed our previous reports that discussed its mission and operations.⁸ We supplemented our analyses with interviews of the Director of NTIS and other relevant agency officials; we also interviewed officials of the Department of Commerce and its National Institute of Standards and Technology (NIST), which have specific reporting relationships with NTIS.

³15 U.S.C. 1153.

⁴GAO, *Information Management: Dissemination of Technical Reports*, [GAO-01-490](#) (Washington, D.C.: May 18, 2001).

⁵Pub. L. No. 112-55 (Nov. 18, 2011).

⁶The cost data reflected in our report were taken from documentation provided by NTIS. However, we did not test the reliability of NTIS's cost accounting system, from which the agency derives its cost data.

⁷For example, 15 U.S.C.1151-57, 15 U.S.C. 3704b-1 & 2, and 15 C.F.R. Part 1180.

⁸GAO, *Information Policy: NTIS' Financial Position Provides an Opportunity to Reassess Its Mission*, [GAO/GGD-00-147](#) (Washington, D.C.: June 30, 2000) and [GAO-01-490](#).

To determine the age of and demand trends for reports added to NTIS's repository, we first analyzed the distribution of the publication dates for all reports added to the repository since 1990. We chose to include reports added since 1990 to determine the current availability of older documents in light of NTIS's role as a permanent repository, and to focus on the reports added since our previous review in 2001.⁹ We subsequently selected a stratified random sample from this body of reports¹⁰ and then used cumulative data provided by NTIS on the sales of any of these reports to analyze the demand for reports in the repository.

To determine the extent to which reports NTIS collects are readily available from other public sources, we searched the Internet to determine if each of the reports included in our sample could be found elsewhere and at no cost. Using a tiered approach, we searched the following four sources in the order shown: (1) the issuing organization's website; (2) the U.S. Government Printing Office's Federal Digital System website—<http://www.gpo.gov/fdsys>; (3) the federal government Internet portal USA.gov—<http://www.USA.gov>; and (4) a web search conducted using the commercial search engine <http://www.Google.com>. Specifically, we determined whether each report was first available at no cost on the issuing organization's website and, if so, concluded the Internet search at this point. However, if the report was not available, then the search continued to the second source, and so on, until either the report was found to be available at one of the remaining sources, or all sources were exhausted. We then used our results to estimate the percentage of the total population of NTIS reports added to the repository during fiscal years 1990 through 2011 that was available from other public sources.

All of the results derived from the sample analyses constituted estimates that are subject to sampling errors. These sampling errors measure the extent to which the sample size and structure are likely to differ from the population they represent. Because we followed a probability procedure based on random selections, our sample is only one of a large number of samples that we might have drawn. Since each sample could have provided different estimates, we express our confidence in the precision of our particular sample's results as a 95 percent confidence interval. This

⁹We did not include reports added for fiscal year 2012 because our study only focused on those fiscal years that had been completed at the time that our study was initiated.

¹⁰Our selected sample consisted of 384 reports.

is the interval that would contain the actual population value for 95 percent of the samples we could have drawn.

A more detailed discussion of our objectives, scope, and methodology is provided in appendix I.

We conducted this performance audit from February 2012 to November 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

NTIS's basic statutory function is to collect research reports, maintain a bibliographic record and permanent repository of these reports, and disseminate them to the public. In addition, NTIS has developed a variety of information-related services. NTIS charges user fees for the sale of its products to the public and services to federal agencies.

Under statutory authority enacted in 1950,¹¹ NTIS collects reports containing scientific, technical, and engineering information from both domestic and foreign sources in a repository and makes the information available to (1) business and industry, (2) state and local governments, (3) other federal agencies, and (4) the general public to increase U.S. competitiveness in the global economy. The statute does not define scientific, technical, and engineering information. However, the Secretary of Commerce has interpreted this to include "all types of information which have a more or less direct bearing on business and industry generally."¹² The Secretary of Commerce described such information as including "economic information, market information, and related information so long as it is reasonably specific and bears some direct relationship to the organization and operation of industrial or business enterprise." NTIS's enabling legislation authorized it to charge fees for its

¹¹15 U.S.C. 1152.

¹²In 1954, the Comptroller General found this to be a reasonable interpretation of the law's use of the word "technical." 34 Comp. Gen. 58 (1954).

products and established a policy to recover all costs, as feasible, through the fees.¹³

NTIS's authority was revised in the National Technical Information Act of 1988.¹⁴ This act gave the agency authority to also enter into contracts, cooperative agreements, joint ventures, and other transactions as necessary in the conduct of the business of NTIS, and declared the NTIS repository to be a permanent federal function that could not be transferred to the private sector without congressional approval. The act was subsequently amended by the American Technology Preeminence Act of 1991,¹⁵ which

- required all costs associated with acquisition, processing, storage, bibliographic control, and archiving to be recovered primarily by fees;
- required agencies to transfer unclassified scientific, technical, and engineering information which results from federally funded research and development to NTIS; and
- provided that NTIS's use of new methods or media for information dissemination should include producing and disseminating information in electronic format.

Further, the Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act of 1993¹⁶ established a revolving fund for the payment of all expenses incurred by NTIS and gave it the authority to use that fund without further appropriations action by Congress.

Our prior work found that, from fiscal years 1988 through 1994, NTIS showed excess revenue from the sale of its products and services in all years except one and generated cumulative net earned revenues of \$5.8 million. However, over the next 5-year period (from fiscal year 1995 through fiscal year 1999), NTIS had a cumulative net cost¹⁷ of about \$4.2

¹³15 U.S.C. 1153.

¹⁴Pub. L. No. 100-519 (Oct. 24, 1988); 15 U.S.C. 3704b.

¹⁵Pub. L. No. 102-245 (Feb. 14, 1992); 15 U.S.C. 3704b-1.

¹⁶Pub. L. No. 102-395 (Oct. 6, 1992).

¹⁷In the remainder of this report, we use the term "net costs" to refer to financial losses or gross costs that exceeded revenues.

million. Accordingly, in August 1999, the Secretary of Commerce proposed closing NTIS by September 30, 2000, because he believed that declining sales revenues would not continue to be sufficient to recover all of the agency's operating costs. The Secretary attributed this decline partly to other agencies' practice of making their research results available to the public for free through the Web. He also proposed transferring NTIS's research report archives to the Library of Congress and requiring federal agencies to give the public free online access to new research reports.

In June 2000,¹⁸ we reported that NTIS could possibly remain solvent for a few years because Commerce and NTIS officials had acted in fiscal year 1999 to reduce costs when it appeared there would not be sufficient funds to operate. However, we noted that the agency's solvency beyond fiscal year 2003 was in doubt based on our forecast of its revenues and costs, which suggested that costs would exceed revenues beginning in fiscal year 2001 and continue. We pointed out that, if these net costs were realized, cumulative net earned revenues from previous years' operations could be absorbed and the agency could run out of operating funds after fiscal year 2003. Based on these findings, we suggested that Congress consider whether NTIS (or another agency) was needed to serve as a permanent repository and disseminator for research reports; we also suggested that Congress could be aided in this assessment by reviewing NTIS annual financial and operational reports that Commerce was required to submit, but which it had not done since fiscal year 1995.

We again reported on NTIS's operations in May 2001.¹⁹ We noted that, according to its Deputy Director, the agency had significantly reduced its costs after our June 2000 report and had shown net earned revenues of \$2.2 million for fiscal year 2000. Moreover, the Deputy Director had projected a net earned revenue of \$1.5 million for fiscal year 2001. We also noted that the agency was providing a variety of other fee-based services for agencies and that, while demand for electronic products was on the rise, research reports and other scientific, technical, and engineering information maintained by NTIS were also becoming increasingly available on agency websites and through other public sources—often at no cost. We included as a matter for congressional

¹⁸ [GAO/GGD-00-147](#).

¹⁹ [GAO-01-490](#).

consideration that Congress look at how this information was defined; whether there was a need for a central repository of this information; and if a central repository was maintained, whether all information should be retained permanently, and what business model should be used to manage it.

The Secretary of Commerce agreed with our assessment and raised as a primary question whether there was a need for a central repository in view of the increasing availability of newer publications from sources other than NTIS. The Secretary also noted that the need for a central repository depended on whether the information would be permanently maintained by agencies and whether the information would be easy to locate without the kind of bibliographic control that NTIS provides.

Subsequent to the issuance of our reports, in December 2003, Congress passed the 21st Century Nanotechnology Research and Development Act, which provided a coordinated federal approach to stimulating nanotechnology research and development. The act directed the Secretary of Commerce to establish a clearinghouse for information related to the commercialization of nanotechnology research using the resources of NTIS to the extent possible. As of September 2012, NTIS noted that it held over 700 publications in its nanotechnology collection.

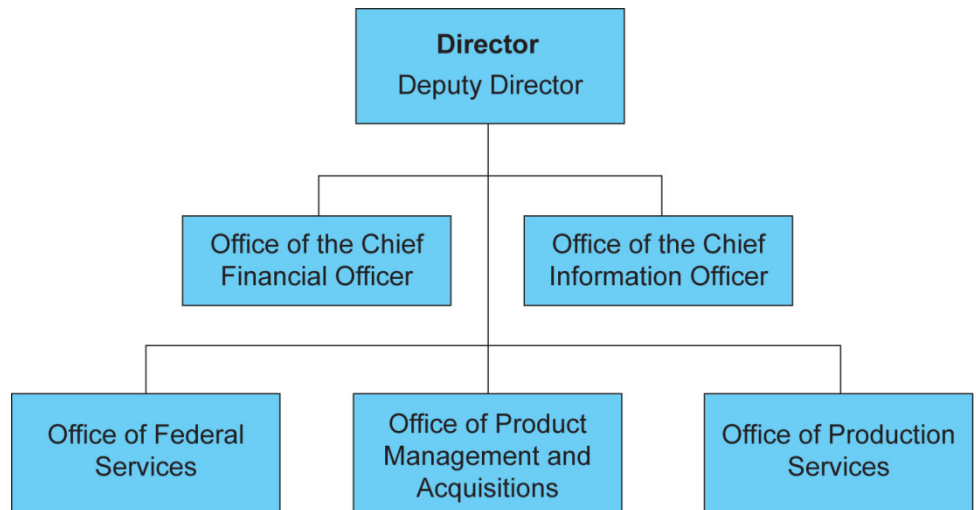
NTIS Carries out a Variety of Functions Related to Its Mission, but Currently Is Financially Sustained by Its Service Offerings

NTIS currently operates as one of 12 independent bureaus within Commerce, with the mission to help promote the nation's economic growth by providing access to information that stimulates innovation and discovery. Headquartered in Alexandria, Virginia (with warehouses in Alexandria, Virginia and in Brandywine, Maryland), the agency is organized into five primary offices. To carry out its statutory functions of collecting and maintaining a permanent repository and bibliographic record of research reports, and to disseminate them, the agency offers a variety of products, such as fee-based access to the reports in its repository. In addition, NTIS offers information-related services to federal agencies, such as distribution and order fulfillment, web hosting, and e-training, that are less directly related to its basic statutory function. While NTIS's service offerings have resulted in increased revenues, allowing the agency to remain financially self-sustaining, it has experienced a net cost relative to its products, calling into question whether the agency's function of acting as a self-financing repository of technical information is still viable.

NTIS Receives Guidance and Oversight from Commerce Department Entities and Carries out Its Functions through Five Primary Offices

NTIS is led by a director, who is aided by two executives—a chief information officer and a chief financial officer. In addition, three operational offices have a variety of responsibilities for providing products and services that include collecting and disseminating technical reports, offering access to other information sources, and providing information-related services to federal agencies. Figure 1 displays the NTIS organization.

Figure 1: NTIS Organization Chart



Source: NTIS.

NTIS operates as a unit within Commerce and receives oversight from the Deputy Secretary of Commerce, the Director of NIST,²⁰ and an advisory board. In this regard, the NTIS Director communicates progress toward agency goals to the Deputy Secretary of Commerce. For example, the Director participates in biweekly executive management meetings that are held with the Deputy Secretary. At these meetings, executive leads from each of Commerce’s components report on the status of performance and strategic goals within their offices, among other things.

²⁰NIST is a Commerce operating unit that, among other things, promotes U.S. innovation and industrial competitiveness by advancing measurements for science, standards, and technology.

In addition, under a Commerce departmental order,²¹ the NTIS Director also reports to the Director of NIST. As outlined in the Commerce organization chart and stated in the Commerce departmental organization order, the NTIS Director is to report and be responsible to the Director of NIST. In turn, the Director of NIST prepares the NTIS Director's annual performance appraisal. Beyond this, the Director of NIST stated that the agency does not provide any other operational or financial oversight functions for NTIS. For example, NIST does not approve NTIS's budget (although it does coordinate NTIS's budget for final inclusion in the department's overall budget, which is approved by Commerce).

Further, NTIS receives guidance on its operations from the NTIS Advisory Board, which was established by law²² in 1988 to review the general policies and operations of NTIS, including policies related to fees and charges for its products and services. The board,²³ comprised of a chairperson and four members appointed by the Secretary of Commerce, is required to meet at least every 6 months to discuss NTIS's activities. The board's last meeting took place in late October 2012, and, according to the notice of open meetings from the Federal Register, the intended focus was on the agency's strategic business plan. The board submits an annual report to the Secretary of Commerce, which includes strategic and tactical recommendations regarding NTIS's future operations.

As of late October 2012, NTIS was supported by 181 staff, all except 6 of which held full-time positions. These included 103 NTIS employees and 78 contractors. Table 1 shows the number of staff dedicated to the Office of the Director and each of the agency's other primary offices as of October 2012.

²¹Department of Commerce Departmental Organization Order 30-7A (Washington, D.C.: November 2008).

²²15 U.S.C. 3704b(c).

²³NTIS Advisory Board members can include individuals who are both internal and external to the Department of Commerce.

Table 1: NTIS Staff as of October 31, 2012

NTIS office	Full-time employees	Part-time employees	Full-time contractors	Part-time contractors	Total
Director	2	0	0	0	2
Chief Financial Officer	13	0	0	0	13
Chief Information Officer	26	0	26	5	57
Federal Services	15	0	3	0	18
Product Management and Acquisition	29	1	5	0	35
Production Services	17	0	39	0	56
Total staff	102	1	73	5	181

Source: NTIS data.

Among these offices, executive functions, such as directing NTIS activities and developing NTIS budgets and policies for the use of information technology, are carried out by the Office of the Director, along with the offices of the Chief Financial Officer and the Chief Information Officer. The three other operational offices have a variety of responsibilities for providing NTIS's products and services. Table 2 summarizes the specific responsibilities and functions of these offices.

Table 2: NTIS Office Responsibilities and Functions

Office	Key responsibilities
Office of the Director	Manages and is responsible for all activities of NTIS. In addition to the Director, officials in this office include a contracting officer, legal personnel, and program analysts.
Office of the Chief Financial Officer	Develops NTIS budgets, financial plans, financial reports, and analyses. Develops, maintains, and operates NTIS financial systems. Provides financial advice to the Director of NTIS. Provides management analysis, administrative management, procurement, facilities management, property management, and office support services to NTIS components and other agencies. Provides financial management services to NTIS components, customers, and source clients.
Office of the Chief Information Officer	Develops and administers plans, policies, and standards for NTIS's acquisition and use of information technology. Represents NTIS on information technology matters, including computer security issues. Plans, develops, operates, and services centralized and decentralized network computer-based capabilities and associated telecommunications networks. Provides training, consultation, technical documentation, and operation of data processing and telecommunications.

Office	Key responsibilities
Office of Federal Services	<p>Develops strategies for information dissemination services and Internet-based service business opportunities for federal agencies.</p> <p>Manages service projects using in-house capabilities or through joint venture partners.</p> <p>Assists agencies in meeting their multimedia product requirements.</p> <p>Coordinates marketing and exhibit activities for information dissemination and Internet-based services.</p>
Office of Product Management and Acquisition	<p>Builds the NTIS bibliographic database by cataloging, indexing, and abstracting information products from either hard copy or electronic media.</p> <p>Identifies and acquires scientific, technical, and business-related information from domestic and international sources.</p> <p>Coordinates the production and sale of clearinghouse products.</p> <p>Manages customer relationships involving order receipt/entry, inquiry and complaint resolution, and product identification functions.</p> <p>Gathers data about customers' or potential customers' needs and expectations.</p> <p>Promotes available federal government information, services, and programs to customers through demand and subscription sales.</p>
Office of Production Services	<p>Provides services relative to order fulfillment, information product dissemination and service delivery, order processing, product manufacturing, warehousing, specialized storage, inventory management, and distribution.</p> <p>Operates, maintains, and manages specialized equipment and computer-based systems for the imaging, publication, and reproduction of information products.</p> <p>Provides project- and product-management support for individual products and services.</p>

Source: GAO analysis of Commerce data.

NTIS Offers Technical Reports and Other Products to a Variety of Customers

As part of its basic statutory function to collect and disseminate technical reports, NTIS offers a variety of fee-based products. According to the agency, its customer base for these products include scientists, engineers, the business community, librarians, information specialists in government, academia, and the general public. The agency has organized its products into three lines of business—"Technical Reports," "Clearinghouse," and "Publishing"—as described below.

Technical Reports

To carry out its statutory function of collecting and disseminating such information, NTIS maintains a searchable repository that contains bibliographic records for the over 2.5 million scientific, technical, engineering, and business research reports it has acquired from federal government agencies, state and local governments, international organizations, and private-sector organizations. NTIS's bibliographic database provides for the classification and cataloging of the records in this database. For example, according to the NTIS Database Search Guide, NTIS classifies its records into 39 categories. These categories can be used for searching the contents of NTIS's database. The database covers a host of scientific and technical subjects, such as biology,

chemistry, physics, transportation, health care, and the environment. Of the 2.5 million reports, NTIS noted that approximately 700,000 reports have been digitized, with the remainder in physical form, such as paper or microfilm.

Access to the reports is provided both through the direct sale of individual reports and by subscription. Individual reports can be purchased via postal mail; phone; e-mail; and NTIS's online ordering system, accessed through its website, <http://www.ntis.gov>. Subscription-based access to the reports is obtained through, among other things, NTIS's National Technical Reports Library, which provides subscribers with the ability to search the bibliographic records repository and to access the approximately 700,000 digitized reports in portable document format (PDF).²⁴ In addition, NTIS's Selected Research Service allows a subscriber to select from more than 378 subcategories and automatically receive reports tailored to that area of interest. According to NTIS, reports that have not been digitized can be provided in a digital format when a customer purchases a copy.

Prices for individual reports and subscriptions vary. For example, an electronic copy of a report from the Economics and Statistics Administration, *Benefits of Manufacturing Jobs: Executive Summary*, can be purchased for \$15; a "customized CD" for this report can be purchased for \$30. Further, an electronic copy of a report from the National Aeronautics and Space Administration (NASA) Marshall Space Flight Center, *NASA Robotics for Space Exploration*, can be purchased for \$15; a "customized CD" for this report can be purchased for \$30. With regard to subscriptions, access to the National Technical Reports Library is sold as an annual subscription to institutions based on the number of individuals accessing the library. For example, as of October 2010, an annual subscription providing access for up to 3,000 individuals costs \$2,100, while an annual subscription providing access for 18,001 to 28,000 individuals costs \$11,200. In addition, subscriptions can be purchased for a specific number of issues of a particular document type. For example, six issues of the *Livestock, Dairy, and Poultry Outlook* can be purchased for \$91.

²⁴The Merriam-Webster Dictionary defines PDF as "a computer file format for the transmission of a multimedia document that is not intended to be edited further and appears unaltered in most computer environments." *Merriam-Webster Online*, accessed October 5, 2012, <http://www.merriam-webster.com/dictionary/pdf>.

Clearinghouse

In addition to the technical reports that it collects and disseminates, NTIS disseminates publications covering a wide array of topics on behalf of other federal agencies. According to NTIS, these agencies request that NTIS distribute the publications in print or electronically. The following are examples of the federal products distributed:

- Standard Occupational Classification Manual. A manual containing information on all occupations in the national economy classified according to the system used by federal statistical agencies for the purpose of collecting, calculating, analyzing, or disseminating occupational data.
- Food and Drug Administration Food Code Manual. A code and reference document that provides technical and legal information about the regulations of the retail and food service industry.
- North American Industry Classification System. A publication that details a system for the collection, analysis, and dissemination of industrial statistics used by government policy analysts, academics, researchers, the business community, and the public.
- Export Administration Regulations. A compilation of regulations issued by Commerce's Bureau of Industry and Security relating to the control of certain exports, re-exports, and activities.
- National Correct Coding Policy Manual. A manual developed by the Centers for Medicare and Medicaid Services to control improper coding leading to inappropriate payment in Medicare Part B claims. The manual provides guidance for providers on the correct coding of claims being submitted for reimbursement.

Publishing

Through a memorandum of understanding or interagency agreement, NTIS also provides access to information collected from federal agencies, which it refers to as its "Publishing" line of business. In some instances, NTIS repackages the information with additional features. According to NTIS, agencies initiate the request for these services. These offerings include the following:

- Drug Enforcement Administration database. The Drug Enforcement Administration database identifies persons and organizations authorized to handle certain controlled drug substances and chemicals under the Controlled Substance Act. NTIS is the authorized official distributor of the database. NTIS provides online subscription

access to the database on a weekly, monthly, or quarterly basis. NTIS also provides this information via a searchable CD-ROM.

- **Death Master File.** This file, maintained by the Social Security Administration (SSA), contains approximately 85 million records of deaths that have been reported since 1936. The file is used by government; credit reporting organizations; and financial, investigative, medical research, and other industries to verify deaths. Through an agreement with SSA, NTIS is the only authorized official distributor of the Death Master File. In this regard, NTIS provides access to this information, including on DVD, and provides the means to search and download the Death Master File online.
- **World News Connection.** NTIS offers access to this online news service, which provides translated and English-language news and information from non-U.S. media sources. The information is obtained from full-text, and summaries of newspaper articles, conference proceedings, television and radio broadcasts, periodicals, and nonclassified technical reports. The material in World News Connection is provided to NTIS by the Open Source Center, a U.S. government agency that provides analysis of foreign open source intelligence.

NTIS Provides Fee-Based Services to Federal Agencies

In addition to its product offerings, NTIS offers a variety of fee-based services to federal agencies that are less directly related to its basic statutory function of collecting and disseminating scientific and technical information. These include services that leverage capabilities NTIS has developed in the course of carrying out its mission. Its five service offerings are distribution and order fulfillment, web-based services and federal cloud computing, brokerage services, e-training and knowledge management services, and digitization and scanning services. To provide its services, NTIS enters into memorandums of understanding or interagency agreements with agencies. Further, NTIS offers some of these services through public-private partnerships with private industry, which it refers to as “joint venture partners.” The five types of services are described below.

Distribution and Order Fulfillment Services

Through a memorandum of understanding or interagency agreement, NTIS distributes large amounts of information products for federal agencies. According to NTIS officials, these services differ from that provided by its Clearinghouse in that they are used for distributing large quantities of agencies’ products rather than selling individual copies of

Web-Based Services and Federal Cloud Computing

publications. NTIS identified five primary clients for these services: the Internal Revenue Service, the Department of Agriculture, the Department of Education, the Pension Benefit Guaranty Corporation, and the Administrative Office of the U.S. Courts. For example, NTIS currently has an agreement with the Department of Agriculture to distribute on its behalf health and nutrition educational materials in the form of brochures, posters, and similar nutritional products. It also has an agreement with the Department of Education to perform similar services.

In 1988, Congress required NTIS to implement new methods or media for disseminating technical information; a 1992 amendment²⁵ specified that this should include producing and disseminating products in electronic formats. According to NTIS, this has been a primary basis for NTIS's transformation from a static paper-based distribution operation to a modern, computer-based model and also a basis for NTIS to provide information-dissemination services to other agencies. For example, NTIS's information systems infrastructure enables it to host federal agencies' applications and websites. The agency currently has an agreement with the Federal Insurance and Mitigation Administration to provide hosting for two of its websites and associated systems and to host its web-based tool for reviewing underwriting and claims operations. NTIS has also expanded its infrastructure to provide cloud computing²⁶ services and, according to the agency, is currently offering infrastructure-as-a-service and software-as-a-service.²⁷ For example, along with joint venture partner Carney, Inc., NTIS had an agreement with the National Archives and Records Administration and currently has an agreement with the Social Security Administration to configure and host the "Jive" platform.²⁸ According to NTIS, the agency has eight primary clients for its

²⁵15 U.S.C. 3704b(e)(5).

²⁶Cloud computing is an emerging form of computing that relies on Internet-based services and resources to provide computing services to customers.

²⁷According to NIST, infrastructure-as-a-service is a model where the service provider delivers and manages the basic computing infrastructure of servers, software, storage, and network equipment on which a platform to develop and execute applications can be developed by the consumer. Software-as-a-service is a model where the service provider delivers one or more applications and the computational resources and underlying infrastructure to run them for use on demand as a turnkey service.

²⁸"Jive" is a social networking product for enterprise implementation. See its website: <http://www.jivesoftware.com>. More specifically, it intends to help employees, customers, and partners to connect, communicate, and collaborate.

web-based services and federal cloud computing offerings, including the Department of Homeland Security, the Internal Revenue Service, and other federal agency initiatives.²⁹

Brokerage Services

NTIS provides billing and collection services on a reimbursable basis to other agencies that, like itself, charge for products and services but which lack the necessary financial infrastructure to do their own billing and collecting. The agency refers to these as its “Brokerage Services.” For example, NTIS had an agreement with the National Agricultural Library to develop, implement, and operate account maintenance, invoicing, and collection procedures for the fees charged by the National Agricultural Library to users of its photocopy and loan services. In addition, the agency had an agreement with the National Library of Medicine to perform invoicing, accounting, and collection services for its Interlibrary Loan services. NTIS officials stated, however, that the agency plans to stop marketing its brokerage services due to the decrease in demand for this service.

E-Training and Knowledge Management Services

NTIS’s service offerings have also been expanded to e-training and knowledge management. Specifically, in conjunction with joint venture partners, the agency provides collaborative software solutions, learning management systems and support services, training evaluation software, and talent management applications. For example, NTIS entered into an agreement with Booz Allen Hamilton to provide, among other things, program management; secure Internet hosting; and operations, maintenance, and support services for the Defense Manpower Data Center’s enterprise training program. According to NTIS, as of May 2012, it had 28 primary government clients for this service offering, including the Departments of Justice, the Interior, and the Treasury, and the U.S. Patent and Trademark Office.

²⁹The other six primary clients are the Defense Manpower Data Center, Department of Commerce, Wage Determination Online, U.S. Commission on Civil Rights, Joint Task Force National Capital Region, and National Telecommunications and Information Administration.

Digitization and Scanning Services

As another service, NTIS digitizes various document types, such as microfilm or microfiche and paper forms, to assist agencies in complying with section 508 standards.³⁰ Further, it offers storage and distribution for the documents that it digitizes. For example, NTIS has an agreement with SSA to provide alternative modes of receiving SSA notices and other communications. NTIS provides this service with the assistance of its joint venture partners, Vastec, Inc. and Braille Works, Inc. NTIS offers this information in data compact disc, large print, and audio compact disc. As of May 2012, the agency had six primary clients for its digitization and scanning services, including SSA and the Department of Justice.

NTIS's Reported Revenues and Costs over the Past Decade

As a fee-for-service entity, NTIS's revenues are generated exclusively from its products and services, and all its revenues, expenses, and capital expenditures are deposited into and paid out of its revolving fund. Overall, NTIS had net earned revenues for 8 of the last 11 fiscal years. For example, for fiscal year 2011, the agency reported that net earned revenues from all its functions (products and services) totaled about \$1.5 million. According to NTIS's Financial Report for fiscal year 2011, the revolving fund ending unobligated balance³¹ was approximately \$7.4 million.

However, over most of the last decade, the agency has incurred net costs for its products. Specifically, NTIS product expenditures exceeded revenues for 10 out of the past 11 fiscal years. The agency lost, on average, about \$1.3 million over the last 11 years on its products.

In contrast, NTIS's overall financial performance has been supported by revenues from its service offerings. The agency's service revenues increased, on average, about \$1.8 million over the last 11 years. In particular, for fiscal year 2011, revenues were about \$53.5 million, costs incurred were about \$52 million, and the overall net earned revenue was approximately \$1.5 million from its service offerings. NTIS officials attribute most of the net earned revenue to the agency's agreements with

³⁰Section 508 of the Rehabilitation Act of 1973 requires federal agencies to ensure that their development, procurement, maintenance, or use of electronic and IT equipment takes into account the need for people with disabilities to have access to and use of information that is comparable to that of individuals without disabilities.

³¹The unobligated balance represents the funds in NTIS's revolving fund that may be carried over into the next fiscal year.

the Departments of Agriculture and Education and the Social Security Administration for various service offerings. Table 3 identifies the net earned revenue or net cost for NTIS products and services over the last 11 fiscal years, as reported by NTIS. In those years in which NTIS had net costs, the agency was sustained by cumulative net earned revenues from previous years' operations.

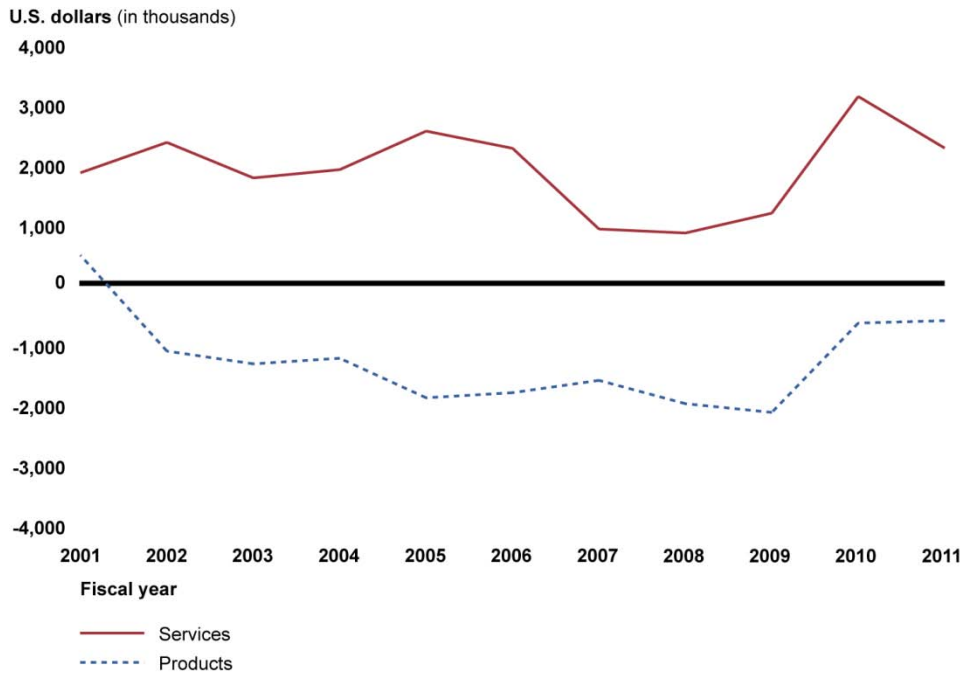
Table 3: Reported Net Earned Revenue (or Net Cost) for NTIS Products and Services, Fiscal Years 2001-2011

Fiscal year	Products	Services	Net earned revenues (net cost)
2001	\$398,233	\$1,772,011	\$2,170,244
2002	(1,197,257)	2,276,535	1,079,278
2003	(1,409,026)	1,685,945	276,919
2004	(1,315,773)	1,824,157	508,384
2005	(1,973,646)	2,465,149	491,503
2006	(1,889,437)	2,179,183	289,746
2007	(1,683,794)	834,741	(849,053)
2008	(2,072,519)	768,982	(1,303,537)
2009	(2,217,263)	1,099,377	(1,117,886)
2010	(730,347)	3,041,803	2,311,456
2011	(690,736)	2,182,535	1,491,799
Total	\$(14,781,565)	\$20,130,418	\$5,348,853

Source: GAO analysis of NTIS-reported data.

Figure 2 illustrates the net earned revenues and net costs associated with NTIS's products and services from fiscal year 2001 through fiscal year 2011.

Figure 2: Fiscal Years 2001-2011 Net Earned Revenues and Net Costs for NTIS Products and Services



Source: GAO analysis based on NTIS provided data.

The decline in revenue for its products continues to call into question whether NTIS's basic statutory function of acting as a self-financing repository and disseminator of scientific and technical information is still viable. This is further highlighted by the fact that the services which are financially sustaining the agency are less directly related to this function.

Recognizing its financial stance, NTIS has conducted analyses, and identified in its 2011-2016 Strategic Plan actions to help address net costs from its products, including its technical reports. The plan emphasizes that the agency's collection, culture, and information technology infrastructure are its main strengths; that continued use of less robust business systems and an aging work force are its primary weaknesses; that growth opportunities still exist in the various sectors served by NTIS, whether through products or services; and that NTIS is threatened by and will have to overcome a shrinking customer base for its products. The plan identifies three strategic initiatives to guide NTIS during this period:

-
1. Increase revenue by enhancing the number of acquisitions, creating new products, reaching more customers, and adding value to what NTIS collects, and to reduce costs by reviewing and improving key business processes.
 2. Improve NTIS's utilization by other agencies by increasing the breadth and depth of its own collection and enhancing the suite of information management services that it can provide.
 3. Achieve workforce excellence by focusing on identifying and acquiring the critical workforce skills required to accomplish the agency's mission in a rapidly changing world.

Beyond these initiatives identified in the strategic plan, the Director of NTIS also provided information on several other initiatives under way to address the budget shortfalls from products. These initiatives include the following product and organizational improvements:

- Enhancing the accessibility of federal science content by shifting from a pricing model for stand-alone products (e.g., paper/print, microfiche, and compact disk media) to one that is subscription-based.
- Repositioning NTIS to support open government initiatives in science—meeting with agencies such as NIST, the National Oceanic and Atmospheric Administration, and the Government Printing Office to address how NTIS can reposition its programs to support current science information needs.
- Building collections of reports based on themes and categories that will be supported through subscriptions.
- Adjusting the NTIS business model to support the increased demand for subscriptions to customers.
- Reducing staff—for example, the agency has received authorization to provide early retirement for eligible employees and has stopped hiring additional staff. The agency anticipates employee attrition to further reduce current staffing levels.

Notwithstanding these efforts, NTIS could likely continue to face challenges in recouping the costs of its products given the increasing availability of technical information from other sources.

Additions to NTIS's Repository Have Mostly Included Older Reports, but Demand for More Recent Reports Is Greater

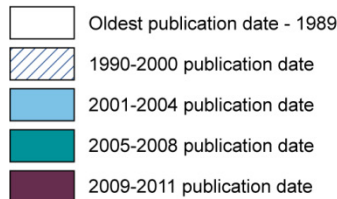
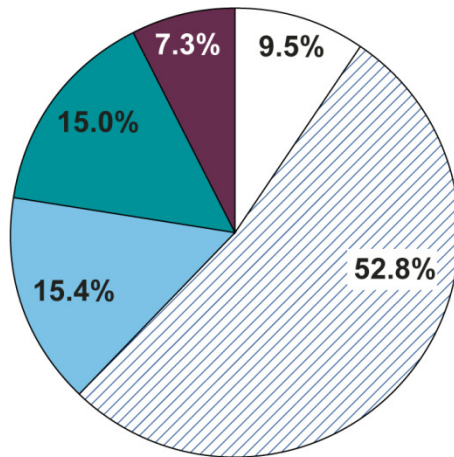
From fiscal year 1990 through 2011,³² most of the additions to NTIS's repository were older reports published in the year 2000 or before; however, the greater demand was for more recently published reports. In this regard, the agency added 841,502 reports to its repository from 1990 through 2011. Of the reports added, approximately 62 percent, or 524,256, had publication dates of 2000 or earlier, while approximately 38 percent, or 317,246, of the reports were published from 2001 to 2011. Specifically, reports that were added to the repository during this period were as follows:

- 79,943 reports published in 1989 and prior years,
- 444,313 reports published from 1990 through 2000,
- 129,591 reports published from 2001 through 2004,
- 126,225 reports published from 2005 through 2008, and
- 61,430 reports published from 2009 through 2011.

Figure 3 shows the distribution of reports that were added by each publication date age group from 1990 through 2011.

³²We did not include reports added for fiscal year 2012 because our study only focused on those fiscal years that had been completed at the time that our study was initiated.

Figure 3: Year of Publication for Documents Added to NTIS Repository, 1990 through 2011



Source: GAO estimates based on NTIS provided data.

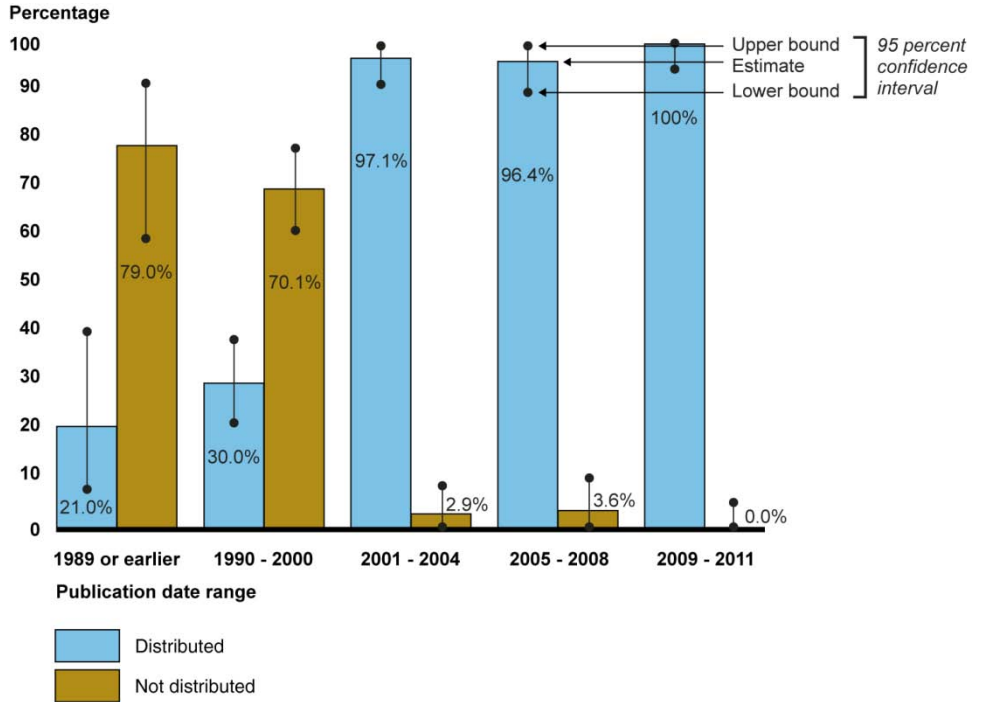
With regard to demand for the reports, we estimate that, during fiscal years 2000 through 2011, NTIS distributed (sold) one or more copies of about 419,657, or almost 50 percent, of the 841,502 reports added to its repository during fiscal years 1990 through 2011.³³ Of these 419,657 reports, approximately 78 percent were distributed through a subscription only.³⁴ NTIS officials attributed this to the fact that subscriptions are a cost-effective way for libraries to meet their collection development requirements within a specific or broad area of interest. The officials noted that direct sales are generally to customers interested in specific topics.

³³The 95 percent confidence interval for the estimated percent of reports distributed one or more times is (44.9, 54.8) percentage points. For purposes of this report, demand is defined as the distribution (sale) of a report by direct sale or subscription.

³⁴The 95 percent confidence interval for the estimated percent of reports distributed through a subscription only is (69.7, 84.4) percentage points.

However, as shown in figure 4, the agency was more likely to distribute a higher percentage of more recently published reports than older ones. For example, we estimate that between 96 and 100 percent of the reports published from 2001 through 2011 had been distributed, while only about 21 percent of reports published in 1989 or earlier were distributed during this time period. That is, the demand for older holdings in the NTIS repository is lower than for newer publications.

Figure 4: Estimated Percentage of Reports Distributed and Not Distributed by Publication Date during Fiscal Years 2000 through 2011



Source: GAO estimates based on NTIS provided data.

Note: This figure presents estimates based upon our random sample of 384 reports. The heights of the bars show the percentage point estimate for each category on the horizontal axis relative to the others. The line on each bar represents the 95 percent confidence interval associated with each estimate. Estimates are rounded to the nearest tenth of a percent, and may sum to greater than 100 percent due to rounding. See app. I for an explanation of confidence intervals.

Most Reports Added Since 1990 Are Freely Available from Other Websites

Based on our sample, we estimate that most (about 74 percent) of the reports added to NTIS's repository during fiscal years 1990 through 2011 were readily available from other public websites, and nearly all of these (95 percent) could be obtained for free.³⁵ Specifically, we estimate that approximately 621,917, or about 74 percent, of the 841,502 reports added to NTIS's repository from fiscal years 1990 through 2011 are readily available from one of the other four publicly available sources we searched (i.e., the issuing organization's website; the Government Printing Office's Federal Digital System website; the U.S. government's official web portal, USA.gov; or from another website located through a Google search).³⁶ The source that most often had the report we were searching for was another website located through <http://www.Google.com>.

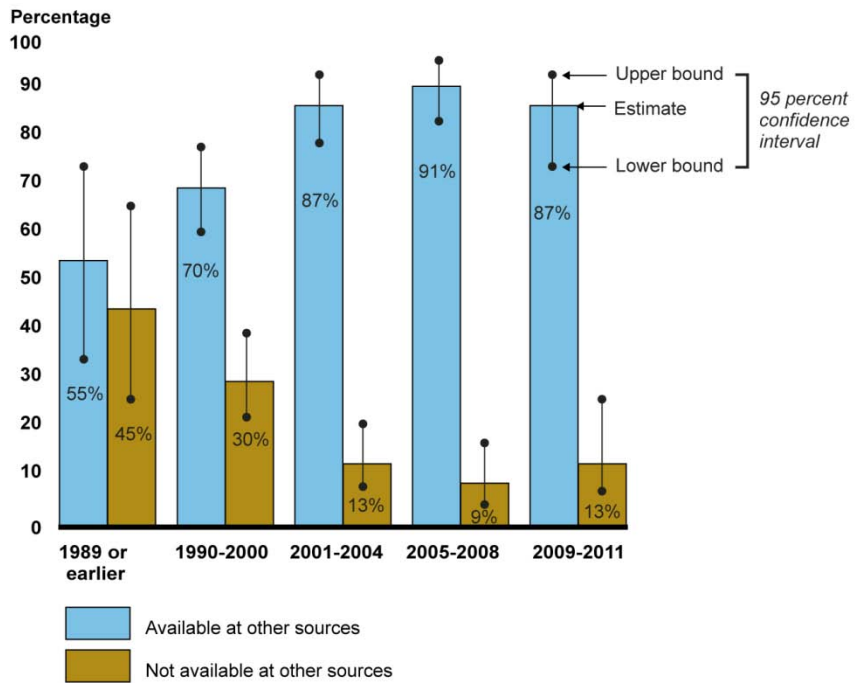
In addition, of the reports added since fiscal year 1990, those with more recent publication dates were more likely to be available from other public sources than older ones. For example, approximately 87 percent of the reports with publication dates from 2009 to 2011 were available elsewhere, while 55 percent of those published in 1989 or earlier were.³⁷ Figure 5 shows the estimated availability of reports added to NTIS's repository since fiscal year 1990 by date of publication.

³⁵The 95 percent confidence interval for the estimated percentage of reports available elsewhere which could be obtained for free is (90.7, 97.5) percentage points.

³⁶The 95 percent confidence interval for the estimated percentage of reports available through one or more of the four publically available sources we searched is (67.9, 80.0) percentage points.

³⁷For reports published between 2009 and 2011, we estimate that 86.5 percent are available elsewhere. The 95 percent confidence interval for this estimate is (74.2, 93.5) percentage points. For reports published in 1989 or earlier, we estimate that 55 percent are available elsewhere. The 95 percent confidence interval for this estimate is (34.1, 74.3) percentage points.

Figure 5: Estimated Availability of Reports by Year of Publication

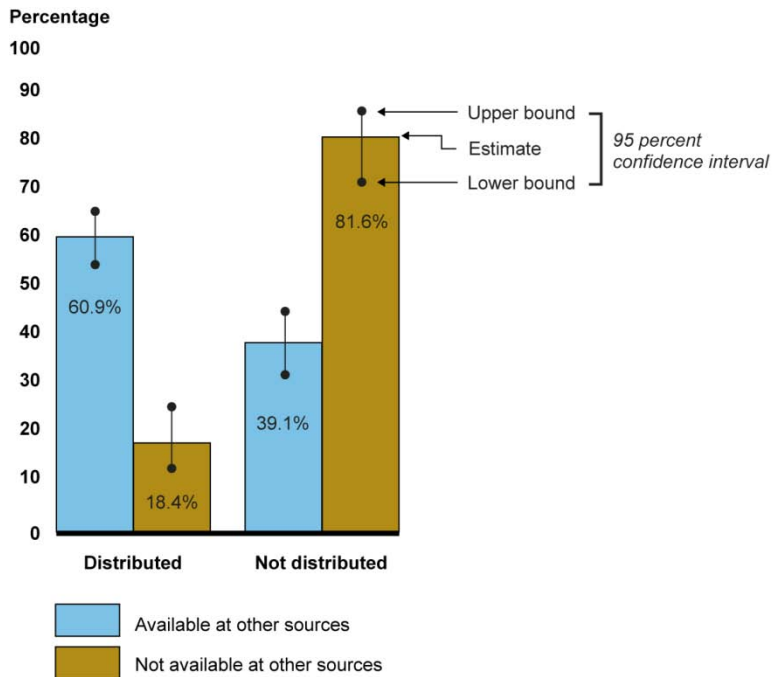


Source: GAO estimates based on NTIS provided data.

As shown in figure 6, of the reports that were found to be readily available from one of the other four sources that we searched, about 61 percent of those reports had been distributed (sold) by NTIS. Conversely, of the reports that were not found to be readily available from one of the other four sources, most, or about 82 percent, had not been distributed by NTIS.³⁸

³⁸The 95 percent confidence interval for the estimated percent available reports that were distributed is (54.0, 67.4) percentage points. The 95 percent confidence interval for the estimated percent of reports not available and not distributed is (73.2, 87.8) percentage points.

Figure 6: Estimated Availability of Reports Distributed and Not Distributed During Fiscal Years 2000 through 2011



Source: GAO estimates based on NTIS provided data.

Not only were most of the reports in our sample available from sources other than NTIS, but about 95 percent of the reports available elsewhere could be obtained free of charge from one of the four other sources we searched.³⁹ The remaining 5 percent were available from the public sources for a fee.⁴⁰ Moreover, the year of publication did not appear to have an effect on whether a report was available free of charge. For example, the following reports available for a fee from NTIS were available free of charge from the issuing organization’s website:

Hazardous Waste Characteristics Scoping Study, November 1996, Environmental Protection Agency, 278 pages. (At NTIS, print on demand costs \$73, electronic \$25.)

³⁹The 95 percent confidence interval for this estimate is (90.7, 97.5) percentage points.

⁴⁰The 95 percent confidence interval for this estimate is (2.5, 9.3) percentage points.

“Homeland Security: Intelligence Indications and Warning,” December 2002, Naval Postgraduate School, 5 pages. (At NTIS, print on demand costs \$17, electronic \$15.)

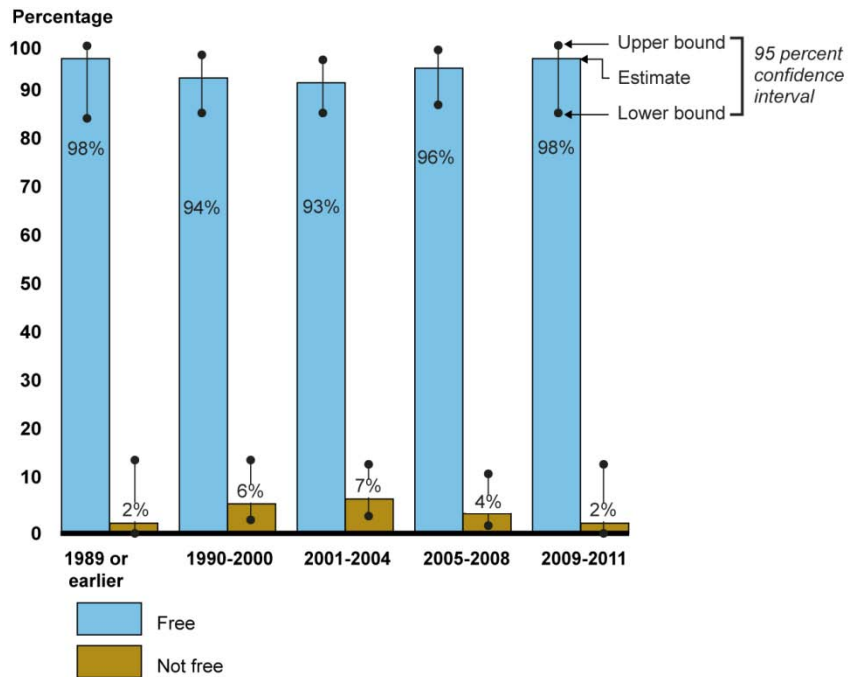
Export Controls: System for Controlling Exports of High Performance Computing Is Ineffective, 2000, GAO, 60 pages. (At NTIS, print on demand costs \$48, electronic \$15.)

FDA Enforcement Report: July 20, 2011, July 2011, Food and Drug Administration, 28 pages. (At NTIS, print on demand costs \$33, electronic \$15.)

Principal Rare Earth Elements Deposits of the United States: A Summary of Domestic Deposits and a Global Perspective, 2010, Geological Survey, 104 pages. (At NTIS, print on demand costs \$60, electronic \$25.)

Of those reports we found available elsewhere, figure 7 shows the estimated percent that were available elsewhere for free by year that the document was published.

Figure 7: Of Reports Found Elsewhere, Estimated Percent Available for Free and Not Free, by Year of Publication



Source: GAO estimates based on NTIS provided data.

Note: These estimates are for reports readily available from one of the other four publicly available sources that we searched.

The Director of NTIS acknowledged two factors that contributed to the free and public availability of reports from other sources:

- Federal agencies are providing information, including their federal scientific, technical, and engineering information products, on their websites in electronic format and on central federal information websites such as <http://www.data.gov> and <http://www.science.gov>. The information is available for immediate download at no cost.
- Federal agencies are participating in programs with Internet search engines that permit the public to locate their products for free or for less than they are when purchased from NTIS. In addition, commercial vendors are also able to obtain these information products from agency websites or through Internet search and are able to make these products available for free or at a price lower than that offered by NTIS.

Further, NTIS acknowledged in its strategic plan that because the Internet continues to change the way people acquire and use information and permits federal agencies to make their information products available for free, NTIS is challenged to meet its statutory mandate as a self-financing repository and disseminator of technical information. Notwithstanding these acknowledgments, NTIS continues to charge for reports that are freely available from other public sources.

Conclusions

NTIS serves as a permanent repository and disseminator of technical information, and by statute, is required to be financially self-sustaining, to the fullest extent feasible, by charging fees for its products and services. While the agency had cumulative net earned revenues as of September 30, 2011, its costs exceeded revenue by an average of about \$1.3 million over the last 11 years from the sale of technical information. The agency's net revenue now comes primarily from services that are less directly related to its basic statutory function. The decline in sales of technical information is due in part to the increasing availability of this information from other sources, including websites and Internet search tools, and often at no charge. Charging for information that is freely available elsewhere is a disservice to the public and may also be wasteful insofar as some of NTIS's customers are other federal agencies. Taken together, these considerations suggest that the fee-based model under which NTIS currently operates for disseminating technical information may no longer be viable or appropriate.

Matter for Congressional Consideration

In light of the agency's declining revenue associated with its basic statutory function and the charging for information that is often freely available elsewhere, Congress should consider examining the appropriateness and viability of the fee-based model under which NTIS currently operates for disseminating technical information to determine whether the use of this model should be continued.

Agency Comments and Our Evaluation

The Acting Secretary of Commerce provided written comments on a draft of this report, which are reprinted in appendix II. In its comments, Commerce expressed appreciation for our study and for our focus on the initiatives that NTIS has undertaken. However, the department said NTIS did not believe our conclusions (that the fee-based model under which it operates for disseminating technical information may no longer be viable or appropriate) fully reflect the additional value that NTIS provides with the work that it performs. Commerce stated that, through its federal

clearinghouse and repository, the agency provides federally funded reports that are not otherwise readily available, such as most of those issued prior to 1989. Additionally, Commerce stated that NTIS recognizes that it cannot remain financially solvent solely through sales and subscriptions of technical reports with expectations that these products will be widely available for free. It added that NTIS is moving in the direction of “open and improved access” to information, but recognizes that it needs to maintain a sustainable financial model and continue providing enhanced value to the information generated by other federal agencies. In this regard, Commerce described features that it believes have added value to the technical reports that NTIS maintains, how these features improve access to the documents and related data, and specific information services that the agency provides to science information professionals.

Our report highlighted various initiatives that NTIS has undertaken to provide older reports that might not otherwise be readily available, and to increase the value of its technical reports, information management services, and technology transfer capabilities. However, as discussed in the report, we found that the demand for older holdings in the agency’s repository is lower than for new publications. For example, we estimate that between 96 and 100 percent of the reports published from 2001 through 2011 had been distributed, while only about 21 percent of reports published in 1989 or earlier were distributed during this time period. Further, as the agency acknowledged, its financial health is based on both its information product and service missions. Also, as we state in our report, the agency’s net revenue now comes primarily from services that are less directly related to its basic statutory function, while sales of its technical information products have resulted in net losses. This decline in sales of NTIS’s technical reports is due in part to the increasing availability of this information from other sources, including websites and Internet search tools, and often at no charge. With these factors in mind, we stand by our conclusion that the fee-based model under which NTIS currently operates for disseminating technical information may no longer be viable or appropriate.

NTIS also provided technical comments on the report via e-mail, which we have incorporated as appropriate.

We are sending copies of this report to interested congressional committees. We are also sending copies to the Secretary of Commerce; the Director, NTIS; the Director, NIST; and other interested parties.

Copies of this report will also be available at no charge on GAO's website at <http://www.gao.gov>.

Should you or your staffs have any questions on information discussed in this report, please contact me at (202) 512-6304 or melvinv@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 III.



Valerie C. Melvin
Director
Information Management
and Technology Resources Issues

Appendix I: Objectives, Scope, and Methodology

Our objectives were to determine (1) how the National Technical Information Service (NTIS) is currently organized and operates, including its various functions, current staffing level, reported cost of operations, and revenue sources; (2) the age of and demand trends for reports added to NTIS's repository; and (3) the extent to which these reports are readily available from other public sources.

To determine how NTIS is organized and operates, we reviewed the agency's strategic plan, and documentation on its organizational and reporting structure, office staffing level and assigned responsibilities, and types of products and services offered. We also reviewed cost data contained in the agency's annual financial reports.¹ In addition, we reviewed relevant laws and regulations on NTIS's authority and responsibilities² and our previous reports that discussed its mission and operations.³ We supplemented our analyses with interviews of the Director of NTIS and other relevant agency officials; we also interviewed officials of the Department of Commerce and its National Institute of Standards and Technology (NIST), which have specific reporting relationships with NTIS.

For our second and third objectives, we obtained from NTIS the full list of document accession numbers for reports added to its repository since fiscal year 1990. We chose to include reports added since fiscal year 1990 to determine the current availability of older documents in light of NTIS's role as a permanent repository, and to focus on the reports added since our previous review in 2001.⁴ We then stratified the list of document accession numbers into four strata by the year in which a document was added to the repository. We subsequently selected a stratified random sample with 96 document accession numbers per strata, for a total

¹The cost data reflected in our report were taken from documentation provided by NTIS. However, we did not test the reliability of NTIS's cost accounting system, from which the agency derives its cost data.

²For example 15 U.S.C. 1151-57, 15 U.S.C. 3704b-1 & 2, and 15 C.F.R. Part 1180.

³GAO, *Information Policy: NTIS' Financial Position Provides an Opportunity to Reassess Its Mission*, [GAO/GGD-00-147](#) (Washington, D.C.: June 30, 2000) and *Information Management: Dissemination of Technical Reports*, [GAO-01-490](#) (Washington, D.C.: May 18, 2001).

⁴We did not include reports added for fiscal year 2012 because our study only focused on those fiscal years that had been completed at the time that our study was initiated.

sample size of 384 reports. All of the estimates made with this sample are weighted to reflect the stratified design. NTIS provided us with the full bibliographic data for each document in our sample.

To determine the age of reports added to NTIS's repository since fiscal year 1990, we used the year of publication for the reports in our sample to estimate the age range (prior to 1990; 1990-2000; 2001-2004; 2005-2008; and 2009-2011) for all documents added from fiscal year 1990 through fiscal year 2011. To determine the demand trends for reports added to NTIS's repository during fiscal years 1990 through 2011, we requested the sales data from fiscal year 2000 through fiscal year 2011 for the 384 reports in our stratified sample. NTIS provided the distribution data for both direct sales and subscriptions for all of these documents. We then used our sample and the sales data to estimate the extent and prevalence of the sales among all reports added to the NTIS repository. Specifically, we used these data to estimate the (1) total number of reports distributed by direct sale and subscription, (2) total number of reports distributed one or more times, (3) percentage of reports distributed relative to the year the reports were published, and (4) percentage of reports distributed relative to their availability elsewhere. The observations were statistically weighted in the estimation process to reflect the stratified sample design that we used.

To determine the extent to which reports in the repository are readily available from other public sources, we first developed a methodology for conducting systematic Internet searches to determine availability elsewhere. More specifically, as part of this methodology, we searched the Internet to determine if each of the reports included in our sample of 384 reports could be found elsewhere and at no cost. Using a tiered approach, we searched the following four sources in the order shown: (1) the issuing organization's website; (2) the U.S. Government Printing Office's Federal Digital System website—<http://www.gpo.gov/fdsys>; (3) a web search conducted using the federal government Internet portal USA.gov—<http://www.USA.gov>; and (4) a web search conducted using the commercial search engine <http://www.Google.com>.⁵ Specifically, with this methodology, we determined whether each report was first available at no cost on the issuing organization's website and, if so, concluded the

⁵These sources and the order in which they were searched were based on an effort to duplicate the methodology used in our previous 2001 study of NTIS.

Internet search at this point. However, if the report was not available, then the search continued to the second source, and so on, until either the report was found to be available at one of the remaining sources, or all sources were exhausted.⁶ We then used our results to estimate the percentage of the total population of NTIS reports added to the repository during fiscal years 1990 through 2011 that was available from other public sources.

All of the results derived from the sample analyses constituted estimates that are subject to sampling errors. These sampling errors measure the extent to which samples of this size and structure are likely to differ from the population they represent. Because we followed a probability procedure based on random selections, our sample is only one of a large number of samples that we might have drawn. Since each sample could have provided different estimates, we express our confidence in the precision of our particular sample's results as a 95 percent confidence interval. This is the interval that would contain the actual population value for 95 percent of the samples we could have drawn.

To determine the reliability of the data provided from NTIS's repository of reports, we performed basic steps to ensure the data provided were valid, and reviewed relevant information describing the database supporting the repository. We tested for duplicate records, missing values, and out-of-range values in the data received from NTIS. We did not assess the reliability of the system used to maintain these data or the processes used in extracting the data for our engagement purposes. To determine the reliability of the sales data provided by NTIS, we conducted interviews with agency officials to gain an understanding of the process by which accounts receivable records are added and managed within NTIS's system of accounts receivable—"CIS.PUB." Further, we asked cognizant agency officials specific questions to understand the controls in place for ensuring the integrity and reliability of the data contained in CIS.PUB. In addition, we met with NTIS officials to discuss data collected from NTIS and obtained their assertions regarding the data it provided. Based on the results of these efforts, we found the data sources to be sufficiently reliable, given the way they are reported herein.

⁶In identifying the reports' availability elsewhere, we did not assess if the source at which the report was found was the original issuer of the report or whether the report's content was unaltered from its original issuance.

We conducted this performance audit from February 2012 to November 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Comments from the Department of Commerce



UNITED STATES DEPARTMENT OF COMMERCE
The Secretary of Commerce
Washington, D.C. 20230

November 8, 2012

Valerie C. Melvin
Director, Information Management
and Technology Resources Issues
U.S. Government Accountability Office
441 G. Street, NW
Washington, DC 20548

Dear Ms. Melvin:

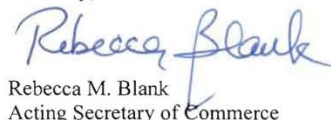
Thank you for the opportunity to review and comment on the U.S. Government Accountability Office's (GAO) draft report entitled "Information Management: National Technical Information Service's Dissemination of Technical Reports Needs Congressional Attention" (GAO-13-99).

We appreciate the work that the GAO has done to update the prior 2001 GAO Report on the National Technical Information Service (NTIS). We are pleased that your team recognizes that NTIS successfully performs their statutory missions and responsibilities while remaining financially self-sustaining. The GAO team focused on current initiatives that NTIS has undertaken to increase the value of its technical reports, information management services, and technology transfer capabilities. NTIS executed these enhancements while containing costs and remaining financially self-sustaining.

NTIS recognizes that it cannot remain financially solvent solely through sales and subscriptions of technical reports with expectations that these products be widely available for free. NTIS is moving in the direction of "open and improved access" but we also recognize that NTIS needs to maintain a sustainable financial model and to continue providing enhanced value to the information generated by other federal agencies. While "open and improved access" is one goal, the challenge for science information management is more than free and open access to documents. NTIS has been an active agent for the transition and expansive access to technical reports and positioned for data linking. NTIS has invested in information technologies through NTIS service offerings to federal clients and with the Federal Science Repository Service.

If you have any questions regarding our response, please contact Bruce Borzino, Director of the National Technical Information Service, at (703) 605-6405.

Sincerely,


Rebecca M. Blank
Acting Secretary of Commerce

Enclosure

**Department of Commerce
National Technical Information Service
Comments to the Draft GAO Report Entitled
“INFORMATION MANAGEMENT: National Technical Information Service’s
Dissemination of Technical Reports Needs Congressional Attention”
(GAO-13-99, November 2012)**

General Comments

Thank you for the opportunity to review and comment on your draft report regarding the National Technical Information Service (NTIS). We appreciate the work of your staff and thank them for their diligence. Your team recognized that NTIS successfully performs its statutory missions and responsibilities while remaining financially self-sustaining. NTIS was pleased that during this review, the GAO team focused on current initiatives that NTIS has undertaken to increase the value of its technical reports, information management services, and technology transfer capabilities. We appreciate that GAO recognizes NTIS has executed enhancements while containing costs and remaining financially self-sustaining. NTIS acknowledges that its financial health is based on both the information product mission that GAO reviewed as well the information service mission that GAO did not review during this engagement. When viewed in combination, NTIS continues to remain financially healthy as a fee based organization. NTIS acknowledges that recommendations to provide value-added information products, such as subscriptions to technical reports, cannot be considered or addressed in isolation from the overall mission and mandates.

NTIS Response to GAO Conclusion

The draft GAO report states, “Charging for information that is freely available elsewhere is a disservice to the public and may be wasteful insofar as some NTIS customers are other federal agencies. Taken together, these considerations suggest that the fee-based model under which NTIS currently operates for disseminating technical information may no longer be viable or appropriate.” We do not believe the conclusion fully reflects the additional value that NTIS provides with the additional work NTIS performs.

NTIS provides federally funded reports that are not otherwise readily available.

NTIS research has determined that most federally originated technical reports prior to 1989 do not have assured availability from the source agency, other federal public sources, or from generally available internet sources. However, these reports are currently available to the public, industry, and academia because NTIS operates a permanent federal clearinghouse and repository containing authenticated agency technical reports and associated value-added bibliographic meta-data for over 2.5 million federal publications.

In addition to making the reports available, NTIS has added value to the reports.

NTIS is moving in the direction of “open and improved access”, but we are also mindful of the need to be responsible stewards of science information particularly as such efforts impact national efforts for economic growth. NTIS needs to maintain a sustainable financial model in information management in an era of reduced federal spending. NTIS sees open information access as a foundation for new business inspired growth using open source technologies, agile

development of information services valued by federal clients, and continuous improvement of information services to the federal community.

NTIS is surviving in the “open” information environment by providing a value-added service which consists of the following process:

- Acquisition of new documents in two formats: (1) the document file, and (2) the meta-data for each document.
- Conversion to searchable text and that text is added to the meta-data, resulting in a user friendly aggregate scientific, technical, and engineering information (STEI) database of federally funded research.
- Quality control for content integrity that is reviewed, abstracted, and indexed by a team of information specialists.
- The addition of a new set of data points is added to the meta-data of each document, e.g. data points include keywords, subject categories, related subject categories and more.

The improved access to the documents and related data results in:

- Facilitating greater discoverability of federally funded research meta-data that is indexed and organized.
- Ensuring availability to the academia, corporate and the public via the NTIS website or through one of NTIS’s subscription-based access sites.
- The document, meta-data, and the index each becomes a part of the NTIS Collection which greatly increases the qualitative discoverability for research and technology transfer endeavors that benefits the public.

The National Technical Reports Library...a valued service to science information professionals

To increase the value and availability of those reports, NTIS launched the National Technical Reports Library (NTRL) in 2009. NTRL is a collection of all NTIS electronic technical reports available on a subscription basis at the institutional level, such as a federal agency or university. NTRL currently has 70 institutional subscribers providing access to 1.6 million users. Subscribers have repeatedly reported the value of the NTRL is in delivering specific information to the subscriber. This value added is created by NTIS staff and is in addition to the content of the underlying technical reports. NTIS continues to work closely with federal and public scientific communities to seek innovative solutions to meet general and scientific information needs.

Representative Sample of NTRL Subscribers:

- U.S. Department of Interior: 69,000 I.P. User License
- Emory Riddle Aeronautical University: 8,800 I.P. User License
- U.S. EPA National Library Network: 5,000 I.P. User License
- Princeton University: 7,600 I.P. User License
- Stanford University: 8,775 I.P. User License
- University of California (multiple sites): 125,000 I.P. User License

The Federal Science Repository Service... a valued service to federal science agencies

As noted in the GAO Report, NTIS is effectively serving a wide variety of federal clients in innovative solutions to general and scientific information needs. These information needs have been transformational in positioning NTIS organization skill sets on basic needs such as digitization, repository development, and website management to very advanced information technologies. These technologies utilize open source solutions for enhancing science information management options. Additionally, Federal Science Repository Service (FSRS) establishes a gateway for potential links to collaborative productivity, innovative knowledge management solutions, and interoperable data and records management.

In 2011, NTIS launched the FSRS to federal clients. The FSRS is based on the same open source repository technology used in the NTRL and gives federal data and records managers a path forward in distributed information technology solutions. NTIS is currently working with the U.S. State Department and the National Oceanic and Atmospheric Administration (NOAA) in FSRS projects.

NTIS sees that the services provided by FSRS are needed to continue growing information services in a federal culture of efficiency innovation. The GAO notes that the end result of NTIS information services is to assist financial support to the core STEI mission. It also needs to be recognized that the technical skill sets acquired for these services benefit the federal customers as well providing a future investment in technical skills sets needed for a variety of information challenges going forward.

Moving forward in the Science Information Service

NTIS provides innovative value and solutions to the evolution of information management:

- Value of aggregation of science content utilizing core indexing across source platforms.
- Value of permanent and persistent access with a solid link to a National Archives and Records Administration (NARA) archival solution.
- Discovery of science information that goes beyond PDFs and Technical Reports, linking to data and records management.
- Embracing the emerging "economy of data" in all science.
- Science information that is not easily available elsewhere via "Digital-on-Demand."
- Private-public cooperation in advancing the science information.
- Metrics focused on the effectiveness of federal research dollars invested.
- Science information in secure environments.

NTIS... Working in a Science Networked Environment

A core function of NTIS is to act as a clearinghouse and repository for technical information, such as reports and databases, from across the Federal Government. In furtherance of this core function, NTIS continues to work closely with federal and public scientific communities to seek innovative solutions to meet general and scientific information needs. While science information management has changed dramatically in the past decade, NTIS has been an active agent for the transition and expansive access to technical reports and positioned for data linking. NTIS has invested in information technologies through NTIS service offerings to federal clients and with the Federal Science Repository Service. NTIS needs to continue with the central index to science content while utilizing the advanced features of networked science.

Statement Summary

The challenge for science information management is more than free and open access to documents. The primary challenge is to further the discovery of science content that results in broader use of reports, data, and related linked materials resulting in more efficient technology transfer, economic growth, and societal benefits.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Valerie C. Melvin, (202) 512-6304 or melvinv@gao.gov

Staff Acknowledgments

In addition to the contact named above, Cynthia Scott (Assistant Director), Carl Barden, Virginia Chanley, Elena Epps, Nancy Glover, Alina J. Johnson, Lee McCracken, Constantine Papanastasiou, David Plocher, Bradley Roach, and Tina Torabi made key contributions to this report.

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