



SCIENCE & TECHNOLOGY POLICY INSTITUTE

# **Scientific Collections: Mission-Critical Infrastructure for Federal Scientific Agencies**

## **Technical Report**

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## **PREFACE**

This document was prepared by the Science and Technology Policy Institute of the Institute for Defense Analyses under a task titled “Scientific Collections.” This work was done in support of the Director of the Office of Science and Technology Policy (OSTP). The publication does not indicate an endorsement by the White House Office of Science and Technology Policy, nor should the contents be construed as reflecting the official position of that office.

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## **EXECUTIVE SUMMARY**

In 2005, the George W. Bush Administration identified two research and development areas in need of special attention, including an assessment of the priorities for and stewardship of federal scientific collections. Recognizing the importance of these collections to the national research infrastructure, and acknowledging the lack of comprehensive information on them, the National Science and Technology Council's Committee on Science subsequently established the Interagency Working Group on Scientific Collections (IWGSC) to examine the current condition of scientific collections and to recommend actions to ensure their preservation for future use.

After reviewing the relevant literature and prior studies of scientific collections, the IWGSC determined the need for a comprehensive survey of federal object-based scientific collections. To that end, the IWGSC invited directors and collections managers of federal agencies with over \$100 million in research funding in FY 2004 and with known responsibility for the management of scientific collections to provide information about the purpose, size, and scope of their collections.

Respondents answered questions using 1 or more of the 10 different versions of the questionnaire tailored to 10 categories of "collection type." (See Appendix 1 for a list of collections included in this survey by type.) Each survey form allowed respondents to report on up to six different collections of that collection type.

The IWGSC collected data between June 2006 and September 2007. Collections managers representing 14 federal departments and agencies completed 155 questionnaires and provided information about 291 different scientific collections. The technical report that follows summarizes the responses of the 14 U.S. Federal departments and agencies that participated in the IWGSC survey.

### **KEY FINDINGS**

#### **Scientific research is the primary function of most reporting units**

Seventy-nine percent of the respondents to the collections manager survey identified the primary function of their unit as "scientific research." Further, 85% of the respondents indicated that basic research is a primary use of their unit's collections. In addition, over half the

respondents reported that all their collections are unique (i.e., none of their collections are duplicated elsewhere). Respondents also reported that their collections are used primarily by professional researchers, reporting unit staff, and other government agencies.

**Most Federal object-based scientific collections described in this survey increased in size since FY2000**

Over 40% of the federal object-based scientific collections surveyed have a geographic scope that is regional within the United States. Over three-quarters of the collections included in the survey increased in size by up to 25% annually since FY2000; the overwhelming majority of those increases were anticipated by the agencies and represented routine collection activity. Of the handful of collections that decreased in size during that time, about 25% of the decreases were unanticipated and caused by changes in staff or budget.

**Most Federal object-based scientific collections described in this survey are reported to be in good or very good condition, but few collections have been assessed in their entirety**

More than 75% of the surveyed collections are reported to be in “good” or “very good” condition, but the condition of 86% of the collections had not been entirely assessed.

**Most Federal object-based scientific collections described in this survey are adequately stored**

Over three-quarters of survey respondents reported that their collections are stored either mostly or entirely (i.e., more than 50% of a collection) in conditions that are adequate for their care and preservation; for those stored under inadequate conditions, new or improved storage equipment was the most cited need. Survey respondents identified cataloguing, additional/improved space, additional staff, and digitization as the most important care and preservation issues.

**Most Federal object-based scientific collections described in this survey are available for research**

While over three-quarters of the collections surveyed are mostly or entirely (i.e., more than 50%) available for research use, only 27% are completely catalogued. For collections that respondents deemed at least partly inaccessible to researchers, the three most important needs are new or improved storage equipment, new or improved environmental controls, and renovated storage space. Eighty-six percent of respondents report that their agencies do not charge researchers for access to their collections.

Only 16% of the collections surveyed are entirely accessible through electronic databases, and most have neither collection content nor metadata available through the Web.

**The Federal government is the primary funding source for the care and maintenance of the object-based scientific collections included in this survey**

Most respondents report that the Federal Government is the primary source of funding for collection care and maintenance, but 19% rely on external funding sources. Although 28% of respondents reported that their agencies specifically allocate funds for collection care and management, 41% reported that their agencies have no funds specially allocated for the purpose. Five percent of respondents report that they do not know their agencies' dedicated budgets.

**Many reporting units lack policies and procedures for the management of the Federal object-based scientific collections included in this survey**

Over one-fourth of the respondents reported that their reporting units lack written, approved policies and procedures for collections management. Of those that have policies and procedures, the most up-to-date are those governing documentation, acquisition, access and use, and preservation.

**Some Federal object-based scientific collections described in this survey have no full-time staff**

More than one-fourth of the survey respondents reported that their collections lack associated full-time staff. Furthermore, less than half of the respondents reported having part-time paid staff associated with their collections.



## INTRODUCTION

In response to the administration's FY2007 Research and Development Budget Priorities Memorandum,<sup>1</sup> the National Science and Technology Council's Committee on Science established the Interagency Working Group on Scientific Collections (IWGSC) to examine the current status of federally owned object-based scientific collections that are part of a federal agency's holdings or for which an agency has permanent responsibility. Fundamental to research in the sciences and engineering, object-based scientific collections are repositories for important and sometimes rare specimens. In addition, through their active use by researchers, teachers and students, the collections can play an important role in assessing public health and safety, promoting trade and economic development, and advancing medical discoveries. Although the U.S. Federal Government supports the development and maintenance of these scientific collections, there is no systematic monitoring of them, and little is therefore known about their size, scope and condition.

## APPROACH

To assess the condition of federal scientific collections, the IWGSC initially conducted a review of the literature to understand what was known about the status of federal scientific collections. The IWGSC found that published surveys, reports, and articles focused primarily on *non-federal* scientific collections, although a few studies included information about the Smithsonian scientific collections. The IWGSC concluded that more up-to-date and focused information about federal scientific collections would be needed for the working group to accomplish its goal of addressing the purpose, size, and scope of collections. Thus, the working group undertook its own survey of object-based scientific collections.

## SURVEY DESIGN

The IWGSC developed a survey instrument, and in December 2005, asked the IDA Science and Technology Policy Institute (STPI) to provide technical assistance. Working with the survey instrument drafted by the IWGSC, the STPI project team began refining the survey

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<sup>1</sup> FY 2007 Administration R&D Budget Priorities Memorandum, 8 July 2005, [http://www.ostp.gov/pdf/ostp\\_omb\\_guidancememo\\_fy07.pdf](http://www.ostp.gov/pdf/ostp_omb_guidancememo_fy07.pdf).

form in January 2006, with the entire IWGSC reviewing each new version of the questionnaire. Issues such as the number of individual survey instruments to develop, the major topics to be addressed by the survey, and identification of individual and agency respondents were decided at monthly IWGSC meetings.

In February 2006, STPI conducted a pilot study of the questionnaires. Five IWGSC member agencies volunteered to participate in the pilot: the Center for Disease Control, the United States Geological Survey, the National Aeronautics and Space Administration, the United States Department of Agriculture, and the National Park Service. A total of 10 scientific collections questionnaires were completed during the pilot. No agency director surveys were completed during the pilot. The scientific collections survey was designed to be completed electronically, although respondents could print paper copies and complete those if necessary.

In early March, STPI conducted follow-up telephone interviews with participants in the pilot survey soliciting feedback on issues, including:

- time required to complete the survey
- ease of access to online and paper versions of the survey
- clarity of instructions and questions
- ability to answer questions
- relevance of the questions
- completeness of the survey

Respondents reported that they had little trouble accessing the online survey and did not find the length of the survey to be onerous. The range of completion times was 20 minutes to 1 hour. They did report, however, that some definitions needed to be clearer and that some questions needed more response choices. These responses were presented to the IWGSC and used to clarify the survey instructions, revise the questions, and develop a list of frequently asked questions that survey respondents could consult for assistance.

Because many agencies have more than one collection, the committee decided that a respondent could provide information on up to six collections of the same type on a questionnaire. The pilot survey also revealed that a single universal questionnaire was insufficient for surveying the wide range of respondent agencies and the collections they maintained. As a result, the single pilot questionnaire was replaced with a set of questionnaires, 1 for each of the 10 collection categories.

Ten different versions of the questionnaires were designed to allow for the collection of information unique to the following collection types:

- archaeological, anthropological, and ethnographic collections
- botanical collections
- cellular and tissue collections
- chemical collections
- geological and geophysical collections
- invertebrate zoology collections
- paleontology collections
- technological collections
- vertebrate zoology collections
- other collections (not elsewhere specified)

In addition to a questionnaire directed to federal collections managers, The IWGSC developed a separate questionnaire directed to agency directors to collect information on agency stewardship of collections. The results of the “agency stewardship survey” are not reported here.

## **PARTICIPATING AGENCIES**

The IWGC wanted to identify and include all federally owned or funded object-based scientific collections in its analysis. However, the working group discovered that no comprehensive list of federal collections exists at this time. Furthermore, few object-based scientific collections are included as line items in federal agency budgets, making difficult their direct identification. It therefore became necessary for the IWGSC to develop another strategy for capturing information about federal scientific collections.

The IWGSC decided to establish eligibility criteria for specifying the set of agencies to include in the collections survey. The working group adopted the following eligibility criteria. First, agencies would be included in the survey whose federal R&D obligations were at or exceeded \$100 million in FY 2004.<sup>2</sup> Second, among those agencies, only those with known responsibility for the organization and maintenance of object-based scientific collections would be invited to respond to the IWGSC survey.

Ultimately, 14 federal agencies participated in the survey:

DOC-NIST.....Department of Commerce – National Institute of Science and  
Technology

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<sup>2</sup> See <http://www.nsf.gov/statistics/nsf05307/pdf/tabc7.pdf>.

DOC-NOAA .....	Department of Commerce – National Oceanic and Atmospheric Administration
DOE .....	Department of Energy
DHHS-CDC .....	Department of Health and Human Services – Centers for Disease Control
DHHS-FDA .....	Department of Health and Human Services – Food and Drug Administration
DHHS-NIH .....	Department of Health and Human Services – National Institutes of Health
DOI-NPS .....	Department of the Interior – National Park Service
DOI-USGS .....	Department of the Interior – United States Geological Survey
DOT .....	Department of Transportation
NASA.....	National Aeronautics and Space Administration
SI.....	Smithsonian Institution
USDA-ARS.....	United States Department of Agriculture – Agricultural Research Service
USDA-FS.....	United States Department of Agriculture – Forest Service
VA.....	Department of Veterans Affairs

The National Science Foundation (NSF), a major federal research agency, elected to conduct a separate survey of current and former grantees because it does not maintain collections. The results of the NSF survey of object-based scientific collections will be reported separately by that agency.

## **SURVEY LAUNCH**

The White House Office of Science and Technology Policy (OSTP) agreed to host the online survey. The OSTP Director, Dr. John Marburger, sent a letter to the directors of eligible federal agencies inviting their participation in the IWGSC survey. (See Appendix A2a for a sample letter.) A letter from the IWGSC co-chairs provided potential respondents with details regarding the purpose of the survey and directions for completing the online survey. (See Appendix A2b for a sample letter.)



The survey was conducted from June 2006 to September 2007. Survey participants selected and completed the version of the online questionnaire designed for their type of object-based scientific collection(s). Results are presented in the order in which the questions were asked (see Appendix 4 for a sample survey questionnaire).

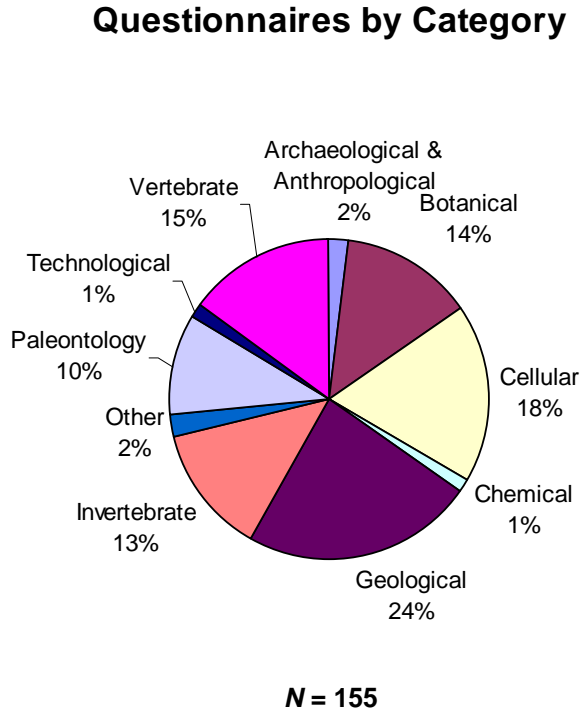
STPI provided technical support to OSTP and the IWGSC, designing the online survey form, gathering and analyzing the survey results, and routinely briefing the IWGSC on survey returns and key findings.

The IWGSC requested that STPI summarize the results of the survey in a technical document, which also serves as an archive of the survey strategy.

## DATA OVERVIEW

Each questionnaire allowed respondents to provide information for up to six individual collections. The respondents themselves determined what constituted a collection. As of October 30, 2007, respondents completed 155 questionnaires providing information on 291 different object based scientific collections.

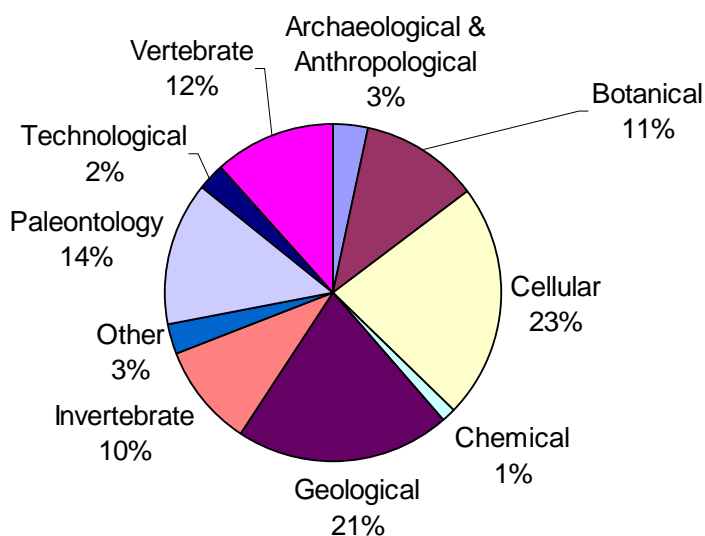
Figure 1 summarizes the distribution of completed questionnaires by collection type.



**Figure 1. Distribution of Completed Questionnaires by Category**

Figure 2 shows the distribution of the 291 collections included in the survey by respondents. (See Appendix 1 for a list of collections by agency and collection type).

### Collections By Category



**N = 291**

**Figure 2. Distribution of Collections by Category**

### INTERPRETING THE TABLES IN THIS REPORT

Given the structure of the questionnaires, the unit of analysis varies from table to table. In cases where respondents were asked to provide *collective* information about all their collection(s), the tables are based on the number of respondents (155). In cases where respondents were asked to provide information about *individual* collections, the tables are based on the number of collections (291). Finally, some tables report on a subset of responses resulting from a skip pattern that allowed respondents to ignore questions that did not apply. For example, a respondent who reported that his or her collection increased in size would not be expected to answer questions about size decreases.

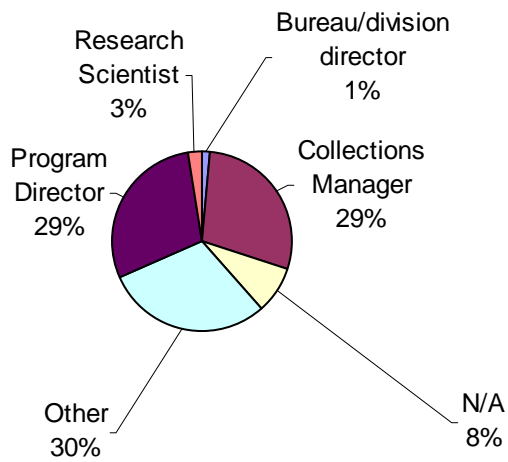
## SECTION A: REPORTING UNIT INFORMATION

Section A of the questionnaire collects information on the individuals completing the survey and their reporting unit.

### Most survey respondents are collections managers or program directors

**A-4. Which level listed below best describes the level at which you are reporting about your scientific collection? (Mark just one.)**

#### Level of Individual Reporting



**N = 155**

#### Observations

- Most respondents are either collection managers or program directors.
- Thirty percent of respondents fall into the “Other” category, which includes responses such as researcher, scientific investigator, and task leader.
- Only a small percentage actually conduct scientific research.

#### Why is this measure important?

Individuals who work more closely with collections are presumed to have more information regarding the condition of those collections. Individuals with greater administrative seniority may possess more information regarding policy and budget.

## SECTION B: DESCRIPTION OF THE REPORTING UNIT

Survey participants were asked to describe the agency with which their collections are affiliated. Since these agencies may be part of a larger institution, this report refers to them generically as “reporting units.” Table 1 lists the 14 reporting units from the 9 Federal agencies participating in the survey and the collection type of questionnaire(s) completed by each unit. See Appendix 3 for full name of agencies and bureaus.

### Agencies have a range of collection types

**Table 1. Collection-Type Questionnaire Type Completed by Reporting Unit**

Parent Agency	Anthropology & Archaeological	Botanical	Cellular	Chemical	Geological	Invertebrate	Other	Paleontology	Technological	Vertebrate
DOI-USGS	—	1	9	—	41	5	—	28	—	2
USDA-FS	—	23	2	—	6	5	3	6	—	2
Smithsonian	8	4	9	—	4	7	—	6	—	7
DOC-NOAA	—	2	12	1	—	5	—	—	—	20
DHHS-NIH	—	1	19	—	—	—	5	—	—	—
USDA-ARS	—	—	5	3	1	3	—	—	—	1
DOC-NIST	—	—	6	—	1	—	—	—	—	—
DOI-NPS	2	1	1	—	1	1	—	1	—	1
DOT	—	—	—	—	—	—	—	—	6	—
NASA	—	—	—	—	5	—	—	—	1	—
DHHS-FDA	—	1	—	—	—	3	—	—	—	—
DOE	—	—	—	—	1	—	—	—	—	1
DHHS-CDC	—	—	1	—	—	—	—	—	—	—
VA	—	—	1	—	—	—	—	—	—	—

***N* = 291**

### Observations

- The Department of the Interior has the largest number of collections among survey respondents.
- There are more cellular collections (65) than any other type. Geological collections were second in number (60).

### Why is this measure important?

Given that there is no central location for information on collections, it is helpful to know which agencies have certain collection types.

## Almost all reporting units are located in U.S. federal agencies

Respondents were asked to describe their reporting units' governance. Almost all report that they are in U.S. federal agencies. Table B-1 shows the distribution of completed questionnaire type by reporting unit governance.

**B-1. Which of the following most closely describes your reporting unit's governance?  
(Mark just one)**

Survey type	Federal agency	Nonprofit, nongovernmental organization	Total
Archaeological & Anthropological	3	—	3
Botanical	20	1	21
Cellular	26	1	27
Chemical	2	—	2
Geological	36	1	37
Invertebrate	18	2	20
Other	3	—	3
Paleontology	16	—	16
Technological	2	—	2
Vertebrate	23	1	24
<b>Total</b>	<b>149 (96%)</b>	<b>6 (4%)</b>	<b>155</b>

**N = 155**

### Observations

- Ninety-six percent of the respondents report that their collections are held by federal agencies.
- The remaining respondents report that collections are held outside of the Federal Government.

### Why is this measure important?

Collections held by federal agencies are subject to federal regulations, including those applying to creation, maintenance, storage, use, and disposition.

## Scientific research is the primary function of most reporting units

### B-2. Which of the following most closely describes your reporting unit's primary function or service? (Mark just one.)

Survey type	Museum	Nature center or zoo	Other	Regulatory agency	Scientific research organization	Total
Archaeological & Anthropological	—	—	2	—	1	3
Botanical	—	—	3	1	17	21
Cellular	—	1	7	1	18	27
Chemical	—	—	—	—	2	2
Geological	2	—	3	—	32	37
Invertebrate	1	1	3	1	14	20
Other	—	—	—	—	3	3
Paleontology	—	—	1	1	14	16
Technological	—	—	—	1	1	2
Vertebrate	—	1	3	—	20	24
Total	3 (2%)	3 (2%)	22 (14%)	5 (3%)	122 (79%)	155

**N = 155**

### Observations

- Scientific research is the primary function of 79% of the reporting units.
- Fourteen percent of the reporting units are primarily involved in other activities such as repositories and analytical labs.
- The remaining 7% are regulatory agencies (5), museums (3), and nature centers or zoos (3).

### Why is this measure important?

The reporting unit's function or service affects a broad range of relevant issues, including users, budget, and staffing.

## SECTION C: PURPOSE AND USE OF COLLECTIONS

**C-1. In the space provided, list the scientific collection you will be describing in this survey. You may list up to six collections. This information will be used to guide your responses in sections D, E, F, and G that follow.**

Respondents listed the scientific collections they described in the survey. Their responses appear in Appendix 1.

**Basic research is the primary purpose of most collections**

**C-2. What is the primary purpose of the collection? (Mark all that apply.)**

Survey type	Basic research	Environmental monitoring	Homeland security	Medical research	Other	Public health	Public safety	Trade or econ development
Archaeological & Anthropological	3	1	—	—	2	—	—	—
Botanical	16	3	—	2	4	2	—	—
Cellular	22	13	—	9	5	4	—	—
Chemical	2	1	—	1	1	1	—	—
Geological	32	9	—	—	5	—	—	3
Invertebrate	18	8	0	2	6	3	0	1
Other	1	1	—	1	1	—	—	—
Paleontology	16	3	0	—	2	—	—	1
Technological	1	—	—	—	1	—	—	—
Vertebrate	21	10	0	—	13	—	0	1
Total	132 (85%)	49 (32%)	0	15 (10%)	40 (26%)	10 (6%)	0	6 (4%)

**N = 155**

### Observations

- Eighty-five percent of the respondents indicate that basic research is a primary use of their collections.
- In addition, 32% report that environmental monitoring is also a primary use for their collections.
- Only 10% of the respondents report that medical research is a primary use of their collections.
- No respondents report that public safety or homeland security are primary uses of their collections (note that the Department of Homeland Security did not participate in the survey).

- Technological, archaeological, and vertebrate collections have the least varied uses, and invertebrate collections have the most varied uses, with collections in all but two use categories.

**Why is this measure important?**

In addition to basic research, scientific collections have wide applicability to public policy and the maintenance of a strong scientific infrastructure.



## Few collections are duplicated in other repositories

### C-3. What percentage of the collection is duplicated in other repositories? (Mark just one.)

Survey type	None	≤50%	>50%	100%	Dnk	Total
Archaeological & Anthropological	2	1	0	—	—	3
Botanical	5	10	0	—	6	21
Cellular	16	7	2	—	2	27
Chemical	—	1	0	—	1	2
Geological	25	9	0	—	3	37
Invertebrate	6	5	2	1	6	20
Other	—	2	0	—	1	3
Paleontology	13	3	0	—	—	16
Technological	1	0	1	—	—	2
Vertebrate	11	10	1	1	1	24
Total	79 (51%)	48 (31%)	6 (4%)	2 (1%)	20 (13%)	155

**N = 155**

### Observations

- More than half the respondents report that none of their collections are duplicated.
- Thirty percent report that less than half of their collections are duplicated.
- Only 4% of respondents report that more than 50% of their collections are duplicated in other repositories, and only 1% of respondents report that all their collections are duplicated.
- Botanical and geological collections have the least reported duplication.

### Why is this measure important?

The extent to which collections are not duplicated is a measure of their uniqueness, an important consideration when assessing care and preservation requirements.

**Collections are used primarily by professional researchers, reporting unit staff, and other government agencies**

**C-4. Who are the primary users of the collection? (Mark no more than 3.) \***

Survey type	Academic institutions	Commercial agencies	Federal agencies	General public	Intl research	Natl research	Nonprofit organizations	Regulatory agencies	Reporting unit staff	State/local agencies	Students
Archaeological & Anthropological	1	—	2	—	1	2	—	—	4	1	1
Botanical	4	1	6	—	7	10	—	—	15	1	2
Cellular	11	1	12	—	11	14	1	1	11	3	6
Chemical	2	—	—	—	—	2	—	—	2	—	—
Geological	13	3	15	—	11	25	—	1	19	4	3
Invertebrate	8	1	8	0	6	10	0	1	13	2	3
Other	2	—	1	—	1	—	1	—	2	—	—
Paleontology	5	—	5	0	4	9	0	—	10	—	5
Technological	2	1	—	—	1	1	—	—	—	—	—
Vertebrate	10	—	10	0	5	12	0	2	13	6	8
Total	58 (37%)	7 (5%)	59 (38%)	0	47 (30%)	85 (55%)	2 (1%)	5 (3%)	89 (57%)	17 (11%)	28 (18%)

**N = 155**

\* Some respondents selected more than the three categories allowed.

**Observations**

- Botanical, cellular, geological, invertebrate, paleontological, and vertebrate collections have the broadest representation of primary users.
- Technological and chemical collections are the least widely used of the identified types of scientific collections.
- Reporting unit staff and national researchers represent the majority of primary users.
- Nonprofit organizations, regulatory agencies, and commercial agencies represent the smallest number of users.
- Of the collections identified in the survey, none are used by the general public, and few are used by nonprofit organizations or commercial entities.

**Why is this measure important?**

The wide range of audiences that use federal scientific collections is an indicator of the importance of these collections to science.

## SECTION D: SCOPE AND SIZE OF THE COLLECTION

The geographic scope of most collections is within the United States

### D-1. What is the geographic scope of the objects in the collection? (Mark all that apply.)

Survey type	Local United States	National- worldwide	Other	Regional United States	Regional worldwide	United States	Worldwide
Archaeological & Anthropological	—	—	1	—	1	1	2
Botanical	8	1	3	6	3	3	7
Cellular	5	6	3	10	4	11	8
Chemical	—	2	—	2	1	2	2
Geological	7	8	6	14	7	8	11
Invertebrate	6	7	2	12	6	8	6
Other	1	—	—	—	—	—	—
Paleontology	3	3	2	6	5	6	4
Technological	—	1	1	—	—	—	—
Vertebrate	4	1	7	13	7	3	2
Total	34 (22%)	29 (19%)	25 (18%)	63 (41%)	34 (22%)	42 (27%)	42 (27%)

**N = 155**

### Observations

- Most collections have either a nationwide, regional, or local scope within the United States.
- Technological collections have the least geographic distribution among the specified types of collections, followed by archaeological and anthropological collections.

### Why is this measure important?

Geographic scope can indicate the depth and breadth of a collection.

### D-2. Describe the size of your unit's object-based scientific collection.

Respondents provided information on the size of their collections in units appropriate to the type of collection. Due to the variation in these measures, a summary table could not be provided. For further information about the size of these collections, see the *STPI Technical Memorandum on Collection Size*, August 2007. (This appendix is included on a compact disc (CD) located on the inside back cover of the hardcopy version of this report and as an Excel file on the CD version of this report.)

## Most collections have increased in size since FY2000

### D-3. How has the size of the collection(s) changed since FY2000? (Mark just one per collection.)

Survey type	Decreased	Increased	No change	No answer given	Total
Archaeological & Anthropological	1	9	—	—	10
Botanical	6	18	8	1	33
Cellular	—	57	7	1	65
Chemical	—	4	—	—	4
Geological	3	40	16	1	60
Invertebrate	3	19	3	4	29
Other	1	7	—	—	8
Paleontology	—	37	4	—	41
Technological	—	7	—	—	7
Vertebrate	2	29	3	—	34
Total	16 (5%)	227 (78%)	41 (14%)	7 (2%)	291

**N = 291**

### Observations

- Over three-quarters of the collections surveyed have increased in size since FY2000.
- Respondents report that 90% of their paleontology, 88% of their cellular and 85% of their vertebrate collections increased in size.
- The collections that decreased in size belong to the archaeological and anthropological, botanical, geological, invertebrate, and vertebrate categories.
- Botanical collections are the most likely to experience a decrease, with 18% decreasing in size.
- Fourteen percent of the collection types have remained the same size. They are botanical, cellular, geological, invertebrate, paleontological, and vertebrate collections.

### Why is this measure important?

As collections increase in size, so may the demands on agency resources required to maintain them.

**Most collections that increased in size had an average annual growth of up to 25%**

**D-4. For those collections that increased in size, estimate the average annual growth in the collection since FY 2000. (Mark just one per collection.)\***

<b>Survey type</b>	<b>1–25%</b>	<b>26–50%</b>	<b>51–75%</b>	<b>76–100%</b>	<b>More than 100%</b>	<b>Total</b>
Archaeological & Anthropological	3	5	—	1	—	9
Botanical	13	3	—	—	3	19
Cellular	41	8	1	1	6	57
Chemical	2	1	—	—	1	4
Geological	30	4	1	3	4	42
Invertebrate	19	2	—	—	—	21
Other	5	—	—	2	—	7
Paleontology	31	1	3	—	2	37
Technological	3	2	—	—	2	7
Vertebrate	21	2	2	—	4	29
<b>Total</b>	<b>168 (74%)</b>	<b>28 (12%)</b>	<b>7 (3%)</b>	<b>7 (3%)</b>	<b>22 (10%)</b>	<b>232</b>

**N = 227 (Based on the answer to question D-3)**

**\* Some respondents selected more than one category for their collection.**

### **Observations**

- Over 74% of collections that increased in size have grown by up to 25% annually since FY2000.

### **Why is this measure important?**

Annual collection growth could be an indicator of the overall health of the collection and possibly an indicator of current or forecasted agency funding of collection development.

## Most increases in collection size were predicted or anticipated

### D-5. Was the increase predicted or anticipated? (Mark just one per collection.)\*

Survey type	No	Yes	Total
Archaeological & Anthropological	—	9	9
Botanical	—	18	18
Cellular	1	58	59
Chemical	1	3	4
Geological	2	39	41
Invertebrate	6	16	22
Other	5	3	8
Paleontology	—	31	31
Technological	1	6	7
Vertebrate	3	26	29
Total	19 (8%)	209 (92%)	228

**N = 227 (based on the answer to question D-3)**

**\* One respondent selected both (Yes and No) for their collection.**

### Observations

- Respondents report that 92% of the increases in collection size were anticipated.
- Invertebrate and chemical collections each experienced the largest percentage of unexpected increases, about 25% each.

### Why is this measure important?

To the extent that increases are anticipated, managers can better plan for the care and maintenance of their collections.

## Routine collection activity is the primary reason for increases in collection size

### D-6. What were the primary reasons for this increase? (Mark all that apply.)

Survey type	Routine collection activity	Government mandates	Change in reporting unit	Financial/budgetary	Staff changes	Reorganization	Other
Archaeological & Anthropological	9	—	1	—	3	—	—
Botanical	15	—	2	—	2	—	—
Cellular	60	8	7	—	8	3	—
Chemical	4	1	—	—	—	—	—
Geological	36	5	1	1	2	—	—
Invertebrate	15	2	1	—	—	1	1
Other	3	—	1	—	1	—	—
Paleontology	37	2	—	—	3	1	—
Technological	7	—	—	—	—	—	—
Vertebrate	24	6	3	—	2	4	1
Total	210 (93%)	24 (11%)	16 (7%)	1 (0%)	21 (9%)	9 (4%)	2 (1%)

**N = 227 (based on the answer to question D-3)**

### Observations

- Over 90% of respondents report that routine collection activity was the primary reason for increases in collection size.
- About 10% of respondents report that government mandates and staff changes were the primary reasons for increases in collection size (11% and 9% respectively).
- The remaining increases are attributed to a change in the reporting unit and to reorganization.

### Why is this measure important?

By spotting trends in collection size increases, collection managers can reallocate staff, budget, and other resources to better address collection needs.

**Collections that decreased in size had an average annual decrease of not more than 25%**

**D-7. For those collections that decreased in size, estimate the average annual decrease in the collection since FY 2000. (Mark just one per collection.)**

Survey type	Not answered	1–25%	26–50%	Total
Archaeological & Anthropological	—	1	—	1
Botanical	5	1	—	6
Cellular	—	—	—	0
Chemical	—	—	—	0
Geological	3	—	—	3
Invertebrate	1	2	—	3
Other	—	—	1	1
Paleontology	—	—	—	0
Technological	—	—	—	0
Vertebrate	1	1	—	2
Total	10 (63%)	5 (31%)	1 (6%)	16

**N = 16 (based on the answer to question D-3)**

### **Observations**

- Reported decreases in size are less than 50% annually.

### **Why is this measure important?**

Decreases in size could signal problems with the collection such as loss of important materials or storage space.



## Decreases in size were frequently unpredicted

### D-8. Was the decrease predicted or anticipated? (Mark just one per collection.)

Survey type	Not answered	No	Yes	Total
Archaeological & Anthropological	—	—	1	1
Botanical	2	3	1	6
Cellular	—	—	—	0
Chemical	—	—	—	0
Geological	3	—	—	3
Invertebrate	1	1	1	3
Other	1	—	—	1
Paleontology	—	—	—	0
Technological	1	—	—	1
Vertebrate	—	—	1	1
Total	8 (50%)	4 (25%)	4 (25%)	16

**N = 16 (based on the answer to question D-3)**

### Observations

- Of those collections addressed by respondents in this question, half experienced unexpected decreases in collection size.

### Why is this measure important?

The ability to predict decreases can be helpful for allocating staff and financial resources.

## Finance and staffing changes are the primary reasons for decreases in collection size

### D-9. What were the primary reasons for this decrease? (Mark all that apply.)

Survey type	Change in reporting unit	Government mandates	Financial/budgetary	Reorganization	Routine collection activity	Staff changes	Other
Archaeological & Anthropological	—	—	—	—	—	—	—
Botanical	—	—	3	—	—	3	—
Cellular	—	—	—	—	—	—	—
Chemical	—	—	—	—	—	—	—
Geological	—	—	—	—	—	—	—
Invertebrate	—	—	3	—	—	3	—
Other	—	—	—	—	—	—	—
Paleontology	—	—	—	—	—	—	—
Technological	—	—	—	—	—	—	—
Vertebrate	—	—	—	—	—	—	—
Total	0	0	6 (38%)	0	0	6 (38%)	0

**N = 16 (based on the answer to question D-3)**

### Observations

- Respondents cite staff changes and financial/budgetary considerations as the only reasons for decreases in collection size.

### Why is this measure important?

By identifying the major causes of collection decreases, agencies may be able to allocate resources more effectively to address urgent needs.

## SECTION E: CONDITION OF THE COLLECTION

**Most collections are in “good” or “very good” condition**

**E-1. How would you characterize the overall condition of the collection?  
(Mark just one per collection.)**

Survey type	Not answered	Poor	Fair	Good	Very good	Total
Archaeological & Anthropological	—	—	3	7	—	10
Botanical	—	4	8	12	9	33
Cellular	1	3	9	18	34	65
Chemical	—	—	—	2	2	4
Geological	—	—	9	29	22	60
Invertebrate	—	2	10	9	8	29
Other	—	—	—	1	7	8
Paleontology	6	—	1	21	13	41
Technological	—	—	—	6	1	7
Vertebrate	2	—	4	19	9	34
Total	9 (3%)	9 (3%)	44 (15%)	124 (43%)	105 (36%)	291

**N = 291**

### Observations

- Respondents report that 79% of their collections are in “good” or “very good” condition.
- Respondents report that nearly one in five collections is in “poor” or “fair” condition.
- Cellular (52%) and chemical (50%) collections have the highest percentage of collections in “very good” condition.

### Why is this measure important?

The overall condition of a collection indicates the relative risk to unique or rare scientific data, as well as the general usability of the collection by researchers.

**Over half the respondents report that their reporting unit has never assessed the condition of their collections**

**E-2. Has your reporting unit ever completed a condition survey or an assessment of object-based scientific collections? (Mark just one.)**

Survey type	Not answered	No	Yes, but not recently	Yes, for a portion of the collection	Yes, for the entire collection	Total
Anthropology & Archaeological	—	1	1	1	—	3
Botanical	—	11	5	4	1	21
Cellular	2	15	2	8	—	27
Chemical	—	1	—	1	—	2
Geological	—	22	5	6	4	37
Invertebrate	—	11	1	4	4	20
Other	—	3	—	—	—	3
Paleontology	—	10	2	1	2	16
Technological	—	—	—	—	2	2
Vertebrate	—	11	3	2	7	24
Total	2 (1%)	85 (55%)	19 (12%)	27 (17%)	20 (13%)	155

**N = 155**

**Observations**

- The condition of approximately 13% of the collections has been entirely assessed.
- More than half of the collections have not had their condition assessed.
- The condition of both surveyed technological collections have been entirely assessed.

**Why is this measure important?**

Surveys and assessments that evaluate the condition of the collection are important tools for assessing the overall health and usability of a collection, which in turn can be used to determine its continued relevance to the agency's mission.

## SECTION F: CARE AND PRESERVATION OF THE COLLECTION

**Most collections are entirely stored under conditions considered to be adequate for their care and preservation**

**F-1. What percentage of the collection is stored under conditions considered to be adequate for its care and preservation? (Mark just one per collection.)**

Survey Type	Do not know	None	≤50%	51–99%	100%	Total
Archaeological & Anthropological	0	1	2	5	2	10
Botanical	0	5	6	13	9	33
Cellular	1	—	6	15	43	65
Chemical	0	—	0	3	1	4
Geological	7	1	7	24	21	60
Invertebrate	2	1	1	12	13	29
Other	0	—	5	2	1	8
Paleontology	7	—	3	14	17	41
Technological	0	—	0	0	7	7
Vertebrate	5	3	1	14	11	34
Total	22 (8%)	11 (4%)	31 (11%)	102 (35%)	125 (43%)	291

**N = 291**

### Observations

- Most collections are stored either entirely or largely (i.e., greater than 50% of the collection) in conditions that are adequate for care and preservation.
- Botanical collections have the widest variation in storage conditions, with nearly 15% stored under conditions considered completely inadequate.
- Botanical and vertebrate collections have the highest percentage of collections that are stored entirely in inadequate conditions.
- Only technological collections are reported to be stored under completely adequate conditions.

### Why is this measure important?

Collection storage conditions indicate the relative risk to unique or rare scientific objects, to the potential detriment of both the agency and the users of the collection.

**The greatest need for collections stored under inadequate conditions is new or improved storage equipment**

**F-2. For those collections stored under inadequate conditions, indicate areas of MAJOR need. (Mark all that apply.)**

Survey type	Additional on-site storage	New or additional off-site storage	Renovated storage space	New or improved storage equipment	New or improved environmental controls
Archaeological & Anthropological	3	4	3	5	4
Botanical	10	5	6	18	16
Cellular	16	7	14	17	9
Chemical		3	3	3	3
Geological	13	7	15	30	17
Invertebrate	7	4	8	11	9
Other	2	—	1	1	1
Paleontology	6	4	3	12	7
Technological	—	—	—	—	—
Vertebrate	8	5	5	11	10
Total	65 (45%)	39 (27%)	58 (40%)	108 (75%)	76 (53%)

**N = 144 (based on Question F-1. If condition is known and less than 100%)**

**Observations**

- The areas of greatest need for collections stored inadequately are new or improved storage equipment.
- Environmental controls, additional on-site storage, and renovated storage space are also frequently cited needs.
- Technological collections surveyed have no major storage needs because all collections are stored under adequate conditions (see Question F-1).

**Why is this measure important?**

By identifying the areas of greatest need for collection preservation, agencies can take steps to allocate resources to address those needs in a timely fashion, thereby ensuring that collections are preserved for future generations.

**Respondents most frequently identified cataloguing, additional staff, additional or improved space, and digitization as the most important areas for the maintenance of their collections**

**F-3. Which of the following areas are MOST IMPORTANT to the maintenance of the collection(s)? (Mark all that apply.)**

Survey type	Acquisition of additional collections	Refinement and disposal of collections	Additional staff for collections	Additional or improved space for collections	Additional or improved equipment and supplies for collections	Cataloguing of collections	Digitization of collection images and information	Improved access to collections by users
Archaeological & Anthropological	4	—	8	8	8	5	9	3
Botanical	9	6	19	14	16	24	19	17
Cellular	17	8	25	29	18	39	27	23
Chemical	1	1	2	4	3	3	4	4
Geological	14	11	32	29	25	42	27	26
Invertebrate	10	11	15	16	13	19	15	13
Other	—	—	3	7	2	—	—	1
Paleontology	14	1	14	13	20	12	21	4
Technological	7	1	1	1	1	1	—	1
Vertebrate	11	1	18	14	7	11	10	5
Total	87 (30%)	40 (14%)	137 (47%)	135 (46%)	113 (39%)	156 (54%)	132 (45%)	97 (33%)

**N = 291**

### **Observations**

- The four most important issues identified by survey respondents are cataloguing, additional staff, additional or improved space, and digitization.
- Respondents reported that the refinement and disposal of existing collections are the least important issues among the choices.

### **Why is this measure important?**

By identifying collection maintenance needs, steps can be taken to improve collection preservation and to increase researcher access through appropriate budget and resource allocation.

## SECTION G: COLLECTION DOCUMENTATION AND ACCESSIBILITY

About two-thirds of the collections are mostly or entirely catalogued

**G-1. Estimate the percentage of the collection(s) that is catalogued. (Mark just one per collection.)**

Survey type	Do not know	None	≤50%	>50%	100%	Total
Archaeological & Anthropological	1	—	2	6	1	10
Botanical	2	3	6	14	8	33
Cellular	3	1	14	20	27	65
Chemical	0	—	0	4	—	4
Geological	6	2	17	23	12	60
Invertebrate	3	3	5	11	7	29
Other	0	—	5	2	1	8
Paleontology	9	2	2	20	8	41
Technological	0	—	0	1	6	7
Vertebrate	1	2	3	20	8	34
Total	25 (9%)	13 (4%)	54 (19%)	121 (42%)	78 (27%)	291

**N = 291**

### Observations

- Overall, 69% of the collections are either mostly or completely (i.e., at least 50% or greater) catalogued.
- The surveyed technology and cellular collections are the most thoroughly catalogued.
- Paleontological collections have the highest number and highest percentage of collections for which the state of cataloguing is unknown.

### Why is this measure important?

Cataloged collections are not only more easily accessed by users, but are at lower risk of permanent loss from damage or theft.



## Most collections are accessible for scientific research

**G-2. What percent of the collection(s) is/are accessible for scientific research or other uses? (Mark just one per collection.)**

Survey type	Do not know	None	≤50%	>50%	100%	Total
Archaeological & Anthropological	0	—	0	6	4	10
Botanical	0	1	1	13	18	33
Cellular	2	1	14	20	28	65
Chemical	0	—	1	2	1	4
Geological	15	2	4	16	23	60
Invertebrate	0	1	3	9	16	29
Other	5	—	0	2	1	8
Paleontology	8	—	1	14	18	41
Technological	0	—	0	1	6	7
Vertebrate	2	—	0	10	22	34
Total	32 (11%)	5 (2%)	24 (8%)	93 (32%)	137 (47%)	291

**N = 291**

### Observations

- Slightly less than half the collections are completely accessible, while another one-third are more than 50% accessible.
- Almost 86% of the technological collections and 65% of the vertebrate collections are completely accessible.
- In contrast, only 44% of the paleontology collections, 40% of archeological/anthropological collections, 38% of the geological collections, and 25% of the chemical collections are completely accessible.

### Why is this measure important?

Accessibility indicates that a collection is able to fulfill its agency function and contribute to scientific research.

**New or improved storage equipment, renovated storage space, and environmental controls are the greatest need for collections considered inaccessible**

**G-3. For those collections deemed inaccessible, indicate areas of MAJOR need.  
(Mark all that apply.)**

Survey type	Additional on site storage	New or additional off site storage	Renovated storage space	New or improved storage equipment	New or improved environmental controls
Archaeological & Anthropological	—	—	—	—	—
Botanical	1	—	1	4	4
Cellular	8	—	7	11	5
Chemical	1	—	4	3	3
Geological	2	6	12	11	4
Invertebrate	4	—	4	8	5
Other	2	—	—	—	1
Paleontology	1	3	1	1	2
Technological	—	—	1	1	—
Vertebrate	3	—	1	7	3
Total	22 (18%)	9 (7%)	31 (25%)	46 (38%)	27 (22%)

**N = 122 (based on Question G-2. If accessibility is known and less than 100%)**

**Observations**

- New or improved storage equipment, renovated storage space, and new or improved environmental controls are the three areas of greatest need reported for inaccessible collections.
- Respondents report that all archaeological and anthropological collections are entirely accessible.
- Cellular, geological, and invertebrate collections have the largest number of major needs for improving access.

**Why is this measure important?**

By identifying the most important needs for inaccessible collections, steps can be taken to improve collection access, thereby potentially increasing research use of the collections.

## Most collections are partially or entirely cataloged in electronic databases

### G-4. Estimate the percentage of the collection that is accessible through an electronic database. (Mark just one per collection.)

Survey type	Do not know	None	≤50%	>50%	100%	Total
Archaeological & Anthropological	1	3	0	6	—	10
Botanical	3	14	9	4	3	33
Cellular	3	9	16	14	23	65
Chemical	0	—	1	3	—	4
Geological	11	16	11	15	7	60
Invertebrate	1	12	4	9	3	29
Other	0	—	5	2	1	8
Paleontology	14	8	11	5	3	41
Technological	6	—	1	0	—	7
Vertebrate	1	8	3	17	5	34
Total	40 (14%)	70 (24%)	61 (21%)	75 (26%)	45 (15%)	291

**N = 291**

#### Observations

- Only 15% of the collections are entirely accessible through electronic databases.
- Cellular collections have the highest percentage of complete availability through electronic databases.
- None of the archaeological/anthropological, chemical, or technological collections are entirely accessible through electronic databases.

#### Why is this measure important?

Electronic databases are an effective means of making information about a collection available to a wide range of remote researchers, thereby increasing knowledge about, and use of, the collection.

## Information about most collections is not available through the Web

### G-5. Estimate the percentage of the collection that is accessible via the Web. (Mark just one per collection.)

Survey type	Do not know	None	≤50%	>50%	100%	Total
Archaeological & Anthropological	0	7	2	1	0	10
Botanical	2	19	10	2	0	33
Cellular	1	42	11	5	6	65
Chemical	0	2	0	2	0	4
Geological	9	35	7	8	1	60
Invertebrate	0	18	8	3	0	29
Other	0	2	0	0	6	8
Paleontology	11	20	8	1	1	41
Technological	0	7	0	0	0	7
Vertebrate	1	22	5	5	1	34
Total	24 (8%)	174 (60%)	51 (18%)	27 (9%)	15 (5%)	291

**N = 291**

### Observations

- Seventy-eight percent of the collections surveyed have less than half their content available through the World Wide Web.
- No technological collections surveyed have any content available via the Web.
- Cellular and geological categories have the highest percentages of collections that are entirely unavailable on the Web.

### Why is this measure important?

The World Wide Web is an increasingly popular method of seeking and obtaining information about federal research resources, as well as a powerful research tool in its own right for scientists in all sectors.

**In general, few collections have descriptive information about them accessible via the Web**

**G-6. Indicate the types of information about the collection that are accessible via the Web. (Mark all that apply.)**

Survey type	None	Collection level descriptions	Minimum catalog information of collections	Images of collection	Minimum catalog information	Enhanced catalog information of collection	Enhanced catalog information and images of collection
Archaeological & Anthropological	3	2	7	—	2	1	3
Botanical	20	10	2	3	4	1	2
Cellular	35	11	6	1	7	9	2
Chemical	2	2	—	—	—	1	—
Geological	18	12	12	—	4	9	1
Invertebrate	15	7	5	4	4	4	3
Other	2	5	1	—	—	5	—
Paleontology	14	10	7	—	5	—	4
Technological	6	—	—	—	—	—	—
Vertebrate	21	7	6	3	2	5	3
Total	136 (47%)	66 (23%)	46 (16%)	11 (4%)	28 (10%)	35 (12%)	18 (6%)

**N = 291**

### **Observations**

- Nearly half the collections surveyed have no information about the collection available via the Web.
- Of the collections that have at least some descriptive information available, most of the information is in the form of collection-level descriptions.
- Minimum catalog information, enhanced catalog information, and images are the least available forms of descriptive information available via the Web.
- Geological and vertebrate collections have the widest variety of information available via the Web.

### **Why is this measure important?**

The more information about a collection that is available on the World Wide Web, the more access points that are available to researchers, thus enhancing the value of the collection to both the agency and the field of study.

## Most agencies do not charge user fees for access to their collections

**G-7. Does your agency charge user fees? (Mark just one.)**

Survey type	Do not know	No	Yes	Total
Archaeological & Anthropological	—	2	1	3
Botanical	—	20	1	21
Cellular	3	19	5	27
Chemical	—	2	—	2
Geological	2	32	3	37
Invertebrate	—	19	1	20
Other	—	3	—	3
Paleontology	1	14	1	16
Technological	—	2	—	2
Vertebrate	1	21	2	24
Total	7 (5%)	134 (86%)	14 (9%)	155

**N = 155**

### Observations

- Over four-fifths of respondents report that their agency does not charge user fees to access their collections.
- All chemical, technological, and other (not otherwise identified) collections reported on in this question are available for free; the rest have a mix of free and fee-charging collections.

### Why is this measure important?

User fees are a source of revenue for an agency, which can be used to improve collection preservation, access, and use.

## SECTION H: COLLECTION FUNDING

**Most respondents report that their agency's FY06 budget did not have funds specifically allocated for collection care and management**

**H-1. Does your agency's FY06 budget have funds specifically allocated for the care and management of your collections? (Mark just one.)**

Survey type	Not answered	Do not know	No	No specific line-item in budget, but other budgeted funds are averaged	No, but other funds available	Yes	Total
Archaeological & Anthropological	—	—	1	—	—	2	3
Botanical	—	—	14	—	3	4	21
Cellular	1	—	8	—	8	9	26
Chemical	—	—	—	—	1	1	2
Geological	1	4	10	5	6	11	37
Invertebrate	—	—	8	—	8	4	20
Other	—	—	—	—	2	1	3
Paleontology	—	3	10	1	—	2	16
Technological	—	—	—	—	—	2	2
Vertebrate	—	1	11	—	5	8	25
Total	2 (1%)	8 (5%)	62 (40%)	6 (4%)	33 (21%)	44 (28%)	155

**N = 155**

### Observations

- Twenty-eight percent of the respondents report that funds were specifically allocated for the care and management of their collections.
- Of the collections lacking dedicated funding, 21% are reported to have other funds available.
- Agencies with botanical collections are the least likely to specifically allocate funds for their care and preservation.

### Why is this measure important?

Specifically allocated funds ensure that a collection can be maintained, grown, preserved, and made accessible for users.

**Most respondents report that either they do not know the portion of their agency’s annual budget designated for collections for FY05 or that their agency had no dedicated funding for that year**

**H-2. For FY05, what was the agency’s annual budget designated specifically for the care and management of your collections?**

Survey type	Not answered	Do not know	None	\$1–\$500	\$501–\$5000	\$5001–\$25,000	\$25,000–\$100,000	>\$100,000	Total
Archaeological & Anthropological	1	—	1	—	—	—	1	—	3
Botanical	13	1	2	1	1	2	—	1	21
Cellular	14	1	3	—	1	—	2	5	26
Chemical	—	—	—	—	—	—	1	1	2
Geological	16	9	5	—	1	1	3	2	37
Invertebrate	12	2	3	—	—	—	—	3	20
Other	2	—	—	—	—	—	—	1	3
Paleontology	9	3	4	—	—	—	—	—	16
Technological	1	—	—	—	—	—	—	1	2
Vertebrate	13	4	2	—	3	1	—	2	25
Total	81 (52%)	20 (13%)	20 (13%)	1 (1%)	6 (4%)	4 (3%)	7 (5%)	16 (10%)	155

**N = 155**

**Observations**

- Thirteen percent of respondents reported that they did not know their agencies’ dedicated budget, and 13% reported that their agencies did not have dedicated funding for collection care and management.
- Cellular, geological, and invertebrate collections had the greatest number of collections with dedicated funding of over \$100,000 in FY05.
- Nearly one-quarter of geological collections fell under the “do not know” category, the largest single percentage of all survey types.

**Why is this measure important?**

NSF established the FY05 budget as a useful baseline to measure overall increases and decreases in dedicated funding for collection care and management.



## The Federal Government is the major source of funds for the care and management of collections

### H-3. What was the source of your agency's funds designated for the care and management of your collections? (Mark all that apply.)

Survey type	Federal	State	County or municipal	Corporate	Foundation	Individual donor
Archaeological & Anthropological	3	—	—	—	2	—
Botanical	18	1	—	—	—	—
Cellular	25	—	—	—	1	—
Chemical	2	1	—	—	—	—
Geological	33	2	—	—	—	—
Invertebrate	20	1	—	—	2	—
Other	3	—	—	—	—	—
Paleontology	12	—	—	—	1	—
Technological	2	—	—	—	—	—
Vertebrate	24	—	—	1	4	—
Total	142 (92%)	5 (3%)	0	1 (1%)	10 (6%)	0

**N = 155**

### Observations

- Over 90% of respondents report that the funding for their collection care and management comes from the Federal Government, with private foundation sources a distant second (6%) and state government funding third (3%).
- No funds are reported to come from individuals or county/municipal governments.
- Botanical, chemical, invertebrate (one collection each), and geological (two collections each) collections use state funds, while cellular and paleontological (one collection each), anthropological/archaeological and invertebrate (two collections each), and vertebrate (four collections) all rely on private foundation funding.

### Why is this measure important?

This measure indicates the vital importance of federal funding for the care and management of federal object-based scientific collections.

**Twenty percent of respondents report that their agencies rely on external funding for support of collections-related activities**

**H-4. Does your agency rely on external funding sources to support scientific collections-related activities? (Mark just one.)**

Survey type	Not answered	No	Yes	Total
Anthropology & Archaeological	2	1	—	3
Botanical	2	14	5	21
Cellular	2	18	7	27
Chemical	—	1	1	2
Geological	3	30	4	37
Invertebrate	5	11	3	19
Other	—	2	1	3
Paleontology	4	12	—	16
Technological	—	1	1	2
Vertebrate	3	14	8	25
Totals	21 (14%)	104 (67%)	30 (19%)	155

**N = 155**

**Observations**

- Over two-thirds of the respondents indicated that their collections do not rely on external funding to support collections-related activities.
- The collection types with the highest percentages of reliance on external funding are cellular (26%) and botanical (24%).
- No anthropological/archaeological or paleontological collections surveyed rely on external funding.

**Why is this measure important?**

Taken together with Question H-3, this measure indicates the vital importance of federal (specifically agency) funding for collections management.

## SECTION I: POLICIES AND PROCEDURES

**One-fourth of the reporting units have written, approved policies and procedures addressing the security of their collections**

**I-1. For which of the following activities does your reporting unit have written, approved policies and procedures for the management of these collections? (Mark all that apply.)**

Survey type	None	Do not know	Acquisition	Disposal	Documentation	Preservation	Access and use	Handling	Security
Archaeological & Anthropological	1	—	1	1	1	1	1	1	1
Botanical	8	4	9	5	8	5	8	5	5
Cellular	6	—	13	9	16	14	12	14	10
Chemical	1	—	2	1	2	1	2	1	2
Geological	9	8	14	13	13	10	13	9	7
Invertebrate	5	5	10	9	11	11	10	8	7
Other	1	—	2	2	2	2	1	1	1
Paleontology	7	6	2	2	2	2	1	1	1
Technological	—	1	2	2	2	2	2	2	—
Vertebrate	5	2	15	10	14	13	11	11	5
Total	43 (28%)	26 (17%)	70 (45%)	54 (35%)	71 (46%)	61 (39%)	61 (39%)	53 (34%)	39 (25%)

**N = 155**

### Observations

- Over one-quarter of respondents report that their reporting unit lacked written, approved policies and procedures for collections management.
- Most written, approved policies and procedures address acquisition and documentation of collections (45% and 46%, respectively), followed by those that address preservation and access/use (39% each).

### Why is this measure important?

Collection management policies are essential for ensuring that collections are maintained and used in accordance with current statutory, legal, and regulatory standards and practices.

**Documentation, acquisition, and preservation policies and procedures are the most up to date**

**I-2. Which policies and procedures are current and up-to-date? (Mark all that apply.)**

Survey type	Do not know	None	Acquisition	Disposal	Documentation	Preservation	Access and use	Handling	Security
Archaeological & Anthropological	—	1	1	1	1	1	1	1	1
Botanical	4	9	8	5	7	5	7	5	5
Cellular	1	6	13	8	15	14	15	13	9
Chemical	—	1	2	—	1	—	1	—	1
Geological	7	9	14	9	12	9	12	8	8
Invertebrate	5	3	9	8	9	9	8	6	7
Other	—	1	2	2	2	2	1	1	1
Paleontology	7	7	1	—	1	1	—	—	—
Technological	1	—	1	1	1	1	1	1	1
Vertebrate	1	5	16	9	13	14	10	10	6
Total	26 (17%)	42 (27%)	67 (43%)	43 (28%)	62 (40%)	56 (36%)	56 (36%)	45 (29%)	39 (25%)

**N = 155**

**Observations**

- Forty-one percent of paleontology collections do not have any policies and procedures that are up to date.
- Over one quarter of the respondents report that no collection policies and procedures are up to date.

**Why is this measure important?**

Up-to-date policies and procedures ensure that object-based scientific collections are maintained and used in a manner consistent with current professional standards and practices, as well as all applicable statutory, legal, and regulatory requirements.

## SECTION J: COLLECTION STAFFING

**One-fourth of the survey respondents report that their collections lacked associated full-time staff**

**J-1. How many full time paid staff are associated with your collections?**

Survey type	Not answered	None	1–10	11–50	>100	Total
Anthropology & Archaeological	1	—	2	—	—	3
Botanical	2	5	12	2	—	21
Cellular	2	5	18	1	1	27
Chemical	—	—	1	—	1	2
Geological	3	14	17	3	—	37
Invertebrate	1	3	13	1	2	20
Other	1	—	2	—	—	3
Paleontology	1	7	8	—	—	16
Technological	1	—	—	—	1	2
Vertebrate	1	4	15	2	2	24
Total	13 (8%)	38 (25%)	88 (57%)	9 (6%)	7 (5%)	155

**N = 155**

### Observations

- Most collections (57%) have between 1 and 10 full-time staff associated with them.
- Paleontological and geological collections have the highest percentage of collections that have no full-time paid staff.
- Some cellular, chemical, technological collections (1 collection each), and invertebrate and vertebrate collections (2 collections each) have over 100 dedicated staff.

### Why is this measure important?

Collectively, Questions J-1 through J-4 can be used to assess whether staffing levels are sufficient to maintain collections according to professional standards, to monitor collections regularly, and to provide not only access to, but also prudent oversight of, users.

## Less than half the respondents report having part-time paid staff associated with their collections

### J-2. How many part-time paid staff are associated with your object-based scientific collections?

Survey type	Not answered	None	1–10	11–50	50–100	Total
Anthropology & Archaeological	1	—	2	—	—	3
Botanical	8	7	6	—	—	21
Cellular	9	9	7	1	1	27
Chemical	—	—	2	—	—	2
Geological	18	16	3	—	—	37
Invertebrate	9	1	7	2	1	20
Other	1	—	2	—	—	3
Paleontology	4	9	3	—	—	16
Technological	2	—	—	—	—	2
Vertebrate	7	6	10	—	1	24
Total	59 (38%)	48 (31%)	42 (27%)	3 (2%)	3 (2%)	155

**N = 155**

### Observations

- Over one-quarter of the respondents report that their collections have between one and 10 part-time paid staff associated with the collections.
- Only three respondents report that a collection (cellular, vertebrate, and invertebrate) have between 50 and 100 part-time staff, while 3 respondents report that 3 collections (2 invertebrate and 1 cellular) have between 11 and 50 part-time staff.
- Geological and paleontological collections have the highest percentages of collections with no associated part-time staff.

### Why is this measure important?

Collectively, Questions J-1 through J-4 can be used to assess whether staffing levels are sufficient to maintain collections according to professional standards, to monitor collections regularly, and to provide not only access to, but also prudent oversight of, users.

## Very few collections have full-time unpaid staff

### J-3. How many full-time unpaid staff are associated with your object-based scientific collections?

Survey type	Not answered	None	1–10	50–100	Total
Archaeological & Anthropological	2	1	—	—	3
Botanical	9	12	—	—	21
Cellular and Tissue	12	14	1	—	27
Chemical	1	—	1	—	2
Geological	17	20	—	—	37
Invertebrate	14	6	—	—	20
Other	1	2	—	—	3
Paleontology	5	9	2	—	16
Technological	2	—	—	—	2
Vertebrate	13	10	—	1	24
Total	76 (49%)	74 (48%)	4 (3%)	1 (1%)	155

**N = 155**

#### Observations

- Only cellular and tissue, chemical, and paleontological collections are reported to have up to 10 full-time unpaid staff associated with them.
- One vertebrate collection has 50–100 full-time unpaid staff associated with it, the only collection so reported.

#### Why is this measure important?

Collectively, Questions J-1 through J-4 can be used to assess whether staffing levels are sufficient to maintain collections according to professional standards, to monitor collections regularly, and to provide not only access to, but also prudent oversight of, users.

## Few survey respondents report part-time unpaid staff associated with their collections

### J-4. How many part-time unpaid staff are associated with your object-based scientific collections?

Survey type	Not answered	None	1–10	11–50	Total
Archaeological & Anthropological	2	1	—	—	3
Botanical	9	11	1	—	21
Cellular	13	14	—	—	27
Chemical	2	—	—	—	2
Geological	17	18	1	1	37
Invertebrate	14	4	2	—	20
Other	1	2	—	—	3
Paleontology	6	8	2	—	16
Technological	2	—	—	—	2
Vertebrate	13	10	1	—	24
Total	79 (51%)	68 (44%)	7 (5%)	1 (1%)	155

**N = 155**

### Observations

- Only 6% of the collections have any part-time unpaid staff.
- One geological collection has 11–50 part-time unpaid staff associated with it, the only collection so reported.

### Why is this measure important?

Collectively, Questions J-1 through J-4 can be used to assess whether staffing levels are sufficient to maintain collections according to professional standards, to monitor collections regularly, and to provide not only access to, but also prudent oversight of, users.



**The number of respondents reporting unstable and declining collections staff is nearly equal to the number reporting stable staffing**

**J-5. Please characterize recent staffing experiences for this collection. (Mark just one.)**

Survey type	Not answered	Staff is increasing and new hires have been added	Staffing is stable and vacancies are replaced	Staffing is stable and vacancies are replaced; staff is increasing	Staffing is unstable and declining	Total
Archaeological & Anthropological	—	—	1	—	2	3
Botanical	1	—	7	—	13	21
Cellular	13	1	8	—	5	27
Chemical	—	—	1	—	1	2
Geological	4	3	19	2	9	37
Invertebrate	1	—	11	—	8	20
Other	—	—	1	—	2	3
Paleontology	4	2	1	—	9	16
Technological	—	—	2	—	—	2
Vertebrate	2	1	10	—	11	24
Total	25 (16%)	7 (5%)	61 (41%)	2 (1%)	60 (40%)	155

**N = 155**

**Observations**

- Only 6% of respondents report stable staff or staffing increases with new hires. These are for the cellular, geological, paleontological, and vertebrate collections.
- Geological and invertebrate collections have the highest percentages of collections with stable staffing.
- All technological collections are reported to have stable staffing.

**Why is this measure important?**

Stable and even increasing staffing is essential for ensuring continuity of operations at an adequate level, maintaining institutional memory, and providing adequate user services. It is also a benchmark against which to measure agency support over time.

## SECTION K: ADDITIONAL QUESTIONS

To provide an opportunity for respondents to add information in areas of concern, the questionnaire included the following questions:

**K-1. List one question you wish we would have asked you about your reporting unit's object-based collection.**

**K-2. In the space provided, briefly explain the answer you would give in response to that question. (No more than 25 words.)**

Sixty respondents provided questions and answers (see Appendix 5). The distribution of survey types was:

Survey type	Number of responses
Archaeological, anthropological, and ethnographic	1
Botanical	7
Cellular and tissue	10
Chemical	1
Geological and geophysical	12
Invertebrate zoology	7
Paleontology	9
Technological	2
Vertebrate zoology	11
Other (not elsewhere specified)	0

### Response Summary by Collection Type

The issues raised by the questions, summarized by collection type follow.

#### **Archeological, Anthropological, and Ethnographic**

- Ability of collections to enhance the scientific value of research

#### **Botanical**

- Need for additional support to guarantee conservation and accessibility
- Risks to collection from insufficient curation
- Need for additional staff

### **Cellular and Tissue**

- Inadequacy of resources to identify and characterize the collection
- The importance of online databases
- Length of time that a collection is to be maintained
- Use of staff from other organizations
- Waste of resources by collections due to lack of goal or usage plan
- Important clinical data associated with specimens
- Percentage of staff time spent on collection
- Contractual commercial support of collections
- Improvement in availability resulting from additional shelving and storage

### **Chemical**

- The use issue

### **Geological and Geophysical**

- Need for special freezing and refrigeration for preservation
- Lack of clear policy regarding collection curation
- Environmental and security controls required for proper curation
- Inadequate or insufficient metadata
- Collection storage time
- Need for funds for cataloguing and Web placement
- Uniqueness of collection and care
- Research supported by collection

### **Invertebrate Zoology**

- Availability of staff training or replacement policies
- Sufficiency of staffing levels
- Long-term disposition planning
- Impact of Hurricane Katrina on collections
- Uniqueness of collections that specialize in insects found in foods

### **Paleontology**

- Funding for collection cataloguing
- Lack of authority to fund care and curation

- Need for funds to increase staff

### **Technological**

- Collection use
- Availability of proper environmental and security controls

### **Vertebrate Zoology**

- Full time staff responsibility for collections
- Staff affiliation
- Staff sufficiency
- Percentage of staff time devoted to collection
- Age of the collection
- Collection significance and use
- Improvements to availability due to additional shelving and allocated storage
- The need to make R&D findings available via the web

## **APPENDIX 1: COLLECTIONS INCLUDED IN THE REPORT BY COLLECTION TYPE**

### **Agency Abbreviations**

DOC-NIST .....	Department of Commerce – National Institute of Science and Technology
DOC-NOAA .....	Department of Commerce – National Oceanic and Atmospheric Administration
DOE .....	Department of Energy
DHHS-CDC .....	Department of Health and Human Services – Centers for Disease Control
DHHS-FDA .....	Department of Health and Human Services – Food and Drug Administration
DHHS-NIH .....	Department of Health and Human Services – National Institutes of Health
DOI-NPS .....	Department of the Interior – National Park Service
DOI-USGS .....	Department of the Interior – United States Geological Survey
DOT .....	Department of Transportation
NASA.....	National Aeronautics and Space Administration
SI.....	Smithsonian Institution
USDA-ARS.....	United States Department of Agriculture – Agricultural Research Service
USDA-FS.....	United States Department of Agriculture – Forest Service
VA.....	Department of Veterans Affairs

Survey Type	Parent Agency	Collection Name
<b>Archaeological, Anthropological, and Ethnographic</b>		
	DOI-NPS	Anthro. and ethnographic collections in multiple parks Archaeology collections in multiple parks
	Smithsonian	Archaeology collection Archaeology study collection Archives collections Ethnology collection Late Pleistocene faunal collection Physical Anthropology (Osteology) collection Phytolith and starch grain collection Skeleton reference collection
<b>Botanical</b>		
	DHHS-FDA	Herbarium
	DHHS-NIH	Cryopreserved tissue
	DOC-NOAA	Alaskan marine algae Milford Laboratory marine microalgal culture collection
	DOI-USGS	Pressed plant specimens
	DOI-NPS	Botanical collections in multiple parks
	SI	Amazon Basin collection Barro Colorado Island base collection Department of Botany and National Herbarium Replicate collection
	USDA-FS	Armillaria collections Cascade Range and the Central Sierra Nevada herbarium Central Hardwoods basal tree cross-sections Coniferous forest tree plantations Coniferous forest tree seed bank Critchfield Herbarium Douglas-fir seed collection Eddy Arboretum Fernow Experimental Forest herbarium Forest soils Fungal culture collection Fungal herbarium collection Herbarium samples Koleria macrantha seed collection Riverside Fire Lab herbarium San Joaquin Experimental Range herbarium Slide collection Soil and tissue sample archives Study area herbarium samples Study area tree increment cores and disks Unknown plants and voucher specimens Vegetation samples White pine blister rust spore collections
<b>Cellular and tissue</b>		
	DHHS-CDC	CDC and ATSDR CASPIR
	DOI-NPS	Monera, protista, and fungal collections in multiple parks
	DHHS-NIH	Aged rodent tissue bank Blood donor/recipient serum samples cell lines, fixed for microscopy cord blood units Human and Animal cell lines

Survey Type	Parent Agency	Collection Name
		M17K Mouse clone collection MGC Human 9k clone collection NEIBank Ocular cDNA clone collection NIDDK Biosample Repository NIDDK Genetics Repository Specimens from patients with cardiovascular diseases Specimens from patients with pulmonary diseases Specimens from sickle cell disease patients Surgical pathology material, donated Viral Antibodies (Polyclonal, Monoclonal) Viral Expression/Cloning Vectors Viral Proteins and Peptides Viruses (HIV-1, HIV-2, SIV, FIV, HTLV-1, Vaccinia) Xenografts, fixed for microscopy
	DOC-NIST	Avian specimen bank Fish tissues Human blood serum Human liver specimen bank Mussel watch specimen bank National marine mammal Tissue bank
	DOC-NOAA	Atlantic salmon genetic tissue collection Fish reproductive tissues Marine mammal tissue bank Milford Laboratory marine bacteria collection MMHSRP digital/photo documentation supplement MMHSRP gross tissue collection MMHSRP histopathology slide and block collection MMHSRP serology samples MMHSRP virology tissue samples North Pacific Rim forage fish genetic tissues North Pacific Rim salmonid genetic tissues Tissue collection
	DOI-USGS	Hawaiian and Samoan forest bird blood/tissue samples Hawaiian and Samoan forest bird plasma samples Hawaiian forest bird Plasmodium relictum live isolates Hawaiian forest bird Poxvirus avium live isolates NCBP/BEST fish tissue archive Wildlife bacterial isolates Wildlife parasite collection Wildlife tissues Wildlife virus isolates
	SI	Bird DNA Collection Bird Tissue Collection DMSO collection Fish DNA Collection Fish Tissue Collection Frozen collection Genetics program collection Pathology collection Reproductive sciences collection
	USDA-ARS	Animal germplasm Bacteria collection Cellular collection Fungal collection Virus collection
	USDA-FS	Jeffrey pine foliar collections Ponderosa pine tissue
	VA	Bio-repository

Survey Type	Parent Agency	Collection Name
<b>Chemical</b>		
	DOC-NOAA	Marine natural products
	USDA-ARS	Chemicals DNA, ESTs, etc. Pheromones
<b>Geological and geophysical</b>		
	DOC-NIST	Marine sediments
	DOC-NIST	Geological Collections in multiple parks
	DOE	Nuclear Weapons Testing and Radionuclide Migration
	DOI-USGS	Borehole cores of coastal plain sediments
		Borehole cores of coastal plain sediments
	DOI-USGS	Borehole cores of crystalline
		Borehole cores of crystalline
	DOI-USGS	Chesapeake Bay impact crater drill cores
		Coral cores
	DOI-USGS	David Roddy research collection
		Drill core
	DOI-USGS	Drill core from 8 wells drilled by the Tennessee Div.
		Drill core: Eyreville
	DOI-USGS	Drill core: NPRA drilling project
		Eugene Shoemaker research collection
	DOI-USGS	Field records
		Fluorospar collection
	DOI-USGS	Foraminifer microfossil collection
		Foraminifera microfossil collection
	DOI-USGS	Geochemical reference materials
		Geologic Materials;
	DOI-USGS	Ice core collection
		Invertebrate megafossils (primarily mollusks) collection
	DOI-USGS	Marine, terrestrial, and lacustrine sediment cores
		Oriented rock samples
	DOI-USGS	Physics building rock storage area
		Prepared geochemical samples
	DOI-USGS	Radiolarian microfossil collection
		Rock core samples and well cuttings
	DOI-USGS	Rock samples
		Rock samples
	DOI-USGS	Samples from national geochemical soil survey
		Seabed core and sediment sample archive
	DOI-USGS	Sediment cores
		Spokane Geologic Collection
	DOI-USGS	Tephra and obsidian samples
		Tephra and related samples. Also paper field notes
	DOI-USGS	Thin sections of rock samples: active researchers
		Thin sections of rock samples: AK tech data
	DOI-USGS	Uncatalogued geological samples, materials, and
		Waldemar Lindgren Economic Geology collection
	DOI-USGS	Wisconsin bedrock core from Wisconsin
		Wisconsin benthic invertebrates
	NASA	Apollo lunar samples
	NASA	Comet and interstellar dust
	NASA	Cosmic dust
	NASA	Meteorites
	NASA	Solar wind
	SI	National collection of invertebrate, vertebrate
	SI	National gem and mineral collections
	SI	National meteorite collection



Survey Type	Parent Agency	Collection Name
		National rock and ore collections
	USDA-ARS	Soils
	USDA-FS	FIA soil archive Forest soils LTEPP - Willamette Site 1993 LTEPP, Soils Collection - Hebo Site 1995 LTEPP, Soils Collection - Siskiyou Site 1992, 2003 LTEPP, Soils Collection - Sappho Site 1993 & 1994
<b>Invertebrate zoology</b>		
	DHHS-FDA	Dissected insect collection Insect collection Insectary
	DOC-NOAA	Alaskan marine and freshwater invertebrates Benthic macrofauna Ichthyoplankton collection SEAMAP Invertebrate Plankton Samples Zooplankton collection
	DOI-NPS	Invertebrate collections in multiple parks
	DOI-USGS	Arthropods Benthic invertebrates Bird fecal/digestive tract samples Bird tail feathers Small mammal digestive tract samples
	SI	Invertebrate zoology collection Living invertebrates National Entomology Collection North American benthic fouling invertebrates Octocorals (soft corals) Panamania leaf beetles Scleractinian corals (hard corals)
	USDA-ARS	Insects Nematodes Parasitic worms
	USDA-FS	Bark beetle and common associates insect collections Forest insects Mites Quarantine voucher collection Rocky Mountain Research Station entomology
<b>Paleontology</b>		
	DOI-USGS	Atlantic and Gulf Coastal Plain Upper Cretaceous and Benthic foraminifers Cenozoic nannofossils Cenozoic pollen collection Conodonts Conodonts Drilling core samples and annotated logs Foraminifera sections Foraminiferal collection Invertebrate fossils Mega sample collection Mesozoic nannofossils Micro fossils Miscellaneous fossils Modern and fossil pollen: microscope slides Modern and fossil pollen: processed residue Oriented rock samples

Survey Type	Parent Agency	Collection Name
		Paleomagnetism Lab: oriented rock samples Palynology Palynomorphs Planktic foraminifer collection Quaternary ostracodes South Florida Ecosystem History Collection; South Florida Geohydrologic core sample collection; South Florida Paleoecology Tephra and obsidian samples Tephrochronology Lab: tephra and obsidian samples Vertebrate fossils
	SI	Bulk samples of gross invertebrate assemblages Fossil neogene cupuladriid bryozoans Holocene mollusks Paleobotany collection Palynology collection Tropical neogene invertebrates
	USDA-FS	Brigham Young University Chadron State College Denver Museum of Nature and Science North Dakota Heritage Museum South Dakota School of Mines and Technology Sternberg Museum of Natural History
	DOI-NPS	Paleontological collections in multiple parks.
<b>Technological</b>		
	DOT	Rail of different metallurgic properties Railroad axles with defects Railroad bridges Railroad fasteners of different types Railroad rails with defects Railroad ties of various materials
	NASA	Space exposed hardware
<b>Vertebrate zoology</b>		
	DOC-NOAA	Alaskan fishes Alaskan fishes Alaskan reptiles and amphibians Atlantic salmon otolith collection Atlantic salmon scale collection Birds, mammals, and herbs reported by SI Fish Fish hard parts (otoliths, spines, scales) Fish sagittal otoliths Groundfish prey collections: DNA identification Groundfish prey collections: stable isotope analysis Groundfish stomach samples Groundfish systematics collection Ichthyoplankton collection Ichthyoplankton collection Larval fish collection Marine fish scales, otoliths, and vertebra Marine mammal osteological collection National Sea Turtle Aging Laboratory bone archive University of Washington ichthyoplankton collection
	DOE	Live mice
	DOI-USGS	Lake Ontario/St. Lawrence River cormorant otoliths Tampa Bay wetland fishes and macroinvertebrates

Survey Type	Parent Agency	Collection Name
	DOI-NPS	Vertebrate collections in multiple parks
	SI	Division of BirdsDivision of Fishes Division of Mammals Division of Reptiles and Amphibians Fish Collection STRI Living animals Voucher specimens
	USDA-ARS	Fishes
	USDA-FS	BirdsMammals
<b>Other (not elsewhere specified)</b>		
	DHHS-NIH	Cytokine StandardsCytokinesImaging Reagents Monoclonal Antibodies Rabbit Antisera
	USDA-FS	Armillaria fungal collections Rocky Mountain Research Station fungus collection White pine blister rust spore collections



## **APPENDIX 2: SURVEY TRANSMITTAL LETTERS**

**A2a: Transmittal Letter from Dr. John H. Marburger III, August 17, 2006**

EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY  
WASHINGTON, D.C. 20502

August 17, 2006

The Honorable Raymond L. Orbach  
Under Secretary for Science  
U.S. Department of Energy  
1000 Independence Avenue, S.W.  
Washington, DC 20585

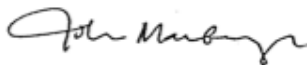
Dear Dr. Orbach:

I am writing to inform you of an important study being launched by the National Science and Technology Council's Committee on Science (NSTC/COS). The Scientific Collections Survey seeks to determine the condition of Federal or federally-supported object-based scientific collections. Here, we are considering collections that have been accumulated and stored primarily for research purposes rather than historical or artistic purposes. These collections include such things as ice cores, rocks and fossils, meteorites, animals and plants, tissues, and marine biological samples.

Last July, the OMB Director and I identified scientific collections as one of two priority areas requiring special attention by the NSTC and the agencies (see enclosed memo). Subsequently, we formed an Interagency Working Group on Scientific Collections (IWGSC), which is being co-chaired by Dr. Phyllis Johnson of USDA and Dr. David Evans of the Smithsonian Institution. The Committee on Science has directed this group to develop a comprehensive strategy to evaluate, preserve, and manage scientific collections in the future. The Scientific Collections Survey is the first step in developing such a strategy and was distributed to agencies on June 2, 2006 with the expectation of receiving responses by the end of the summer.

I urge you to participate in this important effort so that we can evaluate the state of our collections. In spite of their importance to both science and society, collections, including those held by governments, museums, universities, and the private sector, are facing serious issues today. We need your help in taking these initial steps to improve our stewardship of scientific collections.

Sincerely,



John H. Marburger, III  
Director

Enclosure

cc: Dr. David Evans, Under Secretary for Science, Smithsonian  
Dr. Phyllis Johnson, Director, Agricultural Research Services, USDA

**A2b: Transmittal Letter from Dr. David Evans and Dr. Phyllis Johnson, May 31, 2006**

EXECUTIVE OFFICE OF THE PRESIDENT  
**NATIONAL SCIENCE AND TECHNOLOGY COUNCIL**  
WASHINGTON, D.C. 20502

May 31, 2006

Dear Colleague:

On behalf of the National Science and Technology Council, Committee on Science (NSTC/COS), Interagency Working Group on Scientific Collections (IWGSC), we invite you to participate in the first comprehensive study of federal object-based scientific collections. The information that you provide will be used to establish the condition of these important collections and assist us in developing a coordinated, inter-agency strategy for their preservation and care.

You have been identified as a person responsible for managing or maintaining object-based scientific collections at your agency. Therefore, we ask that you follow the link below to complete the appropriate survey for collections at your agency. Instructions and additional information are available on the survey website.

In order for us to be able to include your survey responses in our study, please complete and submit your survey by **Friday, June 30, 2006**.

Please go to: <http://www.ostp.gov/iwgsc/> to log in to the survey home page. The Username is "iwgsc" and the password is "csgwi".

We thank you for your participation in this important project.

Sincerely,



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## APPENDIX 4: SAMPLE IWGSC QUESTIONNAIRE

National Science and Technology Council (NSTC)  
Committee on Science (COS)  
Interagency Working Group on Scientific Collections (IWGSC)  
Botanical Collections Survey

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Dear Participant,

The FY 2007 Research and Development Budget Priorities Memorandum established Federal scientific collections as one of two areas requiring special attention by the National Science and Technology Council (NSTC). Arguing that object-based scientific collections provide the fundamental infrastructure for contemporary and future research, the NSTC Committee on Science (COS) formed the Interagency Working Group on Scientific Collections (IWGSC) to address the scientific, environmental, societal, and national security needs for such collections, including an assessment of current collection resources.

The survey that follows will establish for the first time the scope and breadth of Federally held object-based scientific collections. The survey results will provide a snapshot of the current condition of object-based scientific collections held or supported by Federal agencies. The information collected will enable the NSTC to assess the priorities for and stewardship of scientific collections.

On behalf of the NSTC/COS Interagency Working Group on Scientific Collections, we thank you for your participation in this survey.

Signed:

David Evans, The Smithsonian Institution

Phyllis Johnson, US Department of Agriculture

### INSTRUCTIONS

In the pages that follow, we ask that you provide information regarding the object-based scientific collection and any associated ancillary collections that are part of your Agency's holdings or for which your Agency has permanent responsibility.

### ONLINE INSTRUCTIONS

The Survey is divided into 11 short sections which must be completed sequentially. The on-line version does not allow you to return to a previous section once you have started the next section. Upon completing each section, you will be given the option of:

**Saving your responses and continuing to the next section**

**OR**

**Saving your responses and continuing the survey at a later time.**

Reminder: Once you start a section, even if you only view it, you must complete that section because the survey does not allow you to return to a section that you have already viewed. For example, if section C is the last section you were working on, and you choose to save and continue later, when you open the document you will be directed to section D even if you have not completed section C.

For your convenience in completing the on-line survey, we suggest that you print out a copy of the survey and review all the sections **prior** to completing the on-line version.

## FOR FURTHER INFORMATION

If you have any questions about this survey, please contact William Tompkins [[tompkinw@osia.si.edu](mailto:tompkinw@osia.si.edu)], 202-357-3125.

## DEADLINE

In order for us to include your response with those of all other participating agencies, we ask that you complete this survey no later than **June 2, 2006**.

## COLLECTIONS INCLUDED IN THIS SURVEY

This survey includes only object-based scientific collections maintained or financially supported by the Federal Government, and any ancillary materials directly related to the object-based scientific collections. The survey is designed to allow you to report on up to 6 separate collections.

“Object-based scientific collections” are defined as collections primarily acquired, maintained and used for scientific research, such as natural and physical science specimens, living animals and plants, archaeological and ethnographic objects, or technological objects of current or contemporary design.

“Ancillary collections” include important materials that are associated with an object-based scientific collection, but only if the material is directly used for scientific research, such as archival and library materials, audio and visual media, and data that might reside in databases.

## COLLECTIONS EXCLUDED FROM THIS SURVEY

Historic and artistic collections that **do not function** as scientific collections are excluded from the survey. For example, a collection of wreckage from an aircraft accident would fall outside the scope of the survey if it were part of a current investigation, maintained for historical purposes only, or otherwise closed to access. However, this same collection would be within the scope of the survey if it were being maintained for the use of researchers who are researching metal fatigue, fire dynamics, failure propagation, or other related phenomena.

Library collections are also excluded unless the collection is in support of the research objects themselves.

Collections of data (both analog and digital) or databases containing such data are **excluded** from this survey unless those data collections are associated with an object-based scientific collection and are used directly to support the conduct of scientific research, in which case they may be treated as ancillary collections. (See “Ancillary collections” definition above).

Independent, non-object based collections of data are not included in this survey as the NSTC/COS plans a separate study of those collections.

## INFORMATION TO BE PROVIDED BY SECTION

### Reporting Unit Information

- A. Description of the Reporting Unit
- B. Purpose and Use of the Collection
- C. Scope and Size of the Collection
- D. Condition of the Collection
- E. Care and Preservation of the Collection
- F. Collection Documentation and Accessibility
- G. Collection Funding
- H. Policies and Procedures
- I. Collection Staffing
- J. Additional Questions

## A. Reporting Unit Information

In this section, we ask that you provide the name of your reporting unit, parent organization, and the name of the individual completing the survey complete with contact information.

### A-1.

Name of the reporting unit:

Street Address:

City, State, Zip:

### A-2.

Name of parent agency or organization, if applicable:

### A-3.

Name of the individual completing this survey:

Title:

Street Address:

City, State, Zip:

Telephone: (ex: 123-456-7890)

Fax: (ex: 123-456-7890)

Email:

Today's date: (ex: 12/31/2006)

**A-4.** Which level listed below best describes the level at which you are reporting about your scientific collection? (Mark just one.)

1. Agency director
2. Bureau/division director
3. Program director
4. Collections manager
5. Other, please specify \_\_\_\_\_

**A-5.** May the NSTC Interagency Working Group on Scientific Collections include your reporting unit on a published list of survey participants? (Mark just one.)

1. Yes
2. No

## B. Description of the Reporting Unit

**In this section, we ask that you provide descriptive information regarding your reporting unit's governance and primary purpose.**

**B-1.** Which of the following most closely describes your reporting units governance? (Mark just one.)

1. Federal agency
2. Independent Federal agency
3. State agency
4. Local (county or municipal) agency
5. Non-profit, non-governmental organization
6. Other, please specify: \_\_\_\_\_

**B-2.** Which of the following most closely describes your reporting units primary function or service? (Mark just one.)

1. Archaeological repository
2. Bio-repository
3. Medical research center
4. Museum
5. Nature center or zoo
6. Regulatory agency
7. Scientific research organization
8. Other, please specify: \_\_\_\_\_

### C. Purpose and Use

**In this section, we ask that you list the botanical collection(s) you will be describing, as well as information on the primary purpose and users of the collection(s).**

**C-1.** In the space provided, list the scientific collection you will be describing in this survey. You may list up to six collections. This information will be used to guide your responses in sections D, E, F, and G that follow.

## Collection 1

Collection 2

Collection 3

Collection 4

Collection 5

Collection 6

**C-2.** What is the primary purpose of the collection? (Mark all that apply.)

1. Public health
2. Public safety
3. Trade and/or economic development
4. Medical research
5. Homeland security
6. Environmental monitoring
7. Basic research
8. Other, please specify: \_\_\_\_\_

**C-3.** What percentage of the collection is duplicated in other repositories? (Mark just one.)

1. None

2. 1 – 25%
3. 26 – 50%
4. 51 – 75%
5. 76 – 99%
6. 100%
7. Do not know

**C-4.** Who are the primary users of the collection? (Mark no more than 3.)

1. Reporting unit staff
2. Students
3. Federal agencies
4. State/local agencies
5. Non-profit organizations
6. Academic institutions
7. Regulatory agencies
8. Government / policy administrators
9. Commercial entities
10. National professional researchers / scientists
11. International professional researchers / scientists
12. General public

**C-5.** In the questions below, estimate the number of individuals and institutions that used the collection(s) themselves or associated ancillary collections in FY2005. (Mark just one per row.)

**Individual users**

	0	1-100	101-1,000	1,001-10,000	More than 10,000
Individuals that physically accessed the collection(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individuals that electronically accessed the collection(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individuals that physically accessed any ancillary collection(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Individuals that electronically accessed any ancillary collection(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Institutions**

	0	1-100	101-1,000	1,001-10,000	More than 10,000
Institutions that physically accessed the collection(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Institutions that electronically accessed the collection(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Institutions that physically accessed any ancillary collection(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Institutions that electronically accessed any ancillary collection(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**D. Scope and Size**

**In this section, we ask that you describe the scope and size of this object-based botanical collection(s) together with information about changes in the collections size in recent years.**

**D-1.**What is the geographic scope of the objects in the collection? (Mark all that apply.)

1.       Worldwide
2.       Regional-worldwide
3.       National-worldwide
4.       United States
5.       Regional-United States
6.       Local-United States
7.       Other, please specify: \_\_\_\_\_

**D-2.** In the boxes provided below, describe the size of your unit's object-based scientific collection. Estimate the number of objects in the collection using the defined unit of measurement for each category or enter UNK if the number of units is unknown or enter 0 for holding categories that do not apply.



# BOTANICAL COLLECTIONS

	Living specimens --- Bulk material (Record in cubic feet)	Living specimens --- Individually catalogued (Record in items)	Living specimens Ancillary collections (Record in items)	Living specimens Ancillary collections (Record in cubic feet)	Living specimens Ancillary collections (Record in linear feet)
Collection 1	O	O	O	O	O
Collection 2	O	O	O	O	O
Collection 3	O	O	O	O	O
Collection 4	O	O	O	O	O
Collection 5	O	O	O	O	O
Collection 6	O	O	O	O	O

	Non-living specimens (e.g. botanical specimens, wet and dry preparations) --- Bulk material (Record in cubic feet)	Non-living specimens --- Individually catalogued (Record in items)	Nonliving specimens Ancillary collections (Record in items)	Non-living specimens Ancillary collections (Record in cubic feet)	Non-living specimens Ancillary collections (Record in linear feet)
Collection 1	O	O	O	O	O
Collection 2	O	O	O	O	O
Collection 3	O	O	O	O	O
Collection 4	O	O	O	O	O
Collection 5	O	O	O	O	O
Collection 6	O	O	O	O	O

**D-3.** How has the size of the collection(s) changed since FY2000? (Mark just one per collection.)

	Increased	Decreased	No Change
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**D-4.** FOR THOSE COLLECTIONS THAT INCREASED IN SIZE, estimate the average annual growth in the collection since FY2000. (Mark just one per collection.)

	1-25%	26-50%	51-75%	76-100%	More than 100%
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**D-5.** Was the increase predicted or anticipated? (Mark just one per collection.)

	Yes	No
Collection 1	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>

**D-6.** What were the primary reasons for this increase? (Mark all that apply.)

	Routine collection activity	Government mandates	Change in reporting unit mission	Reorganization or restructuring	Financial / budgetary changes	Staff changes (number and expertise)	Other
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**D-7.** FOR THOSE COLLECTIONS THAT DECREASED IN SIZE, estimate the average annual decrease in the collection(s) since FY2000. (Mark just one per collection.)

	1-25%	26-50%	51-75%	More than 75%
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**D-8.** Was the decrease predicted or anticipated? (Mark just one per collection.)

	Yes	No
Collection 1	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>

**D-9.** What were the primary reasons for this decrease? (Mark all that apply.)

	Routine collection activity	Government mandates	Change in reporting unit mission	Reorganization or restructuring	Financial / budgetary changes	Staff changes (number and expertise)	Other
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## E. Condition of the Collection

In this section, we ask that you characterize the condition of your object-based botanical collection(s).

**E-1.** How would you characterize the overall condition of the collection? (Mark just one per collection.)

	Very poor	Poor	Fair	Good	Very good
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**E-2.** Has your reporting unit ever completed a condition survey or an assessment of object-based scientific collections? (Mark just one.)

1. Yes, for the entire collection
2. Yes, for a portion of the collection
3. Yes, but not recently
4. No
5. No, but one is planned, please explain: \_\_\_\_\_

## F. Care and Preservation

In this section, we ask that you address the adequacy of resources for the care and preservation of your object-based botanical collection(s).

**F-1.** What percent of the collection is stored under conditions considered to be adequate for its care and preservation? (Mark just one per collection.)

	None	1-25%	26-50%	51-75%	76-99%	100%	Do not know
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**F-2.** For those collections stored under inadequate conditions, indicate areas of MAJOR need. (Mark all that apply.)

	Additional on-site storage	New or additional off-site storage	Renovated storage space (either on-site or off-site)	New or improved storage equipment (e.g., shelving, cabinetry, racks)	New or improved environmental controls (e.g., temperature, humidity, or light)
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**F-3.** Which of the following areas are MOST IMPORTANT to the maintenance of the collection(s)? (Mark all that apply.)

	Acquisition of additional collections	Refinement and disposal of collections	Additional staff for collections	Additional or improved space for collections	Additional or improved equipment and supplies for collections	Cataloguing of collections	Digitization of collection images and information	Improved access to collections by users
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## G. Collection Documentation and Accessibility

In this section, we ask that you address the documentation and accessibility of your object-based botanical collection(s) for research and other uses.

**G-1.** Estimate the percentage of the collection(s) that is catalogued. (Mark just one per collection.)

	None	1-25%	26-50%	51-75%	76-99%	100%	Do not know
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**G-2.** What percent of the collection(s) is accessible for scientific research or other uses? (Mark just one per collection.)

	None	1-25%	26-50%	51-75%	76-99%	100%	Do not know
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**G-3.** For those collections deemed inaccessible, indicate areas of MAJOR need. (Mark all that apply.)

	Additional on-site storage	New or additional off-site storage	Renovated storage space (either on-site or off-site)	New or improved storage equipment (e.g. shelving, cabinetry, racks)	New or improved environmental controls for temperature, humidity, or light
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**G-4.** Estimate the percentage of the collection that is accessible through an electronic database. (Mark just one per collection.)

	None	1-25%	26-50%	51-75%	76-99%	100%	Do not know
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**G-5.** Estimate the percentage of the collection that is accessible via the Web. (Mark just one per collection.)

	None	1-25%	26-50%	51-75%	76-99%	100%	Do not know
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**G-6.** Indicate the types of information about the collection that are accessible via the Web. (Mark all that apply.)

	None	Collection-level descriptions	Minimum catalog information of collection	Images of collection	Minimum catalog information and images of collection	Enhanced catalog information of collection	Enhanced catalog information and images of collection
Collection 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collection 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**G-7.** Does your agency charge user fees? (Mark just one.)

1. Yes
2. No
3. Do not know

## H. Funding

**In this section, we ask that you describe the funding associated with the management of your object-based botanical collection(s).**

**H-1.** Does your agency's FY06 budget have funds specifically allocated for the care and management of your collection(s)? (Mark just one.)

1. Yes
2. No specific line-item in budget, but other budgeted funds are available
3. No (Go to question H-3)
4. Do not know

**H-2.** For FY05, what was the agency's annual budget designated specifically for the care and management of your scientific collections?

Budget in \$

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**H-3.** What is the source of your agency's funds designated for the care and management of scientific collections? (Mark all that apply.)

1. Federal
2. State
3. County or municipal
4. Corporate
5. Foundation
6. Individual donor

**H-4.** Does your agency rely on external funding sources to support scientific collections-related activities? (Mark just one.)

1. Yes
2. No

## I. Policies and Procedures

**In this section, we ask that you describe the availability and status of written and approved policies and procedures designed to guide the management of your object-based botanical collection(s).**

**I-1.** For which of the following activities does your reporting unit have written, approved policies and procedures for the management of these collections? (Mark all that apply.)

1. None
2. Acquisition
3. Disposal
4. Documentation
5. Preservation
6. Access and use
7. Handling
8. Security
9. Do not know

**I-2.** Which policies and procedures are current and up-to-date? (Mark all that apply.)

1.       None
2.       Acquisition
3.       Disposal
4.       Documentation
5.       Preservation
6.       Access and use
7.       Handling
8.       Security
9.       Do not know

## **J. Staffing**

**In this section, we ask that you provide information about the number and adequacy of current staffing for your object-based botanical collection(s).**

**J-1.** In the spaces below, describe the current staffing associated with your object-based scientific collection(s).Number of Full-time paid staff

--

Number of Part-time paid staff

--

Number of Full-time unpaid staff

--

Number of Part-time unpaid staff

--

**J-2.** Please characterize recent staffing experiences for this collection. (Mark just one.)

1.        Staffing is stable and vacancies are replaced
2.        Staff is increasing and new hires have been added
3.        Staffing is unstable and declining

## **K. Additional Questions**

**K-1.** In the space provided, please list one question you wish we would have asked you about your reporting unit's object-based botanical collection(s):

**K-2.** In the space provided, briefly explain the answer you would give in response to that question. (No more than 25 words.)

## APPENDIX 5: SECTION K: ADDITIONAL QUESTIONS POSED BY RESPONDENTS

Survey Type	Desired Question	Desired Answer
Archaeological, anthropological, and ethnographic	Do your collections enhance the scientific value of your research?	Absolutely. Our archaeozoological and paleobotanical collections are vital for our research. They are not duplicated anywhere.
Botanical	Do you consider that you need more support to guarantee the conservation and accessibility of the pollen reference collections at STRI? disciplines of scientific research why doesn't the SI give the collection more support?	Absolutely, because the pollen reference collection is a vital research tool for several scientific disciplines
Botanical	How long has the collection existed?	60 years
Botanical	How many FTEs are devoted to the maintenance of the collection, and how many are actually needed?	Virtually none are devoted to the collection, and 0.5 FTE at a professional level would be desirable.
Botanical	Is the collection increase/decrease percentage likely to change in the near future (over the next 5 years)?	Yes - the increase percentage will increase significantly due to expansion of study area
Botanical	What proportion of the botanical collection are dry (Herbarium sheets) and what proportion are wet specimens?	80% Herbarium sheets (300 specimens, 120 species). 50% of space or one herbarium cabinet. 50% of space devoted to wet specimens.
Botanical	What is the expected lifespan of the collection if curation continues at the current level of support?	Some of our botanical collections will be severely compromised or completely lost within 10 years.
Botanical	Where will this collection be in 5 years?	Possibly in a state university's herbarium.
Cellular and tissue	Are adequate resources provided to enhance and modernize characterization of objects in the collections?	No. 80-90% of these bacteria have not been properly identified. None have been sequenced. Molecular analysis of the strains would add greatly to the value of the Milford collection.
Cellular and tissue	Do you intend to perpetually maintain the collections?	No. After our research has been completed, we intend to distribute our specimens to museums or universities. We may, however, keep some specimens as vouchers to support conclusions and recommendations that are based on our results.

Survey Type	Desired Question	Desired Answer
Cellular and tissue	Does your collection consist of both physical samples and a database of analyzed data?	Yes. The online database of analyzed DNA sequences and genomic annotations is probably more important and more the physical clone collection.
Cellular and tissue	Has the availability (including cataloging) of your object-based cellular & tissue collection changed since FY2000? How many years of collection is included in your object-based cellular & tissue collection?	Yes, with additional shelving and allocated storage space with adequate ventilation and temperature control environment. Years of collection: < 20 years
Cellular and tissue	how is the collection supported?	Through a contract to a commercial entity.
Cellular and tissue	Of the staff associated with the collection, are they from other organizations than the reporting unit and other locations than collection site?	We rely on state agencies, universities, and other Federal reporting units to provide sample collections. I did not include them in the number of staff associated with the collection because they are too numerous and varied. Also, the people collecting th
Cellular and tissue	Over the next 10 years, do you expect your Collection to increase annually, and if so, and by how much?	Yes, by 3000 samples annually (~11 cu ft).
Cellular and tissue	What is the long term plan for the collection? (renewal, depletion, archiving)	We have seen collections with no goal or use plan, wasting dollars. Not our own, fortunately.
Cellular and tissue	What other information (data) is associated with this collection?	These specimens were collected within clinical trials sponsored by the VA Cooperative Studies Program. A large amount of clinical data is associated with these specimens.
Cellular and tissue	What percent of staff time is spent working with the collections?	One full-time staff spends 75% of time One full-time staff spends 2% of time
Chemical	What is the use/issues?	Drug Discovery/Intellectual Property
Geological and geophysical	Are there any special any special environmental conditions required to preserve your collection?	Yes. The majority of the collection requires freezing and refrigeration for preservation.
Geological and geophysical	Does the Bureau have a clear policy regarding the curation of this collection? And, if so, has this policy been implemented?	There is no clear policy on the curation of this collection. In essence, this collection exists in limbo. This collection should be evaluated as to whether its present location and lack of use indicates it should be moved and consolidated somewhere.
Geological and geophysical	For what fraction of the collection has adequate metadata been captured.	25-50%
Geological and geophysical	how long do you plane to store this collection?	I have no idea; as long as somebody says its worth storing

Survey Type	Desired Question	Desired Answer
Geological and geophysical	If additional funds were made available to support the collection, how would they be used?	Complete the cataloging of the collection and make the catalog web based (CRMRT intranet chemistry web page)
Geological and geophysical	If funding were available to curate collection, would you apply for it?	Yes
Geological and geophysical	Is the organization's budget model organized in such a way as to account for the need for curation of collections and dissemination of collection information to other potential users.	A more efficient budget model for operating some laboratories could be devised at minor extra cost to the organization, that would benefit the scientific community by addressing critical needs for preserving and disseminating information about collections
Geological and geophysical	Is this collection part of a long-term study? If so, how long and frequency of sample collection?	This is a 200 year study with plans for resampling every 20 years or after a major disturbance.
Geological and geophysical	What environmental and security controls are required to properly curate this collection?	All samples are curated in dedicated cleanrooms (class 1000 or better). Samples collected on space missions are processed and stored in positive pressure and gloveboxes under high-purity nitrogen. Samples collected on Earth are processed on laminar flow b
Geological and geophysical	What is its approximate total market value?	\$0. Purely scientific collection with no intrinsic value.
Geological and geophysical	What is unique about this collection and its care?	The USGS is funded by DOE through a contractor to oversee this collection and it is housed on an access controlled base Nevada Test Site.
Geological and geophysical	What research topic(s) is/are supported by these collections?	Planetary impact cratering for both of our collections. The collections are commonly rocks and/or core samples from impact craters around the world.
Invertebrate zoology	Does your agency intend to continue staffing the collection with trained professional?	The agency locally expresses a desire to maintain the collections but has no program to train staff or replace staff lost to retirement or other attrition.
Invertebrate zoology	Is your collection onsite?	Our collection is maintained by another group and some of my 'don't know' answers result from this.
Invertebrate zoology	What do you consider an OPTIMUM Staffing level to support the collection-related personnel requirements of the IZ Collection?	0-25 Curators depending on breadth of coverage 40-50 GS-1016 Technical Staff – 1 FTE per curator to provide basic research support and research-specific collection support 20-25 “core” CM staff to support IZ's Collection Program

Survey Type	Desired Question	Desired Answer
Invertebrate zoology	What is the long-term plan for the disposition of the benthic invertebrate collection housed at the USGS National Water Quality Laboratory?	An alternative acceptable procedure for disposition, requiring NARA's approval, is being prepared and evaluated for eventual deposition at museums and permanent repositories.
Invertebrate zoology	What was the effect of Hurricane Katrina on the collection?	Katrina destroyed the area housing the SIPAC collection and, to date, 1250 of 9010 samples (14%) have been recovered. Recovery efforts are ongoing.
Invertebrate zoology	Why is it being maintained?	It is mandatory for all quarantines to maintain a voucher collection of all species and strains that are brought into the facility.
Invertebrate zoology	Why is it important to maintain this collection?	This is the only collection specializing in collecting and documenting insects found in foods.
Paleontology		Currently have only one active collection. All previous collections have been archived to the Smithsonian Institution.
Paleontology	Could we get funds to catalog our paleontology collection and put that information out on the web?	We think it would be a worthwhile venture but we don't have the funds ourselves.
Paleontology	Does your Federal agency have the legal authority to fund the care and curation of scientific collections?	No, the Forest Service does not have the legal authority under its enabling act, the Federal property laws, or other authority to fund the curation of paleontological resources.
Paleontology	If your unit had funds available specifically for improving the paleontology collections, what would you spend them on?	Give full-time positions to the three part-time personnel in order to improve and accelerate cataloging
Paleontology	Is electronic/Web access necessary for these collections?	No. Collections are mostly created/used by in-house researchers and collaborators, who have full access; collections referenced in scientific literature.
Paleontology	Is the organization's budget model organized in such a way as to account for the need for curation of collections and dissemination of collection information to other potential users.	A more efficient budget model for operating some laboratories could be devised at minor extra cost to the organization, that would benefit the scientific community by addressing critical needs for preserving and disseminating information about collections
Paleontology	Is there a unique focus of the fossil collections?	Yes. These are the fossils from which age calls were made for the USGS geological maps, and energy resources assessments



Survey Type	Desired Question	Desired Answer
Paleontology	Who has ultimate ownership/jurisdiction of the collection	U.S. National Museum
Paleontology	why am I being asked these questions?	I do not know
Technological	Describe in detail the collection and how it is used. Give more than 25 words for each collection -- 100 words per collection would be good.	We have one old steel bridge with defects and 3 contemporary concrete bridges. We monitor their condition in response to millions of tons of traffic and various weather condition.
Technological	What environmental and security controls are required to properly curate this collection ?	All samples are curated in a dedicated cleanroom (class 1000). Samples are maintained in locked containers on a secure NASA site.
Vertebrate zoology	Age of collection	This is a historic collection. Most specimens were collected in the mid-1930s. Some species are no longer found in area.
Vertebrate zoology	Are other collections described associated with this one?	Yes, the NEFSC Zooplankton Collection is based on the same collections
Vertebrate zoology	describe the current staffing associated with your object-based scientific collection(s). - Is this their full time responsibility?	No, part-time responsibility
Vertebrate zoology	Has the availability (including cataloging) of your object-based cellular & tissue collection changed since FY2000? How many years of collection is included in your object-based cellular & tissue collection?	Yes, with additional shelving and allocated storage space with adequate ventilation and temperature control environment. Years of collection: < 20 years
Vertebrate zoology	How are R&D results made available?	R&D findings need to be made available via the web
Vertebrate zoology	more details on uses of collection??	1) marine fish population age composition estimates; 2) growth studies; 3) DNA studies; 4) elemental composition studies; 5) training of age readers; 6) QA/QC protocols
Vertebrate zoology	Of the staff associated with the collection, are they from other organizations than the reporting unit and other locations than collection site?	We rely on state agencies, universities, and other Federal reporting units to provide sample collections. I did not include them in the number of staff associated with the collection because they are too numerous and varied. Also, the people collecting th
Vertebrate zoology	See my comments concerning the algal and invertebrate collections.	One part time curator/taxonomist can not keep up collections covering two kingdoms and an estimated 20 phyla.

Survey Type	Desired Question	Desired Answer
Vertebrate zoology	The collection I was directed to answer survey questions for is one that is supported partially by a Federal contract, so an appropriate question might relate to the level of support provided.	\$100,000 per year, provided for student research assistantships and required supplies.
Vertebrate zoology	what is the significance of the collection	collection contains the ichthyoplankton from >50 years of BCF/NMFS resource surveys in eastern Pacific and from > 50 years of CalCOFI surveys in California Current region
Vertebrate zoology	What percent of staff time is spent working with the collections?	One full-time staff spends 75% of time One full-time staff spends 2% of time

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