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Metadata Creation for Several of the Maryland Geological Survey's Geological and Geophysical Collections (2010-2011)

by

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ABSTRACT

The Maryland Geological Survey (MGS or "the Survey") shares the concerns of other agencies and organizations engaged in geological research – that geoscience collections and data are valuable in their own right, beyond the lifetime of the projects during which they are collected or acquired, and that special efforts are required to preserve them and ensure their accessibility.

In this, its third year as a recipient of a National Geological and Geophysical Data Preservation Program (NGGDPP) grant, MGS created metadata for six more of its permanent collections (three physical and three derived/indirect collections): (1) rock and mineral specimens, (2) macrofossils, (3) exhibition flasks of Maryland's mineral commodities, (4) bathymetric surveys of various reservoirs and coastal water bodies, (5) geophysical logs for deep wells (>2,500 ft deep) in Western Maryland, and (6) a subset of enlarged (2' x 2') aerial photos flown in the 1950s and 1960s over the State's barrier islands. The Survey supplied the metadata to the ScienceBase Catalog, adding a total of over 700 records.

In the course of creating metadata for the six collections, MGS confirmed, once again, that (a) the relative ease of broadly describing a collection masks the amount of work involved in compiling metadata for the items comprising the collection, (b) each collection is unique and poses its own set of problems to be resolved, and (c) if geographic coordinates are not already available for the items in a collection, acquiring them is generally the most time-consuming aspect of completing metadata. The migration of the original National Catalog to the ScienceBase Catalog led to minor changes in the data upload procedures, particularly for collections that had not already been broadly inventoried. MGS continued to find the live link, in the person of the NGGDPP's Richard Brown, extraordinarily helpful in the process. This year, the Survey finalized a system, exemplified by this report, for creating collection-level reports, including an attachment that specifically addresses NGGDPP-compliant metadata creation (i.e., the nature and source of information for each of the metadata fields). The marginally successful attempts to document two of its digital collections revealed the extent to which the Survey is in need of a fully developed plan for the long-term preservation of such data. Finally, independently of the funded activities, MGS continued to find that a panel of outside experts is invaluable in fostering data preservation efforts.

MGS has now completed a collections inventory and honed its experience in metadata creation – the initial steps in building what it hopes will become a first-rate repository that effectively serves the larger geoscience community in Maryland and beyond.

INTRODUCTION

This year, MGS proposed to create NGGDPP-compliant metadata for five more of its permanent collections, indicated as shaded rows in Table 1. MGS finalized and uploaded

metadata for three of these collections: *Maryland Rocks and Minerals* (P1510); *Maryland Macrofossils* (P1518); and *Bathymetric Surveys, Maryland Reservoirs and Coastal Waters* (P1547). Problems documenting the other two collections, *Maryland Rock Cores* and *Maryland Marine & Estuarine Beach & Bottom Sediment Data*, precluded uploading related metadata to the ScienceBase Catalog. In lieu of those two collections, MGS substituted two others: *1952-1964 Aerial Photographs of Fenwick and Assateague Islands, Maryland* (92 of 505 newly discovered black-and-white air photos flown between 1952 and 1964 along the State's barrier islands – P1691) and *Geophysical Logs, Western Maryland Deep Wells* (337 logs from 100 deep wells (2,500-11,600 ft deep) drilled between the 1950s and 1990s, mainly for natural gas exploration in the two westernmost counties in Maryland – P1528).

During the course of documenting the rock and mineral hand samples, MGS (a) broadened the scope of this year's effort to include all of its rock and mineral specimens, not just those on exhibit, and (b) split out a subset of specimens - 38 exhibition flasks that formed part of a display of Maryland's mineral products (e.g., bituminous coal, brick clay and shale, fire clay and shale, greensand, marl), shown at a number of expositions in the U.S. during the first decade of the 20th century. The latter form a new collection (P1692).

The Survey added about 730 records to the ScienceBase Catalog this year, consistent with the proposed estimate of 700 new records.

Table 1: Collections for which MGS created, or proposed to create, metadata (2010-2011)

Collection category	Collection ID*	Collection type and name
PHYSICAL COLLECTIONS		
Hand Samples	P1510 (352923)	*Maryland Rocks and Minerals*
Hand Samples	P1692 (1835540)	*Exhibition Flasks: Mineral Commodities of Maryland*
Paleontological Samples	P1518 (123382)	*Maryland Macrofossils*
Rock Cores	P1531	*Maryland Rock Cores*
DERIVED/INDIRECT COLLECTIONS		
Photographs	P1691 (1866612)	*1952-1964 Aerial Photographs of Fenwick and Assateague Islands, Maryland*
Routine Analysis Data	P1612	*Maryland Marine & Estuarine Beach & Bottom Sediment Data*
Surface & Airborne Data	P1547 (580439)	*Bathymetric Surveys, Maryland Reservoirs and Coastal Waters*
Well Logs	P1528 (123375)	*Geophysical Logs, Western Maryland Deep Wells*

*P#### = Original National Catalog Collection ID for Maryland (State ID = 435934)
(######) = ScienceBase Catalog ID

Preservation of the selected collections is important for reasons that vary by collection. Certain items may be useful for purposes other than those for which they were originally collected. Preservation of the bathymetric data, for example, will facilitate future determinations of drinking water storage capacity and sediment accumulation in the State's reservoirs. The existence of logs from deep wells in Western Maryland may be of interest to natural gas drillers exploring the Marcellus Shale. Many of the items and much of the information are expensive to collect. For example, in addition to the expense of employees' wages, bathymetric surveys involve the costs associated with the use of a research vessel. (The *R/V Kerhin*, the Survey's research vessel, is currently available for $170/hour plus the cost of fuel -$2.45/gallon for a vessel that uses 1.6 gallons/mile at cruising speed (Capt. R. Younger, pers. comm.). Many of the items and much of the information may be impossible to replace. Finding macrofossils, for example, is often a matter of chance. More generally, ready access to existing collections and datasets may facilitate the assessment of natural resources or geologic hazards. The latter particularly may require quick answers, over a timeframe that doesn't allow for additional data collection and laboratory analysis.

The report is organized differently than last year's in two ways. First, each collection is treated as a stand-alone section, an appendix at the end of the report. (Last year, the report followed a more typical outline: Background, Objectives, Metadata Creation, Lessons Learned, etc., with pertinent information about each collection separated out under each heading.) Grouping all of the information about a single collection in one place should facilitate internal tracking of the collection and following up on needs and next steps. It also allows for the creation of a general template for describing all of the Survey's collections. Second, this report serves double duty: to report MGS's progress in terms of this year's NGGDPP grant and to document other, non-grant-related progress with respect to data preservation at the Survey over the same time period - thus, an annual report of MGS's data preservation activities. This will greatly facilitate communicating results to other stakeholders, particularly the Survey's staff and the members of the Data Preservation Advisory Panel.

BACKGROUND

Maryland is a relatively small, densely-populated state, with a land area of 9,844 square miles, a water area of 623 square miles, and an estimated population of 5.6 million people (MGS, 2007; U.S. Census Bureau, 2006). The state straddles six geologically diverse physiographic provinces, from the Appalachian Plateau to the Atlantic Continental Shelf, and contains an extensive network of tidal streams and bays, most notably northern Chesapeake Bay. The Atlantic Ocean forms its eastern border.

The state geological survey has been in existence since 1896. The types of geoscience collections held by MGS reflect its mission, as it has changed over the past 115 years. Current research is focused on the geological underpinnings and groundwater resources of the State. However, MGS has retained several collections from the past, when the

interests of its staff and the needs of Maryland's citizenry were different than they are today. For instance, although the Survey is no longer actively engaged in paleontological research, MGS has a macrofossil collection that numbers in the hundreds of specimens. As a consequence of its longevity and the diversity of its activities, MGS possesses a wide array of holdings in a variety of formats.

Three years ago, in response to financial incentives offered by the NGGDPP, MGS began to address the long-term preservation of its data and collections in a formalized, systematic way. In 2008, NGGDPP awarded MGS a one-year grant to (1) identify and broadly described the geoscience collections and data currently in its possession and (2) enter information about the nature, size, condition, and accessibility of those collections and data deemed "permanent" into the Collections Inventory of the National Catalog (Hennessee and Shelton, 2009). Since then, MGS has identified 31 permanent collections: nine physical collections and 22 derived or indirect data collections. The distribution of the Survey's permanent collections among the NGGDPP collection categories is summarized in Table 2. A detailed list of those collections, as well as their status in terms of data preservation, can be found in Appendix 1.

Table 2: Permanent collections held by MGS, by NGGDPP collection category.

Collection category	Permanent collections (N)
Physical Collections	
1. Auger samples	
2. Fluid samples	
3. Geochemical samples	
4. Hand samples	2
5. Ice cores	
6. Paleontological samples	1
7. Rock cores	1
8. Rock cuttings	1
9. Sediment cores	4
10. Sidewall cores	
11. Thin sections and polished sections	
12. Type stratigraphic sections	
Subtotal	**9**
Derived/Indirect Data	
13. Drilling/completion reports	1
14. Drill stem and other tests	1
15. Field notes	1
16. Geochemical data	1
17. Geophysical data	
18. Lithology logs	1
19. Maps	1

Table 2: Permanent collections held by MGS, by NGGDPP collection category.	
Collection category	**Permanent collections (N)**
20. Paleomagnetic resistivity	
21. Paper reports	3
22. Petrophysical data	
23. Photographs	4
24. Potential fields	
25. Production history	
26. Routine analysis data	2
27. Scout tickets	
28. Seismic data	1
29. Source rock maturity analysis	
30. Special analysis data	
31. Stratigraphic horizons	
32. Surface and airborne data	3
33. 2-D and 3-D seismic reflection	1
34. Vertical seismic profiles	
35. Well logs	2
Subtotal	**22**
Total	**31**

In 2009, NGGDPP awarded MGS a second grant, which enabled the Survey to master metadata creation through the documentation of three of its sediment core collections. Also in 2009, MGS developed a long-range data preservation plan for its non-digital holdings (Hennessee, 2009) and appointed a curator from among its scientific staff. Inspired by the Data Preservation Workshop at Indiana University, which the MGS curator was invited to attend, the Survey created a Data Preservation Advisory Panel composed of outside geologists, archivists, librarians, and archeologists. From its inception, the Advisory Panel has fostered data preservation at MGS: helping to resolve thorny questions (e.g., keep or discard a particular collection), endorsing proposals, and forming partnerships in applying for preservation-related grants.

OBJECTIVES

Designed to further MGS's progress in metadata creation and submittal to the ScienceBase Catalog, the objectives of the 2010 NGGDPP project, as outlined in the proposal, were as follows:

1. For the five proposed collections, assemble the information needed to develop item-by-item metadata, consistent with the metadata template, from existing internal data documentation (e.g., spreadsheets, databases, catalogs, reports)
2. Populate an internal Microsoft Access database, DataPreservation.mdb, with

metadata describing the items that comprise the five collections, in a format consistent with version 1.0 of the *Metadata Profile for the National Digital Catalog*:

3. Through digital transfer, provide metadata to the ScienceBase Catalog for the items that comprise the proposed collections.
4. Develop collection-specific strategies for the preservation of the five collections, addressing such issues as improving storage conditions for existing items in the collection; developing protocols for the addition of new items, including updating the ScienceBase Catalog; devising ways to make the items easier for users to access; and providing additional information about the collection on the MGS website.
5. Submit a final report to the NGGDPP, describing the results, findings, and lessons learned from this year's project.

METADATA CREATION, CONVERSION, AND TRANSFER

GENERAL APPROACH

MGS has finally developed a workable approach to metadata creation. Because so many of its collections are scattered throughout the building, the first step is to inventory the contents of each map/storage/display cabinet shelf or drawer and to enter that information, including specimen labels, copied verbatim, into an Inventory table in the Data Preservation Database. Then, for each collection, the Survey adds another table to the database, which generally includes more information than is required for NGGDPP metadata, and populates it, in part, with pertinent information from the Inventory table. A subset of data fields is extracted from the collection-specific table and stored in an associated UploadMetadata table, which is exported from the Access database to a .csv file for final upload to the ScienceBase Catalog.

POPULATING THE METADATA TABLES

Last year, in creating metadata for the first time, the Survey adopted an idea similar to one suggested in the NGGDPP instructions, *Preparing Metadata for the National Digital Catalog* (05/15/2009), which provides a worksheet for mapping existing digital data into the metadata fields. For each collection, MGS completed an *NGGDPP Metadata Form* describing the information to be supplied as metadata, including explanations and examples for each metadata field and a list of information sources, as appropriate. The completed forms for the six collections that the Survey documented this year are included as part of the individual collection reports (Appendices 2-7). The remainder of this section discusses some of the more important metadata decisions that the Survey made in the course of documenting this year's collections.

Title

Deciding on the contents and format of the *title* field, especially for items that are inconsistently or incompletely labeled, requires careful thought. For example, MGS has numerous specimens of particular Miocene fossils. Rather than list them individually, the Survey decided to report the title as *Genus species*, or if species was unknown, *Genus sp.*,

verifying the spelling, if necessary, through an Internet search. For the rock and mineral collection, the title entries were more complicated, consisting of a combination of four possible bits of information: general rock or mineral name – mineral variety – descriptor(s) – formation name. (All four pieces of information were seldom available for inclusion in the title).

Geographic Coordinates

In assigning geographic coordinates to an item, first, a decision has to be made as to the degree of generality or specificity to be provided. In the case of macrofossils, following the recommendations of the American Museum of Natural History, MGS decided not to identify site-specific localities, even for the specimens where that information was known (see Appendix 4 – *Maryland Macrofossils*). Instead, the Survey reported the geographic coordinates of the county centroid, or, if the county of collection was unknown, the state centroid. Even if MGS does decide to provide site-specific coordinates, these are commonly not recorded at the time of collection, particularly for certain physical specimens like rocks and fossils. For many of these specimens, the only information about the site of collection is a place name, at best, recorded on an associated label. The geographic coordinates of these places then must be retrieved, one by one, from the U.S. Geological Survey's Geographic Names Information System (GNIS). For many of the more poorly labeled specimens, MGS has resorted to reporting county or state centroids in order to upload any metadata at all to the ScienceBase Catalog. Lastly, study areas, such as bodies of water, do not lend themselves to representation by a single pair of coordinates. In those cases, MGS selects an arbitrary, central point in the larger area of study for which GNIS lists coordinates. (For these, it is usually necessary to note the quadrangle name, as well, since coordinates for the same body of water, for instance, vary depending on the quad being viewed.)

Alternate Geometry

Having taken such liberties with the *coordinates* field, MGS then commonly uses the *alternateGeometry* field to document the contents of the *coordinate* field, even though the *alternateGeometry* field is intended for reporting (x, y) coordinates based on other coordinate systems. An example of the MGS version of an *alternateGeometry* field entry might be, "Geographic coordinates (NAD83) represent point on Clarksville quadrangle within Rocky Gorge Reservoir, from the U.S. Geological Survey's Geographic Names Information System (GNIS) [8/9/2011]"

CONVERTING METADATA TABLES AND SUBMITTING FILES TO THE SCIENCEBASE CATALOG

For this year's documented collections, MGS used the same process it had used last year to convert Access metadata tables to .csv-formatted files and upload those files to the ScienceBase Catalog. Once again, the clear instructions in *Preparing Metadata for the National Digital Catalog* (05/15/2009), coupled with MGS-specific instructions and admonitions for metadata upload, included as an appendix in last year's report, made file submission fairly easy (Hennessee and Shelton, 2010). MGS particularly appreciated being able to interact directly with NGGDPP personnel, especially Richard Brown, in resolving occasional minor glitches in the process.

This year, metadata submission rules changed somewhat. NGGDPP participation in the ScienceBase Catalog requires state surveys and other users to become familiar with another interface. It took some time to get accustomed to the new catalog and to use and edit it effectively.

VERIFYING THE ACCURACY AND COMPLETENESS OF THE UPLOADED METADATA

MGS verified the completeness and accuracy of the metadata upload. In terms of completeness, MGS checked that the total number of records in each collection, determined from the appropriate internal database table, matched the number uploaded to the ScienceBase Catalog. Then, for a subset of records in each collection, MGS verified the accuracy of the uploaded information, that is, MGS verified that the information in the ScienceBase Catalog matched the information in the internal database tables. The few programming errors detected in the process were promptly corrected by NGGDPP personnel.

After verifying the accuracy and completeness of the metadata upload, MGS reviewed and, as needed, revised the associated information contained in the original Collections Inventory. In some cases, the number of items uploaded differed from the initial estimates reported in the original description of a collection. Or, as a collection was itemized and documented, the contents of the collection was broadened to include more kinds of items, or narrowed to include fewer, necessitating a change in the collection description.

RESULTS AND LESSONS LEARNED

Although MGS broadly met its objectives by documenting six more of its collections and providing approximately 700 new records to the ScienceBase Catalog, only three of the five proposed collections were fully documented. With regard to the *Maryland Marine and Estuarine Beach and Bottom Sediment Data*, the Survey had proposed to gather the disparate digital data sets that contain the analytical results of 50+ studies, document them in accordance with the Federal Geographic Data Committee's (FGDC) metadata standard (also a State standard for digital spatial data), and store them in a central location on an as-yet-to-be-determined medium. The Survey would also archive the publications that describe the analytical techniques and discuss or display the results of these analyses. A major benefit of undertaking the task would be forcing the Survey to confront the problem of digital data preservation.

The authors were immediately overwhelmed by the magnitude of the task. For all of the collections documented to date, catalogs and/or published reports existed as sources of information – the starting point for metadata creation. Although the Coastal & Environmental Geosciences Program at MGS had a list of the 50+ projects, the associated reports, the digital data files themselves, as well as any FGDC metadata, were in such a variety of formats and hard-to-access locations (e.g., personal computers), that it was impossible to complete metadata creation (FGDC or NGGDPP) within the time allotted.

Most of the paper "file reports" associated with the data sets were written to satisfy the terms of a grant and never published or archived as official MGS publications. Few copies ever existed, and these were never collected in a single location. Their continued existence depends primarily on the authors' having kept copies of their own. More recent reports exist only in digital format, usually in multiple versions on the primary author's personal computer. Without these reports, documenting the data sets is impossible. So, with regard to NGGDPP metadata creation for the *Maryland Marine and Estuarine Beach and Bottom Sediment Data*, this year's main accomplishment entailed collecting most of the associated file reports, converting them as necessary to .pdf files, and storing them in a single location on the Survey's computer network. The next steps will be to discover the digital data files and then begin the onerous task of FGDC, as well as NGGDPP, documentation.

The Survey's failure to document its collection of *Maryland Rock Cores* has an unhappier explanation – the long illness and untimely death of the geologist most familiar with the collection. Without his first-hand knowledge, creating metadata for the rock cores became immediately more daunting, because no catalog of the collection exists. Finding other sources of information about the collection, probably in the form of reports, will require a great deal more research.

As for the six collections that were fully documented, the most important lessons learned are presented below:

- This year's activities confirmed, once again, that the relative ease of broadly describing a collection masks the amount of work involved in compiling metadata for the items comprising the collection.
- Also, that each collection is unique and poses its own set of problems to be resolved. For example, for each of the items in a collection, it is necessary to decide which to include in the internal Data Preservation database vs. which to upload to the ScienceBase Catalog. Sometimes this is a relatively easy decision: omit rock specimens that, from their consistent shape and size and their scanty labeling, appear to have been purchased as a rock kit from a supply house. Other times, it is more difficult: unless a bathymetric survey has resulted in a final, published map, exclude it from the national catalog.
- Often, *coordinates* is the most time-consuming metadata field to populate, because it frequently involves querying the GNIS for the coordinates of localities, one at a time.
- It would be helpful if the NGGDPP provided recommendations, or at least examples, for *titles* of items comprising common types of collections (e.g., rock and mineral collections). Consistent *title* formats might also facilitate searches of the ScienceBase Catalog.
- MGS is desperately in need of a digital data preservation plan. Digital data sets pose real problems. There is no consistency in the way that various researchers handle digital files – no protocols for finalizing products and storing them in a consistent format on archival media. There is no centralized repository for digital information, nor has anyone been designated to develop and maintain such a system. There is no adequate short-term, much less long-term, storage solution;

some digital files are not even backed up. There is no catalog of digital files, located on or off of the MGS network, and, so, no way of finding information that exists digitally other than through polling individual members of the MGS staff. Few of the Survey's many digital holdings are online and accessible to the larger public.

- The need for action on the data preservation front was made clear this year, by the voluntary retirement of one of the geologists on the MGS staff, the forced retirement of two others, and, sadly, the death of yet another.

NON-GRANT-RELATED PRESERVATION ACTIVITIES

Although the activities described in this section of the report were not directly funded by the NGGDPP, MGS has decided to include this section for two reasons: (1) undertaking the activities was inspired by the Survey's involvement with the NGGDPP and (2) compiling all of the Survey's data preservation activities in one place allows the report to serve double duty as a final report to the NGGDPP, as well as an annual report to MGS's data preservation stakeholders (e.g., MGS staff, members of the MGS Data Preservation Advisory Panel).

The most important non-grant activities that MGS undertook this year included:

- Compiling a still-incomplete digital finding aid for its many publications, both reports and maps

  In response to one of the requirements of a National Historical Publications and Records Commission (NHPRC) request for proposals, MGS began developing a finding aid, essentially metadata, for its reports and maps. The first surprise was the sheer number of publications that MGS had produced in its century of existence – at least 500 reports and 1,000 maps, not to mention the nearly 500 oversized illustrations in reports, illustrations that must be handled separately during publication scanning. The second was the realization that, until now, no one had kept careful track of the publications. Although MGS maintains a *List of Publications*, out-of-print works, particularly maps, are dropped from the list as revised editions are released. Finding extant copies of all of them may prove to be difficult, if not impossible.

- Along with MSA, co-authoring a (failed) proposal to the NHPRC to garner funding for a map scanning project

  MSA and MGS were not awarded the NHPRC grant, in all likelihood because the agencies failed to demonstrate the national, as opposed to regional or local, importance of the Survey's maps. Nonetheless, the two agencies, along with JHU, have decided to proceed with the project, as time and resources allow. The existence of the finding aid will facilitate the transfer and tracking of publications and their scanned images and, thereby, help ensure that all of the original material is scanned and preserved.

- Formalizing collaborations with the Johns Hopkins University (JHU) Eisenhower Library, the Maryland State Archives (MSA), and the Maryland Department of Natural Resources (DNR) Library to begin scanning MGS publications and make them available online

  Prior to the submission of the NHPRC grant, MGS had renewed its collaborative efforts with the JHU Library, which, at its own expense, has scanned the ~200 MGS maps in its own collection, as well as ~300 more on loan from the Survey. Once MGS and MSA decided to proceed with the map scanning project, despite the NHPRC rejection, the two state agencies invited JHU to join in the effort. As part of the MGS-JHU-MSA collaboration, JHU is supplying copies of the images it has already scanned to both MGS and MSA. MGS is donating copies of its rarer and more fragile maps to MSA for conservation, scanning, and permanent preservation. And MSA, in turn, is supplying digital images of those maps to MGS and JHU. JHU is making the digital images available online via its publicly available JScholarship website, and, similarly, MSA is making the images available through its Electronic Archives. MGS retains the right to post the same images to its own website, or otherwise distribute them to interested parties.

  Over the course of the year, MGS also made arrangements with the DNR librarian to unbind, trim, and scan about 80 of the Survey's softbound reports.

- Meeting with the MGS Data Preservation Advisory Panel.

  At its annual meeting in September 2010, the Survey's Data Preservation Advisory Panel urged MGS to apply for NGGDPP funding to develop metadata for its early (1930s and 1950s) aerial photos and index maps. With a letter of endorsement from the Advisory Panel, MGS successfully did so.

- Working with the Maryland State Geographic Information Committee (MSGIC) to revive the defunct Historical Aerial Images Committee

  At the recommendation of the chairman of the Data Preservation Advisory Panel, MGS contacted a MSGIC member who, several years earlier, had convened the first and only meeting of MSGIC's Historical Aerial Images Committee (HAIC). The goals of the HAIC were to locate, digitize, and preserve older aerial photographs and related imagery flown for the State. After hearing the objectives of the Survey's NGGDPP proposal, MSGIC reconvened the HAIC, which has since met twice. After conducting a broad survey of aerial photo holdings in the State, the HAIC, through MSA, is in the process of creating a Google Docs inventory form for use by individual agencies, private companies, etc., in describing their collections. (see Appendix 5 - *1952-1964 Aerial Photographs of Fenwick and Assateague Islands, Maryland*)

- Exploring solutions for the long-term preservation of the Survey's digital files with MSA
- Visiting the Delaware Geological Survey to learn how a neighboring state has implemented proper preservation techniques for its geological collections

CONCLUSIONS

During the past year, MGS has initiated and/or successfully completed a number of activities in building what it hopes will become a first-rate repository that effectively serves the larger geoscience community in Maryland and beyond. Having created and uploaded metadata for a total of nine of its 31 permanent collections to the ScienceBase Catalog, MGS now fully understands the process and has developed procedures and collection-level reporting requirements for documenting the outcome. The Survey is now painfully aware of its shortcomings in handling digital data and is making progress in resolving some of those problems. Finally, MGS has embarked on several independent initiatives to digitize and preserve its reports, maps, and aerial photographs, ensuring continued accessibility to their digital counterparts. In its data preservation efforts, the Survey's next steps are to continue documenting its remaining collections, to seek funding for and prepare all of the collections for long-term preservation, and to continue addressing mechanisms for public access to the collections.

REFERENCES

Hennessee, L., 2009, Long-range data preservation plan: Year 1: Baltimore, Md., Maryland Geological Survey, Coastal and Estuarine Geology File Report No. 09-08, 42 p.

Hennessee, L., and Shelton, D., 2009, Inventory of geological data and collections at the Maryland Geological Survey: Baltimore, Md., Maryland Geological Survey, Coastal and Estuarine Geology File Report 09-04, 43 p.

Hennessee, L., and Shelton, D., 2010, Metadata creation for Maryland Geological Survey's sediment core collections: Baltimore, Md., Maryland Geological Survey, Coastal and Estuarine Geology File Report No. 10-03, 30 p.

Maryland Geological Survey (MGS), 2007, Fact Sheet 2: Land areas, inland-water areas, and length of shorelines of Maryland's counties, http://www.mgs.md.gov/esic/fs/fs2.html, [3/31/2008].

Rein, L., 2009, O'Malley outlines growth strategy: bills proposed to preserve farmland, limit Bay pollution, *Washington Post*, Tues., Jan. 13, 2009, p. B04.

U.S. Census Bureau, 2006, 2006 population estimates, United States – states; and Puerto Rico, http://factfinder.census.gov/, [3/31/2008].

Watson, B.M., 2007, Maryland winters: snow, wind, ice, and cold: National Weather Service, Weather Forecast Office Baltimore/Washington, http://www.erh.noaa.gov/lwx/Historic_Events/md-winter.html, [8/25/2011]

APPENDIX 1
MGS's Permanent Collections and their Preservation Status
September 2011

Table A1-1: Status of the permanent collections held by MGS, by NGGDPP collection category, as of September 2011 (shaded cells indicate that the activity is complete)							
Collection category	**Permanent collections (N)**	**Items in collec-tion* (N)**	**Collection inventory**	**Metadata creation**	**Collection organization & storage**	**Internet accessibility**	**Education/ outreach**
PHYSICAL COLLECTIONS							
1. Auger samples							
2. Fluid samples							
3. Geochemical samples							
4. Hand samples	2						
Maryland Rocks and Minerals (P1510)		99 (203)	NGGDPP 2008	NGGDPP 2010			
Exhibition Flasks: Mineral Commodities of Maryland (P1692)		38	NGGDPP 2010	NGGDPP 2010			
5. Ice cores							
6. Paleontological samples	1						
Maryland Macrofossils (P1518)		156 (200) species; 1500 specimens	NGGDPP 2008	NGGDPP 2010			
7. Rock cores	1						
Rock Cores (P1531)		200	NGGDPP 2008	*(NGGDPP 2010)*			
8. Rock cuttings	1						

Table A1-1: Status of the permanent collections held by MGS, by NGGDPP collection category, as of September 2011 (shaded cells indicate that the activity is complete)							
Collection category	**Permanent collections (N)**	**Items in collec-tion* (N)**	**Collection inventory**	**Metadata creation**	**Collection organization & storage**	**Internet accessibility**	**Education/ outreach**
Rock Cuttings (P1532)		200,000	NGGDPP 2008				
9. Sediment cores	4						
Coastal Plain Cores (P1507)		125	NGGDPP 2008	NGGDPP 2009			
Atlantic Continental Shelf Cores (P993)		282	NGGDPP 2008	NGGDPP 2009			
Chesapeake Bay Cores (P1648)		4,255	NGGDPP 2009	NGGDPP 2009			
Heavy Minerals, Atlantic Coastal Shelf (P1519)		250					
10. Sidewall cores							
11. Thin sections and polished sections							
12. Type stratigraphic sections							
Subtotal	**9**						
DERIVED/INDIRECT DATA							
13. Drilling/completion reports	1						
Well Permits and Well Completion Reports, Maryland (P1526)		500,000	NGGDPP 2008				
14. Drill stem and other tests	1						
Aquifer (Pump) Tests, Maryland Coastal Plain (P1521)		262	NGGDPP 2008				
15. Field notes	1						
Geology Field Notebooks, Maryland (P1522)		70	NGGDPP 2008				
16. Geochemical data	1						

Table A1-1: Status of the permanent collections held by MGS, by NGGDPP collection category, as of September 2011 (shaded cells indicate that the activity is complete)							
Collection category	**Permanent collections (N)**	**Items in collec-tion* (N)**	**Collection inventory**	**Metadata creation**	**Collection organization & storage**	**Internet accessibility**	**Education/ outreach**
Maryland Groundwater Quality Data (P1530)		?	NGGDPP 2008				
17. Geophysical data							
18. Lithology logs	1						
Geological (Lithological) Descriptions of Coastal Plain Cores and Well Cuttings, MD and VA (P1527)		52	NGGDPP 2008				
19. Maps	1						
MGS Maps, including Oversized Inserts in MGS Publications (no USGS ID)		1500	In progress (9/2011)	In progress (9/2011)			
20. Paleomagnetic resistivity							
21. Paper reports	3						
Published MGS Reports		~500	In progress (9/2011)	In progress (9/2011)			
Unpublished MGS Reports (P1553)		300	NGGDPP 2008	In progress (9/2011)			
Doctoral Dissertations on Maryland Geology (P1523)		28	NGGDPP 2008				
22. Petrophysical data							
23. Photographs	4						
Photographs, Chesapeake Bay Shoreline, Maryland (P1565)		20,000	NGGDPP 2008				
X-rays & Xeroradiographs of Marine & Estuarine Sediment Cores, MD (P1589)		300	NGGDPP 2008				
Historical Aerial Photographs (P1603)		25,000	NGGDPP 2008	NGGDPP 2011			
1952-1964 Aerial Photographs of		92 (505 +	NGGDPP	NGGDPP			

Table A1-1: Status of the permanent collections held by MGS, by NGGDPP collection category, as of September 2011 (shaded cells indicate that the activity is complete)							
Collection category	**Permanent collections (N)**	**Items in collec-tion* (N)**	**Collection inventory**	**Metadata creation**	**Collection organization & storage**	**Internet accessibility**	**Education/ outreach**
Fenwick & Assateague Is., MD (P1691)		19 index maps)	2010	2010			
24. Potential fields							
25. Production history							
26. Routine analysis data	2						
Marine & Estuarine Beach & Bottom Sediment Data (P1612)		~50 studies	NGGDPP 2008	*(NGGDPP 2010)*			
Paleontological and Palynological Data Derived from MD Water Wells (P1524)		?	NGGDPP 2008				
27. Scout tickets							
28. Seismic data	1						
Marine and Estuarine Seismic Profile Prints (P1554)		240	NGGDPP 2008				
29. Source rock maturity analysis							
30. Special analysis data							
31. Stratigraphic horizons							
32. Surface and airborne data	3						
Bathymetric Surveys, MD Water Bodies (P1547)		8	NGGDPP 2008	NGGDPP 2010			
Elevation Surveys of Arnold, Broad Creek, and Crofton Meadows Well Fields, Anne Arundel Co., MD (P1529)		15	NGGDPP 2008				
Beach Profiles, Coastal Maryland (P1613)		?	NGGDPP 2008				
33. 2-D and 3-D seismic reflection	1						
2-D Seismic Reflection Profiles, Maryland Coastal Plain (P1520)		2	NGGDPP 2008				

Table A1-1: Status of the permanent collections held by MGS, by NGGDPP collection category, as of September 2011 (shaded cells indicate that the activity is complete)							
Collection category	**Permanent collections (N)**	**Items in collec-tion* (N)**	**Collection inventory**	**Metadata creation**	**Collection organization & storage**	**Internet accessibility**	**Education/ outreach**
34. Vertical seismic profiles							
35. Well logs	2						
Geophysical Logs, Western Maryland Deep Wells (P1528)		337	NGGDPP 2008	NGGDPP 2010			
Well Logs, Maryland and Neighboring States (P1525)		2,000	NGGDPP 2008				
Subtotal	**22**						
Total	**31**						

* Number in parentheses = total number of items held by MGS, vs. number of items for which metadata was reported to the ScienceBase Catalog

APPENDIX 2
Maryland Rocks and Minerals
(MGS Collection ID 5; NGGDPP ID P1510; ScienceBase ID 352923)
September 2011

COLLECTION DESCRIPTION

The collection *Maryland Rocks and Minerals*, in total, consists of about 200 hand samples or slightly larger specimens, primarily representing rock formations of the Maryland Piedmont, Valley and Ridge, and Appalachian Plateau physiographic provinces, west of the Chesapeake Bay. Not surprisingly, very few specimens are from the partially consolidated sediments of the Coastal Plain province. (Incidentally, several of the latter include specimens of indurated shell beds. MGS decided to include these in the rock and mineral collection rather than the macrofossil collection, which consists of individual fossils only.)

Many of the rock and mineral specimens were collected by former Survey employees. A small number - the larger, more stunning specimens - was donated by private mining enterprises in the State. And, finally, a subset of the specimens on display, consisting of small hand samples, all cut to the same dimensions – rectangular (right) prisms – and labeled only with the rock or mineral name, appears to belong to a commercial rock and mineral collection kit purchased for educational purposes. Although the latter are included in MGS's internal database, information about them was not uploaded to the ScienceBase Catalog. Likewise, specimens of unknown origin, specimens from other countries, and specimens from states other than Maryland and its immediate neighbors were excluded from the Catalog. In all, then, MGS provided metadata for just 99 of its rock and mineral specimens to the Catalog.

This collection is no longer growing, nor is it actively maintained. It is used primarily for in-house display or for on-the-road public outreach and educational activities.

STORAGE CONDITIONS

The collection is scattered and poorly organized. Specimens are exhibited or stored in various locations in the Survey's main building in Baltimore: (1) in two locked, glass-fronted display cabinets, one in the front lobby and the other in the library, both accessible to the public (larger specimens are arrayed on top of map cabinets, on the floor, or on individual display stands in the library) and (2) in storage cabinets in the library and in the annex basement. Most specimens are loose (unboxed) on display shelves or in storage cabinets; only about 10% of them are housed in a container of some sort – a cigar box or a shallow, unlidded specimen box. Samples on display are generally described by a separate, typed, paper label propped next to the specimen. Samples in storage more commonly have labels inked directly onto the rock or mineral surface.

Labels vary considerably in terms of their content. In many cases, only the rock or mineral name, or the name of the rock formation, is specified. Collection locality is recorded for only about 2/3 of the specimens. The specificity of the locality ranges from

the name of a particular mine or quarry to the name of a county, region (e.g., Southern Maryland), or state.

Because the rocks and minerals that constitute the collection are stored or displayed in the same rooms, and sometimes the same storage cabinets, as the macrofossil collection, they are subject to the same unsatisfactory conditions described for the latter collection.

COLLECTION DOCUMENTATION

Of the 203 labeled rock and mineral specimens in the Survey's internal Data Preservation Database, metadata for only 99 specimens was uploaded to the ScienceBase Catalog. Excluded were:

- Specimens collected from unknown localities and not suspected of being from Maryland. (Rocks and minerals labeled with only a formation name were judged to have been collected in Maryland, if the formation itself is found in the State.)
- Based on their regular shape and size, specimens presumably comprising a rock and mineral kit, purchased for educational purposes and labeled with only a rock or mineral name.

Based on the contents of the specimen label, the *title* field in rock and mineral metadata consists of one or more of the following elements, separated by dashes: (1) the general rock or mineral name of the specimen (e.g., limestone; apatite) or, rarely, the general form of the specimen (e.g., concretion, geode), (2) mineral variety, (3) one or more adjectives describing the characteristics of the particular specimen (e.g., tourmaline – black; schist – mica schist), (4) the associated formation name, if it includes the rock or mineral type as part of its name (e.g., Wakefield Marble, Oriskany Sandstone) or if it constitutes the only identifying information on the label. If the formation name is included in the title, it is written as recorded on the label, and presumably as assigned by the collector, not necessarily as found on a geologic map (e.g., Pottsville Sandstone, as found on the label, rather than Pottsville Fm., as found, for instance, on the 1968 *Geologic Map of Maryland*). Additional information about the contents of the *title* field can be found in the attached *NGGDPP Metadata Form*.

Unlike the decision that the Survey made with regard to its macrofossil collection, MGS decided to supply as precise a location as possible for the site from which a rock or mineral specimen was collected. If an exact location was not recorded on the specimen label, the *coordinates* field represents the centroid of the county or state within which the collecting site is located or presumed to be located. MGS consulted a number of sources to determine geographic coordinates: the USGS Geographic Names Information System (GNIS), mindat.org, Wikipedia, and others. Only after submitting metadata to the ScienceBase Catalog did the authors learn of an internal database with the names and geographic coordinates of mines and quarries in Maryland.

NEXT STEPS

Virtually all of the "Next Steps" envisioned for the macrofossil collection are applicable to the rock and mineral collection, except those pertaining to prevention of specimen breakage: relocate and reorganize the collection (e.g., group specimens collected from the same general region, locality, and/or formation); have a qualified petrologist confirm the rock or mineral name, particularly for specimens identified by formation name only; and box and relabel (stored) specimens. In addition, MGS should consider:

- Replacing site-specific coordinates with those stored in the Survey's internal mines and quarries database
- Expanding the collection to include all Maryland formations,
- Making better use of the collection in terms of education and public outreach, such as periodically changing the in-house exhibits and creating more meaningful on-the-road displays,
- Consulting field notebooks, if possible, for additional pertinent metadata about specific specimens, and
- Encouraging staff geologists to properly house and label specimens in their private collections, with the idea that these may ultimately be incorporated into the MGS collection.

NGGDPP METADATA FORM

Maryland Rocks and Minerals
(MGS Collection ID 5; NGGDPP ID P1510; ScienceBase ID 352923)

Sources of Information:

- Typed labels associated with specimens; types of information and level of detail provided vary from label to label
- Sources to consult for site location information (i.e., geographic coordinates) and for latitude/longitude conversions from degrees-minutes-seconds to decimal degrees:
    - MGS database with mine/quarry names and locations (pers. comm., H. Quinn)
    - U.S. Geological Survey's Geographic Names Information System (GNIS) website - geographic coordinates of the county in which the collection site is located
    - MineralMundi - Mineral Locations Database website (www.mineralmundi.com)
    - wikimapia – geographic locations of particular quarries from which a specimen was collected
    - Maryland Cultural Features: Mines (http://maryland.hometownlocator.com/features/cultural,class,mine.cfm)
    - Find The Best Mineral Resources in Maryland
    - (http://mineral-resources.findthebest.com/detail/108336/Stoneyhurst-Quarry-Number-1)
    - Latitude/longitude converter - http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html
- Sources to consult for information about the specimens themselves:
    - The legends of state and county geologic maps published by MGS, as well as related Survey publications
    - Hurlbut, C.S., Jr., 1971, Dana's Manual of Mineralogy (18th edition): New York, John Wiley & Sons, Inc., 579 p.
    - Sinkankas, J., 1964, Mineralogy for Amateurs: New York, Van Nostrand Reinhold Co., 585 p.

MetadataID

Definition: Metadata identification number
Value: 1 to N (metadata for only 99 of 203 specimens submitted to ScienceBase Catalog)
Source: Assigned automatically by Microsoft Access

CollectionID

Definition: NGGDPP collection identification number
Value: 352923 (ScienceBase ID for the collection *Maryland Rocks and Minerals*)
Source: DataPreservation.mdb – tblCollection – field "ScienceBaseID"

Title

Definition: Official, human-readable title for individual record, used in listings & search results (short, distinctive) – mandatory
Value: Based on the contents of the specimen label, the name of the rock or mineral, which may consist of one or more of the following elements, separated by dashes: (1) the general rock or mineral name of the specimen (e.g., limestone; apatite) or, rarely, the general form of the specimen (e.g., concretion, geode), (2) mineral variety, (3) one or more adjectives describing the characteristics of the particular specimen (e.g., tourmaline – black; schist – mica schist), (4) the associated formation name, if it includes the rock or mineral type as part of its name (e.g., Wakefield Marble, Oriskany Sandstone) or if it constitutes the only identifying information on the label. If the formation name is included in the title, it is written as recorded on the label, and presumably as assigned by the collector, not necessarily as found on a geologic map (e.g., Pottsville Sandstone, as found on the label, rather than Pottsville Fm., as found, for instance, on the 1968 *Geologic Map of Maryland*).

The title, which usually corresponds to the reformatted first line of the label, generally consists of only one or two of the four elements listed above. For example, a number of the specimens in the collection are labeled with the formation name only. To the extent possible, all specimens are supplied with a general name/form (the first element in the list), so that, if the list is sorted alphabetically by title, all limestones, for example, are grouped together.

Not all of the information on the label is necessarily included in the title. For example, the following information, at least intermittently found on labels, is omitted:

- Geologic age (a separate field in the internal Data Preservation Database contains that information; for example, the title of a specimen labeled "Miocene – Calvert Fm." would be "Calvert Fm.")
- Collection locality (again, a separate field in the internal database contains a written description of the collection locality)
- The member name of a particular formation (only the formation name is included in the title; separate fields in the database contain member and formation names)
- The chemical composition of the specimen
- The uses to which particular rocks and minerals are put (e.g., "building stone," "glass and natural gas")

Some of the titles are identical from specimen to specimen, although same-named specimens were not necessarily collected from the same locality. The database expects titles to be unique, so in the event that the titles of two or more specimens are identical, the titles are numbered (1), (2), etc. following the title (e.g., borite (1), borite (2))
Source: Paper label associated with specimen or label hand-written, in ink, directly on specimen

Examples:

- "marble - Cockeysville Marble"
- "siltstone - with stress joints"
- "concretion - iron-oxide - Pottsville Sandstone
- "calcite crystals - Wakefield Marble"
- "serpentine - var. chrysotile (asbestos)"
- "Pleasant Grove Fm."

Alternate Title

Definition: Additional title identifiers for individual record (e.g., for further identification by other Web service interfaces); textual titles or specific sample IDs used by collection – optional
Value: The alternate title corresponds to the unique rock/mineral identification number in the internal Data Preservation database
Source: DataPreservation.mdb – tblRxMinlsSpecimens - SpecimenID
Example: "Specimen ID = 103"

Abstract

Definition: Human-readable description of individual record, used to help determine nature of underlying physical data resource; contains much information about data resource – mandatory
Value: the contents of the specimen label, verbatim, without commas; semi-colons separate individual lines of text, as they appear on the labels. (The abstract provides a user with as much information as is known about the specimen from the label itself, vs. implied information included in the title, geographic coordinates, etc.)
Source: specimen label
Example: "CASH SMITH MEMBER OF THE FREDERICK LIMESTONE WITH SECONDARY PYRITE CRYSTALS; FREDERICK COUNTY MARYLAND"

SupplementalInformation

Definition: Information on how to access physical data represented by metadata record (e.g., general for entire collection, such as URL, or specific reference to online resource, like ordering system with specific ID) - mandatory
Value: "Contact the MGS curator at (410) 554-5500 for additional information."
Source: n/a

Coordinates

Definition: Geographic coordinates (longitude, latitude), in decimal degrees – mandatory
Value: (-)decimal longitude, decimal latitude (geographic coordinates of the actual site (e.g., mine, quarry) from which the specimen was collected or, if such a site is not specified, the centroid of the county or state within which the collecting site is located or presumed to be located).

Source: Unlike the collection *Maryland Macrofossils*, MGS decided to supply geographic coordinates of the exact collection locality, if possible. Table A2-1 contains geographic coordinates of some of the mines or quarries from which specimens were collected. Table A4-1 (see Appendix 4 – *Maryland Macrofossils*) contains county and state centroids for less specific localities.

Table A2-1: Geographic coordinates of quarries mentioned on labels identifying specimens in the collection *Maryland Rocks and Minerals*, from (1) wikimapia.org, (2) maryland.hometownlocator.com, (3) GNIS, (4) mindat.org, (5) wikipedia, (6) MineralMundi (July 2011)

Locality	Latitude (DMS)	Longitude (DMS)	Latitude (DEC)	Longitude (DEC)
Churchville Quarry, Harford Co., MD Bel Air quad (3)	393147N	0761521W	39.5297222	-76.2558333
French Creek Mines St. Peters, Warwick Township, Chester Co., PA (4)	401100N	754300W	40.18333	-75.71667
Grays Run Quarry, Harford Co., MD Aberdeen quad (GNIS)	393102N	0761315W	39.5172222	-76.2208333
Herring Run Park, Baltimore, MD (3)	391919N	0763334W	39.3220516	-76.5594098
Texas (populated place)**,** Baltimore Co., MD (GNIS) Cockeysville quad	392749N	0763837W	39.4637172	-76.6435817
Mechanics Valley Quarry (Maryland Minerals, Inc.), Cecil Co., MD (4)	393827N	755527W	39.64083	-75.92417
Medford Quarry (Redland Genstar Quarry) Medford, Carroll Co., MD (3)	393240N	0770250W	39.5444444	-77.0472222
Sideling Hill Road Cut (elev. 2301 ft = 701 m) Washington Co., MD PawPaw quad (5)	394309.08N	0781701.41W	39.719189	-78.283725
Silver Crater Mine (Basin Property) Faraday Township, Hastings Co., Ontario,	450145N	0780039W	45.02917	-78.01083

Table A2-1: Geographic coordinates of quarries mentioned on labels identifying specimens in the collection *Maryland Rocks and Minerals*, from (1) wikimapia.org, (2) maryland.hometownlocator.com, (3) GNIS, (4) mindat.org, (5) wikipedia, (6) MineralMundi (July 2011)				
Locality	**Latitude (DMS)**	**Longitude (DMS)**	**Latitude (DEC)**	**Longitude (DEC)**
Canada (4)				
Wood Chromite Mine, (mine) Lancaster Co., PA (GNIS)			39.7317742	-76.1063393

AlternateGeometry

Definition: Alternate method of storing geospatial footprint; description of authoritative source of geographic location & how simple coordinates derived – optional

Value:

If site-specific coordinates are known:

"Site-specific geographic coordinates (NAD83) for [site name, county name, MD] from [U.S. Geological Survey's Geographic names Information System (GNIS), OR mindat.org, OR Wikipedia, etc.]"

If site-specific coordinates are unknown:

"Geographic coordinates (NAD83) represent centroid of (County Name), from the U.S. Geological Survey's Geographic names Information System (GNIS)"

Source: n/a

OnlineResource

Definition: URL pointer(s) to textual information about specific record - optional

Value: none supplied

Source: n/a

BrowseGraphic

Definition: URL pointer(s) to images representing specific record - optional

Value: none supplied

Source: n/a

Date

Definition: Meaningful date (e.g., collection date) attached to record; may be to any degree of precision or left blank (e.g., 20010101, 1939-1945, -20030331, 2000-) - optional

Value: 4-digit year of collection, seldom known

Source: specimen label

DatasetReferenceDate

Definition: Reference date indicating currency of underlying data record (e.g., date metadata record added to National Catalog); format=YYYYMMDD - mandatory

Value: Date record provided to NGGDPP for uploading to the ScienceBase Catalog

Source: Provided by curator

VerticalExtent

Definition: Vertical extent (e.g., vertical depth information for rock core samples); contains 2-3 elements: unit of measure, max value, min value (e.g., m, 35.4, 0 => rock core measured at 35.4 total meters)

Value: unknown – at best, the geological formation from which the specimen was collected is identified on the paper label; if the collection site and geological formation are known, it may be able to reconstruct the range of the vertical extent from the outcrop, but that has not been done

Source: n/a

Location of Rock and Mineral Specimens

Rock and mineral specimens are exhibited or stored in three different rooms at the Survey's main building in Baltimore: (1) a display cabinet in the lobby (Room 225), (2) display and storage cabinets in the library (Room 314), as well as arrayed along the top of waist-high map cabinets and on individual specimen stands, and (3) storage cabinets in the basement of the annex (Room 7).

Omissions from ScienceBase Catalog

Not all of the metadata for rock and mineral specimens displayed or stored at MGS was submitted to the ScienceBase Catalog. The following specimens or types of specimens were omitted:

- Unlabeled specimens,
- Specimens for which the collection locality is unknown and cannot be surmised from the specimen (or formation) name,
- Specimens from other countries or from states other than Maryland and its immediate neighbors,
- Specimens collected primarily for the structural features they illustrate (e.g., slickensides, stress joints) and lacking identifying information as to rock or mineral type,
- Specimens which, due to their shape and size, appear to comprise a purchased rock and mineral kit, and
- Specimens in the private collections of MGS staff geologists

Additional Information about the Sources, Samples, Etc.

References

Questions to Resolve

APPENDIX 3

Exhibition Flasks: Mineral Commodities of Maryland

(MGS Collection ID 32; NGGDPP ID P1692; ScienceBase ID 1835540)

September 2011

COLLECTION DESCRIPTION

The rock- and sediment-filled exhibition flasks were part of a systematic display of Maryland's mineral products – "all the more important natural minerals together with their manufactured products" – presented at the 1901 Pan-American Exposition in Buffalo, N.Y., the 1902 South Carolina, Interstate, and West Indian Exposition in Charleston, S.C., and the 1904 Louisiana Purchase Exposition in St. Louis, Mo. The exhibit was designed to be not only educational but of commercial value. In 1906, the collections were installed as a "permanent" Mineral Exhibit in the Old Hall of Delegates in the State House in Annapolis, Md.

Wide-rimmed, glass bottles, originally sealed with cork stoppers and, when displayed, inverted to rest on the stoppered rim, the flasks contain bituminous coal, brick clay and shale, fire clay and shale, greensand, marl and other mineral resources of the State. Clark (1906) reports that "many of the most important mineral products were arranged in the form of special exhibits….In connection with (the coal) exhibit was a collection of glass jars filled with samples of coal from all the workable seams…" (Clark, 1906, p. 271-2) Also, "a large collection of the raw clays of the State, classified according to their various uses, was arranged in jars." (Clark, 1906, p. 273) In the same report, the flasks appear in a number of photographs taken at the various exposition venues.

STORAGE CONDITIONS

Of the 38 flasks, 14 are currently on display in two areas accessible to the public at the Survey's main building. Arrayed along the top of waist-high display cabinets, these are vulnerable to being handled, dropped, or knocked over by passersby. The remaining 24 are stored in four cardboard boxes, in three different areas of a basement storage room, which contains a motley assortment of collected materials, field equipment, and old files. One of the cardboard boxes has no cover and is splitting at the seams; the unwrapped flasks stacked inside are collecting dust and risk being broken if the box is jostled.

The flasks themselves are in various states of disrepair: 12 have broken or chipped rims, five have missing cork stoppers replaced with crumpled cloth or paper towels, and about half have fading and/or partly illegible labels. Those on display are generally in the best condition. The rims of many of the flasks in storage are so badly broken that they can no longer be displayed upright.

COLLECTION DOCUMENTATION

The *title* field in exhibition flask metadata is a unique identifier consisting of the first line of the label. Some of the first lines are identical from flask to flask, although the contents of the flasks were collected from different localities. The internal database expects titles

to be unique, so in the event that the first line of two or more labels is identical, the titles are numbered (1), (2), etc. following the title.

The *geographic coordinates* associated with the exhibition flasks identify the centroid of the county from which the contents of the flask were collected. County of collection was the common denominator, known for every flask. Some labels included more detailed information, such as the name of a particular mine or a nearby town. In the future, geographic coordinates that more nearly pin-point the collection site may be added to the internal database and, perhaps, to the National Catalog.

The meaningful *date* associated with each flask was taken to be 1901, the date of the first exposition at which the flask was likely displayed.

NEXT STEPS

- As mentioned above, the exhibit flasks are in various states of disrepair. At a minimum, missing corks could be replaced at little expense. Although it is unlikely that similar flasks are still available, if they are, the contents of the broken flasks could be transferred to new ones. As it is, the broken flasks can no longer be displayed, and they are dangerous to handle.
- Consolidate and repackage the stored flasks so that they are all in one location and better protected from breakage. Likewise, consider relocating the flasks on display to a better protected (enclosed) display cabinet.
- Consider numbering the flasks to correspond with the internal database identification numbers.
- Research the additional information available on some of the labels (e.g., references to an earlier collection numbering system, references to other MGS publications, geologic time periods and formation names) to better document the contents of the flasks and, possibly, to assign site-specific geographic coordinates to the collection locality.
- Depending on the results of this research, consider creating fields in the Exhibit Flask table in the internal database for site-specific geographic coordinates, geologic time period, and formation name, for example.
- Make the original report by Clark (1906) more readily available (e.g., scan it and post it to the MGS website). Try to find some of the pamphlets mentioned in the report and make them available, as well.

NGGDPP METADATA FORM

Exhibition Flasks: Mineral Commodities of Maryland
(MGS Collection ID 32; NGGDPP ID P1692; ScienceBase ID 1835540)

Sources of Information:

- Report by Clark (1906) about MGS exhibits of Maryland's mineral products, 1901-1906 (see References).
- Typed labels affixed to flasks; types of information and level of detail provided vary from label to label
- U.S. Geological Survey's Geographic Names Information System (GNIS) website - geographic coordinates of the county in which the collection site is located

MetadataID

Definition: Metadata identification number
Value: 1 to 38
Source: Assigned automatically by Microsoft Access

CollectionID

Definition: NGGDPP collection identification number
Value: 1835540 (ScienceBase ID for the collection *Exhibition Flasks: Mineral Commodities of Maryland*)
Source: DataPreservation.mdb – tblCollection – field "ScienceBaseID"

Title

Definition: Official, human-readable title for individual record, used in listings & search results (short, distinctive) – mandatory
Value: First line of label. Some of the first lines are identical from flask to flask, although the contents of the flasks were collected from different localities. The database expects titles to be unique, so in the event that the first line of two or more labels is identical, the titles are numbered (1), (2), etc. following the title
Source: Paper label affixed to flask
Examples: "Bituminous Coal - Pa. - Monongahela - Pittsburg (2)," "Pleistocene Shell Marl"

Alternate Title

Definition: Additional title identifiers for individual record (e.g., for further identification by other Web service interfaces); textual titles or specific sample IDs used by collection – optional
Value: None

Abstract

Definition: Human-readable description of individual record, used to help determine nature of underlying physical data resource; contains much information about data resource – mandatory

Value: "One of 38 glass exhibition flasks, part of a display of Maryland's mineral products (e.g., bituminous coal, brick clay and shale, fire clay and shale, greensand, marl), shown at a number of expositions in the U.S. during the first decade of the 20th century. Reference: Clark, W.B., 1906, Exhibits of Maryland mineral resources made by the Maryland Geological Survey at Buffalo, Charleston, St. Louis, and Annapolis, 1901, 1902, 1904, 1906, in Maryland Geological Survey Volume Six: Baltimore, Md., The Johns Hopkins Press, p. 263-278."
Source: n/a

SupplementalInformation

Definition: Information on how to access physical data represented by metadata record (e.g., general for entire collection, such as URL, or specific reference to online resource, like ordering system with specific ID) - mandatory
Value: "Contact the MGS curator at (410) 554-5500 for additional information."
Source: n/a

Coordinates

Definition: Geographic coordinates (longitude, latitude), in decimal degrees – mandatory
Value: (-)decimal longitude, decimal latitude (centroid of county within which collecting site is located).
Source:

Table A3-1: Geographic coordinates (NAD83) of county and state centroids, from the Geographic Names Information System (GNIS), January 2011 (Feature class = Civil)

County	Latitude (DMS)	Longitude (DMS)	Latitude (dec. deg.)	Longitude (dec. deg.)
Allegany	394000N	0783959W	39.666667	-78.666389
Anne Arundel	390000N	0763659W	39.	-76.616389
Baltimore	392800N	0763859W	39.466667	-76.649722
Baltimore City	391725N	0763644W	39.290278	-76.612222
Calvert	383300N	0763459W	38.55	-76.583056
Caroline	385200N	0754959W	38.866667	-75.833056
Carroll	393300N	0770059W	39.55	-77.016389
Cecil	393400N	0755659W	39.566667	-75.949722
Charles	382900N	0765859W	38.483333	-76.983056
Dorchester	382800N	0755959W	38.466667	-75.999722
Frederick	392800N	0772359W	39.466667	-77.399722
Garrett	393300N	0791459W	39.55	-79.249722
Harford	393300N	0761759W	39.55	-76.299722
Howard	391501N	0765559W	39.250278	-76.933056
Kent	391800N	0760159W	39.3	-76.033056
Montgomery	390900N	0771159W	39.15	-77.199722

Table A3-1: Geographic coordinates (NAD83) of county and state centroids, from the Geographic Names Information System (GNIS), January 2011 (Feature class = Civil)				
County	**Latitude (DMS)**	**Longitude (DMS)**	**Latitude (dec. deg.)**	**Longitude (dec. deg.)**
Prince Georges	385000N	0765059W	38.833333	-76.849722
Queen Anne's	390400N	0755859W	39.066667	-75.983056
Somerset	380800N	0754359W	38.133333	-75.733056
St. Mary's	381800N	0763659W	38.3	-76.616389
Talbot	384600N	0760459W	38.766667	-76.083056
Washington	393700N	0774559W	39.616667	-77.766389
Wicomico	382200N	0753559W	38.366667	-75.599722
Worcester	381200N	0752259W	38.2	-75.383056
State of MD	390001N	0764500W	39.0003880	-76.7499690

AlternateGeometry

Definition: Alternate method of storing geospatial footprint; description of authoritative source of geographic location & how simple coordinates derived – optional

Value: "Geographic coordinates (NAD83) represent centroid of (County Name), from the U.S. Geological Survey's Geographic names Information System (GNIS)"

Source: n/a

OnlineResource

Definition: URL pointer(s) to textual information about specific record - optional

Value: none supplied

Source: n/a

BrowseGraphic

Definition: URL pointer(s) to images representing specific record - optional

Value: none supplied

Source: n/a

Date

Definition: Meaningful date (e.g., collection date) attached to record; may be to any degree of precision or left blank (e.g., 20010101, 1939-1945, -20030331, 2000-) - optional

Value: 1901 (i.e., the date of the first exposition at which the flask was probably displayed, as shown in photographs)

Source: Clark, W.B. (1906)

DatasetReferenceDate

Definition: Reference date indicating currency of underlying data record (e.g., date metadata record added to National Catalog); format=YYYYMMDD - mandatory
Value: Date record provided to NGGDPP for uploading to National Catalog
Source: Provided by curator

VerticalExtent

Definition: Vertical extent (e.g., vertical depth information for rock core samples); contains 2-3 elements: unit of measure, max value, min value (e.g., m, 35.4, 0 => rock core measured at 35.4 total meters)
Value: unknown – at best, the geological formation from which the specimen was collected is identified on the paper label; if the collection site and geological formation are known, it may be able to reconstruct the range of the vertical extent from the outcrop, but that has not been done
Source: n/a

Location of Exhibition Flasks

The flasks are displayed or stored in three different rooms at the Survey's main building in Baltimore. Seven of the 38 flasks are on display in the lobby (Room 225), and another seven are on display in the library (Room 314), arrayed along the top of waist-high wood-framed, glass display cabinets. The remainder are in the annex storage room (Room 9), in four cardboard boxes on three different shelving units (Unit-Shelf 2-3, 9-1, and 10-1).

Additional Information about the Sources, Samples, Etc.

References

Clark, W.B., 1906, Exhibits of Maryland mineral resources made by the Maryland Geological Survey at Buffalo, Charleston, St. Louis, and Annapolis, 1901, 1902, 1904, 1906, in Maryland Geological Survey Volume Six: Baltimore, Md., The Johns Hopkins Press, p. 263-278.

Maryland Commissioners, Pan-American Exposition, 1901, Maryland and Its Natural Resources: Baltimore, Md., Maryland Geological Survey, 38 p. (Google Books, 4/29/2011)

Questions to Resolve

APPENDIX 4
Maryland Macrofossils
(MGS Collection ID 6; NGGDPP ID 1518; ScienceBase ID 123382)
September 2011

COLLECTION DESCRIPTION

The collection *Maryland Macrofossil*s consists of about 1500 specimens, representing over 200 species of fossils found in Maryland or in geological formations that extend beyond the State's boundaries. Invertebrates – mollusks, brachiopods, trilobites, crinoids – comprise most of the collection, along with a few marine fish, reptile, and mammal artifacts (e.g., shark teeth, crocodile jaws, whale vertebrae) and plant fossils. The Miocene is particularly well-represented.

Most of the fossil specimens were excavated by former Survey employees. A small collection of plant fossils was discovered by a private citizen and donated to MGS by his family. The collection is no longer growing, nor is it actively maintained. It is used primarily for educational purposes, there being no paleontologist currently on staff.

STORAGE CONDITIONS

As is the case with many of the Survey's collections, *Maryland Macrofossils* is scattered and imperfectly organized. Fossils are exhibited or stored in three different locations in the Survey's main building in Baltimore: (1) in display cabinets in the library, (b) in storage cabinets in the annex basement, and (c) in a cardboard box in the annex storage area.

Exhibited fossils are arrayed on shelves in three locked wood and glass display cabinets in the library, which is open to the public during normal business hours. These fossils are among the finest examples of particular species in the Survey's collection. Typed labels propped next to the specimens identify the fossils (usually the genus name, sometimes the genus and species names, or, infrequently, only the common name) and its associated geologic age, but not the specific location within Maryland from which the fossil was collected. These specimens are removed from time to time for temporary display in other public venues, such as the Maryland State Fair, or for use at Girl Scout or Boy Scout troop meetings. When fossils are removed from the cabinets for use or display elsewhere, they are wrapped in newspaper to protect them during transport and stacked in a cardboard box.

The exhibited specimens are stored at ambient indoor temperature and humidity, although, despite central air conditioning, the library sometimes gets hot during the summer, reaching temperatures in excess of 90^{o}F. The room itself is cleaned regularly, and the enclosed display cabinets protect the fossils from dust.

Most of the specimens in storage are located in the annex basement, in a locked room that doubles as a graveyard for unused office furniture and obsolete computer equipment. The room is never cleaned. Worse still, the room is directly connected to the Baltimore

sewer system through a covered manhole in the floor. Macrofossils are housed in two metal storage cabinets with pull-out drawers and lockable doors. Access to the cabinets is obstructed by the other contents of the room.

Within the cabinets, the satisfactoriness of specimen storage varies from drawer to drawer. Specimen containers include lidded cigar boxes, shallow, unlidded specimen boxes, unsealed paper envelopes, plastic Ziploc bags, newspaper wrappings, or no container at all. Labels, typed or hand-written strips of paper, occasionally illegible, follow no particular format and are sometimes separated from the specimens they originally described. At best, fossils are stored in compartments in closed cigar boxes, sometimes lined with crumpled tissue or pieces of woolen cloth (gray herringbone), or in open specimen boxes. A label, placed in the compartment or specimen box beside or beneath the specimen, usually provides at least the scientific name of the fossil. The best organized drawers are filled with labeled cigar boxes divided into compartments that contain labeled specimens, all of the same genus or from the same locality. At worst, fossil specimens and labels are loose and jumbled in a drawer, stored along with rock samples or bags of sediment.

Ambient temperatures in the storage room vary over a smaller range than in the library, in part because the room is partially below ground level. Flooding, however, periodically raises humidity levels, and sewer gases waft up around the man-hole cover.

COLLECTION DOCUMENTATION

The *title* field in macrofossil metadata consists of the scientific name (Genus and species names) of the specimens in the collection or, if the species name is unknown of "Genus sp." The Survey's internal database includes a few broader categories, as well (e.g., Class Crinoidea, Order Eurypteria); these were omitted from the ScienceBase Catalog.

In its internal database, MGS established three fields pertaining to the location of the site from which a fossil specimen was excavated: a written description of the locality (e.g., site, county, and state names), site-specific geographic coordinates, and generalized geographic coordinates. Only the latter are included in the ScienceBase Catalog.

Based on data management recommendations of the American Museum of Natural History, as presented on its Paleontology Portal website, the geographic coordinates associated with the Survey's macrofossil specimens and reported as metadata to the National Digital Catalog identify the centroid of the county in which a fossil-collecting site is located, or, if the county is unknown, the centroid of the state. The Museum's recommendations are designed to thwart the looting of sites and to guard the owners of fossil-bearing property from unwanted trespassing. The Survey had another compelling reason to adopt the recommendations; most of its fossil specimens are labeled with the county or state name, if the collection site is identified at all.

To determine the geographic centroids of the counties and states, MGS consulted the U.S. Geological Survey's Geographic Names Information System (GNIS) website, searched

on individual county and state names, and recorded the coordinates reported as the centroid of each "Civil" area.

NEXT STEPS

The main threats to the exhibited fossil specimens are:

- Theft, owing to the fossils being publicly displayed,
- Breakage during transport to other public venues or handling by audience members, and
- Mislabeling, due to the removal and replacement of fossils and their labels for use or display elsewhere.

To reduce these risks, the Survey should routinely lock all display cases; acquire a traveling case that separates and cushions the specimens during transport; and develop a system that ensures that the specimens remain properly identified when they are removed from a display case and then replaced.

The main threats to the fossil specimens in storage are:

- The inhospitable conditions of the storage room, primarily sewer gases, but also obstructions in the form of office furniture and computers, which make access to the specimens unhealthful and unnecessarily difficult,
- Breakage of fragile specimens due to inadequate cushioning and/or stacking of specimen boxes, and
- The continued disorganized state of the collection, including missing, mismatched, and liable-to-migrate labels.

To reduce these risks, the Survey should relocate stored fossils to a space dedicated solely to that purpose (e.g., the now-vacant room formerly occupied by the Survey's publications archive). As part of the relocation, specimens should be repackaged in boxes especially designed for the purpose and relabeled. Boxes should be chosen to eliminate stacking and make it more difficult for labels to migrate from one container to another. Then, the fossils should be reorganized so that they are grouped by geologic age, with like specimens stored adjacent to one another in uniquely-labeled specimen boxes.

A number of other steps should be taken to enhance the usefulness of the collection:

- Because the fossil collection has been neglected for such a long time, all of the specimens should be reexamined by one or more professional paleontologists, with the intent of confirming or definitively establishing their identity.
- MGS should develop a management policy with regard to the collection, a policy that explicitly characterizes the contents of the collection and addresses such matters as future accessions, proper labeling and storage of specimens, and the conditions of outside access to the collection.
- In keeping with a strong recommendation by the Survey's Data Preservation Advisory Panel, MGS should make photographs and descriptions of many of the fossil specimens available online.

NGGDPP METADATA FORM

Maryland Macrofossils
(MGS Collection ID 6; NGGDPP ID 1518; ScienceBase ID 123382)

Sources of Information:

- Labels, usually typed or handwritten paper strips inside compartments/boxes containing fossils; types of information and level of detail provided vary considerably from label to label
- U.S. Geological Survey's Geographic Names Information System (GNIS) website - geographic coordinates of the county or state in which the fossil collection site is located
- General Internet search to confirm spelling of scientific name of fossil

MetadataID

Definition: Metadata identification number
Value: 1 to 156
Source: Assigned automatically by Microsoft Access

CollectionID

Definition: NGGDPP collection identification number
Value: 123382 (ScienceBase ID for the collection *Maryland Macrofossils*)
Source: DataPreservation.mdb – tblCollection – field "ScienceBaseID"

Title

Definition: Official, human-readable title for individual record, used in listings & search results (short, distinctive) – mandatory
Value: Specimen name (Genus and species or Genus sp.)
Source: Names of fossils identified by paper labels, with spelling verified by Internet search
Examples: Turritella mortoni, Anadara sp.

Alternate Title

Definition: Additional title identifiers for individual record (e.g., for further identification by other Web service interfaces); textual titles or specific sample IDs used by collection – optional
Value: None at present, though might consider using common name, or reference in Systematic Report (Volume, Page, Figure Nos.)

Abstract

Definition: Human-readable description of individual record, used to help determine nature of underlying physical data resource; contains much information about data resource – mandatory
Value: "Specimen in Maryland Geological Survey's Maryland Macrofossil Collection"
Source: n/a

SupplementalInformation

Definition: Information on how to access physical data represented by metadata record (e.g., general for entire collection, such as URL, or specific reference to online resource, like ordering system with specific ID) - mandatory
Value: "Contact the MGS curator at (410) 554-5500 for additional information."
Source: n/a

Coordinates

Definition: Geographic coordinates (longitude, latitude), in decimal degrees – mandatory
Value: (-)decimal longitude, decimal latitude (centroid of county or state within which fossil collecting site is located).
Source:
Based on data management recommendations of the American Museum of Natural History, as presented on its Paleontology Portal website, the geographic coordinates associated with the Survey's macrofossil specimens and reported as metadata to the National Digital Catalog identify the centroid of the county in which a fossil-collecting site is located, or, if the county is unknown, the centroid of the state. The Museum's recommendations are designed to thwart the looting of sites and to guard the owners of fossil-bearing property from unwanted trespassing. The Survey had another compelling reason to adopt the recommendations; most of its fossil specimens are labeled with the county or state name, if the collection site is identified at all. To determine the geographic centroids of the counties and of the State as a whole, MGS consulted the U.S. Geological Survey's Geographic Names Information System (GNIS) website, searched on individual county and state names, and recorded the coordinates reported as the centroid of each area (Table A4-1).

Table A4-1: Geographic coordinates (NAD83) of county and state centroids, from the Geographic Names Information System (GNIS), January 2011 (Feature class = Civil)

County	Latitude (DMS)	Longitude (DMS)	Latitude (dec. deg.)	Longitude (dec. deg.)
Allegany	394000N	0783959W	39.666667	-78.666389
Anne Arundel	390000N	0763659W	39.	-76.616389
Baltimore	392800N	0763859W	39.466667	-76.649722
Baltimore City	391725N	0763644W	39.290278	-76.612222
Calvert	383300N	0763459W	38.55	-76.583056
Caroline	385200N	0754959W	38.866667	-75.833056
Carroll	393300N	0770059W	39.55	-77.016389
Cecil	393400N	0755659W	39.566667	-75.949722
Charles	382900N	0765859W	38.483333	-76.983056
Dorchester	382800N	0755959W	38.466667	-75.999722
Frederick	392800N	0772359W	39.466667	-77.399722
Garrett	393300N	0791459W	39.55	-79.249722

Table A4-1: Geographic coordinates (NAD83) of county and state centroids, from the Geographic Names Information System (GNIS), January 2011 (Feature class = Civil)				
County	**Latitude (DMS)**	**Longitude (DMS)**	**Latitude (dec. deg.)**	**Longitude (dec. deg.)**
Harford	393300N	0761759W	39.55	-76.299722
Howard	391501N	0765559W	39.250278	-76.933056
Kent	391800N	0760159W	39.3	-76.033056
Montgomery	390900N	0771159W	39.15	-77.199722
Prince Georges	385000N	0765059W	38.833333	-76.849722
Queen Anne's	390400N	0755859W	39.066667	-75.983056
Somerset	380800N	0754359W	38.133333	-75.733056
St. Mary's	381800N	0763659W	38.3	-76.616389
Talbot	384600N	0760459W	38.766667	-76.083056
Washington	393700N	0774559W	39.616667	-77.766389
Wicomico	382200N	0753559W	38.366667	-75.599722
Worcester	381200N	0752259W	38.2	-75.383056
State of MD	390001N	0764500W	39.0003880	-76.7499690
State of NJ	401001N	0743000W	40.1670562	-74.4998748
Erie	424600N	0783959W	42.7667263	-78.6664163
State of NY	430001N	0753000W	43.0003472	-75.4998978
Lancaster*	401501N	0761500W	40.250278	-76.25
York	400731N	0770000W	40.1253701	-76.9999770
Commonwealth of PA	404501N	0774500W	40.7503414	-77.7499975
King George	381600N	0770859W	38.2667950	-77.1496991
Stafford	382500N	0772759W	38.4167923	-77.4663728
York	371401N	0763259W	37.2334783	-76.5496743
Commonwealth of VA	373002N	0783000W	37.5004253	-78.5000013
Mineral	392400N	0785659W	39.4000963	-78.9497479
Morgan	393400N	0781500W	39.5667613	-78.2500075
State of WV	383001N	0803000W	38.5003838	-80.5000866

* Degrees-minutes-seconds converted to decimal degrees using online converter

Rules for assigning this value (NGGDPP metadata) are as follows:

1. If the county is known, assign the county centroid.
2. If only the state is known, assign the state centroid.

3. If multiple specimens exist, collected from different counties in the same state, assign the state centroid.
4. If multiple specimens exist, collected from different counties in Maryland PLUS other out-of-state counties, assign the State of Maryland centroid.
5. If multiple specimens exist, collected from one county in Maryland PLUS one or more out-of-state counties, assign the county centroid of the Maryland county.
6. If multiple specimens exist, one or more collected from a known county and the other(s) from an unknown cite(s), assign the centroid of the known county.
7. If multiple specimens exist, one or more collected from a known county and the other(s) from an unknown county(s) in the same state, assign the centroid of the known county.
8. For specimens from Potomac Creek, VA, assign Stafford Co. coordinates as general site location, because more of the creek lies in Stafford than in King George Co.

MGS's Internal Data Preservation Database

The internal database provides a field for site-specific coordinates, if a location is known in greater detail than county and/or state. Many specimens have been collected from the same site. Table A4-2 lists the geographic coordinates of some of the more common fossil-collecting localities.

Table A4-2: Geographic coordinates of common fossil-collecting localities mentioned on labels identifying fossils in the collection *Maryland Macrofossils*, from the Geographic Names Information System (GNIS), November 2010

Locality	Latitude (DMS)	Longitude (DMS)	Latitude (DEC)	Longitude (DEC)
Aquia Creek, VA* (mouth of stream) Stafford Co. Widewater quad	382332N	0771856W	38.3923471	-77.3155368
Belvedere Beach, VA (Potomac R.) King George Co. Passapatanzy quad	382006N	0771616W	38.3351262	-77.2710913
Berkeley Springs, WV (populated place) Morgan Co. Hancock quad	393737N	0781338W	39.6270376	-78.2272299
Calvert Beach, MD (populated place) (Chesapeake Bay) Calvert Co. Cove Point quad	382757N	0762838W	38.4659563	-76.4771742

Table A4-2: Geographic coordinates of common fossil-collecting localities mentioned on labels identifying fossils in the collection *Maryland Macrofossils*, from the Geographic Names Information System (GNIS), November 2010				
Locality	**Latitude (DMS)**	**Longitude (DMS)**	**Latitude (DEC)**	**Longitude (DEC)**
Cove Point, MD (Chesapeake Bay) Calvert Co. Cove Point quad	382304N	0762252W	38.3845677	-76.3810602
Cumberland, MD (populated place) Allegany Co. Cumberland quad	393910N	0784545W	39.6528654	-78.7625185
Deer Park, MD (populated place) Garrett Co. Deer Park quad	392525N	0791930W	39.4237073	-79.3250412
Devils Backbone, MD (summit) Washington Co. Funkstown quad	393252N	0774216W	39.5478761	-77.7044367
Eighteen Mile Creek, NY* (mouth of stream) Erie Co. Eden quad	424305N	0785809W	42.7181144	-78.9692034
Evitts Creek, MD* (mouth of stream) Allegany Co. Patterson Creek quad	393729N	0784422W	39.6248105	-78.7394622
Evitts Mountain, MD (summit) Allegany Co. Evitts Creek quad	394313N	0783935W	39.7203646	-78.6597393
Governor Run, MD (populated place) (Chesapeake Bay) Calvert Co. Prince Frederick quad	383000N	0763016W	38.5001228	-76.5043972
Hanover, MD (post office) Anne Arundel Co. Relay quad	391050N	0764227W	39.1806634	-76.7074697
Jones Wharf, MD** (Jones Wharf PO,				

Table A4-2: Geographic coordinates of common fossil-collecting localities mentioned on labels identifying fossils in the collection *Maryland Macrofossils*, from the Geographic Names Information System (GNIS), November 2010				
Locality	**Latitude (DMS)**	**Longitude (DMS)**	**Latitude (DEC)**	**Longitude (DEC)**
historical; St. Mary's Co.; unknown lat/long)				
Keyser, WV (populated place) Mineral Co. Keyser quad	392627N	0785826W	39.4409277	-78.9739156
Little Cove Point, MD Calvert Co. Solomons Island quad	382141N	0762315W	38.3615124	-76.3874494
Oakland, MD (populated place) Garrett Co. Oakland quad	392428N	0792424W	39.4078747	-79.4067116
Oldtown, MD (populated place) Allegany Co. Oldtown quad	393229N	0783641W	39.5414805	-78.6114037
Plum Point, MD (cape) Calvert Co. Prince Frederick quad	383713N	0763049W	38.6203981	-76.5135653
Potomac Creek, VA* (mouth of stream) Border between **Stafford Co.** & King George Co. Passapatanzy quad	382050N	0771711W	38.3473481	-77.2863695
Six-Mile House*** (see Evitts Mountain, MD)				
St. Mary's River, MD* (mouth of stream) St. Mary's Co. St. George Island quad	380608N	0762632W	38.1023493	-76.4421739
Wailes Bluff, MD St. Mary's Co. Point Lookout quad (near Cornfield Harbor)	380356N	0762154W	38.0656822	-76.3649483
White Marsh, MD (populated place) Baltimore Co.	392301N	0762556W	39.3837187	-76.4321837

Table A4-2: Geographic coordinates of common fossil-collecting localities mentioned on labels identifying fossils in the collection *Maryland Macrofossils*, from the Geographic Names Information System (GNIS), November 2010				
Locality	**Latitude (DMS)**	**Longitude (DMS)**	**Latitude (DEC)**	**Longitude (DEC)**
White Marsh quad				
Windmill Point, MD St. Mary's Co. St. Mary's City quad	380932N	0762705W	38.1590153	-76.4513410
York, PA (populated place) York Co. York quad	395745N	0764340W	39.9625984	-76.7277450
Yorktown, VA (populated place) York Co. Yorktown quad	371420N	0763035W	37.2387556	-76.5096731

*For site descriptions that name a stream as the greatest level of detail (e.g., St. Mary's River, Evitts Creek), the site-specific geographic coordinates listed in the internal database coincide with the mouth of the stream.

**Jones Wharf appears on a 1903 geologic map of St. Mary's County, on the S shore of the Patuxent River, opposite Broomes Island, upstream of Captain Point, between St. John Creek and Cole Creek, near Drumcliff.

***Six-Mile House is/was located "six miles east of Cumberland on south side of U.S. Route 40, Cumberland vicinity, Allegany County (Sixth Congressional District), from Maryland Historical Trust Inventory of Historic Properties, Inns on the National Road

AlternateGeometry

Definition: Alternate method of storing geospatial footprint; description of authoritative source of geographic location & how simple coordinates derived – optional
Value: "Geographic coordinates (NAD83) represent centroid of (County Name or State Name), from the U.S. Geological Survey's Geographic names Information System (GNIS)"
Source: n/a

OnlineResource

Definition: URL pointer(s) to textual information about specific record - optional
Value: none supplied
Source: n/a

BrowseGraphic

Definition: URL pointer(s) to images representing specific record - optional

Value: none supplied
Source: n/a

Date

Definition: Meaningful date (e.g., collection date) attached to record; may be to any degree of precision or left blank (e.g., 20010101, 1939-1945, -20030331, 2000-) - optional
Value: date of sample collection, which is seldom indicated on specimen labels (i.e., the field is usually blank)
Source: from paper labels

DatasetReferenceDate

Definition: Reference date indicating currency of underlying data record (e.g., date metadata record added to National Catalog); format=YYYYMMDD - mandatory
Value: Date record provided to NGGDPP for uploading to National Catalog
Source: Provided by curator

VerticalExtent

Definition: Vertical extent (e.g., vertical depth information for rock core samples); contains 2-3 elements: unit of measure, max value, min value (e.g., m, 35.4, 0 => rock core measured at 35.4 total meters)
Value: unknown – at best, the geological formation from which the specimen was collected is identified on the paper label; if the collection site and geological formation are known, it may be able to reconstruct the range of the vertical extent from the outcrop, but that has not been done
Source: n/a

Location of Archived Samples

Additional Information about the Sources, Samples, Etc.

References

Questions to Resolve

APPENDIX 5
1952-1964 Aerial Photographs of Fenwick and Assateague Islands, Maryland
(MGS Collection ID 34; NGGDPP ID P1691; ScienceBase ID 1866612)
September 2011

COLLECTION DESCRIPTION

This collection consists of 13 sets of unrectified, black-and-white aerial photographs flown along Fenwick and/or Assateague Islands, Maryland, between October 1952 and July 1964 (Table A5-1). Each of the 505 photos in the collection is about 2'x2' in size, most with an approximate scale of 1 inch = 200 feet. The photographs cover the Maryland section of two narrow barrier islands that lie along the State's Atlantic coast, separated by the Ocean City Inlet: Fenwick Island to the north and Assateague Island to the south. The general area of coverage (though not for every set) extends from the Maryland-Delaware state line in the north, about 10 miles north of the Ocean City Inlet, to the Maryland-Virginia state line in the south, about 23 miles south of the inlet. For several sets, handwritten markings on the front of the photographs indicate miles north or south of the Ocean City Inlet (Mile 0), as well as some street numbers or names and the general area now occupied by Assateague State Park. In addition to the 505 photos, 19 index maps are included in the collection, covering all but 20 of the photos, flown in October 1952 or December 1957.

Based on information found on the back of many photographs, the sets were originally acquired by the Maryland State Roads Commission (now, the Maryland State Highway Administration) and later transferred to MGS. Serendipitously, they flank the date of the Ash Wednesday Storm (March 1962), arguably "the most intense nor'easter of the 20th century (Watson, 2007).

Table A5-1: 1952-1964 aerial photos of Fenwick and Assateague Islands, Maryland

Date(s)	Project ID	Flight line	Frames		Index map
			N	Frame nos.	
10/30/1952	402	3	3	39, 42, 43	None
		Subtotal	3		
11/28/1952	411	1	10	2-9, 11, 13	Index Map ID = 392
		2	12	15-24, 26, 28	
		3	13	31-43	
		Subtotal	35		
2/1/1954	462	1	7	even nos. from 100-112	Index Map ID = 393
		2	5	odd nos. from 81-89	
		3	4	odd nos. from 69-75	
		Subtotal	16		

Table A5-1: 1952-1964 aerial photos of Fenwick and Assateague Islands, Maryland					
			Frames		
12/8/1954	538	1	3	odd nos. from 41-45	Index Map ID = 396
		2	8	odd nos. from 15-29	
		3	3	odd nos. from 3-7	
		Subtotal	14		
1/26/1956 1/28/1956	672	1	10	odd nos. from 223-237, 238, 240	Index Map ID = 394
		2	14	even nos. from 250-276	Index Map ID = 394
		3	14	odd nos. from 289-311, 312, 314	Index Map ID = 394 for 289-303 Index Map ID = 395 for 305-314
		4	13	odd nos. from 153-157, 327-345	Index Map ID = 395
		5	15	odd nos. from 207-215, 377-395	Index Map ID = 397
		6	6	odd nos. from 175-185	Index Map ID = 397
		Subtotal	72		
3/5/1957	806	1	13	even nos. from 6-30	Index Map ID = 398
		2	15	even nos. from 38-66	Index Map ID = 398 for 38-52 Index Map ID = 399 for 54-66
		3	8	odd nos. from 87-101	Index Map ID = 399
		4	10	odd nos. from 111-129	Index Map ID = 399
		Subtotal	46		
12/21/1957	866	1	13	odd nos. from 5-29	None
		2	3	odd nos. from 33-37	None
		3	1	107	None
		Subtotal	17		

Table A5-1: 1952-1964 aerial photos of Fenwick and Assateague Islands, Maryland					
			Frames		
1/12/1960	997	1	14	even nos. from 142-168	Index Map ID = 359
		2	17	odd nos. from 101-133	Index Map ID = 360 for 101-117 Index Map ID = 359 for 119-133
		3	9	even nos. from 64-80	Index Map ID = 360
		4	10	even nos. from 8-26	Index Map ID = 360
		Subtotal	50		
1/17/1962	605	1	8	3-10	Index Map ID = 402
		2	8	1-8	Index Map ID = 403
		Subtotal	16		
1/17/1962	606	1	34	odd nos. from 3-69	Index Map ID = 363 for 3-5 Index Map ID = 364 for 7-27 Index Map ID = 365 for 29-69
		4	13	even nos. from 4-28	Index Map ID = 363 for 4-8 Index Map ID = 364 for 10-28
		5	2	odd nos. from 11-13	Index Map ID = 364 for 11-13
		7	15	odd nos. from 1-29	Index Map ID = 364 for 1-13 Index Map ID = 365 for 15-29
		Subtotal	64		
5/6/1962	635	1	32	odd nos. from 1-63	Index Map ID = 366 for 1-29 Index Map ID = 367 for 31-63
		2	25	odd nos. from 1-47, 48	Index Map ID = 366 for 1-33

Table A5-1: 1952-1964 aerial photos of Fenwick and Assateague Islands, Maryland					
			Frames		
					Index Map ID = 367 for 35-48
		4	16	odd nos. from 1-31	Index Map ID = 368 for 1-31
		5	6	1, odd nos. from 7-15	Index Map ID = 368 for 7-15
		Subtotal	79		
3/24/1963	1285	1	12	odd nos. from 133-143, 147-157	Index Map ID = 390
		2	18	even nos. from 98-132	Index Map ID = 390 for 128-132 Index Map ID = 391 for 98-124
		3	8	even nos. from 64-78	Index Map ID = 391
		4	8	odd nos. from 3-17	Index Map ID = 391
		Subtotal	46		
7/7/1964	1446	1	10	even nos. from 4-18, 22-24	Index Map ID = 404
		2	17	even nos. from 38-70	
		3	10	even nos. from 88-106	
		4	10	odd nos. from 121-139	
		Subtotal	47		
		TOTAL	505		

STORAGE CONDITIONS

The curator discovered the photos, quite by accident, in two different locations in the main building: (1) in an office vacated hurriedly by its former occupant, who, due to the nation's economic downturn and the ensuing budgetary constraints at the state level, was forced into retirement, and (2) in the Survey library. All of the photos have been stored, some stacked upside down, in map cabinet drawers, forgotten and unused for at least 30 years.

For the most part, the photos are in very good shape, except for slight curling of the edges, minor to moderate bending and/or tears along the edges of a few of the more heavily utilized/handled photos, and occasional cracking of the photo surface. Much of the damage from handling the photos occurs along the east or west edges (tears) or

corners (bending) but, because of the north-south orientation of islands, the damage seldom impinges on the land masses depicted in the photos.

COLLECTION DOCUMENTATION

The Survey's Data Preservation Database

Several years ago, MGS developed and began populating a Microsoft Access database, AirPhotoIndex.mdb, with information about all of the aerial photos in its collection. The database, stored on the MGS network (Common on 'Mgsdc':/AirPhotoIndex), contains two primary tables, tblAirPhoto and tblIndexMap, with information about air photos and index maps, respectively. For purposes of this grant, MGS copied tblAirPhoto, structure only, to the Data Preservation Database as tblAerialPhotos_OC1964 and populated it with information about the Fenwick/Assateague aerial photographs. Two additional iterations of the table, tblMetadata_P1691_APOC and, finally, tblUploadMetadata_P1691_AP_OC produced metadata in NGGDPP-compliant format.

The table tblAerialPhotos_OC1964 allows for a description of photo condition. In populating that field, MGS discovered that damage to the photos is best assessed by looking at the back of the photo, as well as the front. Usually, tape used to repair tears was applied to the back, though not always. Likewise, small tears and holes left from the removal of staples are generally easier to detect from the back of the photo. MGS also checked for bending, especially of the corners; general wear or fraying of the edges; and chips, scratches, or cracks on the photo surface.

The National ScienceBase Catalog

For aerial photos, the *title* field in aerial photo metadata is a unique identifier consisting of the project area-film negative roll-frame number, which is embedded in the top right corner of each photograph. For index maps, the *title* field is in the form "Index_YYYYMMDD_#of#" and indicates the date of flight, the sheet number, and the total number of sheets.

MGS assigned one of two pairs of geographic coordinates to each photo or index map, depending on its location vis-à-vis the Ocean City Inlet. For photos flown north of the inlet, MGS assigned the geographic coordinates for Fenwick Island, as they appear on the Ocean City quadrangle. This location is approximately mid-way between the inlet and the Maryland-Delaware line. For photos flown south of the inlet, MGS assigned the geographic coordinates for Assateague Island, as they appear on the Tingles Island quadrangle. This location is approximately mid-way between the inlet and the Maryland-Virginia line. MGS acquired the coordinates from the GNIS website. For index maps spanning both islands, MGS assigned the geographic coordinates of Ocean City Inlet, the point of origin of the miles marked on the associated aerial photographs.

Only two sets of photos, those flown in 1963 and 1964, were uploaded to the ScienceBase Catalog this year. The remaining sets were discovered after these first two had been uploaded. Metadata for the former are still incomplete, primarily because assigning geographic coordinates is so time-consuming.

NEXT STEPS

Owing largely to the data preservation efforts at MGS, a subcommittee of the Maryland State Geographic Information Committee (MSGIC) has recently been reconvened to preserve historical aerial photographs and make digital images of them available, possibly through the Maryland State Archives' (MSA's) Electronic Archives website. Through the generosity of the Johns Hopkins University Library, MGS is having the Fenwick Island and Assateague Island photos digitized and will then submit both the original photographs and a copy of the scanned images to MSA for permanent preservation. (MGS will also retain a copy of the digital images.) Visitors to the MGS website will be able to link to the digital images available through the Electronic Archives. In many respects, this effort will serve as a pilot project for the MSGIC Historic Aerial Photos Committee.

NGGDPP METADATA FORM

1952-1964 Aerial Photographs of Fenwick and Assateague Islands, Maryland

(MGS Collection ID 34; NGGDPP ID P1691; ScienceBase ID 1866612)

Sources of Information:

- Information embedded, stamped and/or handwritten on the aerial photographs or associated index maps
- U.S. Geological Survey's Geographic Names Information System (GNIS) website - geographic coordinates for Fenwick and Assateague Islands

MetadataID

Definition: Metadata identification number
Value: 1 to N (of 505 photos and 19 index maps, 92 have been uploaded to the ScienceBase Catalog
Source: Assigned automatically by Microsoft Access

CollectionID

Definition: NGGDPP collection identification number
Value: 1866612 (ScienceBase ID for the collection *1952-1964 Aerial Photographs of Fenwick and Assateague Islands, Maryland*)
Source: DataPreservation.mdb – tblCollection – field "ScienceBaseID"

Title

Definition: Official, human-readable title for individual record, used in listings & search results (short, distinctive) – mandatory
Value:
For the aerial photos: Flight line: Project area – film negative roll – frame number
For the index maps: Index_YYYYMMDD_#of#

Where,
YYYYMMDD = date of flight
#of# = Sheet # of total # of sheets

Source:
For the aerial photos: Embedded in upper right corner of aerial photograph
For the index maps: Information included on index map
Examples:
For the aerial photos: 1285-1-133, 1446-1-24
For the index maps: Index_19630324_1of2

Alternate Title

Definition: Additional title identifiers for individual record (e.g., for further identification by other Web service interfaces); textual titles or specific sample IDs used by collection – optional
Value: None

Abstract

Definition: Human-readable description of individual record, used to help determine nature of underlying physical data resource; contains much information about data resource – mandatory

Value: Embedded, stamped, and/or handwritten information found on the front and back of the photo:

For the aerial photos: "Black-and-white aerial photograph flown in (Month, Year) along (Fenwick Island and/or Assateague Island), Maryland

For the index maps: "Index map of aerial photographs flown on (Date) over (Place), Maryland; Sheet (No.) of (No.)"

Source: the photo or index map itself

SupplementalInformation

Definition: Information on how to access physical data represented by metadata record (e.g., general for entire collection, such as URL, or specific reference to online resource, like ordering system with specific ID) - mandatory

Value: "Contact the MGS curator at (410) 554-5500 for additional information."

Source: n/a

Coordinates

Definition: Geographic coordinates (longitude, latitude), in decimal degrees – mandatory

Value: (-)decimal longitude, decimal latitude

Source:

The aerial photographs cover the Maryland section of two narrow barrier islands that lie along the State's Atlantic coast, separated by the Ocean City Inlet: Fenwick Island to the north and Assateague Island to the south. The area extends from the Maryland-Delaware state line in the north, about 10 miles north of the Ocean City Inlet, to the Maryland-Virginia state line in the south, about 23 miles south of the inlet. Handwritten markings on the front of the photographs indicate miles north or south of the Ocean City Inlet (Mile 0).

After consulting the U.S. Geological Survey's Geographic Names Information System (GNIS) website, MGS assigned one of two pairs of geographic coordinates to each aerial photo, depending on its location vis-à-vis the Ocean City Inlet. For photos flown north of the inlet, MGS assigned the geographic coordinates for Fenwick Island, as they appear on the Ocean City quadrangle. This location is approximately mid-way between the inlet and the Maryland-Delaware line. For photos flown south of the inlet, MGS assigned the geographic coordinates for Assateague Island, as they appear on the Tingles Island quadrangle. This location is approximately mid-way between the inlet and the Maryland-Virginia line.

For the index maps, MGS assigned the appropriate geographic coordinates of one or the other island to index maps covering only one island, and the geographic coordinates of Ocean City Inlet, to index maps covering both islands.

The pairs of coordinates of the photographs and index maps are reported in Table A5-2.

Table A5-2: Geographic coordinates (NAD83) of Fenwick and Assateague Islands, MD, from the Geographic Names Information System (GNIS), March 2011

County	Latitude (DMS)	Longitude (DMS)	Latitude (dec. deg.)	Longitude (dec. deg.)
Fenwick Island (Ocean City quad)	3821410N	0750424W	38.3615029	-75.0732384
Assateague Island (Tingles Island quad)	381000N	0750959W	38.1667846	-75.1662987
Ocean City Inlet	381928N	0750526W	38.3245590	-75.0904616

AlternateGeometry

Definition: Alternate method of storing geospatial footprint; description of authoritative source of geographic location & how simple coordinates derived – optional
Value:
For the aerial photos: "For photographs flown N of the Ocean City Inlet, geographic coordinates represent the coordinates of Fenwick Island, as they appear on the Ocean City quadrangle. For photographs flown S of the Ocean City Inlet, geographic coordinates represent the coordinates of Assateague Island, as they appear on the Tingles Island quadrangle (from the Geographic Names Information System, 3/28/2011). All coordinates are based on NAD83."

For the index maps: "Geographic coordinates represent the coordinates of (Fenwick Island, as they appear on the Ocean City quadrangle; Assateague Island, as they appear on the Tingles Island quadrangle; or the Ocean City Inlet) (from the Geographic Names Information System, 3/28/2011). All coordinates are based on NAD83."
Source: n/a

OnlineResource

Definition: URL pointer(s) to textual information about specific record - optional
Value: none supplied
Source: n/a

BrowseGraphic

Definition: URL pointer(s) to images representing specific record - optional
Value: none supplied
Source: n/a

Date

Definition: Meaningful date (e.g., collection date) attached to record; may be to any degree of precision or left blank (e.g., 20010101, 1939-1945, -20030331, 2000) - optional
Value: date on which the aerial photo was flown
Source: Embedded in upper left corner of aerial photograph
Examples: dates as they occur on the photos, 3-24-63 or 7-7-64, for example, are reformatted, respectively, as follows: 19630324 or 19640707

DatasetReferenceDate

Definition: Reference date indicating currency of underlying data record (e.g., date metadata record added to National Catalog); format=YYYYMMDD - mandatory
Value: Date record provided to NGGDPP for uploading to National Catalog
Source: Provided by curator

VerticalExtent

Definition: Vertical extent (e.g., vertical depth information for rock core samples); contains 2-3 elements: unit of measure, max value, min value (e.g., m, 35.4, 0 => rock core measured at 35.4 total meters)
Value: n/a
Source: n/a

Location of Archived Samples

Two sets of aerial photos, flown in1963 and 1964, were found in a map cabinet in Room 214 of the main building; the remaining sets were found in a map cabinet in Room 315. They had been stored there, some upside down, for years, forgotten and unused. Nonetheless, they are in fairly good shape, except for slight curling along the edges and minor tears on a few of the more heavily utilized/handled photos, especially those showing the proposed Assateague State Park.

Additional Information about the Sources, Samples, Etc.

This section includes detailed information about the two sets of air photos submitted to the ScienceBase Catalog on 4/28/2011: Set A - 45 photos flown on March 24, 1963, and Set B - 47 photos flown on July 7, 1964. Each photo is about 2'x2' in size, with an approximate scale of 1 inch = 200 feet. Handwritten markings on the photos indicate miles north or south of the Ocean City Inlet (Mile 0), as well as some street numbers or names and the general area now occupied by Assateague State Park. The area extends from the MD-DE state line, ~10 miles N of the inlet, to the MD-VA state line, ~23 miles S of the inlet. Index maps (2 sheets) exist for Set A only.

Set A: Photos flown on March 24, 1963

Ocean City Inlet, as well as the starting points (Mile 0) for mileage markers N and S of there, appears on Photo 1285-1-133

Going N from the inlet, photos are numbered, in order (minus the 1285- prefix): (1-135, 2-128), (1-137, 2-130), (1-139, 2-132), 1-141, 1-143, 1-147, 1-149, 1-151, 1-153, 1-155, 1-157. (There are no photos 1-145 and 2-126.) Photos 2-128, 2-130, and 2-132 cover about the same area as photos 1-135, 1-137, and 1-139, respectively.

Going S from the inlet, photos are numbered, in order: 2-124, 2-122, 2-120, 2-118, 2-116, 2-114, 2-112, 2-110, 2-108, 2-106, 2-104, 2-102, 2-100, (2-98, 3-78), 3-76, 3-74, 3-72, 3-70, 3-68, 3-66, 3-64, 4-17, 4-15, 4-13, 4-11, 4-09, 4-07, 4-05, 4-03. Photo 3-78 covers about the same area as photo 2-98.

Set B: Photos flown on July 7, 1964
Ocean City Inlet, as well as the starting points (Mile 0) for mileage markers N and S of there, appears on Photo 1446-2-44.

Going N from the inlet, photos are numbered, in order (minus the 1446- prefix): 2-42, 2-40, 2-38, 1-24, 1-22, 1-18, 1-16, 1-14, 1-12, 1-10, 1-08, 1-06, 1-04. (There is no photo 1-20.)

Going S from the inlet, photos are numbered, in order: 2-46, 2-48, 2-50, 2-52, 2-54, 2-56, 2-58, 2-60, 2-62, 2-64, 2-66, 2-68, 2-70, 3-88, 3-90, 3-92, 3-94, 3-96, 3-98, 3-100, 3-102, 3-104, 3-106,4-121, 4-123, 4-125, 4-127, 4-129, 4-131, 4-133, 4-135, 4-137, 4-139. (From the Collection Table (tblCollection) in the internal data preservation database, DataPreservation.mdb)

The two sets of aerial photos, flown a little more than a year apart, were probably produced for a precursor of the State Highway Administration, based on a notation on the back of a few of the 1963 photos, “Return to Thompson – Room 500 – MD State Roads.” In both sets of photos, the general area now occupied by Assateague State Park is marked, as is the proposed approach to Sinepuxent Bridge (1963 photos only), linking Assateague Island to the mainland. The two index maps for the 1963 photos indicate that the project was intended for a “Beach Erosion Study.”

MGS intends to digitize the photos. Once the photos are scanned, MGS will permanently transfer the original photos and a copy of the digital images to the Maryland State Archives.

References

Questions to Resolve

APPENDIX 6
Bathymetric Surveys,
Maryland Reservoirs and Coastal Waters
(MGS Collection ID 24; NGGDPP ID P1547; ScienceBase ID 580439)
September 2011

COLLECTION DESCRIPTION

Digital bathymetric survey products consist of (a) raw and processed water depth and water level measurements, (b) contour maps derived from the processed data, and (c) associated reports. Bathymetric data and maps are available for surveys of the Maryland and Virginia coastal bays, Baltimore Harbor, and six Maryland lakes or reservoirs. In addition to these eight large-area surveys, MGS routinely acquires bathymetric data at smaller, site-specific areas in the coastal waters of the State, to supplement other information collected at the same time and place. These, however, have been excluded from the metadata uploaded to the ScienceBase Catalog due to their limited extent, usually no more than a few square kilometers.

Bathymetric surveys of the coastal bays provide the physical framework for other scientific studies (e.g., habitat restoration), assist in bay management, and serve as an aid to navigation. Surveys of Baltimore Harbor have confirmed that the main shipping channel is deep enough to accommodate the passage of tall ships beneath Baltimore's Key Bridge during the State's celebration of the centenary of the War of 1812. Reservoir surveys, repeated on a 20-year cycle, are used to estimate water storage capacity and sediment accumulation behind dams. The bathymetric maps have also found an unintended audience – fishermen in search of good fishing spots.

STORAGE CONDITIONS

All of the bathymetric survey products, from the raw point data (soundings) to the final bathymetric maps, were born digital. The disposition of these files represents the Survey's most successful efforts yet at internal digital data preservation and accessibility. For each surveyed area, raw and interim bathymetric data, the final bathymetric map, the associated project report, and metadata compliant with Federal Geographic Data Committee (FGDC) standards are stored on read-only DVDs. Most of the digital maps and reports are accessible online from the MGS website for free viewing and/or download. (This ease of accessibility accounts for the large number of website visitors, estimated at 12,000/month and thought to be primarily fishermen.) In an effort to ensure the survival of the coastal bays surveys, files have been transferred offsite to a National Park Service data server at Assateague Island National Seashore.

Unfortunately, not all bathymetric projects have been finalized. Several files reside in a common drive on the MGS network, known only to the researcher who created them. And though the handling of bathymetric files represents the Survey's best preservation efforts, these are still inadequate. DVDs have an "unrecorded shelf life…conservatively estimated to be between 5 and10 years" (National Archives). Not all files are stored

offsite. Not all files are backed up. There are no consistent standards/protocols in place for staff to follow in preserving digital data sets. Server storage capacity is inadequate, and back-up is not always guaranteed. There are no provisions for longer-term needs, such as changing file formats and storage media. Nor are there any protocols for copying files from one "permanent" storage medium to another, before the shelf life of the first has expired. Basically, once a researcher has created a data CD or DVD, and perhaps copied certain of the files to the MGS website, the project is considered complete.

COLLECTION DOCUMENTATION

The Survey's Data Preservation Database

In the Data Preservation Database, the table tblUploadMetadata_P1547_BathySurveys was created outright, primarily from information included on the digital bathymetric maps themselves, supplemented with geographic coordinates obtained from the U.S. Geological Survey's Geographic Names Information System (GNIS). Two MGS employees familiar with the bathymetric surveys pointed the authors to the locations of these maps on either the MGS website or network. Once the UploadMetadata table was finalized, its structure and data were copied to tblMetadata_P1547_BathySurveys. Several fields were added to the latter, so that, for example, complete survey dates and contour intervals could be reported as separate fields, instead of being combined with other information in the *abstract* field.

The National ScienceBase Catalog

Uploading the collection metadata to the ScienceBase Catalog was straight-forward, accomplished by following the steps in an appendix to last year's NGGDPP report (Hennessee and Sheldon, 2010).

NEXT STEPS

- The collection is complete but disorganized. Like much of MGS's digital data, the collection is in need of an archival management plan entailing (a) the organization of data, including documentation, at the conclusion of a project, (b) the decision as to how long data are to be kept readily available vs. being archived, and (c) the means of logging collections (e.g., internally and into the ScienceBase Catalog)
- Modify the internal database table, tblMetadata_P1547_BathySurveys, as necessary, to include additional fields for various files associated with the surveys, possibly including file dates and sizes
- Decide whether to include small-area bathymetric surveys in the internal Data Preservation database

REFERENCES

Hennessee, L., and Shelton, D., 2010, Metadata creation for Maryland Geological Survey's Sediment Core Collections: Baltimore, Md., Maryland Geological Survey, Coastal and Estuarine Geology File Report No. 10-03, 30 p.

National Archives, (2011), Frequently asked questions (FAQs) about optical storage media: Storing temporary records on CDs and DVDs: http://www.archives.gov/records-mgmt/initiatives/temp-opmedia-faq.html, [9/9/2011].

NGGDPP METADATA FORM

Bathymetric Surveys, Maryland Reservoirs and Coastal Waters

(MGS Collection ID 24; NGGDPP ID P1547; ScienceBase ID 580439)

Sources of Information:

- Ortt, R., pers. comm.
- Wells, D., pers. comm.
- Collection Inventory Form (P1547)
- Maryland Geological Survey website – Reservoir Bathymetry and Data; http://www.mgs.md.gov/coastal/maps/lr/index.html [8/9/2011]
- U.S. Geological Survey's Geographic Names Information System (GNIS) website

MetadataID

Definition: Metadata identification number
Value: 1 to N (8 surveys uploaded to ScienceBase Catalog)
Source: Assigned automatically by Microsoft Access

CollectionID

Definition: ScienceBase Catalog identification number
Value: 580439 (ScienceBase ID for the collection *Bathymetric Surveys, Maryland Reservoirs and Coastal Waters*)
Source: DataPreservation.mdb – tblCollection – field "ScienceBaseID"

Title

Definition: Official, human-readable title for individual record, used in listings & search results (short, distinctive) – mandatory
Value: "Bathymetry of [water body name], MD
Source:
Example: "Bathymetry of Loch Raven Reservoir, MD"

Alternate Title

Definition: Additional title identifiers for individual record (e.g., for further identification by other Web service interfaces); textual titles or specific sample IDs used by collection – optional
Value: None

Abstract

Definition: Human-readable description of individual record, used to help determine nature of underlying physical data resource; contains much information about data resource – mandatory
Value: see example below
Sources:
(1) Maryland Geological Survey website – Reservoir Bathymetry and Data; http://www.mgs.md.gov/coastal/maps/lr/index.html [8/9/2011]

(2) U.S. Geological Survey's Geographic Names Information System (GNIS) website
Example: "Digital bathymetric map of Rocky Gorge Reservoir (Patuxent R., Howard, Montgomery, & Prince George's Cos., MD); 2-m contours; downloadable, 5.2 megabyte, PDF file"

SupplementalInformation

Definition: Information on how to access physical data represented by metadata record (e.g., general for entire collection, such as URL, or specific reference to online resource, like ordering system with specific ID) - mandatory
Value: "For additional information, contact the Coastal & Environmental Geosciences Program at the Maryland Geological Survey, (410) 554-5500."
Source: n/a

Coordinates

Definition: Geographic coordinates (longitude, latitude), in decimal degrees – mandatory
Value: (-)decimal longitude, decimal latitude (point within water body).
Source: U.S. Geological Survey's Geographic Names Information System (GNIS)

Table A6-1: Geographic coordinates (NAD83) of Maryland water bodies, from the Geographic Names Information System (GNIS), August 2011 (Feature class = Lake, Reservoir)

Water body	Latitude (DMS)	Longitude (DMS)	Latitude (dec. deg.)	Longitude (dec. deg.)
Reservoirs and manmade lakes				
Lake Habeeb (**Rocky Gap Reservoir**), Allegany Co., Evitts Creek quad, Rocky Run	394217N	0783906W	39.7047466	-78.6517385
Liberty Lake (**Liberty Reservoir**), Carroll & Baltimore Cos., Finksburg quad, N Br. Patapsco R.	392536N	0765327W	39.4267230	-76.8908896
Little Seneca Lake, Montgomery Co., Germantown quad, Tenmile Cr.	391109N	0771803W	39.1859393	-77.3008176
Loch Raven Reservoir, Baltimore Co.,	392728N	0763426W	39.4579112	-76.5739329

Table A6-1: Geographic coordinates (NAD83) of Maryland water bodies, from the Geographic Names Information System (GNIS), August 2011 (Feature class = Lake, Reservoir)				
Water body	**Latitude (DMS)**	**Longitude (DMS)**	**Latitude (dec. deg.)**	**Longitude (dec. deg.)**
Towson quad, Gunpowder Falls				
Prettyboy Reservoir, Baltimore Co. Hereford quad, Gunpowder Falls	393725N	0764435W	39.6234774	-76.7429224
Rocky Gorge Reservoir (T Howard Duckett Reservoir), Howard, Montgomery, and Prince George's Cos., Clarksville quad, Patuxent R.	390754N	0765504W	39.1316274	-76.9178409
Triadelphia Reservoir, Howard & Montgomery Cos., Sandy Spring quad Patuxent R.	391134N	0770019W	39.1928844	-77.0052552
Coastal water bodies				
Inner Harbor (**Baltimore Harbor**) Baltimore (city), MD Baltimore East quad Patapsco R.	391700N	0763634W	39.2834404	-76.6094113
Maryland/Virginia Coastal Bays Worcester Co., MD; Accomack Co., VA Boxiron quad Chincoteague Bay	380351N	0751647W	38.0642872	-75.2796366

AlternateGeometry

Definition: Alternate method of storing geospatial footprint; description of authoritative source of geographic location & how simple coordinates derived – optional

Value: "Geographic coordinates (NAD83) represent point on [Quadrangle Name] quadrangle within [Reservoir Name], from the U.S. Geological Survey's Geographic Names Information System (GNIS) [8/9/2011]"

Source: n/a

OnlineResource

Definition: URL pointer(s) to textual information about specific record - optional
Value: MGS website for File Report (PDF format) pertaining to bathymetric survey
Source: n/a
Example: http://www.mgs.md.gov/coastal/pub/FR99-4.pdf

BrowseGraphic

Definition: URL pointer(s) to images representing specific record - optional
Value: MGS website for "[Reservoir Name] Bathymetry and Data," from which PDF file of map accessible
Source: n/a
Example: http://www.mgs.md.gov/coastal/maps/lr/lochraven.html

Date

Definition: Meaningful date (e.g., collection date) attached to record; may be to any degree of precision or left blank (e.g., 20010101, 1939-1945, -20030331, 2000-) - optional
Value: 4-digit year (or year-year date range) of bathymetric survey
Source: Maryland Geological Survey website – Reservoir Bathymetry and Data; http://www.mgs.md.gov/coastal/maps/lr/index.html [8/9/2011]

DatasetReferenceDate

Definition: Reference date indicating currency of underlying data record (e.g., date metadata record added to National Catalog); format=YYYYMMDD - mandatory
Value: Date record provided to NGGDPP for uploading to National Catalog
Source: Provided by curator

VerticalExtent

Definition: Vertical extent (e.g., vertical depth information for rock core samples); contains 2-3 elements: unit of measure, max value, min value (e.g., m, 35.4, 0 => rock core measured at 35.4 total meters)
Value: n/a
Source: n/a

Location of Digital Bathymetric Maps at MGS

Coastal water bodies:

Baltimore Harbor
Graphic: Q:\BaltHarbor\Presentation\BaltimoreHarbor04222010Contours.pdf
(708 KB file, dated 9/7/2010) – bathymetric survey date: 201004; contour interval: 2 ft
Report:

Maryland/Virginia Coastal Bays Bathymetry

Graphic: Q:\ChincoteageBathy\NPSMaps\Coast_Bay_Sediment_2010.pdf (page 3 in pdf file, dated)
Associated Report:
Dennison, W.C., Thomas, J.E., Cain, C.J., Carruthers, T.J.B., Hall, M.R., Jesien, R.V., Wazniak, C.E., and Wilson, D.E. (eds.), 2009, Shifting Sands: Environmental and Cultural Change in Maryland's Coastal Bays: Cambridge, MD, University of Maryland Center for Environmental Science (UMCES), 418 p.

Reservoirs:
Little Seneca Lake
Graphic: Q:\LittleSeneca\Report\LittleSeneca_Plate2Final.pdf
Report:

Additional Information about the Sources, Samples, Etc.

References

Questions to Resolve

APPENDIX 7
Geophysical Logs, Western Maryland Deep Wells
(MGS Collection ID 18; NGGDPP ID P1528; ScienceBase ID 123375)
September 2011

COLLECTION DESCRIPTION
The collection *Geophysical Logs, Western Maryland Deep Wells* consists of 337 geophysical logs – paper strip charts of data (e.g., formation density, gamma ray, induction, sonic, temperature, velocity) throughout the depth of each of 100 deep wells (2,500-11,600 ft deep) drilled mainly for natural gas exploration in Allegany and Garrett Counties in Western Maryland. The logs date from the 1950s through the 1990s. MGS generally acquires such logs from drillers, once a well is completed. Although the number of logs transferred to the Survey had been on the decline, that trend is expected to change with the renewed interest in the Marcellus Shale as a target for natural gas. The collection has been catalogued in an undocumented Excel spreadsheet, *Maryland Well Log Catalog.xls*, which includes information (owner, driller, well name, date drilled, location (lat/long), key horizons, etc.) taken in part from an out-of-print MGS report (Edwards, 1970). Although MGS holds the well logs, the Maryland Department of the Environment, the regulatory authority for these wells, holds the completion reports.

STORAGE CONDITIONS
Except for a few miscellaneous logs, the well logs are stored in alphabetical order by well name in two file cabinets on the third floor "bridge" connecting the main building and annex in Baltimore. Storage conditions are adequate, except for fluctuating temperature and humidity. The logs are well-organized and protected from dust, light, and disruption.

DIGITAL CONVERSION
Using Neuralog software, the Coastal & Environmental Geosciences Program at MGS is in the process of converting the well logs from paper, first to digital raster images (.tif format) and, then, through hand-digitization, to vectors (.las format). As of September 2011, all of the logs had been scanned as .tif images.

Files are stored on the MGS network; they are not accessible through the Survey's website.

COLLECTION DOCUMENTATION
The Survey's Data Preservation Database
Because the collection is electronically catalogued, it was a simple matter to extract the various fields in the Excel spreadsheet corresponding to NGGDPP metadata fields. The only complicating factor was that the spreadsheet lists well names (boreholes), one record per well, grouping the various well logs into a single field. The Survey's Data Preservation Database, on the other hand, lists well logs, repeating the well name for each

log, as appropriate. So, before delivering the Excel extract for import into the internal database, an MGS staff member replicated rows in the spreadsheet to accommodate all of the well logs. The decision to report well logs rather than well names to the ScienceBase Catalog was based on the fact that once each log is scanned, the file name can be easily attached to the individual database record.

The National ScienceBase Catalog

Initially, MGS had reservations about uploading well log metadata to the ScienceBase Catalog, because several of the logs were stamped "Confidential." It hardly made sense to advertise the existence of a collection that the Survey was unable to share. No one currently employed at MGS was familiar with the transfer of the logs to the Survey, there being no accession procedures in place. So, no one could say with certainty whether there were any constraints on making the logs available to others.

MGS contacted Halliburton, one of the companies that had generated some of the confidential logs, and asked about the statute of limitations on well log confidentiality. Halliburton indicated that after a certain amount of time – on the order of two to three years, depending on the state – the logs go into the public domain. If there has been a "data exchange," whereby the logs have legitimately come into the Survey's possession (e.g., through a transfer from the operator), then that essentially ends the period of confidentiality. To be absolutely certain, MGS could contact the operator directly, if the company is still in business (M. Hollingsworth, pers. comm., 8/11/2011).

Based on this conversation, MGS decided to adhere to a three-year rule: any well logs produced more than three years earlier (i.e., 2008 or older) are considered to be in the public domain. All of the well logs currently in the collection qualified for inclusion.

Uploading the collection metadata to the ScienceBase Catalog was straight-forward, accomplished by following the steps in an appendix to last year's NGGDPP report (Hennessee and Sheldon, 2010).

NEXT STEPS

- Work with Dave Brezinski and Megan Farley to create FGDC-compliant metadata documenting the Excel well log collection catalog. (Datasets with a spatial component (e.g., lat/long) are required by the Department of Natural Resources to be documented in accordance with Federal Geographic Data Committee (FGDC) metadata.)
- Develop an accession procedure for well logs from outside operators, indicating if or for how long the period of confidentiality must be extended.
- As the well logs are converted to digital products, (1) update the internal database with the names of the files and periodically update the ScienceBase Catalog, (2) document the individual well log files (i.e., create FGDC-compliant metadata), (3) permanently archive copies of the well log collection catalog, the digital files, and the associated metadata (e.g., at the Maryland State Archives (MSA)), (4) plan for web-based public access to the files, and (5) develop a retention plan for the paper

logs, after which time they will be either discarded or forwarded to MSA for preservation.

- Identify the "miscellaneous" well logs in two of the file cabinet drawers.
- Consider relocating the logs to a room less subject to fluctuations in temperature and humidity, which have a deleterious effect on paper.
- In the next ScienceBase Catalog update, change the point of contact (supplementalInformation) from the Hydrology & Hydrogeology Program to the Coastal & Environmental Geosciences Program.
- Suggest that the day-to-day managers of the collection migrate the Excel spreadsheet to a relational database to store the information more efficiently and make searches and updates easier.

REFERENCES

Brezinski, D.K., Geology of the Marcellus Shale in Maryland, http://www.mgs.md.gov/geo/marcellus.html, [9/8/2011]

Edwards, J., Jr., 1970, Deep wells of Maryland: Baltimore, Md., Maryland Geological Survey Basic Data Report 5, 161 p.

Hennessee, L., and Shelton, D., 2010, Metadata creation for Maryland Geological Survey's Sediment Core Collections: Baltimore, Md., Maryland Geological Survey, Coastal and Estuarine Geology File Report No. 10-03, 30 p.

NGGDPP METADATA FORM

Geophysical Logs, Western Maryland Deep Wells

(MGS Collection ID 18; NGGDPP ID P1528; ScienceBase ID 123375)

Sources of Information:

- Collection catalog, *Maryland Well Log Catalog.xls*, a Microsoft Excel spreadsheet
- D. Brezinski, pers. comm.
- M. Farley, per. comm.

MetadataID

Definition: Metadata identification number
Value: 1 to (337)
Source: Assigned automatically by Microsoft Access

CollectionID

Definition: NGGDPP collection identification number
Value: 123375 (ScienceBase ID for collection *Geophysical Logs, Western Maryland Deep Wells*)
Source: DataPreservation.mdb – tblCollection – field "ScienceBaseID"

Title

Definition: Official, human-readable title for individual record, used in listings & search results (short, distinctive) – mandatory
Value: [well name]-[log type]; the title usually includes the names of the property owner(s) and the driller
Source: *Maryland Well Log Catalog.xls*

Alternate Title

Definition: Additional title identifiers for individual record (e.g., for further identification by other Web service interfaces); textual titles or specific sample IDs used by collection – optional
Value: Well number, usually as reported in Edwards (1970)
Source: *Maryland Well Log Catalog.xls*
Example: "G-25"

Abstract

Definition: Human-readable description of individual record, used to help determine nature of underlying physical data resource; contains much information about data resource – mandatory
Value: "[log type] from deep well (>2500 ft deep) in [Garrett or Allegany] Co. MD
Source: *Maryland Well Log Catalog.xls*
Example: "gamma ray log from deep well (>2500 ft) in Garrett Co. MD"

SupplementalInformation

Definition: Information on how to access physical data represented by metadata record (e.g., general for entire collection, such as URL, or specific reference to online resource, like ordering system with specific ID) - mandatory
Value: "Contact the Coastal & Environmental Geosciences Program at (410) 554-5500 for additional information."
Source: n/a

Coordinates

Definition: Geographic coordinates (longitude, latitude), in decimal degrees – mandatory
Value: (-)decimal longitude, decimal latitude (site-specific well site)
Source: *Maryland Well Log Catalog.xls*

alternateGeometry

Definition: Alternate method of storing geospatial footprint; description of authoritative source of geographic location & how simple coordinates derived – optional
Value: [Garrett or Allegany] Co., MD
Source: *Maryland Well Log Catalog.xls*

OnlineResource

Definition: URL pointer(s) to textual information about specific record - optional
Value: none supplied
Source: n/a

BrowseGraphic

Definition: URL pointer(s) to images representing specific record - optional
Value: none supplied
Source: n/a

Date

Definition: Meaningful date (e.g., collection date) attached to record; may be to any degree of precision or left blank (e.g., 20010101, 1939-1945, -20030331, 2000-) - optional
Value: date or date ranges of well log collection
Source: *Maryland Well Log Catalog.xls*

DatasetReferenceDate

Definition: Reference date indicating currency of underlying data record (e.g., date metadata record added to National Catalog); format=YYYYMMDD - mandatory
Value: Date record provided to NGGDPP for uploading to National Catalog
Source: Provided by curator

VerticalExtent

Definition: Vertical extent (e.g., vertical depth information for rock core samples); contains 2-3 elements: unit of measure, max value, min value (e.g., m, 35.4, 0 => rock core measured at 35.4 total meters)
Value:
Source: *Maryland Well Log Catalog.xls*
Example: ft, 6850, 0

Location of Archived Samples

The original paper well logs are located on the third floor "bridge" between the annex and the main building, in two file cabinets:

Table A7-1: Locations of logs for the deep wells of Western Maryland

Storage unit	Inventory sticker	Drawer	Contents
File cabinet	red DNR inventory sticker no. 0045312	1	Logs for well names beginning with A-G
		2	Logs for well names beginning with H-M
		3	Logs for well names beginning with R-W
		4	Misc. logs
File cabinet	red DNR inventory sticker no. 0045313	1	Misc. logs

Scans of the paper logs are located on the MGS network, along with the Excel collection catalog and, eventually, metadata.

Additional Information about the Sources, Samples, Etc.

The Survey employees most familiar with the collection are Dave Brezinski, Megan Farley, and Jim Reger (ret.)

References Associated with Collection

Edwards, J., Jr., 1970, Deep wells of Maryland: Baltimore, Md., Maryland Geological Survey Basic Data Report 5, 161 p.

Questions to Resolve

APPENDIX 8
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2010-2011 Membership
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