COMPUTER-BASED TOOLS FOR OPTIMIZING PRESERVATION, ACCESS, AND USABILITY OF GEOLOGICAL COLLECTIONS

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ABSTRACT

The geological community houses many geological collections in a variety of settings. As geological localities all over the world are being shut down, reclaimed, and exhausted, the consequences of not caring for our geological collections are increasing significantly. If something is not done soon, the geological community as a whole risks the chance of losing these very valuable specimens forever. In response to this demonstrated need the Collections Profiling Guide and the digital record keeping system, EGEMS, were designed to make managing geological collections easier.

INTRODUCTION

For years the accumulation of geological materials in institutional and individual collections has continued without sufficient thought to long-term preservation, access and usability. Now these collections are at a pivotal point: with storage limits being exceeded and limited funding for collections management, geological materials are becoming endangered. If action is not taken to preserve these collections now, then there is great risk of losing them forever.

The Unheard Message

This message, unfortunately, is not new. A decade ago, the Board on Earth Sciences and Resources wrote a book titled “Geoscience Data and Collections: National Resources in Peril”. Their message was clear “Many [geoscience collections] could act as invaluable resources in the future but immediate action is needed if they are to remain available. Housing of and access to geoscience data and collections have become critical issues for industry, federal and state agencies, museums, and universities. Many resources are in imminent danger of being lost through mismanagement, neglect, and disposal”. This message is as true today as it was in 2002, and it raises the question: Why is nothing being done to better preserve geological collections?

Hearing the Message - A New Set of Tools

A potential answer is that the tools required to enable institutions with limited resources to better preserve their collections and the data associated with them have been missing. Especially in universities where over the years collections comprised of thesis samples, synthesized research materials, and teaching collections have grown to overwhelming sizes (Figure 1), the question of long term preservation is becoming a problem.
Over the past few years I have been working to develop user-friendly tools with the intention of making the management of geological collections easier. Since the first useful tool when beginning any task is a set of instructions, or guidebook, I created the Collections Profiling Guide. It is a step-by-step guide to identifying the most valuable specimens in a collection and determining their appropriate level of care. The guide, however, is only half the solution. Once it is clear where to begin, the question becomes, how best to ensure long term preservation of the collection? Taking into consideration that labels can fade and deteriorate overtime, and given that in many cases storage space is limited and part of the collection may at some point need to be re-located, digitizing the specimen information is the easiest way to ensure it is preserved and ready to be easily transferred. Since no simple program for digitizing geological collections existed I developed a program called EGEMS. EGEMS has a simple, easy-to-use interface, allows for storage of many data types (text, audio, documents, etc) and has a multi-field search to aid users in easily finding information quickly. My hope is that these tools revolutionize the way all geological collections, and the data associated with them, are cared for, resulting in the optimization of their long term preservation, access, and usability.

**COLLECTIONS PROFILING GUIDE**

Prioritizing care for any collection is vital to ensure its survival. The Collections Profiling Guide was created to help simplify a potentially daunting task and provide tips on how best to care for a geological collection long term. A couple of questions guide the user to identify which areas in the collection should be cared for first thus taking any stress away from the prioritizing process.

The questions are simple (Figure 2), and once answered they provide a clear plan of action for best managing a geological collection. An example is given below of how to use this guide in prioritizing care for a geological collection. In this example the collection is used primarily for classroom demonstration, and it has deteriorating specimens from extinct localities (Figure 3). Given this information the educator can use his/her resources more wisely making conscience decisions to ensure the collection is well cared for.

{Insert Figure 2 here}

{Insert Figure 3 here}
EGEMS

EGEMS is the first digital record keeping system developed specifically for geological materials. As a result EGEMS has many capabilities that other digital record keeping systems do not. Also, because EGEMS was designed by a geologist familiar with collections management, the system is intuitive and does not require a user-manual. Detailed below are some of the capabilities EGEMS has.

EGEMS has three screens for entering/viewing data so that depending on how much information the user wishes to enter/view at one time they may choose the Full Screen, Quick Screen, or Browse Screen. The Home Screen (figure 4) provides access to all of these screens, as well as a number of “other screens” including the Address Book and a History of Changes. EGEMS also has pre-set accounts created for different levels of security. Depending on which account a user is assigned, there are some screens (such as the Account Screen) and some fields (such as value and location) that may not be accessible. The “full user” account has complete access to all EGEMS offers, including managing account privileges.

In EGEMS the Full Screen (Figure 5) displays all of the information for one record. This information is split across various tabs so as not to overwhelm the user and to guarantee the easiest way of finding information again in the future. Most of the screens also have a navigation bar at the top which allows easy access to the other screen types as well as the home screen, address book, search function, new record button, and the import button. The Full Screen is the only screen with the easy data import button.

If the user already has data digitized they will appreciate the easy data import feature (Figure 6) as there is no need to re-type anything. The import button on the Full Screen will bring the user to an import set-up, and if importing from excel, the column names will conveniently appear so the user can match them to the corresponding fields in EGEMS. Also, after importing their data, EGEMS will automatically go through each of the drop-down menus and update them with any new values as well as delete any duplicate values.

It is just as simple to export data from EGEMS as it is to import data. This can be extremely useful in providing key statistics to ensure and potentially increase funding. For example, exporting usage data such as the number of loans created per year, from EGEMS into Excel, makes it easy to take tables of numbers and create easy-to-read graphs (Figure 7). EGEMS also allows for exporting in other formats such as pdfs.
The Quick Screen (Figure 8) shows only the essential information associated with a particular specimen. This can be especially useful when entering large amounts of data in a short amount of time. Also, on either the full or quick screen, if the user right clicks, a menu will pop up with an option to “duplicate record.” This is a great feature for a user entering data for similar samples. The “duplicate record” function will create a new record that has all of the same information as the previous record already filled in. Then the user can choose the fields he/she wishes to change.

The Browse Screen (Figure 9) lists all of the records for a particular material. As a result, this is the most ideal place to begin when performing a search. Also, once the user has performed a search on the browse screen, he/she may select the row of the specimen they are interested in and then click on the “Quick Screen” or “Full Screen” to see more information about that particular specimen.

In addition to the more commonly known materials (Rocks, Minerals, Fossils) EGEMS also has the capability to store information for other materials such as Research Products. Research Products are geological materials that can be used for future research purposes or were derived from pre-existing research projects. Examples include: thin sections (polished or covered), billets, experimental powers, synthesized materials, etc. When information for these are fully filled in they act as a recipe that can be re-created in the future (Figure 10). Most of the fields for Research Products in EGEMS are new to digital record keeping systems everywhere.

EGEMS also has the ability to store and browse images (Figure 11) and documents (Figure 12). This can aid in communicating to future geologists information such as what a specimen looks like, if any research has previously been done on the specimen, and what publications the specimen is associated with.
In addition to the unique functions mentioned above, EGEMS also has more basic capabilities such as linking GPS coordinates to specimen records, printing tray labels, and storing contact information. The combination of these unique and basic features is what allows EGEMS to meet such a wide variety of needs and since EGEMS was designed specifically for the geological community it has an intuitive user interface that anyone familiar with geological materials should easily be able to use.

CONCLUSION

As access to geological localities becomes more and more restricted, the importance of our collections and the cost of not preserving them increases significantly. If these irreplaceable collections and the data associated with them have any hope of surviving for future research, education, and display, then action is required now. These tools have been designed to make managing geological collections easier, but they can only be effective if the geological community listens and responds to this message.

Figure 1: Photographs depicting disorganization of geological collections in a university setting
Figure 2: Example steps 1 & 2 of the Collections Profiling Guide

Figure 3: Example step 3 for the Collections Profiling Guide
Figure 4: EGEMS Home Screen

Figure 5: EGEMS Full Screen for Rock Material
Figure 6: Easy data import button and import example

Figure 7: Example graph of data exported from EGEMS
Figure 8: EGEMS Quick Screen for Rock Material

Figure 9: EGEMS Browse Screen for Rock Material
Figure 10: Example record for Research Product Materials in EGEMS

Figure 11: Image Browse for Rock Materials in EGEMS
Figure 12: Document Browse for Research Product Materials in EGEMS

ACKNOWLEDGEMENTS

I would particularly like to thank the Virginia Tech Department of Geosciences, especially Dr. Bob Tracy and Llyn Sharp for all of their support and everything they have done to help make EGEMS possible. I am also very grateful to the Virginia Museum of Natural History, specifically Dr. Jim Beard and Dr. Alton Dooley for their confidence and encouragement.

REFERENCES

