

Annual Report for Period: 09/2003 - 09/2004**Submitted on:** 08/24/2004**Principal Investigator:** Tinker, Scott W.**Award ID:** 0331241**Organization:** U of Texas Austin**Title:**

Support for the Curation of Academic Research Cores, Samples, and Collections in the Geosciences

Project Participants**Senior Personnel****Name:** Tinker, Scott**Worked for more than 160 Hours:** No**Contribution to Project:**

Coordinated project and interacted with academic community.

Name: Dutton, Shirley**Worked for more than 160 Hours:** No**Contribution to Project:**

Coordinated project, including interaction with academic community and supervision of NSF-project activities at the Houston Research Center (HRC). Co-convener of NSF Workshop on Curation of Terrestrial Scientific Cores, Samples, and Collections.

Post-doc**Graduate Student****Undergraduate Student****Technician, Programmer****Name:** Els, John**Worked for more than 160 Hours:** No**Contribution to Project:**

Programmed HRC database system, including online access. Interacted with the developers of the PetDB database to insure compatibility of the HRC sample database with the geoscience cyberinfrastructure systems currently being developed.

Name: McDonald, Randy**Worked for more than 160 Hours:** Yes**Contribution to Project:**

Supervised and led effort to organize and reshelve new and existing legacy cores at the HRC and dedicate space for the NSF core and sample collections.

Other Participant**Name:** DeJarnett, Beverly**Worked for more than 160 Hours:** Yes**Contribution to Project:**

Geological curator at the HRC for NSF project. Interacted with the academic community relative to curation needs; assisted researchers using the HRC facility; coordinated equipment acquisition and maintenance; conducted community education and outreach. Represented The University of Texas at Austin at DOSECC (Drilling, Observation, and Sampling of the Earth's Continental Crust) annual meeting. Coordinated logistics for hosting the NSF Workshop Curation of Terrestrial Scientific Cores, Samples, and Collections at the HRC.

Name: Zahm, Laura**Worked for more than 160 Hours:** Yes

Contribution to Project:

Geological curator at the HRC for NSF project. Interacted with the academic community relative to curation needs; assisted researchers using the HRC facility; conducted community education and outreach. Assisted in developing HRC database system. Interacted with the developers of the PetDB database to insure compatibility of the HRC sample database with the geoscience cyberinfrastructure systems currently being developed.

Name: Haynes, Darrell

Worked for more than 160 Hours: Yes

Contribution to Project:

Reshelfed new and existing legacy cores at the HRC to dedicate space for the NSF core and sample collections.

Name: Gutierrez, Richard

Worked for more than 160 Hours: Yes

Contribution to Project:

Reshelfed new and existing legacy cores at the HRC to dedicate space for the NSF core and sample collections.

Name: Hafford, Marcus

Worked for more than 160 Hours: Yes

Contribution to Project:

Reshelfed new and existing legacy cores at the HRC to dedicate space for the NSF core and sample collections.

Research Experience for Undergraduates**Organizational Partners****Other Collaborators or Contacts**

We have begun to work closely with the SAMPLES Working Group (Sample Archive and Management PLanning for the Earth Sciences).

We have interacted with Steven Goldstein and Kirsten Lehnert, both of Lamont-Doherty Earth Observatory of Columbia University. The need for a facility to archive and distribute important terrestrial petrology-geochemistry and structural geology samples was recognized at the GERM (Geochemical Earth Reference Model) meeting in La Jolla, California in March 2001 and by the SAMPLES Working Group (Sample Archive and Management PLanning for the Earth Sciences) at the Workshop on Cyberinfrastructure (CI) for the Integrated Solid Earth Sciences (ISES) held in Lawrence, Kansas in March 2003. Dr. Goldstein, as head of the SAMPLES group, visited the HRC in September 2003 to discuss how the HRC can meet the needs of the hard-rock academic research community for storage and curation. Dr. Lehnert interacted with our curators and database manager and offered suggestions for insuring compatibility of the HRC sample database with the geoscience cyberinfrastructure systems currently being developed.

We have had contacts with Dennis Nielson (University of Utah) and Ken Miller (Rutgers University) about the future needs of the DOSECC program for core storage and curation. Similarly, we have been in contact with Stephen Hickman (U.S. Geological Survey, Menlo Park) about the future core-storage needs of the SAFOD (San Andres Fault Observatory at Depth) project.

Greg Anderson (PBO Data Products Manager at UNAVCO) contacted the HRC about the possibility of storing cores collected for the Plate Boundary Observatory (PBO) component of EarthScope at the HRC. The PBO project will drill and core about 150 boreholes to depths of 200-300 m in the western U.S. and Canada.

Before submitting an NSF proposal, Michael Blum (Louisiana State University) inquired about the possibility of storing future cores collected in the Mississippi Valley at the HRC.

Activities and Findings**Research and Education Activities:**

We have established space within the Bureau of Economic Geology's Houston Research Center (HRC) for storage and curation of terrestrial scientific cores, rock samples, and collections acquired by NSF-funded research projects. The HRC will curate this material and facilitate continued access to, and use of, the material by researchers in the academic community. Geological curators, core handlers, and a database

researchers at the facility, and maintaining metadata associated with the samples in a database compatible with geoscience cyberinfrastructure systems. The HRC was staffed this year by two on-site geologist/curators and four full-time core handlers; the facility is open from 8 a.m. to 5 p.m. Monday through Friday. Researchers can find information at the following Web site: <http://www.beg.utexas.edu/crc/houston.htm>, under the heading NSF Cores and Samples.

We have begun to acquire equipment needed by visiting researchers for examining and sampling materials stored at the HRC. Two high quality petrographic microscopes and five binocular microscopes that were donated to the HRC were professionally refurbished. An additional binocular microscope has been donated and will be refurbished. A forklift for moving core boxes was also donated to the HRC.

A geologic library was donated and has been set up in the HRC this year. The donation includes books, journals, monographs, maps, and State and Federal geological reports primarily in the areas of geology, geochemistry, geophysics, and petroleum engineering. The library is open to the public; researchers and students visiting the HRC will benefit from the availability of this resource.

We hosted an NSF Workshop on Curation of Terrestrial Scientific Cores, Samples, and Collections at the HRC in May 2004. This one-day workshop brought together geoscientists working with terrestrial cores, samples, collections, and other geologic materials that have been acquired as part of academic research projects. Participants in the workshop toured our public-sector, state-of-the-art sample repository and viewed space currently available for long-term storage, curation, and easy access to rock material and other collections. Participants discussed the needs of the research community and prioritized the facilities, equipment, and metadata storage that would best suit the different types of geologic material to be curated. By establishing a list of priority needs and major issues facing academic researchers, an effective plan for meeting those needs can be formulated.

Major educational activities of the project this year were the following:

March 2004 • B. DeJarnett and L. Zahm made a technical presentation to the Lone Star Chapter of the Association of Women Geoscientists. 'The Houston Research Center Rocks • How Holding a Rock in your Hand can Change your Life!'

April 2004 • L. Zahm and Scott Tinker made a presentation on the BEG and HRC to the AAPG Core and Sample Preservation Committee at the 2004 annual meeting of the American Association of Petroleum Geologists.

May 2004 • B. DeJarnett made a presentation entitled 'The Bureau of Economic Geology, the University of Texas at Austin • Core and Sample Repositories' at the DOSECC annual meeting.

May 2004 • The HRC hosted the NSF Workshop on Curation of Terrestrial Scientific Cores, Samples, and Collections.

University of Houston geology courses taught by Charlotte Sullivan and Vivek Chitale used the HRC core layout facilities 8 days during the past year for various class exercises.

Findings:

The goal of this project is to provide a facility for the preservation and curation of cores, samples, and collections that result from NSF-funded research. Contacts with members of the academic community confirm the need for such a facility, comparable to those in place at Texas A&M University for marine sediment cores from the Ocean Drilling Program (ODP) and at the University of Minnesota Limnological Research Center (LacCore) for lacustrine sediment cores. The public preservation of terrestrial cores and samples will make them available for later research studies beyond the projects that originally collected the material.

An Advisory Committee consisting of four to six members of the academic community should be established in the coming year to review operations and policies and advise the Bureau on NSF-curation activities at the HRC. The Advisory Committee will guide policy for NSF core acquisition and deaccession and sampling of the cores.

Contacts with the research community indicate that the main equipment needs for the facility are saws and pluggers for collecting samples, petrographic and binocular microscopes for core and sample examination, and digital cameras for core and thin-section photography. Shelving will have to allow for flexibility in storage because the cores and samples are not uniform in size and shape.

Development of a database that is compatible with the current initiatives in Geoinformatics is essential. The database should be a web-based curation-information system that includes essential metadata associated with the cores and samples. It will be critical for the HRC curators to closely follow the current efforts underway in the academic community to create unique sample identifications for materials stored at the HRC.

Training and Development:

Training and development meetings held at the HRC include the following:

August 2003

- ò Petroleum Technology Transfer Council (PTTC) Lunch and Learn lecture
- ò PTTC tour held

September 2003

- ò PTTC Lunch and Learn lecture
- ò PTTC Meeting with Texas Region Producer Advisory Committee
- ò Dr. Charlotte Sullivan from University of Houston (UH) taught university class here
- ò Hosted Geoinformatics/BEG database meeting with BEG staff and Steve Goldstein of Columbia University

October 2003

- ò Field Trip at HRC for Houston Geological Society Earth Science Week
- ò PTTC Lunch and Learn lecture

November 2003

- ò Halliburton/UH Class Taught at HRC

December 2003

- ò UH graduate student û several days of core description
- ò UH classes held several days in December

January 2004

- ò UH graduate student û several days of core description

February 2004

- ò Dr. Charlotte Sullivan from UH taught university class
- ò BP internal training course
- ò Meeting of the Outer Continental Shelf group

March 2004

- ò Houston Geological Society Board Meeting
- ò ConocoPhillips new hire training course
- ò BEG Frio Brine Project meeting (The Frio Brine Pilot experiment is designed to field test modeling, monitoring, and verification techniques that can be applied to CO2 sequestration in high-permeability, high-volume sandstones.)

April 2004

- ò BEG Frio Brine Project meeting

May 2004

- ò HRC geologists led field trip for middle school
- ò LSU researchers here to describe core
- ò NSF workshop

June 2004

- ò HRC Grand Opening
- ò HRC geologists held field trip for 60+ children attending science camp
- ò Gulf Coast Carbon Consortium meeting
- ò PTTC day-long workshop
- ò Nautilus USA week-long short course held here

August 2004

- ð Drilling Engineers Association Annual Meeting
- ð University of Kansas/Kansas Geological Survey meeting
- ð PTTC day-long workshop

Outreach Activities:

October 2003 ù Field trip through the HRC for the Houston Geological Society during Earth Science Week (50+ participants).

March 2004 ù Houston Geological Society held a monthly board meeting at HRC.

May 2004 - Field trip through the HRC for forty-eight 4th and 5th graders from St. Rose Intermediate School in Houston, TX.

June 2004 ù Field trip for Conroe First Baptist Church Summer Science Campers (seventy-six kindergarteners through 5th graders) at HRC.

June 2004 ù Official HRC Grand Opening and Open House (170+ attendees)

Journal Publications

DeJarnett, B. B. and Zahm, L. C., "Cores and cuttings: an extraordinary resource (abs)", American Association of Petroleum Geologists Annual Convention Abstracts Volume, p. p. A15, vol. v. 13, (2004). Published

Zahm, L. C., and DeJarnett, B. B., "Dramatic carbonate reservoir facies illustrated in cores from the Bureau of Economic Geology's teaching collection (abs.)", American Association of Petroleum Geologists Annual Convention Abstracts Volume, p. A153, vol. 13, (2004). Published

Berman, A. E., "The Bureau of Economic Geology: An Interview with Director Scott Tinker and Staff and a New Houston Research Center", Houston Geological Society Bulletin, p. 37, vol. , (2004). Published

Blakeney DeJarnett, B. and L. C. Zahm, "World-Class Public Core, Cuttings and Sample Facility right here in Houston, Texas", Houston Geological Society Bulletin, p. 39, vol. , (2003). Published

Fisher Mallick, J., Blakeney DeJarnett, B., and Zahm, L. C., "Big Rocks Found in Houston", Houston Geological Society Bulletin, p. n/a, vol. , (2004). Published

Books or Other One-time Publications

Web/Internet Site

URL(s):

<http://www.beg.utexas.edu/crc/houston.htm>

Description:

Information about the availability of space at the HRC for storage and curation of terrestrial cores, samples, and other collections is given at this site

Other Specific Products

Product Type: Web site access

Product Description:

The NSF Workshop on Curation of Terrestrial Scientific Cores, Samples, and Collections is summarized at:

<http://www.beg.utexas.edu/crc/nsf-workshop.htm>. Copies of the PowerPoint presentations given at the workshop can be accessed from this page.

We organized and hosted an NSF Workshop on Curation of Terrestrial Cores, Samples, and Collections.

Sharing Information:

Visitors to the Bureau web site can link to NSF workshop information through the Houston Research Center home page.

Contributions

Contributions within Discipline:

The development of a facility at the HRC for storage and curation of terrestrial scientific cores, rock samples, and collections acquired by NSF-funded research projects will become a key resource for researchers in the Earth Sciences. As a result of the project, invaluable geologic samples can be professionally preserved and made accessible to the academic community.

Acquisition of terrestrial cores, rock samples, and fossils is critical for conducting much of the geologic research supported by the NSF Division of Earth Sciences. Because of the volume involved, long-term storage, preservation, and curation of these materials are beyond the resources of most NSF-funded academic researchers. Most researchers have a place where cores, samples, and fossils can be accessed during the initial stages of research and sampling but lack an adequate facility where these materials can be permanently preserved, accessed, and sampled/resampled as needed by the wider academic community. As a result of this project, there is now a facility for the permanent storage and curation of terrestrial rock cores, samples, or paleontologic collections acquired during NSF-funded research for continental-based projects.

In 2002, the National Research Council published a report titled *Geoscience Data and Collections: National Resources in Peril*. The report documents the types and volumes of geologic materials that are at risk of being lost because of lack of space and resources to store and curate them. The report concluded that valuable geoscience data and collections may be lost through mismanagement, neglect, or outright disposal unless immediate action is taken. As a follow-up to this report, NSF sponsored a workshop in Bloomington, Indiana in January 2003 in which the academic research community addressed the issues of long-term storage and curation of valuable scientific research materials. Of particular concern were cores and samples that are acquired at great expense, require a significant amount of space to store, and may be difficult or impossible to reacquire if lost. The need for a facility to archive and distribute important terrestrial petrology-geochemistry and structural geology samples for the academic research community was similarly recognized at the GERM (Geochemical Earth Reference Model) meeting in La Jolla, California in March 2001 and by the SAMPLES Working Group (Sample Archive and Management PLanning for the Earth Sciences) at the Workshop on Cyberinfrastructure (CI) for the Integrated Solid Earth Sciences (ISES) held in Lawrence, Kansas in March 2003. As summarized by the report of the SAMPLES working group, there is a need to develop a systematic approach to archiving and distributing important terrestrial petrology-geochemistry and structural geology samples. Archived samples must be accompanied by metadata and be accessible to the research community through a database compatible with emerging GeoInformatics and cyberinfrastructure protocols.

The geologic core-storage and research facility operated by the Bureau of Economic Geology in Houston, Texas fills this need of the Earth science community. The HRC has dedicated space to curate terrestrial cores and samples and facilitate continued access to, and use of, the material.

Contributions to Other Disciplines:

The rock materials curated at the HRC are likely to be useful data sources for other fields of science and engineering. For example, samples of sedimentary rocks may be used by climate modelers to gather data on earth conditions through time. Cores from shallow boreholes may be of particular use to civil engineers, such as the cores to be collected in a large area of the western U.S. and Canada for the Plate Boundary Observatory (about 150 boreholes to depths of 200-300 m).

Contributions to Human Resource Development:

Field trips and opportunities to see and touch rocks are popular educational activities that can lead K-12 students to consider earth science as a career. Outreach activities provide all students with a better understanding of the importance of earth science to society. The HRC staff has conducted several 'field trips' to the HRC collections during the past year.

The HRC facilities and collections have also been used by classes for undergraduate and graduate students, as well as professional classes. Rock material curated at the HRC can be viewed, described, and sampled for teaching and educational purposes. Materials that are abundant in the collection are available to educators for sampling.

Contributions to Resources for Research and Education:

A key contribution of this project is to make public legacy samples and associated metadata widely available for research and education. By preserving and curating materials acquired with public funds, these materials are available to the entire research and education community.

Contributions Beyond Science and Engineering:

Earth science research contributes to public welfare and national need. The cores and samples that are preserved for future use at the HRC may be used to investigate topics including earthquake science; geological hazards; subsidence; energy, mineral, and water resources; global climate change; land-use planning; and public education.

Special Requirements

Special reporting requirements: None

Change in Objectives or Scope: None

Unobligated funds: \$ 209,202.84

Animal, Human Subjects, Biohazards: None

Categories for which nothing is reported:

Organizational Partners

Any Book

Review Past Submissions

Award--0331241

U of Texas Austin; Support for the Curation of Academic Research Cores, Samples, and Collections in the Geosciences
Scott W Tinker

Select the appropriate report and then click "Show" to review the information on any report listed in the table.

Report #	Report Type	From	To	Submitted on	NSF Approved?
03168954	Progress Report	09/01/2003	09/01/2004	08/24/2004	Not yet



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