Committee on the Preservation of Cores and Samples

Projects

Policy Statement:
Preservation of Geological and Geophysical Data

The American Association of Petroleum Geologists, an international organization, supports the preservation of geological and geophysical data for the public good. AAPG encourages its membership, through their professional affiliations in industry and appropriate individual member actions, to lend their support for the development of a comprehensive, integrated, long-term management plan. Such actions will help ensure preservation of, and future access to, valuable geoscience information. AAPG encourages all geoscience data stakeholders to coordinate their efforts and provide data access to the American Geological Institute's National Geoscience Data Repository System and similar programs in other countries.

Rationale

Responsible management and efficient development of petroleum resources requires improved access to the best available scientific information. Geological and geophysical data provide critical innovation required for sound exploration, development, and environmental decisions. Future generations of scientists and policy makers must be able to use these data to address the energy, environmental, and natural disaster challenges facing the nation in the 21st century.

The downsizing of the energy and minerals industries combined with public-sector budgetary constraints jeopardizes vast quantities of valuable geological and geophysical data. These data are critical to our understanding of the Earth's natural resources and environment. They represent capital investments measured in billions of dollars. Many of these immense data holdings are irreplaceable and are of significant value to independent oil producers, academia, government researchers, and the nation at large.

Preservation and access to these data are critical to energy security and economic prosperity. These data enable energy and minerals companies to enhance their exploration and production programs for improved recovery of oil, gas, and mineral resources. Applications for these data extend beyond the petroleum industry, including environmental protection, water resource management, global change studies, and basic and applied research. These data are also used for reducing risks from earthquakes and other geological hazards, and screening sites for waste disposal, designing highways and other infrastructure.

The National Geoscience Data Repository System (NGDRS) is effort by the American Geological Institute (AGI) to preserve and provide improved access to domestic geological and geophysical data. These data are at extreme risk of being discarded by industry but constitute an invaluable resource for a variety of public domain activities. State geological surveys are a major source of public repositories and play a major role in the preservation and access to geoscience data. Efforts to preserve data should build upon existing state and regional data centers, which should have first right-of-refusal for any data being transferred into be public domain.

Background

- In the course of their exploration and development activities over the past several decades, major oil and gas companies have acquired enormous amounts of domestic geological and geophysical data. These companies have

the most comprehensive geoscience datasets and sample inventories of information related to the Earth's crust of any organizations in the world. Literally billions of dollars worth of subsurface geoscience information is in jeopardy of being lost due to the general decline of industry support for curation and maintenance of data repositories.

- A 1995 National Research Council report, *Preserving Scientific Data on Our Physical Universe,* concluded that "a general problem prevalent among all scientific disciplines is the low priority attached to data management and preservation. Experience indicates that new research projects tend to get much more attention than the handling of data from old ones, even though the payoff from optimal utilization of exists data may be greater." The observations, directed at federal agencies, are equally true for the private sector. A 1996 National Research Council report, *The Dynamics of Sedimentary Basins,* recommended "continued funding for efforts to preserve, archive, and disseminate data on sedimentary basins."

- In the first phase of the NGDRS project, initiated in 1995, AGI documented industry's interest in contributing billions of dollars worth of inactive domestic company data files to a national repository system. For example, the total amount of seismic data identifed is conservatively estimated to represent more than 100 million line miles, which constitute a substantial fraction (perhaps 25 percent) of all seismic data collected in the US since 1950. The rock core and cuttings are estimated to represent a significant fraction (perhaps 60 percent) of the core and cuttings held by the major oil and gas companies.

- Industry data files contain unique and detailed information for countless localities throughout the world. The data are in a wide variety of formats, ranging from digital well logs and seismic refection data tapes, to paper and film records, to rock core and cuttings samples to paleontological collections, including the analyses thereof.

- A model for transferring data from the private to public sector is provided by the 1994 AGI-facilitated transfer of Shell Oil's core facility in Midland, Texas to the University of Texas at Austin. Shell deeded its collection of 2.2 million liner feet of core and cuttings to the university along with its warehouse. Shell also provided an endowment to cover annual operating expenses of the facility. A1l of the data in this transfer entered the public domain for the first time.

Summary

Over many years, the petroleum sector has invested billion of dollars in acquisition of geological and geophysical data. Because of chance exploration targets and economy conditions, significant amounts of data are in jeopardy of being lost or destroyed. These data remain valuable not only to future petroleum exploration but also to basic and applied research, natural hazard mitigation, and environments remediation. Thus, AAPG encourages efforts, such as AGl's National Geoscience Data Repository System, that seek to preserve and improve access to geological and geophysical data. Such voluntary programs are especially important in the United States and other nations where companies retain ownership of their data.

(This information was *prepared and reviewed by certain scientific members of the Governmental Affairs Committee of the Division for Professional Affairs of the American Association of Petroleum Geologists, for use by its members and other interested parties.)*

RESOLUTION OF THE
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS
AS RECOMMENDED BY ITS
CORE AND SAMPLE PRESERVATION COMMITTEE,
IN SUPPORT OF THE NATIONAL GEOSCIENCE DATA REPOSITORY SYSTEM.

(Statement Approved by AAPG Executive Committee, October 1998)

WHEREAS responsible management and development of the nation's petroleum resources requires improved access to the best available scientific information.

WHEREAS geological and geophysical data provide critical information required for sound decisions on resource utilization and environmental protection.

WHEREAS the Association as a professional society promotes and encourages efficient development by the petroleum industry.

WHEREAS the National Geoscience Data Repository is an effort by the American Geological Institute (AGI), a non-profit federation of 31 geoscientific societies, to preserve and provide improved access to domestic geological and geophysical data in danger of being discarded.

WHEREAS future generations of scientists and policy makers must be able to use these data to address the energy, environmental, and natural disaster challenges facing the nation in the 21st century.

Now, therefore, **be it resolved by the American Association of Petroleum Geologists, as recommended by its Core and Sample Preservation Committee, that both the Association and its members issue a strong and clear endorsement of the importance of preserving geoscience data for the public good.**

Further, that the Association encourage its membership, through their affiliations in the petroleum industry, to provide support for the development of a comprehensive integrated long-term management plan to ensure preservation of geoscience information.

Further, that the Association encourage all stakeholders in geoscience data utilization to coordinate their efforts and provide access to data to further the intent of the AGI for the National Geoscience Data Repository System.

Public Core & Sample Repositories

United States
State Repositories

Alabama State Oil & Gas Board

website: *http://www.ogb.state.al.us*
contact: Gary Wilson: gwilson@ogb.gsa.tuscaloosa.al.us
Core and sample information available on-line.

Alaska Geologic Materials Center

Alaska Geologic Materials Center

website:
http://wwwdggs.dnr.state.ak.us/Libguide/Section5.htm

Mississippi Geological Survey

website: *http://www.deq.state.ms.us/*
contact: Jack Moody: jmoody@its.state.ms.us

University of Southern Mississippi

contact: Maurice A. Meylan: mmeylan@ocean.st.usm.edu

Missouri Department of Natural Resources

website: *http://www.dnr.state.mo.us/dgls/geosrv/gdamhp.htm*
contact: gspgdam@mail.dnr.state.mo.us

Nebraska Conservation and Survey Division

contact: Dr. John Reeder : (907) 696-0079

Arkansas Geological Commission

website: *http://www.state.ar.us/agc/n_f.htm*
contact: William V. Bush: bill.bush@mail.state.ar.us

Arizona Oil and Gas Conservation Commission

website: *http://www.azgs.state.az.us/azgs-ogc.htm*
contact: Steve Rauzi, Oil & Gas Admin.: (520) 770-3500

California Well Sample Repository

website: *http://www.wellsample.org/index.html*
contact: Russ Robinson: (661) 664-2324
Catalog of samples available electronically.

Delaware Geological Survey

website: *http://www.udel.edu/dgs/minres.html*
contact: Kelvin W. Ramsey: kwramsey@udel.edu
Sample information available on-line.

Florida Geological Survey

contact: Dr. Jon Arthur: arthur_j@dep.state.fl.us

Illinois Geological Survey - Oil and Gas Section

website: *http://www.isgs.uiuc.edu/oilgas/oilgas.html*
contact: Mike Sargent:
msargent@geoserv.isgs.uiuc.edu

Indiana Geological Survey

website: *http://adamite.igs.indiana.edu/indsurv/about/*
contact: John A. Rupp:
rupp@gismo.geology.indiana.edu

Iowa Department of Natural Resources

website: *http://www.igsb.uiowa.edu/about/facil.htm*
Sample information is available on-line.

Kansas Geological Survey

Lawrence Facility
website:
http://magellan.kgs.ukans.edu/CoreLibrary/index.html
contact: Mike Magnuson: magnuson@kgs.ukans.edu
website: *http://csd.unl.edu/csd/programs/geology.html*

Nevada Bureau of Mines and Geology

contact: David Davis: ddavis@unr.edu

New Mexico Bureau of Mine & Mineral Resources

website: *http://geoinfo.nmt.edu/resources/home.html#subsurface*
contact: Ron Broadhead: ron@gis.nmt.edu
Core and sample information available on-line.

New York State Geological Survey/State Museum

website: *http://www.nysm.nysed.gov/geocollect.html#top*
contact: William B. Rogers: (518) 474-5816

North Dakota Geological Survey

website: *http://www.state.nd.us/ndgs/Core_Library/clib.htm*
contact: Julie LeFever: jlefever@rival.ndgs.state.nd.us

Ohio Geological Survey

website:
http://www.dnr.state.oh.us/odnr/geo_survey/corelib/corelib.htm
contact: Ron Rea: ron.rea@dnr.state.oh.us

Oklahoma Geological Survey

website: *http://www.ou.edu/special/ogs-pttc/rccore.htm*
contact: Walter Esry: (405) 325-4386, or (800) 330-3996

Oregon Dept of Geology & Mineral Industries

contact: Dan Wermiel: dan.wermiel@state.or.us

South Dakota Dept of Environmental & Natural Resources

contact: Fred Steece: FredS@denrrapcty.state.sd.us

Texas Bureau of Economic Geology

Austin Facility
website: *http://www.utexas.edu/depts/beg/crc.html*
contact: George Bush: George.Bush@beg.utexas.edu

Midland Facility
website: *http://www.utexas.edu/depts/beg/midland.html*
contact: Rick Richardson: (915) 686-9902

Tennessee Dept of Environment and Conservation

Wichita Facility
website:
http://magellan.kgs.ukans.edu/Cuttings/index.html
contact: (316) 943-2343
Core and sample information is available on-line.

Kentucky Geological Survey

website:
http://www.caer.uky.edu/kdmm/ongwellsamples.htm
contact: (606) 255-2459

Louisiana Basin Research Institute Resource Center

website: *http://www.brl.lsu.edu*
contact: Patrick O'Neill: pat@vortex.bri..lsu.edu

Maryland Department of Natural Resources

contact: K. Schwartz: (410) 554-5525

Michigan Geological Survey

website: *http://www.deq.state.mi.us/gsd/core.html*
contact: Bill Swenow: swenorw@state.mi.us

Western Michigan University

website:
http://www.wmich.edu/geology/corelab/coreinfo.htm
contact: (616) 387-8633
Core information is available on-line.

contact: Marvin Berwind: (615) 532-1508

Utah Geological Survey

website: *http://www.ugs.state.ut.us/samlib.htm*
contact: Carolyn Olsen: nrugs.colsen@state.ut.us

West Virginia Geological & Economic Survey

website*: http://www.wvgs.wvnet.edu/www/services/servogdt.htm*
Sample information is available on-line.

Wyoming Geological Survey

Core and sample data is available on-line.

Federal Repositories

U.S. Geological Survey Core Research Center

website: *http://energy.usgs.gov/factsheets/core/crc.html*
contact: Tom Michalski: michaski@sedproc.cr.usgs.gov

Canada

Provincial Repositories

Alberta Energy and Utilities Board - Core Research Center

website: *http://www.eub.gov.ab.ca/bbs/products/catalog/g1-data.htm*
#crcservices
contact: (403) 297-6400

Alberta Energy and Utilities Board - Alberta Geological Survey - Mineral Core Repository

website:
http://www.ags.gov.ab.ca/MCRF/BROCHURE/MCRF01.HTP

Nova Scotia Natural Resources Mines & Energy Branch

website: *http://www.gov.ns.ca/natr/meb/dcl-home.htm*
contact: John McMullin: jmcmulln@istar.ca

Saskatchewan Energy & Mines

website:
http://www.gov.sk.ca/enermine/about/semlab/sslabout.htm
contact: (306) 787-2621

Federal Repositories

Geological Survey of Canada - Core & Sample Repository

contact: Tim Berezniuk: Tim.Berezniuk@gov.ab.ca

Manitoba Energy and Mines - Petroleum Core & Sample Storage

website: *http://www.gov.mb.ca/em/petroleum/core/index.html*
contact: Doug Berk: dberk@em.gov.mb.ca
Cores and sample information available on-line.

Newfoundland & Labrador Mines & Energy

website:
http://www.gov.nf.ca/mines&en/core_storage_information.htm
contact: Alvin Harris: alvinharris@mail.gov.nf.ca

website:
http://www.nrcan.gc.ca/gsc/calgary/core&1_e.htm
contact: Al Scott: ascott@gsc.nrcan.gc.ca

For a listing of geoscience data repositories providing paper records as well as core and samples. See the AGI Website.

? Scott L. Montgomery

Core Values:

The Growing Need for Repositories

Introduction

In its day, the great library at Alexandria was known to hold ?the memory of the world.? Built and maintained by the Ptolemaic kings of northern Egypt who came after Alexander the Great, the library sought to preserve works from many lands and languages. It became thereby an invaluable source of knowledge for scholars, rulers, military strategists, city builders, and many others. Loss of the collection by fire is aptly counted among the great tragedies of history.

The needs embodied by the great library have never changed. Building large collections of crucial source material has remained a way to ensure the vitality of knowledge in every conceivable discipline. To anyone engaged in a technical field, loss of access to this material would spell disaster.

We in the geosciences?and this includes petroleum geology, geophysics, and engineering alike?are blessed with another form of such material: rock itself. Outcrops, of course, offer many rewards, but for the petroleum professional, samples from below ground are more critical. Drill cuttings and, above all, cores are the exposures of the subsurface. They are the *only* means to make the hydrocarbon reservoir visible and available to direct analysis.

Loss of such ?exposures? is equivalent to the destruction of a book or document. This should require little elaboration: one need only consider the range of data routinely derived from a single whole-rock core and the role of such data in all levels of reservoir understanding, from facies analysis to reservoir simulation. Each time a core sample is lost, thrown away, or damaged irreparably, the knowledge it bears is abandoned to the flames of neglect. Compounding this misfortune many times is equal to the destruction of an entire library.

Importance of Cores: On the Rise

Petroleum professionals sometimes assume that, in the contemporary era of 3-D computer modeling, core data have a reduced importance. Nothing could be further from the truth. In fact, there are at least four reasons why core samples are more important today.

First, major changes have taken place in the direction of the industry. As widely recognized, this is the age of field re-development and integrated reservoir characterization. Producers are faced with growing demands to optimize recovery through strategic infill drilling, re-completion, waterflooding, carbon dioxide flooding, and so forth. None of these approaches can be rationally planned or applied without a solid understanding of reservoir character, i.e. core data.

Second, sample data is now critical *because* of the rapid advances in geologic, geophysical, and engineering science that have accompanied the ?computer revolution.? These advances have imposed the need to re-examine and, at times, re-analyze existing samples in the light of new understanding. Sequence stratigraphy, seismic attribute analysis, geostatistical modeling, 3-D reservoir simulation?these are all recent innovations that would be impossible without both new and existing core data.

Third, one must consider the future in light of the past. Thanks to steady innovation in completion and EOR technology, field recoveries in much of the world have improved significantly. Nonetheless, in most cases fully 60-70% of potentially recoverable hydrocarbons remains in the ground. What the future will hold may be impossible to say precisely?*except* that advances will surely continue *and* they will depend, as they have in the past, on improved reservoir understanding. New analytical techniques and apparatus will evolve, in large part for this same reason. All of which makes existing core samples an irreplaceable resource.

Finally, due to urban development, environmental restrictions, and other reasons, an increasing number of areas have been closed to future drilling. Core taken in the past from such areas thus attains a greatly added importance.

In sum, core samples acquire a growing value through time. This relates to increased importance as a central data source, the expanding range of analyses drawn from it, and also the high cost of coring itself. Truly, billions of dollars have been invested in coring over the past half century. What would it cost today to replace the samples that now exist? A sobering question, to be sure.

Core Values: The Situation at Present

Why is any of this important? The answer is simple: rock samples are under a greater threat of being lost today, in huge volumes, than at any time in the past.

Two factors seem to conspire toward this situation. First, software-based E&P work has helped shift effort away from direct use of rock, even as such work remains reliant upon it. Workstation-based reservoir analysis generally demands core data, but not core itself. The actual sample, therefore, once ?stripped? of required information, tends to inspire disinterest.

A more serious reason behind the need for core preservation has to do with financial and organizational changes in the industry. On the one hand, cores are not cheap to maintain: a 1995 survey performed by Amoco at 11 major industry and private facilities indicated that costs then ran from $0.67 to $1.51 per box per year (average $1.16), with large companies holding up to several million boxes (Thomas, 1995). On the other hand, the rapid pace of company buy-outs, mergers, property acquisitions, and divestitures have made for a great deal

of uncertainty with respect to preserving and maintaining samples. Mergers have created ?redundancy? in data, while divestitures have resulted in core changing hands multiple times over a few years. Add to this the short-term, chaotic cycle of massive layoffs and partial new hires, plus out-sourcing of many tasks, and it becomes predictable that much core ends up in some type of administrative or warehouse limbo. Finally, the strong shift in activity to the international arena has brought with it a certain devaluation in data and samples from domestic areas.

Historical Perspective

Are these dangers for core preservation unique to the present moment? The answer is both yes and no. As early as 1948, the AAPG recognized that abundant samples ?of fundamental scientific importance? were being lost and discarded at an alarming rate. It therefore assembled a Committee on Preservation of Samples and Cores to examine the problem and offer recommendations (Lonsdale, 1953). The major difficulty, the Committee found, stemmed from a general lack of appreciation for both the near- and long-term value of sample material (AAPG, 1957).

By the early 1980s, things had reversed. A huge, expanding network of public repositories existed, with most accepting new material (Schmoker et al., 1984 list over 100 facilities). A number of states by that time required samples from oil and gas tests. Many state facilities, moreover, were run without any user fees. This is not to mention, moreover, the growing number of private core facilities that came of age beginning in the late 1970s.

To a large degree, the decade between about 1975 and 1985 represented the peak era of core collection and preservation. What has taken place since is a steady decline, geared in part to industry conditions. Yet, if the future is to hold new opportunities for improved scientific analysis of oil fields, and thus better recovery, preserving core samples must be viewed as a priority.

For these reasons, the AAPG Committee on Preservation of Cores and Samples was revitalized in 1995 and is again involved in analyzing conditions that threaten the survival of sample material. Committee members from both industry and government are working in collaboration with the American Geological Institute (AGI), which has itself launched a major effort to address the problem (see below). Moreover, such increased awareness has also led the National Research Council to undertake a study (now in its earliest stages) of the relevant issues involved in preserving geoscience data. Early in the 1990s, the AGI noted that ?billions of dollars worth of domestic geological and geophysical data are in jeopardy of being lost or destroyed.?

Two significant facts have emerged from recent studies by the AAPG Committee and the AGI. A survey of articles in the AAPG *Bulletin* actually shows an increase in the direct use of core data during the past two decades, from an average of 38% of all articles in 1979-1981 to 43% in 1996-1998. At the same time, an AGI survey reveals that the number of public repositories has fallen to about 50?less than half the total in 1985. Taken together, these facts are indicators of the situation facing industry, academic, and government geoscientists today.

Repository Realities

The question naturally arises: why don?t companies simply donate their core to existing repositories, whether private or public? The problems here are two-fold, and related. They have to do with cost and space.

Donating cores without any additional funding to help preserve and maintain them is tantamount to shifting the financial burden to the receiving facility. States, in particular, currently have scant resources to

accept major volumes of new core, which would require building or renting new facilities. At the same time, companies that might be interested in core philanthropy are usually in the midst of cost-cutting measures themselves, and may not be willing or able to contribute funds if the expense is viewed as high. Several private repositories that have raised fees in recent years have seen a significant decline in use.

On the other side, some significant donations have taken place. In 1994, Shell Oil donated its Midland, Texas core facility, including 2.2 linear feet of core and cuttings, to the University of Texas at Austin along with a $1.3 million endowment (equivalent to about $4/ box). This would appear to offer an excellent model for future philanthropy. The problem, however, is that industry conditions today are not what they were 6 years ago. Few companies, including possibly Shell itself, feel they are now in a financial position to make cash donations at such a level.

The second problem is space. Even as they were being built and excellently maintained, the repositories of the 70s and early 80s were filling up due to the accelerated pace of drilling activity linked to the price boom. The surveys conducted by AGI and the AAPG Committee indicate that public facilities are now nearing full capacity. The AGI estimates that as much as 3-4 million ft of core are on the verge of being discarded unless space can be found to save it. By comparison, the USGS core facility in Denver and the Core Research Center (CRC) of the Texas Bureau of Economic Geology in Austin, two of the largest public repositories in the U.S., each hold about 1.4 million ft. The Denver facility cannot presently accept volumes of new core without disposing of old samples, and the CRC is estimated to be 85%-90% full. These facilities summarize the larger circumstance faced by public repositories in general.

What Can be Done?

What steps might be taken to save the great number of samples now threatened? The AGI and AAPG Committee have come up with ideas that seem innovative and workable. On the one hand, with the support of the U.S. Department of Energy and portions of the industry, AGI has investigated archiving and preserving data in existing repositories. Though necessary, this is not sufficient, for all the reasons given above.

Instead, AGI and AAPG propose the creation or identification of a centralized repository site, a Library of Congress for samples that would be in the public domain. Such a repository, in fact, might form a major part of an even larger collection of geoscience data that would include seismic, well log, geochemical, thin section, scout ticket, and other important data also in danger of extinction. This idea has been vigorously pursued by the AGI. Beginning in 1994, the Institute began to study the feasibility of establishing just such a National Geoscience Data Repository System (NGDRS)(AGI, 1994, 1997). Discussions with petroleum and minerals companies since then have indicated a willingness on the part of operators to consider donating truly vast amounts of data (see Table 1), totaling perhaps 25% of all land seismic data collected in the U.S. since 1950 and over 50% of all cores and cuttings held by major oil and gas companies (AGI, 1999).

Table 1

INDUSTRY CORE REPOSITORY UNIT COST ANALYSIS

Company	Units, boxes	Operating costs, $	Unit cost, $
Amoco	850,000	785,000	0.93
Unocal	380,000	574,000	1.51
Shell	50,000	53,000	1.06
Phillips	144,000	190,000	1.32
Marathon	130,000	163,000	1.25
Mobil	180,000	195,000	1.08
Chevron	1,170,000	1,170,000	1.00
BP	30,000	30,500	1.02
Exxon	350,000	500,000	1.43
Conoco	218,000	215,000	0.99
Total	**3,562,000**	**4,426,000**	**1.24**

Source: From 1995 industry study by Amoco

The concept is at once magnificent and daunting. Clearly, it arrives at exactly the right moment, and it has obviously captured the imagination of companies participating in the AGI studies to this point. But it continues to face significant hurdles. On the one hand, the NGDRS has had success in creating a software data catalog and access system called GeoTrek, now available with limited offerings via the World Wide Web (http://www.agiweb.org/NGDRS/). Still in its infancy, GeoTrek promises to be a useful tool. Yet its ultimate utility will obviously depend on whether an actual physical facility can be found to house the repository. Company willingness to donate material is itself largely contingent upon such a repository being located.

The crucial step is therefore to find a site for the NGDRS collection. The AGI estimates that, for samples, a facility with at least 250,000-300,000 sq. ft. able to hold 35-ft high racks will be needed. To adequately set up, maintain, and guarantee such a repository for the long-term, meanwhile, an endowment of about $10 million would be necessary. Recently, the AGI identified an unused hangar at Denver?s Stapleton International Airport, with 250,000 sq ft, as a possible choice. However, expensive repairs ($2-3 million) and environmental liabilities made this option unfeasible.

The best opportunity for an appropriate site currently rests in the private sector, specifically at the large core facility operated by C&M Storage in Schulenberg, Texas. In operation since 1968, the Schulenberg repository contains several million ft of core, both from the U.S. and international areas, and has ample space for expansion. It has had excellent long-term relationships with a number of major and independent companies and is set up to provide an array of core-related services, including slabbing, plug-cutting, drying/boxing, crushing, and more. There are 2,500 linear ft available for core viewing, and the facility is kept at constant temperature and humidity (70° F, 50%) for optimal preservation. All record-keeping is computerized. In a number of ways, therefore, the facility appears excellently set up to act as a national repository site.

C&M Storage, meanwhile, has indicated a distinct willingness to discuss this possibility. At present, the primary hurdle remains economic: money must be provided to support the transfer, preservation, and maintenance of so much new material. One idea that has been recently proposed is to create a ?public trust? in the amount of $20 million, to endow a national repository at Schulenberg and possibly support other facilities as well. Whether such an endowment is feasible in the current climate of continued corporate downsizing remains to be seen. Yet its proposed size can be taken as appropriate evidence of the need that currently exists.

Conclusion

Libraries and human beings share many of the same enemies. War, fire, physical damage, neglect: these are among the forces that reduce the dimensions of life and knowledge. We in the geosciences appear poised to lose large portions of an irreplaceable intellectual legacy. The reasons responsible for this situation, tied as they are to change and turmoil within the energy industry, argue strongly for a new type of ?great library? to counter the threat of loss.

Cores have always been expensive to acquire. Advances in knowledge and technology have guaranteed that the reasons for acquiring them not only persist, but have intensified. There is a decided need for finding ways to save the intellectual and economic capital invested in the subsurface legacy that has come to exist. Allowing such capital to vanish is tantamount to impoverishing the future. Too often in history, scholars and scientists have been forced to witness the destruction of their libraries. Every time core is lost, it means both data and dollars burned. Now, perhaps, is the time to find opportunities to do the opposite. We geoscientists should be become involved and supportive both to find a solution to the larger storage problem and to continue to serve as stewards for the material we may have at hand.

Table 2

SUMMARY RESULTS OF 1998 DATA CAPACITY SURVEY

State	Core & Cuttings	Well Logs	Digital Seismic	Current repository size, sq ft	Available repository space, sq ft	Digital catalog
North Dakota	Y	Y	N	18,000	7,200	Y
Oregon	Y	Y	N	600	120	N
Louisiana	Y	Y	N	1,600	0	Y
Florida	Y	Y	N	10,000	250	N
New Mexico	Y	Y	N	25,000	2,500	Y
Georgia	Y	Y	Y	10,000	5,000	N
Oklahoma	Y	Y	N	20,000	2,000	Y
New Jersey	Y	Y	Y	5,000	500	N
North Carolina	Y	Y	N	3,000	1,500	Y
Kansas	Y	Y	N	26,521	5,304	Y
Pennsylvania	Y	Y	N	5,300	2,120	N
Michigan	Y	Y	N	10,000	2,000	Y
Missouri	Y	Y	N	16,000	480	N
Mississippi	Y	Y	N	6,400	-1,280	Y
Utah	Y	Y	Y	14,000	5,600	Y
Wisconsin	Y	Y	N	29,500	0	N
Texas	Y	Y	Y	96,000	1,920	Y
California	N	N	N	0	0	N
Massachusetts	N	N	N	0	0	N
Nevada	Y	Y	Y	5,000	250	Y
South Dakota	Y	Y	N	6,000	1,200	N
Illinois	Y	Y	Y	17,500	350	N
Wyoming	N	N	N	0	0	N
Total	**20**	**20**	**6**	**325,421**	**37,014**	**11**

Source: NGDRS Phase III final report, August 1999

References

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