Alaska Geologic Materials Center

Abstract

On July 1, 2015, the GMC reopened all of its collections to the public at the new 100,000 ft² Anchorage storage facility. Relocation to Alaska's largest population center will increase access to facility services by the geologic community and the public. Nearly 3 million pounds of rock samples and materials, which represent billions of dollars of acquisition and preservation costs, were safely moved from Eagle River to Anchorage in just over six weeks. The new indoor, temperature-controlled environment dramatically diminishes the freeze-thaw degradation for more than half the samples, which for many years had been stored outside in 57 metal shipping containers at the old facility. Providing efficient and comprehensive access to this collection is critically important for viable exploration programs, for both seasoned and new Alaska exploration companies. A new, browser-based web-map provides search tools and access to detailed information for more than 500,000 samples, allowing clients to plan for and request preliminary and advanced analyses on samples from locations in extensive, remote, and restricted sections of Alaska.

Recent visits by Shell Oil exploration geologists honed interpretation of the Burger well region of the Chukchi basin. Before the transfer of selected BP Exploration (Alaska) North Slope properties to Hilcorp, geologists from both companies examined donated Shell Oil cores from the Milne Point area. Geologists from Repsol visited the GMC several times over the past three years to gain knowledge and insight on the Beaufortian reservoirs in their recently announced "Pikka" discovery in the Colville Delta area. Exploration and development of Alaska's resources generates a tremendous wealth of rock samples, laboratory analyses, and geologic information.

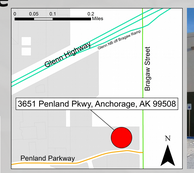
DGGS will be challenged to secure funding to ensure the continued operation of the facility. To meet this challenge, the survey is proposing to institute fees for services at the new facility. As DGGS completes the process of vacating its former Eagle River facility, the Geological Survey will focus on increasing outreach and education programs at the new facility to university, high school, middle school, and grade-school students. While advancing technologies provide powerful geophysical tools for exploring wide swaths of our state, access to physical rock samples is still the single greatest source of geologic truth. Each year, GMC samples are inspected or analyzed by approximately 500 clients from industry, government, and academia. Every one of the rock samples at the GMC represents a significant piece of Alaska's ancient and complicated subsurface puzzle. As a publicly funded geologic sample repository, the Geologic Materials Center makes these at-risk collections accessible to help advance exploration and knowledge of Alaska's natural resources.

Relocation to New Home

Beginning April 6th 2015 in Eagle River, it took 31 working days to move 3 million pounds in 103,000 sample boxes stacked on 2,522 pallets shipped in 142 truck containers, and was completed on May 18th in Anchorage with no injuries.

Pounds	Count	Example
180	16667	People of Sitka & Ketchikan
3,300	909	Subaru Forester
38,000	79	Transit bus
380,000	7.9	USAF C-5B aircraft
405,000	4.4	Saturn V rocket
1,760,000	1.77	Oil drilling rig
3,000,000	1	Geologic Materials Center

GMC Mass Equivalency Chart

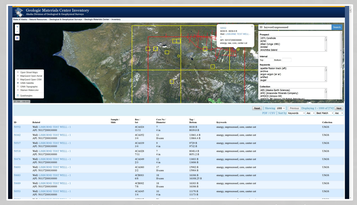


Building provides 100,000 square feet for offices and warehouse

The Alaska GMC is the state's largest and most comprehensive archive of geologic samples from offshore and Federal, State, and private lands. We are the key entity directed to understanding Alaska geology through the acquisition and preservation of physical and digital collections. The cores and samples stored at the GMC are critical for exploration and resource management in the state, as the information they provide will likely help discover new or additional oil and gas reserves, regions of viable geothermal energy, or new mineral prospects.

New Database – More Power

Browser-based Inventory Search Interface



Public link at http://maps.dggs.alaska.gov/gmc/

DGGS Geo Comm Section Powers GMC Software

This year brings a new a public, searchable webmap for locating more than 500,000 samples in the GMC inventory. The browser-based tool allows users to build simple to complex queries through a combination of Google-like text searches, dynamic user-defined area boxes, map-based regions, and drop-down text filters. Each inquiry generates a search-specific URL that can be sent to GMC staff to exactly replicate the user's inventory results. All user search results can be easily transformed into PDF or CSV formats for download to a local computer.

Collection Highlights

2,039 mineral boreholes
2,829 oil & gas wells
106,000 linear feet of oil & gas core
195,000 processed slides and thin sections
300,000 linear feet of mineral core
336,000 surface and seismic shot-point samples
48,000,000 representative feet of oil & gas core chips and cuttings

Giving Exploration a Boost

GMC/DGGS Aids Repsol North Slope Exploration Framework

(Diagram courtesy of Dr. Robert Ravn, IRF Group, 2016)
(Base map courtesy of Alaska Department of Oil and Gas, 2016)

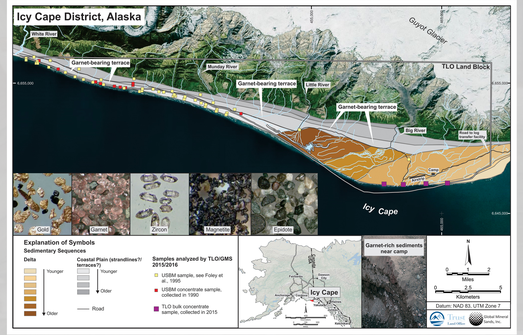
Bob Ravn - Monday

Repsol Letter of Support - February 23, 2016

I am writing to communicate Repsol's support of the efforts of the Alaska Geological Materials Center (GMC) and Division of Geological and Geophysical Surveys (DGGS) to continue to expand the geologic framework of Alaska. Since entering into Alaska five years ago, we have relied on the GMC and DGGS as sources of primary data and high-quality North Slope research studies. Moreover, we utilized the expertise of staff geologists, including M. Wartes and P. Decker, via direct discussion to help us to become familiar with the subsurface geology of the North Slope. We believe the GMC and DGGS have played an important role in helping us understand the regional petroleum system and ultimately become a successful explorer on the slope. (…)
We feel the DGGS and GMC provide an invaluable source of data, new research, and expertise and have helped us become a successful explorer on the North Slope. Thank you for your efforts and we look forward to incorporating any future DGGS work which may expand upon the existing geological framework you have helped establish.

Sincerely,
James R. Bonelli, Ph.D. and James Stutz
Repsol -Alaska Exploration Geologists

GMC "Heavy Sands" Help Alaska Land Trust Identify High Value Targets for 2016 Field Season



(Map courtesy of Alaska Trust Land Office, 2016)

Icy Cape is located on the coast of the Gulf of Alaska near Icy Bay approximately 75 miles northwest of Yakutat. Placer gold in garnet-rich sands that have been described in the Icy Cape region and exploited since the early 1900's.

The Icy Cape Land Block comprises 48,000 acres owned by the Alaska Mental Health Trust Authority and is managed by the Trust Land Office.

The Trust Land Office is currently evaluating the potential for industrial heavy minerals placers such as garnet, zircon, rutile, ilmenite, magnetite and epidote as well as the potential for gold placers as co-or by-product.

(Karsten Eden, 2016, per. comm.)

Selected Recent Donations

Calista Corporation
Over 5,000 drill and skeleton core and pulp boxes from NYAC gold prospect in Southwest, Alaska.

British Petroleum
Over 10,000 boxes of North Slope petroleum materials.

U.S. Geological Survey
Ongoing project to detail over 100,000 Alaska surface samples.

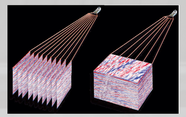
Huge Demand for Archival Continues

Previous year in-kind donations increased the GMC box inventory of geologic samples by 13%. Donations in 2016 are on pace to continue this trend. If this rate continues, the new facility may require further expansion in as soon as seven years.

Assuring Our Future

Fees for Service

DGGS will be challenged to secure funding to ensure the facility continues to operate, grow, and serve long into the future. To meet this challenge DGGS is proposing to institute fees for services at the new facility. This will be an adjustment for our users, but is necessitated by the higher operating and maintenance costs.



Seismic 3D Data Acquisition
(http://www.spe.org/jpt/article/7123-young-technology-showcase-17/, 2016)

Service modules
- Table rental
- Room rental

Activity charges
- Boxes pulled
- Core slabbed
- Plugs drilled

Academic discounts
- Researchers
- Graduate students
- Student classes free

Seismic Data Purchase
- Pre-stack
- Post-stack
- Related wells

Main sample viewing room.

Private sample viewing rooms.

Masonry saws and plugging drill in sample prep room.

High quality petrographic and stereo microscopes with 8MP camera.

Increase Outreach and Education Programs

Anchorage Parks and Rec summer camp students "Race with Dinosaurs".

Chugach Gem and Mineral Society members view mineralized drill core this Spring.

U. of Alaska Anchorage 2015 Core Workshop poster session and public open house.

Sample and Data Preservation

The new facility makes moisture challenges in outdoor connexes a thing of the past.

The National Geological and Geophysical Data Preservation Program provides grants for sample preservation and research.

US Bureau of Mines map recovery through US Mine Map Repository outreach program.

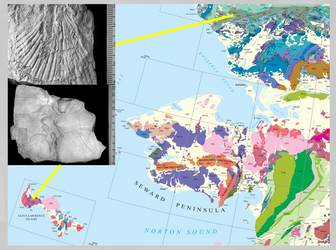
Alaska Fossil Research Collection

Fossil remains represent a primary key element in reconstructing the stratigraphic and tectonic framework of the state of Alaska. Presently there is no centralized collection showing the nature of Alaska fossil fauna and flora through time. Such a collection would be valuable both to researchers, industry, as well as in the education of the general public of the tremendous wealth a data available from our ancient geologic past. A collection such as this housed at the Alaska Geologic Materials Center (GMC) would provide excellent opportunity for scientists and students of Earth Science to visit and become familiar with many of the key species which help provide age control for Alaska's stratigraphy.

Robert Blodgett, 2016

Monotis subcircularis
Norian age (Upper Triassic)
Collected by Shell geologists in Otuk Formation, northwestern Brooks Range in 1964.

Monotis subcircularis
Norian age (Upper Triassic)
Collected by USGS geologist William W. Patton, Jr., on St Lawrence Island in 1971.



Both Monotis specimens identified by paleontologist Robert B. Blodgett. The fauna and host lithology indicate possible similarity between St Lawrence Island and northwestern Brooks Range Otuk Formation.