

2022
Geologic Repositories Rock
Sample Digitization
Webinar Series
Alaska Geologic Materials Center



Geologic Repositories Rock Sample Digitization Webinar Series

The Spring 2022 **Geologic Repositories Rock Sample Digitization** webinar series is co-hosted by the *Alaska Geologic Materials Center* (GMC) and the *Alaska Geological Society* (AGS). Additional support is provided by the USGS National Geological and Geophysical Data Preservation Program (NGGDPP), Alaska Oil and Gas Association (AOGA), Alaska Miners Association (AMA), and American Association of State Geologists (AASG).

Presenters include technology providers, academia, and government bureaus with expertise and actual experiences in creating non-destructive analytical databases for rock sample archives.

Each presentation looks to extend the geologic community's use of repository collections through digitization of rock samples, including examples of cooperation and support across public, academic, and resource industry partnerships. The presentations also look to draw support from the geological community for the acquisition of technological capability and the opportunity to build modern regional integrated analytical rock sample datasets for the nation.

Geologic Repositories Rock Sample Digitization Webinar Series: Original Schedule

Date	Presenter	Organization	Title
2/23	Jacob Proctor	Ingrain - A Halliburton Service	Addressing reservoir challenges in the North Slope and non-destructive dual energy CT
3/9	Kurt Johnson	Alaska GMC	Promise and challenge of digital rocks
3/16	Katrina Cox	Core Laboratories	RAPIDZoom™ core and thin sections: Digitalization of Umiat and Square Lake energy core
3/23	Matthew Andrew	Carl Zeiss X-ray Microscopy, Inc.	Bringing petrography into the digital age: automating acquisition, analysis & quantification of thin sections using the Axioscan 7, advanced algorithms and machine learning
3/30	Dale Blue Caroline Mignot	Halliburton	Diskos 2.0: The National Digital Resource for exploration and production in Norway
4/13	Georgina Gordon Carsten Laukamp	Geological Survey of South Australia CSIRO Mineral Resources	Virtual Core Libraries: Implementation and the impacts of making this resource readily accessible. Insights from the Geological Survey of South Australia and AuScop's National Virtual Core Library
4/20	Marie-Christine Ferland	Photon etc.	Modular multi-sensor core scanning platform for geological applications
4/27	Philip Lypaczewski	College of the North Atlantic	Hyperspectral imaging as a public geoscience tool - Early results of a drill core digitization program in Newfoundland and Labrador, Canada
5/4	Gary Thompson Douglas Morrison	College of the North Atlantic Centre for Excellence in Mining	The Mining Innovation Commercialization Accelerator (MICA) and the role of Canadian colleges in advancing geosciences
5/18	Jacob Proctor	Ingrain - A Halliburton Service	Data acquisition campaign for Alaska reservoirs
5/25	Guy Oliver David McKnight	Geolog Americas Inc. Hitachi Vantara	A digital-cuttings drill-down, with examples from the Geolog Americas Nanushuk-Torok Regional Cuttings Consortium
6/1	Katrina Cox Patrick Huff	Core Laboratories	Non-Invasive Technologies for Reservoir Optimization (NITRO) on the Umiat Core Advanced Cuttings Collection and Reservoir Expression in Cuttings
6/8	Rainer Bärs Phil Harris	Spectral Imaging Ltd. TerraCore	A geological tool for digital transformation: The Sisurock Hyperspectral Scanner

Geologic Repositories Rock Sample Digitization Webinar Series: Published Chapters

This publication includes three chapters organized by the following topics:

Chapter A: Non-destructive scanning instruments

Chapter B: Public Agencies

Chapter C: Third-Party Support Services

Unless otherwise noted, each chapter includes presenter biographies, presentation abstracts, and presentation recordings.

Virtual Core Libraries –

Implementation and the impacts of making this resource readily accessible. Insights from the Geological Survey of South Australia and AuScope's National Virtual Core Library

Talk Date: April 14, 2022

Abstract: The work of the Geological Survey of South Australia (GSSA) is critical to the continual growth of South Australia's minerals and energy resource sector, and to our understanding of the state's geology and resource potential. The understanding and development of mineral systems models across the state is achieved through spectral scanning (HyLogger 3™) and interpretation of geological materials housed at our Drill Core Reference Library. Geoscientific data is then made available to industry stakeholders, and university researchers through our online portal – SARIG – the South Australian Resources Information Gateway and the National Virtual Core Library.

(https://energymining.sa.gov.au/minerals/geoscience/geological_survey/about_the_gssa#mineral_systems)

AuScope's National Virtual Core Library Infrastructure program is the world's largest drill core mineralogical database, freely accessible to users anywhere in the world. NVCL's hyperspectral reflectance spectra is available via the AuScope Discovery Portal.

(<https://www.youtube.com/watch?v=OgGosN3KbZo>)

The CSIRO-developed HyLogger-3 hyperspectral core-scanning system is the backbone of the NVCL infrastructure. Users can find these HyLogging systems in six State and Territory geological surveys together with experts who operate instruments, perform quality control on data, and upload it to the AuScope Discovery Portal for open access. Survey staff also use the collected data to build case studies to help users utilise NVCL data.

The NVCL team offers workshops several times a year to help provide students, researchers and industry geologists with the background knowledge and tools to make the most out of the NVCL datasets. These workshops focus on accessing and the use of NVCL datasets, including case studies and a hands on TSG training component. We also organize a yearly NVCL technical meeting which brings together the entire NVCL community for discussions and knowledge transfer on the advances in data collection, interpretation and analysis.

Both the GSSA and the NVCL are committed to providing findable, accessible, interoperable, and reusable (FAIR) data to the geoscience community.

Link to Video: <https://doi.org/10.14509/30882>

Virtual Core Libraries –

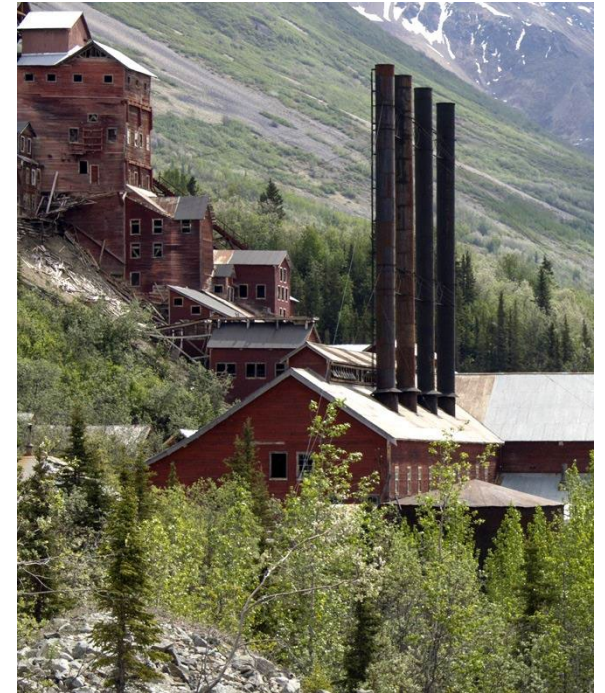
Implementation and the impacts of making this resource readily accessible. Insights from the Geological Survey of South Australia and AuScope's National Virtual Core Library

Talk Date: April 14, 2022

Speaker: Georgina Gordon, Geological Survey of South Australia | georgina.gordon@sa.gov.au
Carsten Laukamp, CSIRO Mineral Resources | Carsten.Laukamp@csiro.au

Georgina Gordon is the Senior Spectral Geologist at the Geological Survey of South Australia. She currently works on spectral analysis and interpretation of mineral systems in Adelaide using non-destructive technologies. Strong research professional with a BSc (Hons) focused on structural geology from University of Adelaide.

Carsten Laukamp is a principal research geoscientist at CSIRO Mineral Resources (Perth, Australia) and leading the AuScope National Virtual Core Library Infrastructure Program. Carsten explores the potential for combined use of reflectance spectroscopy, geochemistry and geophysics for 3D mineral mapping and exploration through cover.



Link to Video: <https://doi.org/10.14509/30882>

Hyperspectral Imaging as a Public Geoscience Tool –

Early results of a drill core digitization program in Newfoundland and Labrador, Canada

Talk Date: April 27, 2022

Abstract: Newfoundland and Labrador (Canada) houses over 1.6 million meters of archival drill core in provincial libraries, and is thus an ideal site for a core digitization program. A recently launched hyperspectral scanning project in Newfoundland and Labrador will be presented, with preliminary results on several mineral deposits highlighting the capabilities of a newly developed instrument spanning the entire VNIR-SWIR-MWIR spectral ranges from 400-5400 nm and LWIR 7500-13000 nm.

Speaker: Phillip Lypaczewski, College of the North Atlantic |
philip.lypaczewski@cna.nl.ca

Dr. Lypaczewski completed his B.Sc. in geology at McGill University, and his Ph.D. in hyperspectral imaging at the University of Alberta. His main research interests are in the applied use of lab- and field-based hyperspectral instruments for the mining industry. Particular research areas include the development of fundamental spectroscopy of minerals, and the development of spectral metrics that have direct applications to the mining industry, either by allowing vectoring towards mineral deposits, or by characterizing exploited material directly at the mine site.



Link to Video: <https://doi.org/10.14509/30882>

The Mining Innovation Commercialization Accelerator (MICA) and the role of Canadian Colleges in advancing geosciences

Talk Date: May 4, 2022

Abstract: Research activities are a relatively new undertaking for Canadian colleges. It wasn't until the start of the 21st Century that applied research was even being considered by colleges in Canada. The barriers faced by many colleges at the time was the lack of funding and faculty time to undertake research. In the last 20 years, with support from the Federal and Provincial governments, colleges have exponentially increased their capacity to undertake research and in doing so have enriched the student experience; quality of college graduates; maintained engaged faculty who are up to date with industry needs and practices; and contributed socially and economical to the communities they serve. In 2019, across Canadian colleges 7,300 research partnerships generated over 4,400 innovations, including new processes, products, prototypes and services, approximately 87% of which were completed in under one year. Government funding in Canada has increased over the last 20 years from virtually zero to \$144M per year in 2017-18.

In 2021, the Centre for Excellence in Mining Innovation (CEMI) launched the Mining Innovation Commercialization Accelerator (MICA). This \$112.4-million five year initiative is supported by an investment of \$40 million by the Government of Canada's Strategic Innovation Fund (SIF).

"A primary objective of the MICA network is to increase the number, scale and market reach of Canadian mining SMEs, producing high-tech solutions to accelerate the low-carbon transition," Douglas Morrison, CEMI CEO.

Two of the 7 national partners in this initiative are Colleges, Saskatchewan Polytechnic, Saskatchewan and the College of the North Atlantic, Newfoundland and Labrador. This highlights the role and impact that Colleges in Canada now have on the innovation ecosystem not just for mining but for all sectors.

Link to Video: <https://doi.org/10.14509/30882>

The Mining Innovation Commercialization Accelerator (MICA) and the role of Canadian Colleges in advancing geosciences

Talk Date: May 4, 2022

Speaker: Gary Thompson, College of the North Atlantic | gary.thompson@cna.nl.ca
Douglas Morrison, Centre for Excellence in Mining | dmorrison@cemi.ca

Dr. Gary Thompson, the Director of Industry Innovation at the College of the North Atlantic, has been involved in the mining and mineral exploration industry undertaking applied research in Newfoundland and Labrador for the past 18 years. He has 30 years of national and international research experience, has published in respected international journals and is a registered professional geoscientist. He continues to work extensively with all sectors of the mineral industry in Newfoundland and Labrador including industry partners, the Government of Newfoundland and Labrador's Department of Industry, Energy and Technology and Memorial University. He helped establish the Mining Innovation Network (MIN) at the College of the North Atlantic, which includes key personnel, the Applied Mineralogy Laboratory, the Mineral Processing Laboratory and the Hyperspectral Scanning Unit (HSU). In 2019 he was recognized as Geoscientist of the Year by the Newfoundland and Labrador Branch of the Canadian Institute of Mining, Metallurgy and Petroleum.

Douglas Morrison, CEO of the Centre for Excellence in Mining innovation (CEMI), has over 35 years of mining experience, operational engineering in deep underground metal mines, and consulting internationally on mine safety and productivity. His focus has always been on innovation and at CEMI, he is directing the development of the continuous, autonomous technologies that are essential for mines to dramatically improve their productive capacity at lower cost. CEMI is also developing solutions to help mines improve their waste management practices and find ways to operate in collaboration with agricultural and indigenous communities for more sustainable and self-sustaining outcomes. CEMI's new MICA Network continues to seek out solution providers in every sector of the economy to help the mining industry become more productive, more progressive and more profitable.

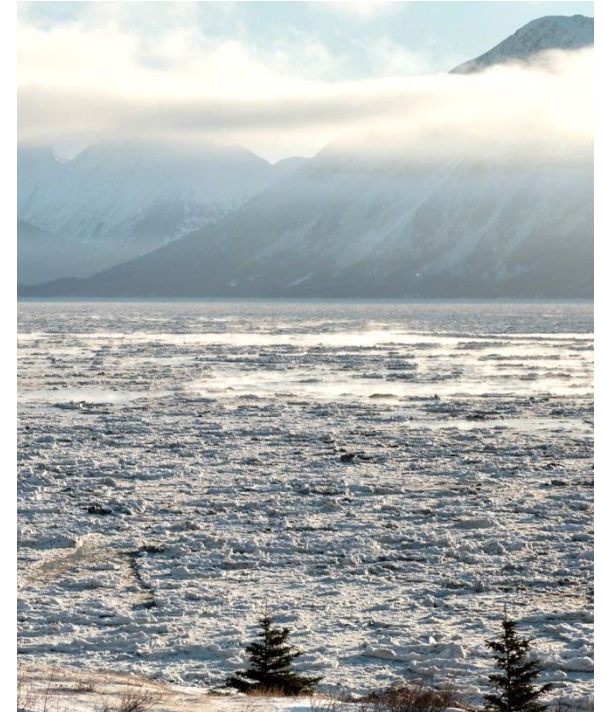
Link to Video: <https://doi.org/10.14509/30882>

Diskos 2.0: The National Digital Resource for Exploration and Production in Norway

Talk Date: March 30, 2022

Abstract: National Data Repositories (NDR's) have provided government regulators, national oil companies, operators and other stakeholders with an effective means of preserving their data assets, promoting their investment potential and protecting their interests in hydrocarbon reservoirs. Recently, the Norwegian consortium (Diskos) that manages data for the Norwegian Continental Shelf has undertaken a digital transformation journey to upgrade their National Data Repository to a National Digital Resource – Diskos 2.0. By doing so, they will be able to make the Diskos E&P repository a digital hub for E&P activity in the country and not just a data file repository or archive. In this session, we will explore:

- The value a National Digital Resource provide to local industry stakeholders: regulators, operators and others
- The Diskos 2.0 NDR – what it contains and how it is implemented both technically and administratively
- Specific examples of how subsurface data can be integrated including seismic, well and rock sample data, and
- Advanced digital process for the acquisition, management and digitization of E&P data including rock and core samples.



Link to Video: <https://doi.org/10.14509/30882>

Diskos 2.0: The National Digital Resource for Exploration and Production in Norway

Talk Date: March 30, 2022

Speaker: Dale Blue, Halliburton | dale.blue@halliburton.com
Caroline Mignot, Ingrain (Norway) | caroline.mignot@halliburton.com

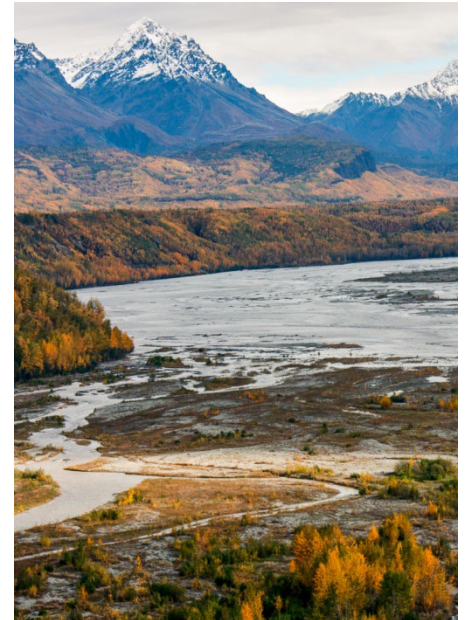
Dale Blue is the Global Business Manager for Digital Solutions in Halliburton Landmark's Global Services group in Houston, Texas and is a career long E&P Information Management Specialist.

He has 32 years of experience leading and executing data strategy and governance programs. Dale has worked with government agencies, NOC's, IOC's and small independent operators around the world to digitally transform their businesses with best-in-class information management systems and best practices. He has a broad range of expertise ranging from the archiving of legacy digital media to defining data management strategies and solutions around the latest cloud-based technologies.

Caroline Mignot holds a Geology BS from the Federal University of Rio de Janeiro (Brazil), Post-Graduation in Marine Geology focused on Stratigraphy at Utrecht University (Netherlands) and Master's in Business Administration, from Getulio Vargas Foundation.

Works with Digital Rock since 2014, applying the technology to optimize reservoir characterization for diverse oil plays scenarios, from conventional to complex conventional. In 2018 she led Halliburton Digital Rock Lab in Brazil, leading exploration and mature fields projects with Shell, Exxon and Petrobras.

Currently based in Norway, she works as Digital Rock Solution Advisor and Business Development for Europe, Eurasia and Sub-Saharan Africa Region.



Link to Video: <https://doi.org/10.14509/30882>

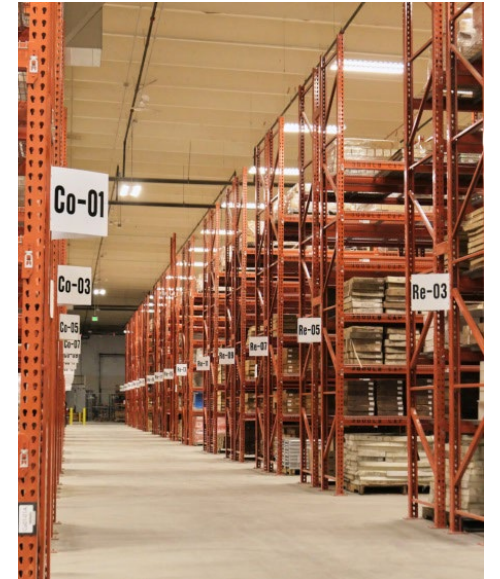
Promise and Challenge of Digital Rocks

Talk Date: March 9, 2022

Abstract: Non-destructive rock scanning technologies offer developing opportunities to both preserve information and leverage repository collections through production of consistent large-scale analytical digital datasets, at the cost of increasingly complex support. Rock digitization can help preserve a record of rock properties to resist sample degradation, help conserve sparse rock material from oversampling, create new research pathways, and extend digital access of repository collections to researchers across the globe. Support for scanning instruments requires significant IT infrastructure to host and serve very large data objects, increased staffing for scanning logistics, long-term fiscal project support, and overall greater operational challenges. This talk also briefly reviews some of the current scanning digitization technologies, how demands on repositories are shifting, what changes to the geologic support infrastructure do researchers require, and how digitalization is changing the research process.

Speaker: Kurt Johnson, Alaska Geologic Materials Center | kurt.johnson@alaska.gov

Geologist Kurt Johnson is the Curator of the Alaska Geologic Materials Center (GMC) in Anchorage, Alaska. He looks to build public and private research partnerships to leverage GMC rock collections to improve regional understandings of Alaska's numerous complex geologic settings. He and his staff leave no "stone" unturned to bolster public accessibility to collections via development of stronger database schemas, improving metadata, and progressing web interfaces to more intuitively find and distribute public datasets. In addition to helping establish and operate the Alaska Museum of Science and Nature he has worked with state, federal, international, energy, mineral, and education organizations during his 40 years in Alaska.



Link to Video: