

DODEX – Geoscience Documents and Data for Exploration in Greenland

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In the following we describe the project Geoscience Documents and Data for Exploration in Greenland, in short DODEX. A central part of DODEX is an interactive web application (<http://www.geus.dk/dodex/>) that provides easy access to all non-confidential company geoscience reports received by the authorities in Greenland and Denmark in accordance with the Mineral Resources Act of Greenland (1 January 2010) and associated regulations. From the web application it is possible to search in the DODEX report database using alphanumeric and geographic search criteria and to access report metadata. It is also possible to download the actual report as a PDF file. In addition to the open DODEX web application, the project also includes the development of a closed web application where authorised users can access

confidential reports. The DODEX project was carried out at the Geological Survey of Denmark and Greenland (GEUS) in cooperation with the Bureau of Minerals and Petroleum (BMP) under the Government of Greenland as part of the promotion of the mineral resources of Greenland.

Data handling and database

The Mineral Resources Act of Greenland stipulates that companies holding licences for exploration or exploitation must submit reports on and data from their activities in Greenland to BMP. These reports are forwarded to GEUS where they are scanned and entered into the database. Most new reports are confidential for a specific period of time. In

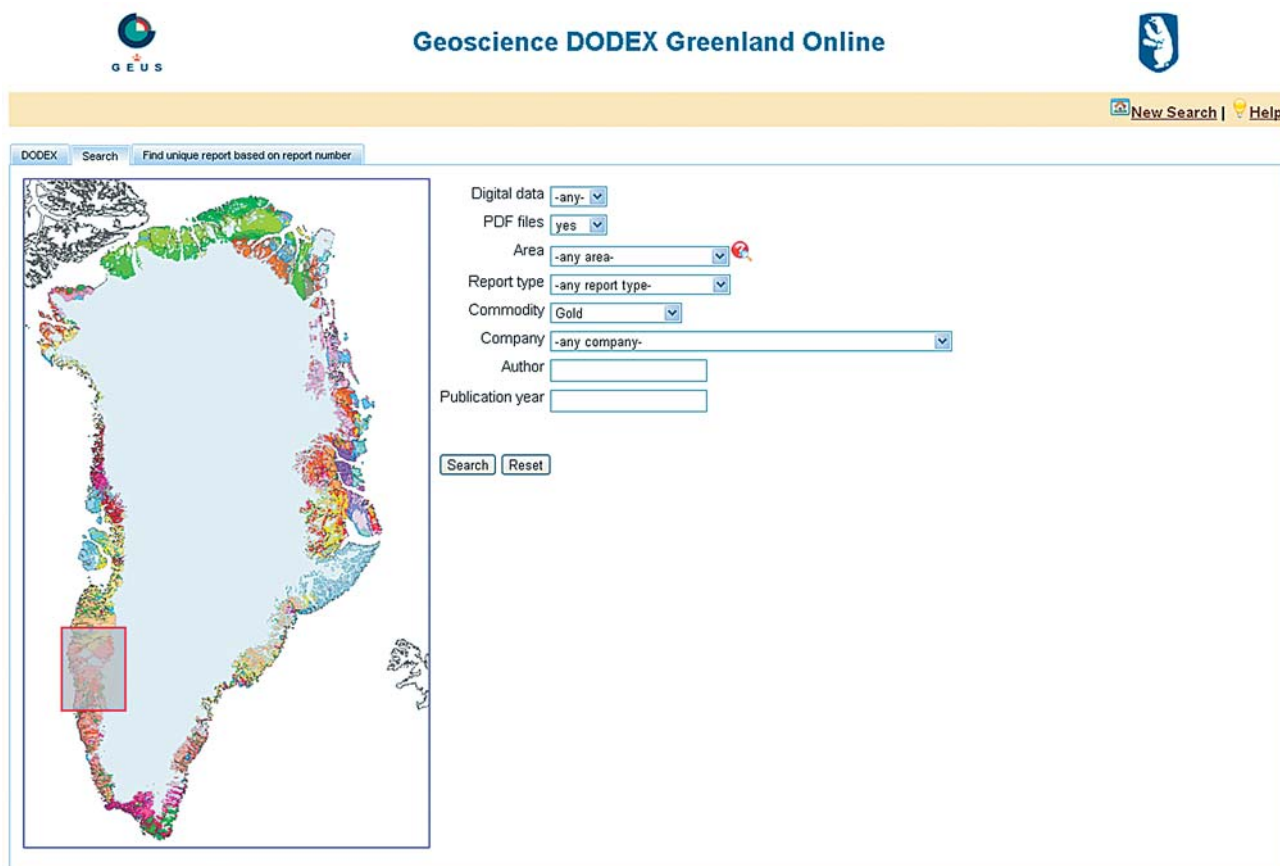


Fig. 1. The DODEX web application allows users to search the database using alphanumeric or geographical search criteria. Here the user searches for reports on gold in PDF files. The research result will include all reports with geo-references located in the marked red rectangle.

Search Result (13 reports) | View Selected Report (21745) | Selected Reports for Download

Report 21745

Title: Mineralogical and Geochemical Examination of four samples from Greenland. Internal report, Ujarak Minerals, 5 pp., 3 appendices.

Authors: Grammatikopoulos, T. & Jøge, B.

Publication year: 2000

Report type: Company report

Language: English

Number of printed pages:

Keywords:

Commodities: Gold

Comments:

Image © 2011 DigitalGlobe
Image © 2011 TerraMetrics

©2010 Google

Add Geology | Redraw Polygon

PDF Files

Type	file name	file size	comments	Add to basket
Main report	21745_1.pdf	798 kb		Add

Fig. 2. The report geo-reference is marked by a blue polygon, while other metadata are listed in the information window.

the case of exploration licences, after a five-year confidential-ity period, or two years after the relinquishment of an ex- ploration licence, the geoscience reports and submitted data will be considered to be in the public domain and become available to all.

Besides entering new reports as they are received at GEUS, we also continuously update the database by scanning and geo-referencing existing reports. The geo-references are poly- gons that represent areas that are treated in the report. Many of the reports were loaded into the database from older da- tabases, and for most of those the area of interest was auto- matically defined as the area covered by the licence. Many of these geo-references have later been edited to represent more accurately the locality or localities treated in the report, and this process of narrowing the areas of interest will continue. New reports entered into the database will be geo-referenced at the time of registration as accurately as practically possible.

The reports and report metadata are stored in a relational database housed and maintained by GEUS (Tulstrup 2004). The DODEX database model is designed to hold quite a long

list of report metadata including obvious parameters such as authors, company, year of publication and commodities described, but also more complex parameters such as geo- graphic reference, confidentiality, and status with respect to quality assurance. At the time of writing the DODEX data- base contains 2151 reports, of which 1197 are non-confiden- tial. Of the 1197 released reports 784 have an associated PDF file, and 731 are geo-referenced.

User and quality control

User control is implemented by database roles that define five different user types, listed with increasing privileges:

1. The public users are only allowed to access non-confi- dential reports that have been quality assured, and are released. Public users correspond to users of the publicly available DODEX search web application (Figs 1, 2) de- scribed in the next section.
2. The trusted users are given a username and password that allow them to log into a restricted web applica-

NOTE: In this mode, DODEX will display public and confidential information in mixed order. It is the user's responsibility that confidentiality is not compromised.

Status for Report: 'Mineralogical and Geochemical Examination of four samples from Greenland. Internal report, Ujarak Minerals, 5 pp., 3 appendices.'

- ✓ The report has a GEUS File No.: '21745'
- ✓ The report has an accompanying pdf-file: [21745_1.pdf](#)
- ✓ The report is a: 'Company report'
- ✓ The report is georeferenced
- ✓ The report is released for display
- ✓ The report has quality status: Approved

Supplements:

Supplement Title	Supplement Type	Edit	Delete
Add New Supplement			

Digital data:

Digital data #:	Data Type	Comment	Edit	Delete
Add New Digital Data				

Done



Fig. 3. The DODEX administration is handled in a separate web application, where authorised users, depending on their type can view, update, edit, and delete reports. A screen view of the application for a quality controller to check the status of a report is shown.

tion (Fig. 3), where they can view confidential and un-released reports. Trusted users can only view reports and are not allowed to change the database content.

3. The compilers are also allowed to login to a restricted web application where they can upload and edit reports, however, they are not allowed to change the confidentiality status of reports or release the report for public users.
4. The quality controllers have all the compiler's privileges and in addition the quality controllers can change report confidentiality status and release reports for public users. The main function of the quality controllers is to review the database work performed by the compilers and to control the quality before reports are released.
5. The administrators develop the system, and can create, read, update and delete all DODEX reports and meta-data. Overall, the setup for DODEX user management and quality assurance has proved successful, and hence has been copied in several later GEUS database projects.

The DODEX public search web application

The public search web application that is available at <http://www.geus.dk/dodex/> constitutes the central part of the DODEX project. It is designed to be interactive and easy to use, providing easy access for interested parties around the world to all non-confidential company geoscience reports on Greenland. From the web application it is possible via alphanumeric and geographic search criteria to search the DODEX report database (Fig. 1). Greenland covers a large geographical area, and an important aspect of the project is that reports are geo-referenced to allow searches in the database for reports relevant for a particular part of the island. The geo-reference polygons of the reports are used for searches on a map of Greenland (Fig. 1). To minimise transmission time, a relatively simple geological map is used on screen in UTM zone 24, with search polygons calculated in decimal degrees, which are the units for the coordinates of report polygons. The search will extract from the database all reports with

an area of interest overlapping the search polygon. Alphanumeric search criteria can be combined with a geographic search (Fig. 1). For the individual reports, public users can obtain a long list of report metadata and download the actual report as a PDF file. It is also possible to add reports to a shopping cart and subsequently get several reports sent by e-mail.

Each search is logged and stored in the database. Since its start in 2008, we have registered a total of 3271 queries from 212 individual users. Most often queries are based on geographic location, with North Greenland and South-West Greenland being the two most popular regions. The two hitherto most sought after commodities are gold and niobium.

DODEX administration

The DODEX administration web application is developed for three user types: trusted users, compilers and quality controllers. The administration web application demands login username and password. Security is implemented in the web application. It also uses a dedicated one-to-one connection to the database, adding a second layer of security provided by the underlying Oracle database authentication and authorisation procedures. This means that when a DODEX user logs into the web application the user will also log into a dedicated Oracle account. At database level, the authorisation ensures that the users are able to select only data they have the privilege to see, and to create, update and delete. The administration web application is designed to make it easy for the various user types to perform their individual tasks, for example providing the quality controller with an overview of the status of a report (Fig. 3).

Concluding remarks

The joint GEUS-BMP DODEX project supports GEUS' obligations, described in the 2008–2011 ministerial con-

tract, to make relevant geoscientific data from Denmark and Greenland accessible to the general public and private companies. The project is in line with GEUS' ambitions to embrace the ongoing development in information technology, and, in particular, the advance in web technology to develop more effective tools to make the large quantities of scientific data we hold in our databases available to a broader public (e.g. Riisager *et al.* 2010; Hansen & Pjetursson 2011 – this volume).

The DODEX project represents the first attempt at GEUS to use new open-source Java frameworks such as Hibernate, and various Java Server Faces frameworks. These steps to modernise software development at GEUS have proved successful and are now incorporated in its database and software group.

Most importantly, the DODEX project has resulted in a new database for geoscience reports on Greenland, and web tools for GEUS personnel to update and extend this database, and public users to see and download non-confidential reports. Hence, DODEX has reduced much of the work at GEUS with organising reports, and photocopying and mailing reports to interested parties, and at the same time made the reports more readily available to the outside world.

References

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