aFieldWork

An Android App for offline recording of geological localities

GEUS has used the Canadian based ArcPDA Ganfield system for data collection during fieldwork in Greenland for some years. With PDA's going out of production a replacement system was needed and aFieldWork developed.

The main objectives are to provide field geologists working out of small field camps in harsh and remote areas, such as in Greenland, with a quick and efficient way of (1) recording geological information on geological localities in digital format and (2) visualizing existing digital geodata in the field, (3) enabling and securing consistent data reporting (i.e. descriptions and classifications of geological features), and (4) allowing the data to be quickly and efficiently transferred into central databases and GIS environments once out of the field.

As simple Android app for description of geological localities was developed as a pilot project. Android devices were selected as hardware based on the large number of devices available, devices in different sizes with several "rough" versions, and with external/removable SD Cards for data storage, which can be removed if the device is broken. With this first version it is possible to collect information about localities, describe samples, record structural measurements (made with a compass) and photographs taken with a camera. All data are stored in a SQLite database on the devices external SD Card to make it easy to transfer data to central database after fieldwork.

This early version was tested during GEUS fieldwork in 2012 on four different devices ranging from 3.5" to 7". The geologist liked the much more responsive interface on modern smartphones compared to the older PDA. Also the screens are much brighter and easier to use than the more dim PDA screens. Based on the experiences from this test we decided to extend the application with off-line geological maps, use of the devices built-in camera and a sketching function to allow the geologist to add notes and simple drawings on pictures and maps. It was also decided to use 5" to 7" devices.

For GEUS fieldwork in 2013, 11 Samsung Galaxy Note II and 2 Samsung Galaxy Tab 2 7" were purchased and these are used in different localities from the far north-eastern to south-western parts of Greenland.

Description of localities

1. Easy data entry through selection lists.
2. Locality (co-ordinates from gps):
3. Earth materials
4. Rock class, type or name from lists
5. Metamorphic grade
6. Minerals ore and alteration
7. Colour
8. Fossils
9. Primary and secondary texture

Samples

1. Automatic numbering
2. Type of sample
3. Purpose of sampling

Structure measurement

1. Type, class and detail from selection lists
2. Measurement from compass or sensors

Photos

1. Internal or external camera
2. Draw sketch and add notes on pictures

Samples and structure measurements are bound to an "earth material" description

All data are stamped with user and date and time.

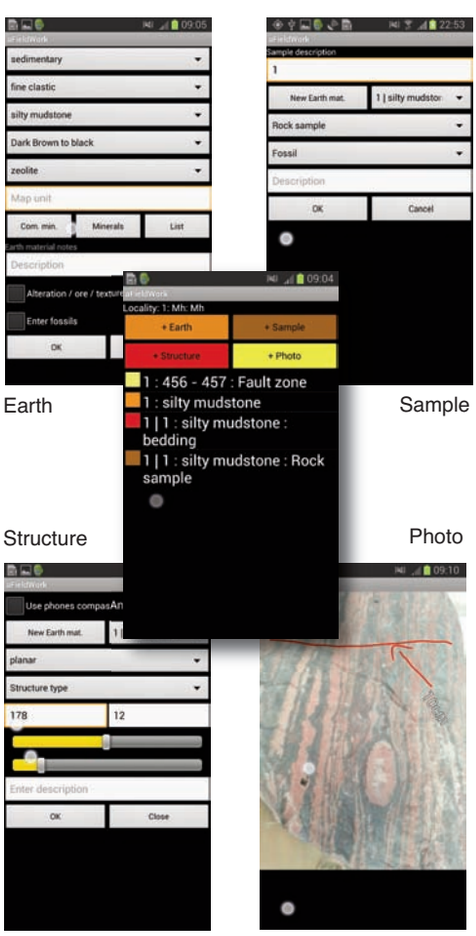
Map view

Map tiles stored in a standard SQLite database. This database is created before field work. The free Open Street Map are used as base map (zoom level 0 to 5), the geological map of Greenland are used from zoom level 5 to 10 (total of 273,861 tiles), in one case orthophotos from a small area are used for zoom levels 11 to 14.

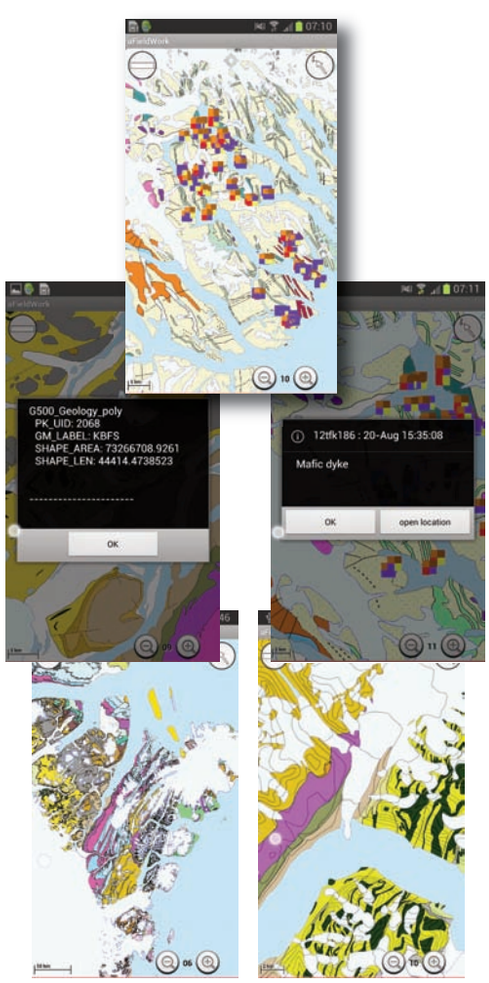
Geological features stored in a Spatialite database (SQLite database with spatial extension). This database stores geological polygons, geological trends, geological lines and elevation contour lines.

By storing these features in a spatial database they becomes searchable and drawable. In the current version the spatial database is used to draw contour lines on the tile map, to give the user information about the geological map and contour lines and a geological legend for the area displayed.

Description of localities



Map view



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