

BSES Disko Island Expedition, Greenland 2007

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Introduction

The British Schools Exploring Society (BSES) is a youth development charity that organizes expeditions for Young Explorers (YEs) to remote environments with an emphasis on the challenging nature of such extreme regions and scientific research. An experienced team of mountaineers, scientists and medics accompanied 50 YEs to Disko Island, Greenland, in July and August 2007, where we spent almost 5 weeks exploring the island. I spent a further 12 days in Greenland hiking.

It had initially be planned to explore the valley Kuannersuit Kuussat (69 38'N 053 17'W). However, when the advance party was trying to access the valley from the fjord, the maps failed to show the large delta that was at the mouth of the valley. As the boats were unable to transport the equipment to this valley, a new site was located, just to the west, Kugssuaq (69 34'N 053 31'W) (figure 1). This became the new science valley.

There were two main projects designed for this expedition; a glacial-geomorphology project and a biodiversity project.

I was responsible for planning and co-ordinating the biodiversity project that involved 6 leaders and 36 YEs, as well as data collection and analysis.

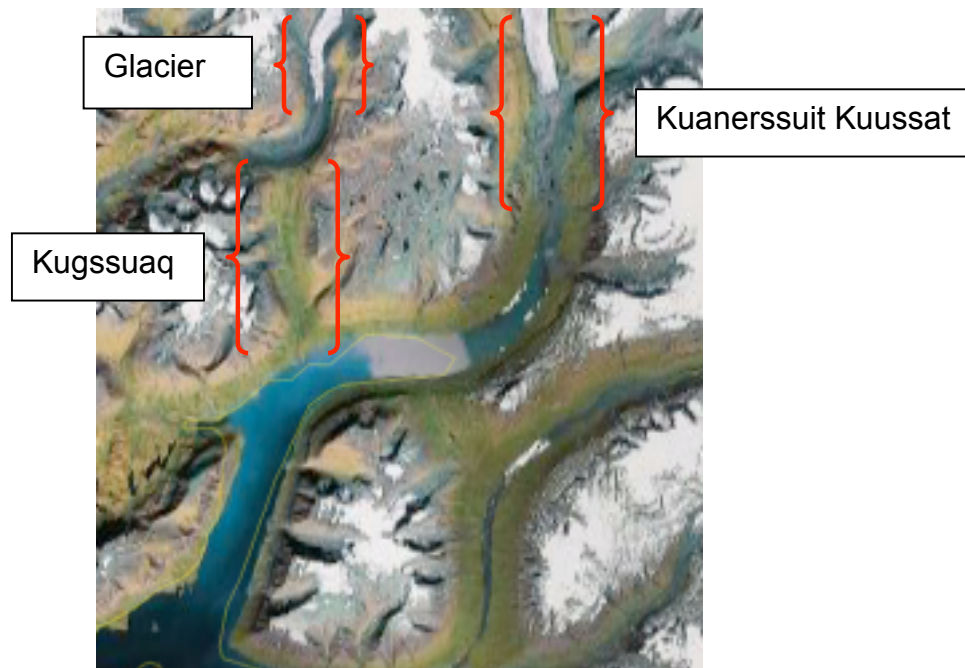


Figure 1. Kuannersuit Kuussat (old science valley) on Disko Island, West Greenland, and Kugssuaq (new science valley). The glacier, which was part of the Glacier phase of the expedition, is also indicated. Image courtesy of Google Earth.

Biodiversity Project: Methods and Results

Three groups on the expedition took part in the biodiversity projects Croft, Ker and Rasmussen. Although each group contributed to an overall biodiversity, the groups were responsible for their own individual planning, implementing and recording of their investigations.

Croft group - Profiling and vegetation sampling

Croft used standard field techniques to produce belt transects of the vegetation and profiling to record the geomorphology of the land at Science camp. They also recorded any signs (feathers, footprints etc) of animals

Ker group - NDVI recording

Normalised Difference Vegetation Index (NDVI) is a derived method to measure the productivity of vegetation. Vegetation reflects both visible and infrared light, and by measuring the reflectance of the two bands a NDVI measurement can be calculated. NDVI measurements can be taken from satellite sensors or from ground level.

Currently satellites are the most common method of taking measurements. However, there is a lack of detail about the type and species of vegetation associated with different readings. Ker group was responsible for recording NDVI measurements and the types of vegetation, a process called ground-truthing. They took 149 pictures of vegetation and the associated NDVI readings, the first recordings from this area.

Rasmussen group - Meiofaunal sampling

As part of the biodiversity theme, Rasmussen sampled small invertebrate (meiofauna) diversity of science camp. Rasmussen collected moss and soil samples from around science camp. Some samples were extracted in the field and examined (figure 2a and 2b).

Another 12 samples were taken back to Edinburgh University for further sampling and molecular analysis.



Figure 2a

Phil (2a) and Emma (2b) examining moss samples under the microscope in field. Note the improvised lab bench.



Figure 2b

Conclusions and discussion

Part of the BSES mission statement is to undertake scientific projects in challenging environments. The projects were designed to be not only at an appropriate level for the YEs but also to inspire them. The projects relied on leaders' knowledge and expertise, and by the end of the science phase, some YEs were almost as knowledgeable as the leaders.

We encountered a few technical hitches (such as having to change science valleys) but that is the nature of expeditions. We improvised and adapted our plans as needed.

All of the YEs (and most of the leaders) acquired new knowledge of the flora and fauna found on Disko Island and in the Arctic, as well as experience in field survey techniques.

We have the first NDVI measurements and associated photographs from the region and work is underway to characterize the meiofaunal biodiversity sampled in the Kugsuaq valley.

Summary of support

Financial

University of Edinburgh; Weir Fund for field studies.

British Schools Exploring Society; Leader Support Fund.

Both funds provided £500 support, which covered the costs of the flights and BSES membership (which included insurance). Personal equipment was purchased privately.

Special thanks to Anthony Newton, Department of Geography, University of Edinburgh and Mark Blaxter, Institute of Evolutionary Biology, University of Edinburgh.

Appendix 1: Itinerary of expedition

Date	Action	Details
12th July 2007	Depart UK to Denmark	Fly Newcastle to Copenhagen (2hrs)
13th July	Denmark to Disko Island	Fly Copenhagen to Kangerlussuaq (4hrs) to Aasiaat (45mins)
		Ferry Aasiaat to Qeqertarsuaq (3.5hrs)
17th July	Qeqertarsuaq to Science Camp	Boat from Qeqertarsuaq to Boat camp (BC) (4hrs) to Science camp (SC) (1hr)
18th July	Science phase begins, Ker group arrive at SC	Ker group begin science phase
19th July	Food dump	Walk up to head of science valley (7hrs)
21st July	Croft group arrive at SC	Croft begin science phase
24th July	Rasmussen arrive at SC	Rasmussen begin science phase
27th July	Glacier phase	Walk to glacier and ice-skills training (all-day)
		Ice camp
1st August 2007	Heli-Evac	Helicopter evacuation of injured leader
		Walk off ice
2nd August	Return to SC	Day walk from snout of glacier to SC
6th August	Pack up SC	Packing up SC including tents and equipment
7th August	24hr solo	SC to Island in fjord (1.5hrs), 24hrs with no contact with anyone
8th August	Return to BC	Boat transfer (20mins)
9th August	Begin packing up BC	Sort excess food and rubbish, cleaning equipment and checking mountaineering equipment
12th August	BC to civilisation	Boat from BC to Qeqertarsuaq (5hrs)
13th August	Packing container	Cleaning of equipment (tents, stoves, crampons etc) and packing equipment and rubbish in the container
14th August	Expedition departs Disko	The main expedition (excluding the advance party and me) begins return journey to UK
15th August	Disko Island to Mainland	Ferry Qeqertarsuaq to Ilulissat (6hrs)
22nd August	Return to Aasiaat	Ferry from Ilulissat to Aasiaat

		(9hrs)
24th August	Return to Kangerlussuaq	Fly Aasiaat to Kangerlussuaq (1hr)
27th August	Return to Denmark	Fly Kangerlussuaq to Copenhagen (4.5hrs)
28th August	Return to UK	Fly Copenhagen to Newcastle (2hrs)
26th January 2008	BSES AGM	Expedition presentation and Science report submission