Non-Technical Project Proposal Summary: **00.00.2011**

Project CASE 12-Vendom Fiord (2011)
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What are we planning to do?
In the field season in summer 2011, the German Federal Institute for Geosciences and Natural Resources (BGR) is planning the geoscientific expedition "CASE 12-Vendom Fiord" to the area between Strathcona Fiord and Vendom Fiord on southern Ellesmere Island. The field work will start by the beginning of August and will be terminated by the end of August 2011. The field work will be divided in (a) airborne aeromagnetic survey and (b) helicopter-supported geological field work. The field party will probably consist of 15 people including scientists, logistic staff and Inuit Polar bear monitors.

Where are we going to do it?

How are we going to do it?
The base camp of CASE 12 will be situated at the abundant landing-strip at the end of Vendom Fiord. The field work will be carried out from this base camp. Transportation of fuel, equipment and expedition staff to Vendom Fiord and back will be done by Twin Otter. No structures will be erected in the field except for the tents in the base camp. The field work will be supported by helicopter during the entire expedition. The helicopter will be used for the aeromagnetic survey as well as for the geological field work: the study area is very big, and the helicopter will be mostly used to bring the field parties in the field in the morning and fly them back to the base camp in the evening.

Why is it important to do it?
Since the beginning of Earth´s history, the development of our planet is dominated by change and evolution. Especially the continents and oceans changed and drifted through time, and the recent geography of our world is just a snapshot of a long development: some 90 million years ago, there was no Arctic Ocean and no North Atlantic, and North America, Europe and Asia have been unified within a large, ancient landmass called Laurasia. The major task of the BGR-project CASE (**C**ircum-**A**rctic **S**tructural **E**vents) is the examination of the recent circum-Arctic continental margins and the processes who resulted in the break-up of Laurasia and finally in the formation of the Arctic Ocean.

Geoscientists of the BGR are working on the onshore geology in the circum-Arctic land masses where the rocks and their structures and deformations can be directly observed. Like surveyors of car-accidents, the structural geologists try to find out the reason and the process of the "accident" by examination the structures of the "crush-collapsible zones" along the recent continental margins, for example, e.g., the western margin of the Barents Shelf and the northern margin of Greenland/Ellesmere Island. The observation of tectonic structures like folds or thrusts enables the structural geologist to interpret the direction, the process and the intensity of a collision of two plates. With the help of paleontologists, the collision can often be dated.

Because the answers cannot be found only in a small part of the Arctic, e.g. Svalbard, examinations have to be extended to see new rock units, structures, metamorphic mountain ranges or sedimentary basins. In geology, it is not possible to make new big theories just by reading papers. One has to go in the field, and by following the Arctic coasts, the process of learning and getting knowledge is continuing and increasing from expedition to expedition. The more we can examine, the more we will know about the evolution of the Arctic. This is the reason why geologists of BGR are working consequently from Svalbard across North Greenland to Ellesmere Island and will continue westwards in the future.

The northernmost part of Ellesmere Island consists of a small microcontinental plate which originally has not been part of the American continent. This fragment of a continent, called “Pearya”, was attached to the recent Canadian Arctic Archipelago not until Early Carboniferous times. Before, Pearya most likely belonged to the Eurasian continental plate: the pre-Carboniferous evolution of Pearya is completely different to the development of ancient North American/North Greenland (Franklinian Basin) but it shows many similarities to the evolution of the Barents Shelf (Svalbard). During the so-called Ellesmerian Orogeny in Early Carboniferous times, Pearya and Svalbard (as parts of Eurasia) approached und collided with the Greenland/North American continental plate forming together the Laurasian continent.

After the break-up of Laurasia and the opening of the Arctic Ocean which separated Svalbard and North Greenland in Cretaceous times, Pearya remained attached to the North American continent forming a small fragment which has originally been part of the Eurasian continental plate. This situation makes Pearya to a key area to understanding the formation of the Arctic Ocean.

Until today, the land areas in the extreme north of Canada are very little explored. Additionally, the water-covered shelf areas north of the Canadian Arctic Archipelago are still unexplored. The knowledge of the structures and architecture of this passive continental margin is very important for the prognostication of the potentials of natural resources like ores or hydro carbons.