

An initiative of coordinated activities on Nordaustlandet, Svalbard, during the International Polar Year 2007/08.

An expression of interest of a multi-disciplinary and international scientific approach by 65 scientists of 15 nationalities, whom proposes 21 integrated potential projects on Nordaustlandet coordinated under the general frame of Polar Exploration and Climate Change,

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This expression of interest is coordinated with the Finnish initiative "Climate change and human impacts in high arctic desert area of Nordaustlandet in Svalbard", separately submitted by Dr. Paula Kankaanpää, Arctic Centre, University of Lapland, Finland.

Summary: We wish to focus research efforts to Nordaustlandet, Svalbard during IPY 2007/08. We present an expression of interest from many disciplines in Earth Science, as well as in Human Sciences to launch a multi-disciplinary thrust on polar exploration, global change, monitoring, and deciphering signals in this rather poorly explored part of the Arctic. We also aim to link our work and monitoring to other *focii* of research on Svalbard during IPY, such as Hornsund and Ny Ålesund in order to get a larger regional coverage of our target zone. We suggest that the old IGY base at Kinnvika is re-vitalized, and that a major camp is erected around the old base. The Kinnvika base can then be used in extension of IPY to monitor various parameters, and provide a temporal credibility to our collected data series. This expression of interest has a strong Nordic axis. The idea to engage in Nordaustlandet as part of IPY evolved independently among Finnish, Norwegian, and Swedish scientists. Because of its initial multi-national character, we have invited colleagues from other countries to participate in this initiative, as an open international operation.

Background

According to the predictions of General Circulation Models (GCMs) of Earth's climate system, one of the most vulnerable regions of climatic change in the Arctic is the northernmost Atlantic Ocean, an area including the Greenland and Barents Seas, and the adjacent Svalbard Archipelago. The reason for this is the excess of heat from the tropics that is advected by the North Atlantic drift up to latitudes of 80° N. This produces large shifts of the edge of the Arctic Ocean pack ice between cold and warm years. If we want to provide information on current direction of changes, then the Svalbard Archipelago is in a strategic position for this task.

Ever since the expeditions by A.E. Nordenskiöld to Svalbard during the first polar year in the mid 19th –century, research in this area has had a strong Nordic component. Svalbard is a part of Norway, but there remains an international involvement on Svalbard, principally through nations that were signatories of the 1920 Svalbard Treaty. The Nordenskiöld expeditions are good examples of Nordic co-operations, since Nordenskiöld himself was born in Finland, then an independent part of the Russian empire, but moved to Sweden, where he organized several Norwegian –Swedish expeditions (Norway and Sweden were in union during Nordenskiöld's days).

General ideas

We intend to focus research activities that fall within the framework of the IPY on the high Arctic island of Nordaustlandet, the northernmost major part of the Svalbard Archipelago (Figure 1). The island is 90% ice-covered, and polar desert and semi-desert ecosystems, underlain by continuous permafrost, dominate the unglaciated terrain. We choose Nordaustlandet as our study site for several reasons:

- (1) In contrast to a variety of extensive research and monitoring activities in southern and western Svalbard, very little research has focused on the northeastern part of Svalbard during the last decades. This is probably due to difficult access and logistics. However, large gradients in climatic and environmental regimes across Svalbard are to be expected. Hence, we expect that a new dedicated research focus in this area will significantly advance our understanding of past, present and future environmental changes in the North Atlantic and Arctic regions. The relatively small human footprint in the area is another important reason to conduct some of our proposed projects.
- (2) Polish efforts during IPY will be focused on changes in the cryosphere in southern Spitsbergen. We intend to coordinate various monitoring protocols, run parallel studies, and to exchange data and participating members between the two Svalbard IPY sites. We also intend to cooperate with the monitoring programmes at Ny Ålesund during the project years.

- (3) Svalbard plays an important part in Nordic polar history. Nordic expeditions were focused here during the two first polar years, and a station was built on Nordaustlandet during the third polar year (IGY 1957). One of our goals is to set the achievements during the earlier polar years in perspective during the coming polar year using the tools at hand by historians of science. This is because the bays surrounding Nordaustlandet carry bountiful information regarding the early exploration and the economic history of Svalbard. Artefacts on the shores and submerged in the bays, together with historical documents of these deeds will tie the present scientific activities in the area with the history of the past through a collaboration between natural sciences, history of sciences and marine archeology. This makes our proposal for activities at Nordaustlandet truly interdisciplinary.
- (4) Nordaustlandet has been subject to research activities as part of previous Polar Years. Our initiative would follow this tradition and directly link to these early efforts, and hopefully also make use of the station built half a century ago. The station, or what is left of it, will serve as a nucleus for new camps that will bring a platform for the general aim of our proposed initiative. This can be propelled using ship-based logistics, taking advantage of the good natural harbours of the Kinnvika Bay.

The focus of our proposal is to establish activities that monitor different aspects of climatic and environmental change (by direct climate parameters, and indirect climate proxies), to retrieve archives of past climatic variability in order to obtain a background perspective against which to evaluate the signals we monitor today, and to explore links between the landscape dynamics of Nordaustlandet today with the dynamics during glacial regimes of the past in lower latitudes. Further, we want to bring an enhanced knowledge of the development of polar exploration of the area, to bring perspective between the economical and scientific drivers that developed into the activities leading up to the present status of the area, and with this tie the spheres between Humanity and Natural Science closer in polar research.

In general, our initiative is meant to provide a broad scientific and logistic platform around which a number of research and monitoring activities can be centered in a truly interdisciplinary manner. These activities, once initiated, are expected to continue beyond the IPY. Due to more difficult access and logistics in this remote northern part of Svalbard compared to the populated and extensively investigated southern and western areas, we consider the frame of IPY ideal, if not essential, for dedicated, effective, multi-disciplinary and international research and monitoring collaboration in this area.

The project ideas

We anticipate to “unleash” a multi-faceted exploration, monitoring, and deciphering activity on Nordaustlandet during, and following, the IPY. Naturally, it is impossible to provide specific details of work-packages at this stage, or of binding agreements by contributing members, since IPY is still some years ahead. We have, however, a condensed list of 21 potential projects with names of 65 scientists from 15 nationalities that are interested in cooperating in a Nordaustlandet initiative, shown in Appendix 1. These projects are generalized under the main themes: *Atmosphere; Biosphere; Climatic and Environmental Archives; Geosphere; Global Change Impacts; Oceanography; Landscape Development; Society; Terrestrial Ice Masses*. The list presents a clear international and multi-disciplinary flavour, which underpins our submission of this letter/expression of interest to ICSUs planning board for IPY. We also submit a more elaborate description of the potential projects in Appendix 2. Affiliations of participants is shown in Appendix 3. Maps of the area are shown in Appendix 4.

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