

NERC Arctic Office

Welcome to the first edition of the NERC Arctic Office newsletter. The Office was established in 2009 by NERC in order to provide support to the UK Arctic research community and it is hosted at the British Antarctic Survey (BAS) in Cambridge. As part of its remit, the Arctic Office will continue to build on existing links to international collaborators and to assist UK researchers with the planning of their logistic requirements. More information can be found on the Arctic Office website at <http://www.arctic.ac.uk>.

The office has a team of three people; Cynan Ellis-Evans, Head of the Arctic Office, Nick Cox, Arctic Station Manager and Nicola Munro, Arctic Office Administrator.

Cynan Ellis-Evans oversees science coordination support at BAS and was substantially involved in the development and management of the recent International Polar Year 2007-2008. He has a background of over two decades of research on aquatic microbial ecology and biogeochemistry in both polar regions and in addition to now leading the NERC Arctic Office, is also science coordinator of the NERC Arctic Research Programme, coordinator of the EU funded CAREX project on life in extreme environments and represents UK on the International Arctic Science Committee (IASC) Council.

Nick Cox joined BAS in 1975 and since then has been in the Antarctic, Arctic or both every year in various science support roles. From 1987 he has managed stations. He spent six summers and one winter season leading field research teams in Svalbard. He has managed the NERC Arctic Station since 1991 (its founding year) drawing on his knowledge of the region and its administration.

Having worked with the IPY International Programme Office for the past five years, Nicola Munro's enthusiasm for the Polar Regions has continued to grow. In her role as NERC Arctic Office Administrator, Nicola assists senior management in daily operations and provides administrative support for the NERC Arctic Office.

Update on UK Polar Facilities

NERC Arctic Research Station

In 1991 the NERC Arctic Research Station was one of the four founding members of the international research community at Ny-Ålesund (79°N, 12°E) which now includes fifteen stations owned by ten nations. The total Ny-Ålesund population reaches 150 in the summer. Four stations are open year round (24 hour dark lasts October to February). Of all the seasonal stations we are the busiest, opening all summer and in some years during March and April.



Ny-Ålesund (Bill Block, BAS)

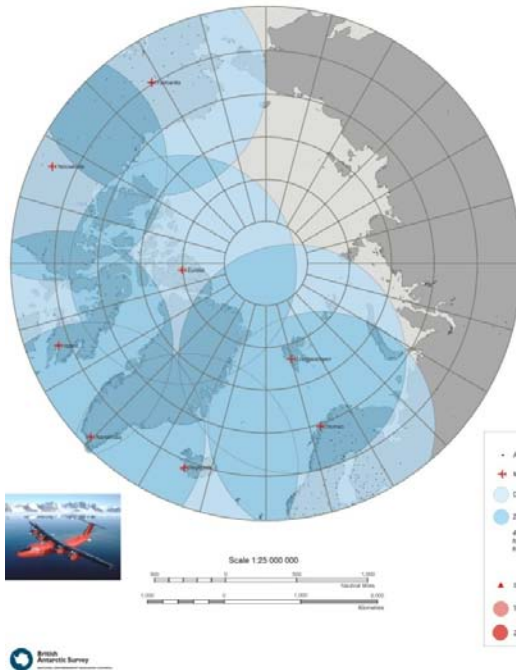
In 2010 the station (managed by BAS) was open June to September. The station was full (often beyond capacity) supporting 14 project groups (8 x terrestrial biology, 3 x glaciology, 2 x marine, and 1 x geology).

During late August the British Ambassador to Norway, Jane Owen, and Stuart Doubleday (FCO, Polar Regions Unit) made a profitable visit including presentations and visits to research sites and other stations.

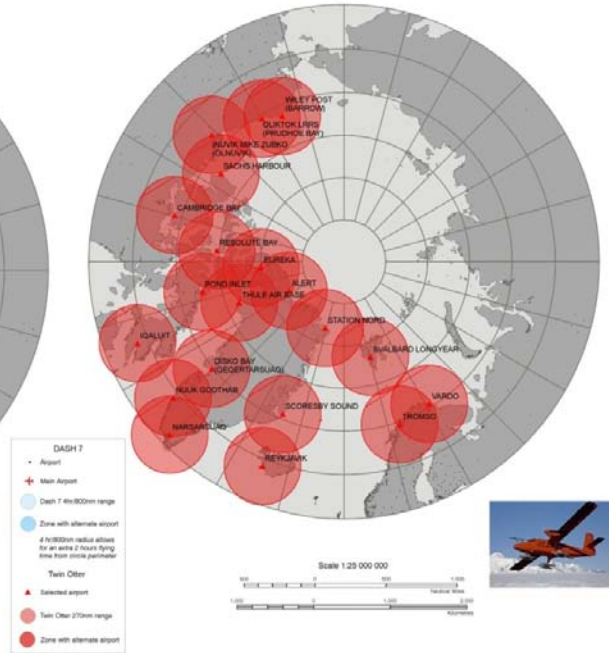
Availability of BAS Aircraft for Arctic Research

BAS currently operates five aircraft for NERC. Four of the aircraft are De Havilland Twin Otters and the other is a De Havilland Dash 7. Although tasked each year for Antarctic support, the Survey has in the past undertaken science support in Svalbard, Greenland and the Canadian Arctic.

Dash 7 endurance from main airports of Western Arctic



Twin Otter endurance from main airports of Western Arctic



The **Twin Otters** have been referred to as the ‘Land Rover’ of the skies – they can be operated on wheels or skis and from very short unprepared landing strips on beaches, gravel, grass or snow. The Survey’s Twin Otters fulfil a logistics and science role. Modifications to all the Survey’s Twin Otters enable operation at higher weights than standard aircraft (6,360kg compared with the normal 5,700kg). Two of the aircraft are solely used for logistic support and usually carry 1000kg of equipment or five people and emergency survival equipment ~400km. Fitting of additional tanks extend the range but limit the room available in these aircraft. The other two aircraft, in addition to this logistic function, have been modified to also be used for scientific surveys.

The survey functions in the past have ranged from vertical aerial photography, hyper-spectral survey (“CASI 1500, SASI 600, TASI 600”), sonar buoy deployment, geophysics and meteorological surveys.

The geophysics equipment includes the following (in combination with a scanning laser altimeter (Regal Q40I) and GPS synchronisation):

- An ice sounding radar with single or full quad polarisation capability.

- Two wing tip mounted Scintrex caesium cs-3 magnetometers (accuracy 0.1 nT at a 10 Hz sampling rate).
- A Gravimeter (accuracy of 3mGal and 5.5km spatial resolution).

The Meteorological equipment fit comprises:

- Turbulence probe
- Radiation, surface temperature sensors
- Cloud probe with aerosol and particle sampling
- Scanning Laser Altimeter

The **Dash 7** is a medium size, four engine “turbo-prop”, originally designed in the 1970’s to fly 50 people on short intercity routes within North America and Europe. It is able to use very short runways (for example London City) and “unpaved” or gravel runways (Greenland Air and various African airlines exploit this ability). For these reasons the Survey selected this aircraft to move staff between the Falklands or South America and the gravel runway at the UK’s largest Research Station (Rothera) on the Antarctic Peninsula.

To enable this task, the aircraft was modified with a cargo door, auxiliary fuel tanks (to extend the range to the inter-continental distances between Falklands and Antarctica

~1600km) and an increased operating weight from 20,450kg to 21,360. The aircraft can carry up to 2000kg of cargo or 14 passengers (or a mix of both) between the continents.

In addition to this primary task, the Dash 7 is also equipped to fill a science role with Magnetometer pods in the wing tips and a Gravimeter to enable geophysical surveys. A grant funded feasibility study is currently examining the possibility of fitting trailing antennas to the aircraft to enable a future ice sounding radar capability.

In recognition of the critical role the Arctic plays in global environmental change the NERC is investing £15m into a five year Arctic Research Programme, over the period 2010-2015. Opportunities to enlist BAS aircraft to investigate the drivers and feedbacks of rapid climate change in the Arctic are particularly timely. These include the development of the NERC polar strategy, the opening of the NERC Arctic Office and the establishment of a UK/Canada Memorandum of Understanding (MOU) (providing access and research collaboration opportunities).

The Survey already has experience of aircraft operations in both Polar Regions and is keen to continue to use the aircraft in the most effective way to support UK science. Please initially contact the NERC Arctic Office (arctic@bas.ac.uk) with any queries regarding use of BAS aircraft to support Arctic science. We can provide realistic costs for grant bids and coordinate with BAS in the planning of support to the UK's Science Programmes in both the Arctic and Antarctic. Note: *NERC ARSF/FAAM aircraft facilities are also available for Arctic research.*

Update on International Polar Facilities

Siberia:

Access to Siberian field research facilities is never entirely straightforward being traditionally coordinated mainly through individual contacts rather than at a national or regional level. A number of facilities are potentially accessible to UK researchers and the Arctic Office can assist in making the appropriate contacts.

A particularly relevant opportunity is that of **Samoylov Field Station** (72°22'N, 126°28'E) which is located on Samoylov Island in the Lena Delta, close to the Laptev Sea (http://www.awi.de/en/infrastructure/stations/samoylov_station/).

It is a focus for major permafrost studies developed under Russian-German (AWI) scientific cooperation and includes long term experimental plots and automated soil and meteorological stations that have been operating for over a decade. The station has facilities for trace gas analysis and microbiological research. Following a visit by Russian Prime Minister Vladimir Putin in 2010 the Russian government has allocated substantial funds to significantly upgrade the facilities at Samoylov Station and this work is currently in progress.



Samoylov Station (Dirk Wagner, AWI)

Further Siberian field stations that we can potentially assist in accessing are:

Northeast Science Station, Cherskii, (69° N, 161°E) which sits in a boreal forest environment and offers year round facilities for Arctic biology, geophysics and atmospheric physics.

Spasskaya Pad Research Station (62°14' N, 129°37'E) a year-round facility which specialises in boreal forest ecosystem studies and includes a CO₂/CH₄ gas flux tower.

Chokurdakh Research Tundra Station (70°48' N, 147°26'E) which is located in a sub-tundra environment and also has a CO₂/CH₄ gas flux tower.

Khibiny Station, Kola Peninsula, NW Russian Arctic (67°38'14"N, 33° 43'31"E) a year round station for glaciology, soil science, biogeography, landscape science, meteorology and geomorphology.

Shapsha-Mukhrino Field Station, Khanty-Mansiysk, West Siberia (60.9 N, 68.7 E) which focuses on process studies in both mires (no permafrost) and a peat area underlain by permafrost.

Canada:

The Canadian Government has announced that the new international **High Arctic Station** will be located at Cambridge Bay, Nunavut and will be built in the next 6-8 years. At present Cambridge Bay has relatively little research infrastructure in place to support international researchers but it is anticipated that the Polar Continental Shelf Programme (PCSP), which operates out of Resolute Bay will facilitate coordination of field project support for the new Station. Ahead of the Station construction the Canadian Government has funded (CAN\$85m) infrastructure upgrades for other key Arctic research facilities across the Canadian Arctic. Many of these facilities are accessible through agreements made with reference to the Canada-UK MOU on polar cooperation.

If you are planning to work in the Canadian High Arctic, please contact the Arctic Office as soon as possible as we can usually advise and help. In particular if a permit is required to work in the Nunavut area we can help ensure the permitting process is completed quickly.

INTERACT: Making Arctic Terrestrial Research come alive

Facilitating environmental research and monitoring the interactions between researchers and local people in the far North through the creative use of long term research sites is the aim of a new European project in the final stages of negotiation. The project - International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT) - will, over the next four years, build capacity for identifying, understanding, predicting and responding to diverse environmental changes throughout the wide environmental and land-use envelopes of the Arctic. The project is funded through the

European Union's FP7 Infrastructure call and involves 32 partners from across the circumarctic region. The project arose from the SCANNET community and the full proposal is available on their website <http://www.scannet.nu/>. The programme has recently announced a call for research focused on the long term monitoring sites involved in the project (see map). *"This is an exciting opportunity to integrate and advance the excellent research conducted in one of the most hostile but important regions of the world and to make the changes there known to the global public"* said Terry Callaghan the project director.



Long term monitoring SCANNET sites

SIOS-PP (Svalbard Integrated Earth System Observing System).

This is an EU funded Framework 7 "Infrastructures" project involving NERC that is tasked over the next three years with developing an international Earth System Observing structure for Svalbard (<http://www.sios-svalbard.org>). Until now all of the fourteen nations working on Svalbard have followed their own national research agenda and have focused fieldwork on the research village of Ny-Ålesund, with some further activities, mainly Norwegian, at the main settlement, Longyearbyen. The intention is that all the nations working on Svalbard cooperate in establishing an Arctic Earth Observing System in and around Svalbard that integrates and complements existing research and monitoring platforms for geophysical, biological and chemical studies with the aim to contribute directly to integrated ES models. This will include

existing, upgraded and new infrastructure organised into a limited number of observation platforms, for example, space, atmosphere, ocean, land, ice. This is intended to develop into an internationally coordinated, nationally funded research hub and the first of the proposed pan-Arctic network of observational stations, envisaged under SAON (Sustained Arctic Observing Network) which is co-sponsored by Arctic Council and IASC (International Arctic Science Committee).

UK Arctic Research

Upcoming Standard Grant Round

The deadline for the upcoming NERC Standard Grant Round is 4pm on 1st July 2011. Please don't hesitate to contact the Arctic Office at the earliest opportunity if you require any assistance with planning your logistic support. A comprehensive list of Arctic stations and infrastructure operated by other nations, which could potentially be made available to UK researchers, can be found on the Arctic Office website: <http://www.arctic.ac.uk/international/index.php>

NERC Arctic Research Programme

In December 2010, 51 full proposals were submitted to the first funding round of the NERC Arctic Research Programme. The moderating panel will meet in May 2011 with the aim of informing applicants on funding decisions by June 2011. If anyone is planning to start work in June 2011, please contact Cynan Ellis-Evans (jcel@bas.ac.uk) to discuss further.

Once the first round is complete, the programme will consider further opportunities, although the majority of research funding is expected to be allocated in Round 1. The earliest that any new opportunities will be published is Autumn 2011.

UK Arctic Science Conference 2011

The University of Leeds will host the next UK Arctic Science Conference on the 14th – 16th September. The meeting will follow the same format as in 2009, with sessions running on the first afternoon, all of day two, and on the morning of day three; allowing a half day for travel at the start and at the end of the meeting

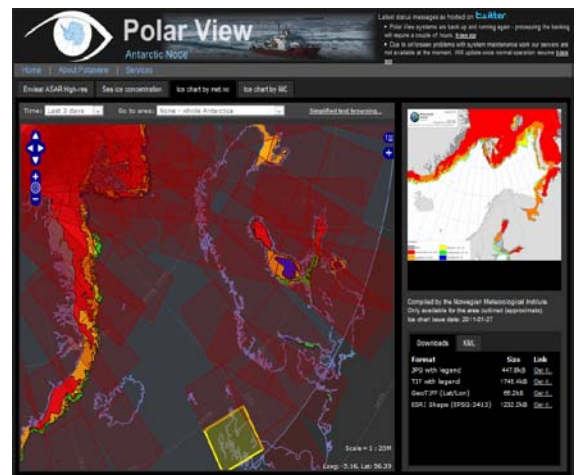
and will include oral presentations and poster presentations.

All enquiries should be directed to arcticinfo@leeds.ac.uk in the first instance. Further details will appear on the UK Arctic Science Conference website soon at <http://www.ukarcticsscience.org>.

Polar View sea ice information now available for Arctic

The Polar View Antarctic service has delivered up to date Southern Ocean sea ice information for the past four years. Through the website it is possible to access data about sea ice concentration, interpreted ice charts and high resolution satellite images. Brought together this provides a comprehensive and detailed picture of sea ice conditions which improves the efficiency and safety of ship navigation.

Recently the service has expanded to cover the Arctic Ocean so that it is now possible to access the same types of near real time data for northern sea ice. A similar range of freely available satellite imagery and ice charts are provided by national ice centres, satellite operators such as the European Space Agency and other information providers. They are accessible either through the high-bandwidth map interface or a simpler query based web page suitable for low bandwidths often experienced on board ships.



In addition to this expansion of geographic coverage, the Polar View service is now able to offer a more intelligent way of delivering information to users based on their specific requirements and their area of operation. The net result is easier access to more relevant

data and better use of expensive ship communication links. For more information please visit the Polar View website at <http://www.polarview.ag> or contact Andrew Fleming (andrew.fleming@polarview.org).

News from International Partners

2011 iAOOS Report: An ocean-observing system for Northern Seas during the legacy phase of the International Polar Year

The 2011 iAOOS Report is released. Over the past four years Bob Dickson (CEFAS) has been coordinating and preparing a series of reports on behalf of the Arctic Ocean Sciences Board (AOSB), now the Marine Working Group of the International Arctic Science Committee (IASC), on how to develop an integrative international ocean observing plan (IAOOS) for Northern Seas (subarctic and Arctic). The latest of these excellent reports was launched at the 2011 Arctic Science Summit Week in Seoul, South Korea and a pdf of the document can be downloaded from http://www.arctic.ac.uk/directory/aosb-2011_lowres2.pdf.

The early reports were largely descriptive of advances made during the focus period of the International Polar Year 2007-2008.

The third report (with Eberhard Fahrback, AWI) began the task of establishing a rational mix of observations to sustain into the future and outlined a set of major questions that reflected current thinking by the science community on the role of Arctic-subarctic seas in climate.

The latest report has been developed with various iAOOS researchers, notably Bert Rudels (University of Helsinki), Craig Lee (UW-APL) and Tom Hain (JHU). It further refines the process to establish a sustained observing system through the IPY legacy years and identifies three major focus areas: Sorting out the Atlantic Water inflows to the Arctic Ocean; Coping with change in the Arctic Ocean water column; and Revitalising ideas about Greenland, freshwater fluxes and the MOC. As always the report includes some of the very latest data and interpretations and provides an invaluable synthesis of current research issues in Northern Seas.

IASC (International Arctic Science Committee)

A major outcome of the International Polar Year was that IASC was identified as the lead international organisation for Arctic science, comparable in many ways to SCAR (Scientific Committee on Antarctic Research) which coordinates all Antarctic science. IASC (<http://iasc.arcticportal.org/>) is in the process of restructuring along the lines of SCAR and has established a set of Working Groups (WG) (terrestrial, marine, atmosphere, cryospheric science and social sciences). Currently UK is represented by Phil Wookey (Stirling) on the terrestrial WG, Julian Dowdeswell (SPRI) is on the Cryosphere WG, Sheldon Bacon (NOC) and Jeremy Wilkinson (SAMS) on the Marine WG. These WGs have now established priority research areas which map well onto the UK Arctic Research Programme and receive annual "glue" money to run workshops and conferences to develop these areas (<http://iasc.arcticportal.org/index.php/home/groups/working-groups>).

Arctic Office Website

The current Arctic Office website can be found at <http://www.arctic.ac.uk> and includes information on both UK and international polar research and facilities along with a news section and calendar of events. Our aim is to upgrade the website this year, to include interactive databases and maps, to assist with further collaborations and logistical planning. If you have any items that you feel should be on the website, please email the Arctic Office (arctic@bas.ac.uk)

Upcoming Events

4th – 8th September: [Polar and Alpine Microbiology Conference](#), Ljubljana, Slovenia

14th – 16th September: [UK Arctic Science Conference](#), University of Leeds. There will be no registration fee, but delegates will have to fund their own travel and accommodation.

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