

Appendix 2: Endorsed IPY projects in or around Svalbard

Out of a 139 proposed IPY projects involving Svalbard or its nearby waters, 35 projects received endorsement for the IPY 2007-2008. These international projects range widely in science field and countries involved – but they all have Svalbard as one major research area. In addition, these projects involve using logistical installments at the archipelago; from the University centre, to optical and radar installations, meteorological stations, ships, helicopters, laboratory facilities, and so on.

Cluster ID 90: Arctic Circum-Polar Coastal Observatory Network (ACCO-Net)

Leading institution: Alfred Wegener Institute for Polar and Marine Research (AWI), Germany

A very sparsely populated region, the Arctic coastline is poorly observed when compared to temperate and tropical coastal zones, despite the fact that human systems in the Arctic are located in and dependent on processes in the coastal zone. Variations in sea ice extent, wave and storm intensity, air and water temperatures, and ground ice content affect the rate and magnitude of coastal change. The Arctic coastal zone needs to be monitored, both as a barometer for global change and for its human relevance. The international effort to align coastal observations in the Arctic is led by the Arctic Circumpolar Coastal Observatory Network (ACCO-Net).

http://www.ipy.org/index.php?ipy/detail/acco_net/

Cluster ID 39: Arctic Palaeoclimate and its Extremes (APEX)

Leading institution: Stockholm University, Sweden

It is common knowledge that the Arctic exerts a critical influence on the Earth's climate and has done so for millions of years. Locked in Arctic ice and sediments are vital records of what the Earth's environment was like in the past. To more accurately predict the future of the Earth's climate, we need to know more about the extremes. Finding out how hot and how cold the Earth was in the past, and how much, as well as how little of it was covered by ice are key questions that APEX hopes to help answer.

<http://www.ipy.org/index.php?ipy/detail/apex/>

Cluster ID 333: Arctic Ocean Diversity (ArcOD)

Leading institution: University of Alaska Fairbanks, USA

The Arctic Ocean environment is undergoing tremendous changes over the last decades with shrinking sea ice cover and increased freshwater run-off and coastal erosion. The documentation of the current state of Arctic marine biological diversity is urgently needed to understand and evaluate the impact of climate change. The Arctic Ocean Diversity project (ArcOD) is an international collaborative effort to inventory biodiversity in the Arctic's three realms (sea ice, water column and sea floor) from the shallow shelves to the deep basins.

http://www.ipy.org/index.php?ipy/detail/arctic_ocean_diversity_arcod/

Cluster ID 11: Arctic Wildlife Observatories Linking Vulnerable EcoSystems (Arctic WOLVES)

Leading institutions: Université Laval, Québec, Canada

ArcticWOLVES will build a network of circumpolar wildlife observatories in order to assess the current state of arctic terrestrial food webs over a large geographical range. The network will provide baseline information to evaluate current and future population trends for a large number of species at several locations using standard protocols. Another aim of the project is to determine the relative importance of bottom-up (resources) and top-down (predators) forces in structuring arctic food webs, and how climate affects these trophic linkages.

http://www.cen.ulaval.ca/arcticwolves/en_intro.htm

Cluster ID 76: Atmospheric Monitoring Network for Anthropogenic Pollution in Polar Regions (ATMOPOL)

Leading institutions: Norwegian Institute for Air Research

The project aims at establishing a long-term Arctic-Antarctic network of monitoring stations for atmospheric monitoring of anthropogenic pollution. Based upon the long and excellent experiences with different scientific groups performing air monitoring within the Arctic Monitoring and Assessment Programme (AMAP), an expanded network will be established including all AMAP stations and all major Antarctic “year-around” research stations.

<http://www.ipy.org/index.php?ipy/detail/atmopol/>

Cluster ID 134: Polar bear (*Ursus maritimus*) circumpolar health assessment in relation to toxicants and climate change (BearHealth)

Leading institution: National Environmental Research Institute, Denmark

Polar bears are indicators of ecosystem health and environmental change such as in sea ice habitat due to global warming. The aim is to examine region-specific effect parameters (histology on internal organs, bone morphology) from necropsy samples taken via local Inuit hunters and haematology samples from the on-going telemetry studies, clitoris biopsies and rectal, vaginal and tracheal swabs and blood samples for bacteriology/virology, cytology and parasitology, vitamin and hormone profiles.

<http://www.ipy.org/index.php?ipy/detail/bearhealth/>

Cluster ID 23: Bipolar Atlantic Thermohaline Circulation (BIAC)

Leading institution: University of Bergen, Norway

Dense water formation in Polar areas; Impact on global ocean circulation and climate
This international team of oceanographers will embark on expeditions to the Polar Oceans with ice going vessels to measure ocean temperature, salinity and currents, ice formation and distribution. They will employ remote sensing as well as bottom anchored instrument moorings to feed global numerical models. The project will try to estimate the impact of dense water formation in the polar regions on the global ocean circulation and climate.

<http://www.ipy.org/index.php?ipy/detail/biac/>

Cluster ID 172: Health of Arctic and Antarctic bird populations (BIRD HEALTH)

Leading institution: University of Groningen, The Netherlands

What does it mean for a bird to be sick? How does this affect not only survival but also reproduction? The aim of the project is to establish the role of parasites and pathogens in determining the size and distribution of arctic and antarctic bird populations.

<http://www.ipy.org/index.php?ipy/detail/birdhealth/>

Cluster ID 175: Contaminants in Polar Regions (COPOL)

Leading institution: Norwegian Polar Institute

COPOL will study the fate, uptake and effects of contaminants in the Arctic and Antarctic ecosystem. The project has two research pillars: 1) the transport and fate of contaminants to and in Polar Regions, and 2) the food web transfer and contaminant status of higher organisms.

http://www.ipy.org/index.php?ipy/detail/copol_contaminants_in_polar_regions/

Cluster ID 40: Developing Arctic Modelling and Observing Capabilities for Long-term Environmental Studies (Damocles)

Leading institution: Université Pierre et Marie Curie, France

DAMOCLES is an integrated ice-atmosphere-ocean monitoring and forecasting system designed for observing, understanding and quantifying climate changes in the Arctic. DAMOCLES is specifically concerned with the potential for a significantly reduced sea ice cover, and the impacts this might have on the environment and on human activities, both regionally and globally.

<http://www.ipy.org/index.php?ipy/detail/damocles/>

Cluster ID 155: Ecosystem Studies of Subarctic and Arctic Regions (ESSAR)

Leading institution: Institute of Marine Research, Norway

ESSAR addresses how climate variability and change affects the marine ecosystems of the polar (Subarctic and Arctic) seas and their sustainability. ESSAR encompasses retrospective and field studies on physics, plankton, benthos, fish and shellfish, marine mammals, sea birds and humans.

<http://classic.ipy.org/development/eoi/proposal-details.php?id=155>

Cluster ID 79: An IPY book series on Environmental aspects in Polar Research (From Pole to Pole)

Leading institution: University Centre in Svalbard, Norway

A book project is planned to summarise all Environmental research in Polar Regions under the umbrella of IPY. All environmental research are encouraged to present their results in review form. The "From Pole to Pole" book series (published by Springer) intend to serve as an encyclopedia in IPY environmental scientific activities for future generations of scientists involved in Polar Research.

http://www.ipy.org/index.php?ipy/detail/from_pole_to_pole_book_series

Cluster ID 37: The dynamic response of Arctic glaciers to global warming (Glaciodyn)

Leading institution: Utrecht University, Netherlands

Changes in the extent of Arctic glaciers will effect sea level, and may lead to substantial changes in sediment and fresh water supplies to embayments and fjords. Glaciodyn is an

internationally-coordinated effort to study the dynamics of Arctic glaciers and develop new tools to deal with this dynamic response. Four of the glaciers studied are located in Svalbard.

<http://classic.ipy.org/development/eoi/proposal-details.php?id=37>

Cluster ID 22: POLARSTERN expedition HERMES - the Nordic margin (HERMES)

Leading institution: Alfred Wegener Institute for Polar and Marine Research (AWI), Germany

The project HERMES is designed to gain new insights into the biodiversity, structure, function and dynamics of ecosystems along Europe's deep-ocean margin to underpin the future development of a comprehensive European Ocean and Seas Integrated Governance Policy. It represents the first major attempt to understand European deep-water ecosystems and their environment in an integrated way (geosphere, hydrosphere, biosphere of a pan-European range). HERMES aims to compare and contrast selected environments around the European margin from high northern latitudes (focus of this IPY proposal) to the Black Sea.

http://www.ipy.org/index.php?ipy/detail/polarstern_expedition_hermes_the_nordic_margin/

Cluster ID 16: Hydro-sensor-FLOWS Arctic and antarctic glacier hydrosystems as natural sensors for recent climatic variations (Hydro-sensor-FLOWS)

Leading institution: CNRS, France

The objective of this clustering project is to investigate the hydrology of polar and subpolar glacier basins and the discharge of subpolar glaciers due to the global warming. The measurements will be done at two different scales on 5 representative polar basins of Arctic (3) and Antarctic (2). The Svalbard location is the Loven East glacier; so study the spatial and temporal hydrological dynamics for the last 40 years in relation with the meteorological data recorded in Ny-Alesund since the 1960s.

<http://www.hydro-sensor-flow.com/>

Cluster ID 14: Integrated ARCTIC OCEAN OBSERVING SYSTEM (iAOOS)

Leading institution: International Study of Arctic Change (ISAC), Sweden

The Polar regions' sensitivity to climate change makes them an ideal early warning system. But an early warning system can only function if scientists can continually monitor the world's oceans and develop better models. A Global Climate Observing System was set up by the United Nations in 1992, but major gaps exist at high latitudes because the harsh environmental conditions make gathering this data very difficult. iAOOS – a project involving a dozen countries, including the UK, USA, Russia and China – will help plug this gap by setting up a long-term ocean monitoring system in the Arctic. This kind of project is impossible without huge international cooperation and is an example of the vitally-important global science that IPY is producing.

http://www.ipy.org/index.php?ipy/detail/integrated_arctic_ocean_observing_system/

Cluster ID 63: Heliosphere Impact on Geospace (ICESTAR/IHY)

Leading institution: Finnish Meteorological Institute, Finland

High energy particles from space generate the Aurora and illustrate why the polar regions are unique places for space research. Throughout IPY scientists from 22 countries, using instruments on balloons, ships, spacecraft and the ground will investigate how plasma and magnetic fields from the Sun affect near-Earth space and our atmosphere, improving our understanding of the impact of space weather on satellites, ground-based technology, terrestrial weather and climate.

http://www.ipy.org/index.php?ipy/detail/icestar_ihy/

Cluster ID 58: Kinnvika – Arctic Warming and Impact Research (KINNVIKA)

Leading institution: Uppsala University, Sweden

Nordautlandet, Svalbard is the northernmost island in the Nordic Arctic sector which is 90% ice covered. The aim is to investigate how the environmental and anthropogenic dynamics have changed recently in comparison with past records of change from existing expedition logs and photographs, proxy climate data from ice-, lake- and sea-sediment cores, and dynamic studies both on terrestrial as marine ice, and also monitor atmospheric, terrestrial and cryospheric chemical, and physical fluxes continuously over, and beyond, the period of the IPY.

<http://www.ipy.org/index.php?ipy/detail/kinnvika/>

Cluster ID 10: Large-scale historical industrial exploitation of polar areas (LASHIPA)

Leading institution: University of Groningen, The Netherlands

Until now, the history of polar science and exploitation of polar areas were almost exclusively studied from a regional and national approach based on written sources from the archives in the countries in the core region. The aim of this project is to study the various (hunting, whaling, mining and research) settlements/stations in their natural settings from a bipolar, international and comparative perspective. The project will give an overview of the development of science and natural resource exploitation and its impact on the natural environment and the indigenous peoples.

<http://www.ipy.org/index.php?ipy/detail/lashipa/>

Cluster ID 153: Marine Mammal Exploration of the Oceans Pole to Pole (MEOP)

Leading institution: Norwegian Polar Institute

This project uses beluga whales and four seal species as ocean explorers to collect information about the conductivity (salinity), temperature and depth (CTD) of Arctic and Antarctic waters. By fitting state-of-the-art CTD tags on dozens of these deep-diving marine mammals, scientists will be able to gather a rich new data set that will extend our knowledge of the world's oceans as well as the top predators that live in them. MEOP will provide a unique source of fundamental physical and biological data from the polar oceans. Its unique approach will compliment efforts in many other IPY projects and will leave a legacy of useful biological and ocean data along with new approaches to understanding the interaction between marine predators and their ecosystem.

<http://www.ipy.org/index.php?ipy/detail/meop/>

Cluster ID 120: Northern High Latitude Climate variability during the past 2000 years: implications for human settlement (NORCLIM)

Leading institution: Vrije Universiteit Amsterdam, The Netherlands

NORCLIM investigates how natural climate change over the past two millennia has affected human presence in the Arctic. Examples are the timing of Viking settlement on the Faroe Islands, Iceland, Greenland and Newfoundland and the shift in whaling activities from Spitsbergen to Davis Strait during the Little Ice Age. To achieve the NORCLIM goals, geologists, climatologists and archeologists from seven countries will carry out marine and terrestrial fieldwork on key locations along a Newfoundland-Spitsbergen transect.

<http://www.ipy.org/index.php?ipy/detail/norclim/>

Cluster ID 38: Ocean-Atmosphere-Sea Ice Snowpack Interactions and connections to climate change (OASIS)

Leading institution: C.N.R. - IIA, Monterotondo Scalo (Roma), Italy

OASIS will study the chemistry in the air over the Arctic Ocean. OASIS will make use of a variety of platforms (icebreakers, ice islands, buoys) to obtain year-round information on the behavior of such key chemicals as ozone, mercury, and carbon dioxide. As the nature and extent of snow and ice cover is changing OASIS will assess the associated impact on, and by, climate change, and the human and ecosystem impacts of these chemicals.

http://www.ipy.org/index.php?ipy/detail/oasis_ipy/

Cluster ID 99: Ozone layer and UV radiation in a changing climate evaluated during IPY (ORACLE-03)

Leading institution: Alfred Wegener Institute for Polar and Marine Research (AWI), Germany

The project implies precisely quantification of polar ozone losses in both hemispheres achieved with concerted international campaigns during which hundreds of ozonesondes will be launched in real-time coordination from station networks in the Arctic and Antarctic. Satellite coverage of ozone and ozone depleting substances will be unprecedented during the IPY, and data from satellites such as ENVISAT, Aura, ACE, Odin, POAM III and SAGE III will be used in a novel approach that combines these measurements with groundbased station data.

<http://www.ipy.org/index.php?ipy/detail/oracleo3/>

Cluster ID 71: Polar Aquatic Microbial Ecology (PAME)

Leading institution: University of Bergen, Norway

Microorganisms – including algae, bacteria, fungi and viruses – are numerically by far the most important group of organisms in polar aquatic ecosystems. As well as being the main drivers of biogeochemical cycles and the major producers and consumers of greenhouse gases, they are also sensitive barometers of environmental change. Yet very little is known about their role in ecosystems or their response to change. Working in both the Arctic and Antarctic with a broad range of techniques, including state-of-the-art molecular methods, this project will assess the diversity and make up of this microbial

world. It will significantly advance understanding of the diversity and activity of these organisms and their role in climate and global environmental change.

http://www.ipy.org/index.php?ipy/detail/polar_aquatic_microbial_ecology_pame/

Cluster ID 26: The Pan Arctic cluster for Climate forcing of the Arctic Marine Ecosystem (PAN-AME)

Leading institution: University of Manitoba, Canada

This study examines the importance of climate processes in changing the nature of a flaw lead system in the Northern Hemisphere, and the effect these changes will have on sea ice, the marine ecosystem, contaminant transport, carbon fluxes, and greenhouse gases. The Circumpolar Flaw Lead (CFL) System Study is a major international effort under Canadian leadership that aims at understanding how changes in the physical system affect biological processes, towards a better understanding of the potential effects of climate change. The CFL project is part of the PAN-AME cluster.

http://www.ipy.org/index.php?ipy/detail/pan_ame/

Cluster ID 430: Pan-Arctic Tracking of Belugas (PATOB)

Leading institution: Greenland Institute of Natural Resources (Denmark)

Beluga whales make an ideal indicator species for Arctic climate change, given their circumpolar distribution and close association with ice formation and decay. This project will instrument 100 belugas per year over three years with satellite transmitters and, in some locations, oceanographic data loggers, to obtain a synoptic snapshot of the pattern and timing of beluga movements in relation to sea ice, surface temperature, primary productivity, bathymetry, as well as temperature and salinity at depth through beluga dive profiles. This baseline data will be invaluable information against which to make comparisons through time as the Arctic undergoes climate change.

<http://www.ipy.org/index.php?ipy/detail/patob/>

Cluster ID 77: Plate Tectonics and Polar Gateways in Earth History (Plates & gates)

Leading institution: Alfred Wegener Institute for Polar and Marine Research (AWI), Germany

Plate tectonics and polar ocean gateways: The keys to understanding long-term global change Water mass exchange between world oceans is of great significance for long-term global climatic change and is controlled by tectonic and sedimentary evolution of oceanic gateways and basins. Reconstructions of the geological history of polar oceanic basins and gateways feed into computer simulations of climate change. PLATES & GATES is an international program focussing on the tectonic and sedimentary formation of those areas of the Arctic and Antarctica which are in particular critical for global change.

http://www.ipy.org/index.php?ipy/detail/plates_gates/

Cluster ID 171: POLAR-AOD: a network to characterize the means, variability, and trends of the climate-forcing properties of aerosols in polar regions (POLAR-AOD)

Leading institution: Institute of Atmospheric Sciences and Climate (ISAC-CNR), Bologna, Italy

The proposed activity aims at establishing a bipolar network to obtain data needed to quantify properties of aerosols at high latitudes, including seasonal background

concentrations by measurements of aerosol optical depth (AOD), spectral characterizations, and the evolutionary patterns of the natural and anthropogenic processes that perturb the aerosol cycles. An effort to quantify direct and indirect climate forcing by polar aerosols will be made through a set of closure experiments using observations in conjunction with model calculation and satellite data.

http://www.ipy.org/index.php?ipy/detail/polar_aod/

Cluster ID 32: POLar study using Aircraft, Remote sensing, surface measurements and modelling of Climate, chemistry, Aerosols and Transport (POLARCAT)

Leading institution: Norwegian Institute for Air Research

Aerosols have a large effect on radiation transmission in the Arctic troposphere, both directly and indirectly via clouds. POLARCAT will study transport to the Arctic of aerosols, as well as of air pollution more generally, from anthropogenic sources and boreal forest fires. It will address the effects of this pollution on atmospheric chemistry and climate.

<http://www.ipy.org/index.php?ipy/detail/polarcat/>

Cluster ID 357: Spitsbergen Climate System Current Status (SCSCS)

Leading institution: Arctic and Antarctic Research Institute of Roshydromet, Russia

The aim is to develop monitoring environment system of the Spitsbergen Archipelago and surrounding waters; the development and unification of the existing system of complex monitoring of the principal climate forming parameters of the environment status in the area of the Spitsbergen Archipelago, among other things.

<http://classic.ipy.org/development/eoi/proposal-details.php?id=357>

Cluster ID 13: Sea level and tidal science in the polar oceans

Leading institution: Proudman Oceanographic Laboratory, United Kingdom

Sea level rise will be responsible for one of the most profound – and costly – impacts of climate change on human society, so gathering accurate data on sea levels worldwide is vitally important. Although sea level is monitored at hundreds of sites, there are large gaps in data from the Arctic and Antarctic because measuring sea level along polar coastlines is a huge technical challenge. By enhancing existing sea level gauges in the Antarctic, and installing new, high-tech devices in the Arctic that will provide high-frequency, real time data, this project will provide the missing piece of the jigsaw for scientists monitoring sea level rise across the globe.

http://www.ipy.org/index.php?ipy/detail/sea_level_and_tidal_science_in_the_polar_oceans/

Cluster ID 59: Terrestrial ecosystems in ARctic and ANTarctic: Effects of UV Light, Liquefying ice, and Ascending temperatures (Tarantella)

Leading institution: Netherlands Institute of Ecology, The Netherlands

Temperature and moisture availability play an important role in the functioning of terrestrial ecosystems in the polar regions. Because the changes in ecosystem structure and functioning are slow in the natural situation, an experimental approach has been developed, using Open-Top Chambers, which increase the temperature and moisture availability. It is the aim of the TARANTELLA project to determine similarities and

differences in the response to climate change between the Arctic and the Antarctic ecosystems.

<http://www.ipy.org/index.php?ipy/detail/tarantella/>

Cluster ID 189: UArctic - Shared Voices, Shared Knowledge for IPY (The University of the Arctic and IPY)

Leading institution: University of Alaska Fairbanks, United States

The University of the Arctic (UArctic) aims to provide opportunities for Arctic indigenous people and northern residents to be active IPY participants through UArctic education programs and IPY research projects. During IPY, UArctic's objective is to increase the participation of indigenous people and northern residents of all ages in education and research, with the ultimate, longer-term goal of increasing their representation in the ranks of scholars who have attained the Ph.D. UArctic IPY activities will focus on five of its core programs: Circumpolar Studies; north2north, GoNorth, Field School and NorthTrex.

<http://www.ipy.org/index.php?ipy/detail/uarctic/>

Cluster ID 121: Improved numerical weather forecasting and climate simulations (THORPEX-IPY)

Leading institution: Norwegian Meteorological Institute

Some of the most dramatic weather events – including spring thaws, sea ice movements and the strong winds and high seas associated with severe winter cyclones – occur in the polar regions, and being able to forecast these events more accurately is crucial for mitigating their impact on local communities, fisheries, wildlife, energy production and transport. Using satellite data, this 15-nation project will help design the next generation of observing networks that are needed to improve our ability to forecast “high impact” weather events in Polar regions.

http://www.ipy.org/index.php?ipy/detail/thorpex_ipy/

Cluster ID 50: Permafrost Observatory Project - Thermal State of Permafrost (TSP)

Lead institution: International Permafrost Association Norway (UNIS)/United States

The goal of TSP is to develop a spatially distributed set of observations on past and present status of permafrost temperatures and active layer thicknesses in North-America, Greenland, Iceland, Northern Scandinavia, Russia and Svalbard, but also in the Southern hemisphere.

http://www.ipy.org/index.php?ipy/detail/permafrost_observatory_project_thermal_state_of_permafrost_tsp/

Reference: Svalbard Science Forum:

http://www.ssf.npolar.no/pages/IPYinSvalbard_lists.htm