Ecosystem Studies of Subarctic and Arctic Regions (ESSAR) IPY Consortium

PICES ASM 2008
Workshop 3
October 24, 2008

Outline

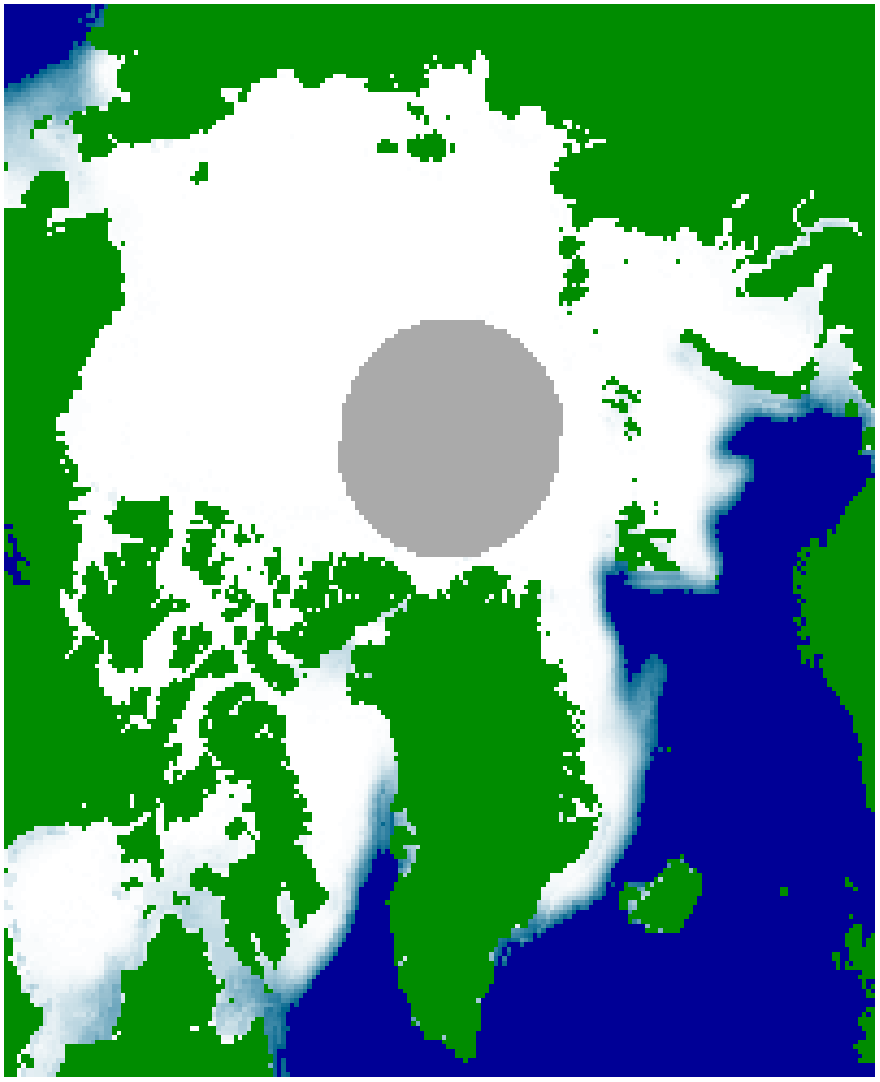
- Aims and background
- Geographic coverage
- Projects within ESSAR
- Future

ESSAR evolved from the GLOBEC regional program ESSAS (Ecosystem Studies of Sub-Arctic Ecosystems) with the general aim of helping to improve our understanding of *how climate variability and change affects the marine ecosystems of the Subarctic and Arctic seas and their sustainability.*

The consortium has been a collection of projects primarily related to Arctic ecosystems rather than a coordinated scientific endeavor.

The work is being achieved primarily through **field studies** but also includes retrospective analysis and modelling studies.

International Polar Year (IPY) 2007-2008



Over 1000 Expressions of Intent (EOIs) to IPY Office by January of 2005

IPY Office requested that EoIs form into Clusters based on subject matter

International Polar Year (IPY)

ESSAS submitted a proposal on Arctic ecosystems to focus on effects of light levels and sea ice on phytoplankton production and their influence on zooplankton.

IPY Office suggested that ESSAS take the lead on a cluster. Contacted EoI leaders of ecological proposals dealing primarily with Subarctic regions and 22 EoIs agreed to join under **ESSAR**, Ecosystem Studies of Subarctic and Arctic Regions, Consortium.

ESSAR

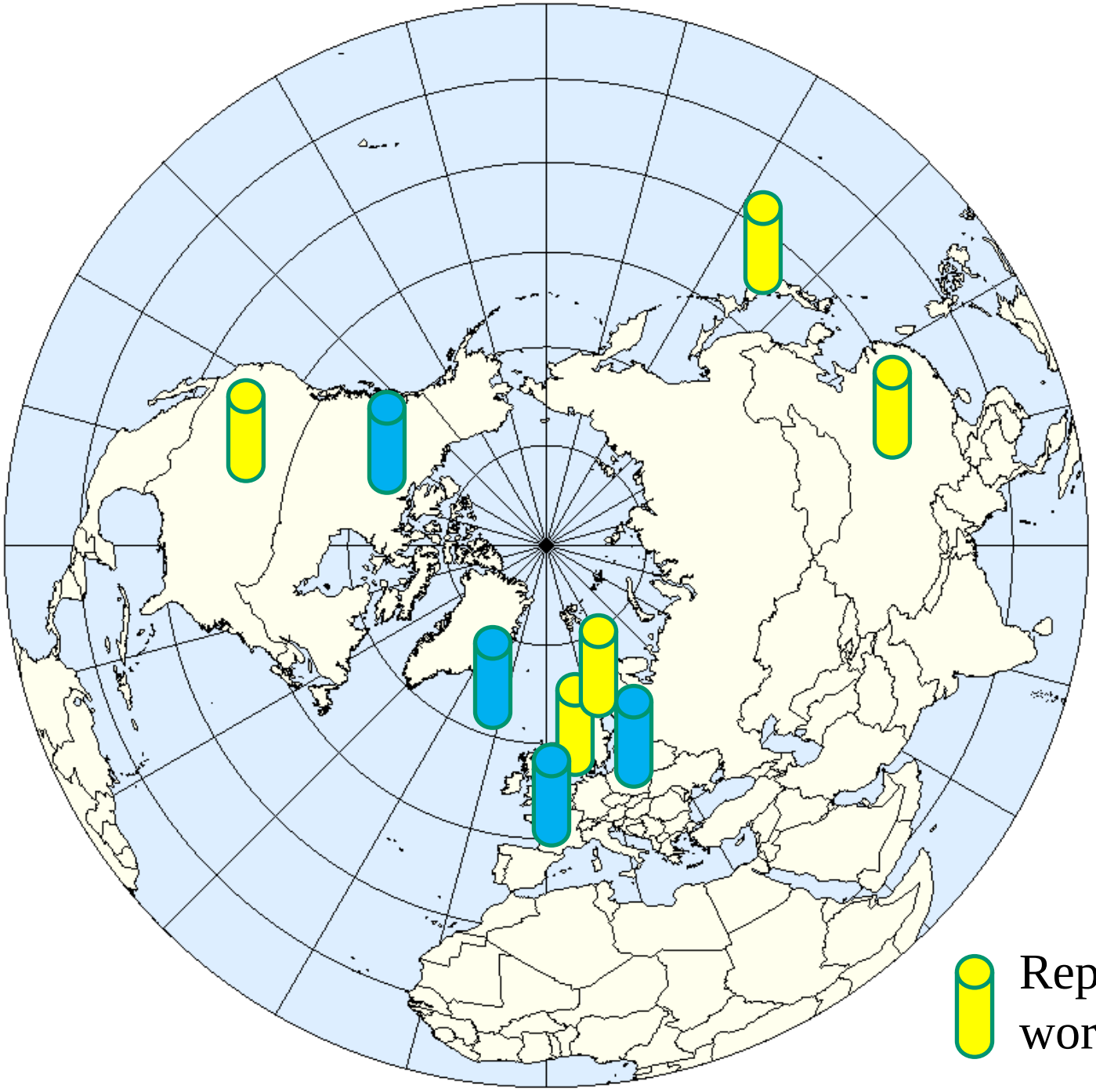
Of the original 22 EoIs within ESSAR (13 of which were from Canada), 11 were funded by their national funding agencies.

Some of the 11 were combined within nations, e.g. in Norway (3 EoIs combined to form 1 proposal to the Research Council of Norway).

The ESSAS proposal includes 4 nationally funded programs:

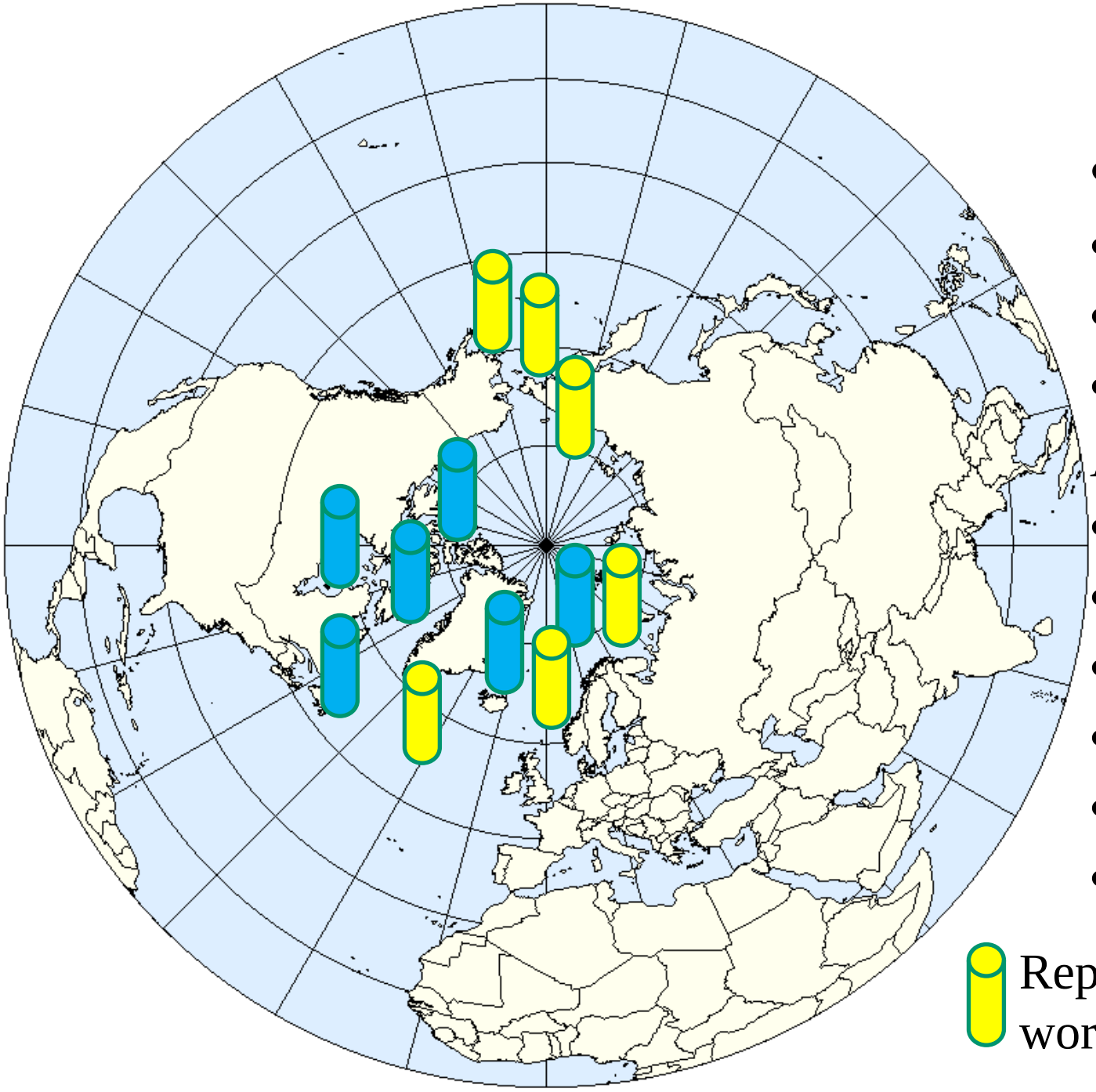
Iceland, Japan, Norway, and the USA

Lead Nations



- Canada
- China
- Denmark
- France
- Iceland
- Japan
- Norway
- Poland
- USA

Represented at this workshop



Study Areas

- Bering Sea
- Chukchi Sea
- Hudson Bay
- Canadian Archipelago
- Labrador Sea
- Irminger Sea
- Iceland Sea
- Norwegian Sea
- Barents Sea
- Spitzbergen

Represented at this workshop

Canada 1 – Greenland Sharks Feeding Dynamics Under the Ice (GREENS)

(EoI 537) - Examining the role of the Greenland shark in Arctic ecosystems, particularly its predation on marine mammals during winter ice cover and summer open water periods.

Field studies began in the Arctic in 2008. Sharks were captured and equipped with satellite tracking devices to monitor movements. Stomachs were removed on others for diet studies.

Lead: Aaron Fisk

Canada 2 – Global Warming and Arctic Marine Mammals (GWAMM)

(EoI 663) - Addressing the impact of global warming and reduced ice cover on marine mammals through tracking, diet studies, genetics and modelling.

In 2007 set up community monitoring and in 2008 have conducted areal surveys for polar bears, whales and seals, acoustic surveys for whales and have been taking samples for contaminants.

Lead: Steven Ferguson

Canada 3 – How Seabirds Can Help Detect Ecosystem Change in theArctic

2 EoIs: (680 – AMAS; SAMPLE) - Diving and surface-feeding seabirds (murres, fulmars, gannets, storm-petrels) are being studied to assess changes that have occurred in high and low Arctic marine food webs and to establish a current baseline against which future change can be assessed.

Work is being carried out off Newfoundland and in the Canadian Archipelago.

Lead: William Montevecchi

China – Sea Ice Decline and Ocean Warming (SIDOW) Project

(EoI 537) - In addition to sea ice and ocean warming looking at associated climate and ecological processes especially phytoplankton. (Also part of 4 other consortia)

R.V. Sea Dragon

2008 cruise to Northern Bering Sea and Chukchi Sea

- what impact does Bering Sea water have on water mass structure when it enters the Chukchi Sea

- what are the some of the physical, optical, and ecological features of Chukchi Sea water

Lead: Jinping Zhao

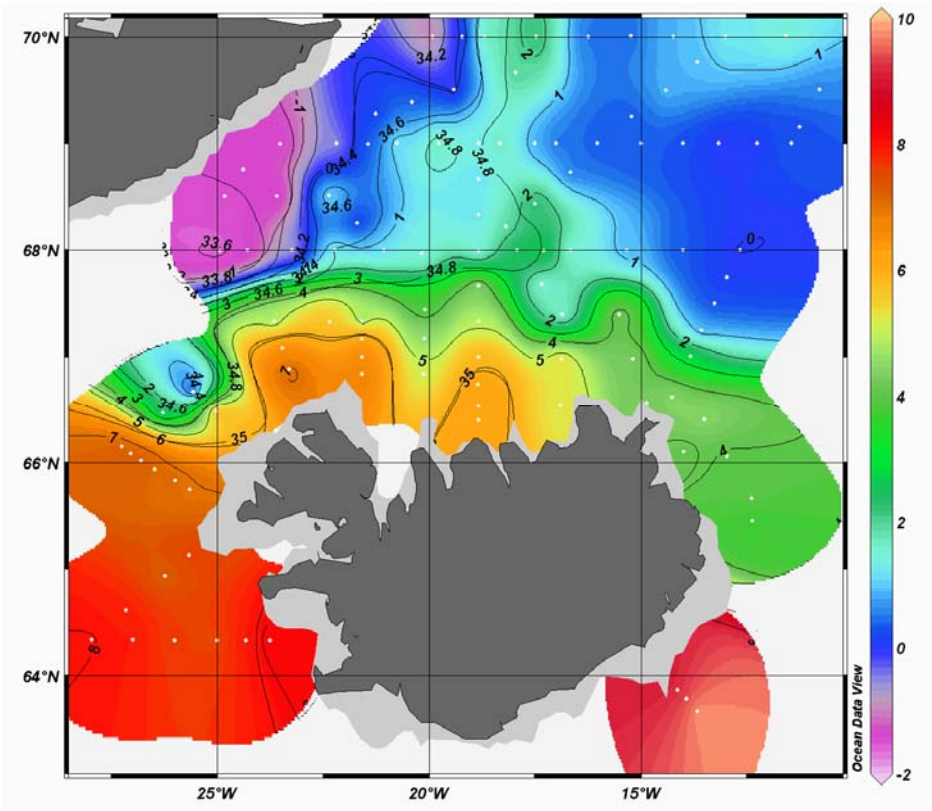
International – Trans North Atlantic Sightings Survey for Cetaceans (TNASS)

(EoI 1136) - An International project, it aims at estimating the summer distribution and absolute abundance of cetacean populations in the North Atlantic between approximately 40°N to 80°N and between Norway and Canada. Seabird observations are also being carried out.

Lead: Genevieve Desportes (Denmark)

Iceland – Iceland Sea Ecosystem (ISE) Project

Part of ESSAS (EoI 305). Examining ecosystem structure and function of the Iceland Sea and adjacent waters with focus on capelin and their response to recent changes.



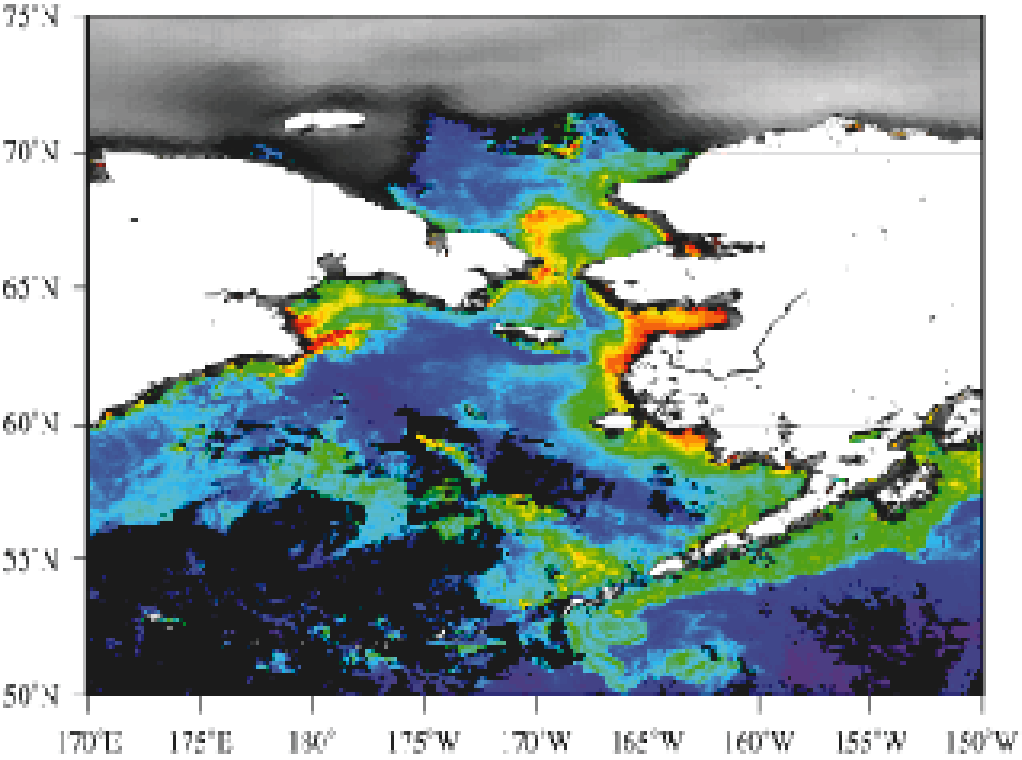
Cruises in 2006-2008 and planning for one in 2009.

Measurements include hydrography, currents, nutrients, phyto and zooplankton and fish.

Lead: Olafur Palsson

Japan – J-ESSAS Project

Part of ESSAS (EoI 305). Examining effects of recent changes in physical oceanography on the marine ecosystems of the Bering and Chukchi Sea including inflows from Bering to Arctic.

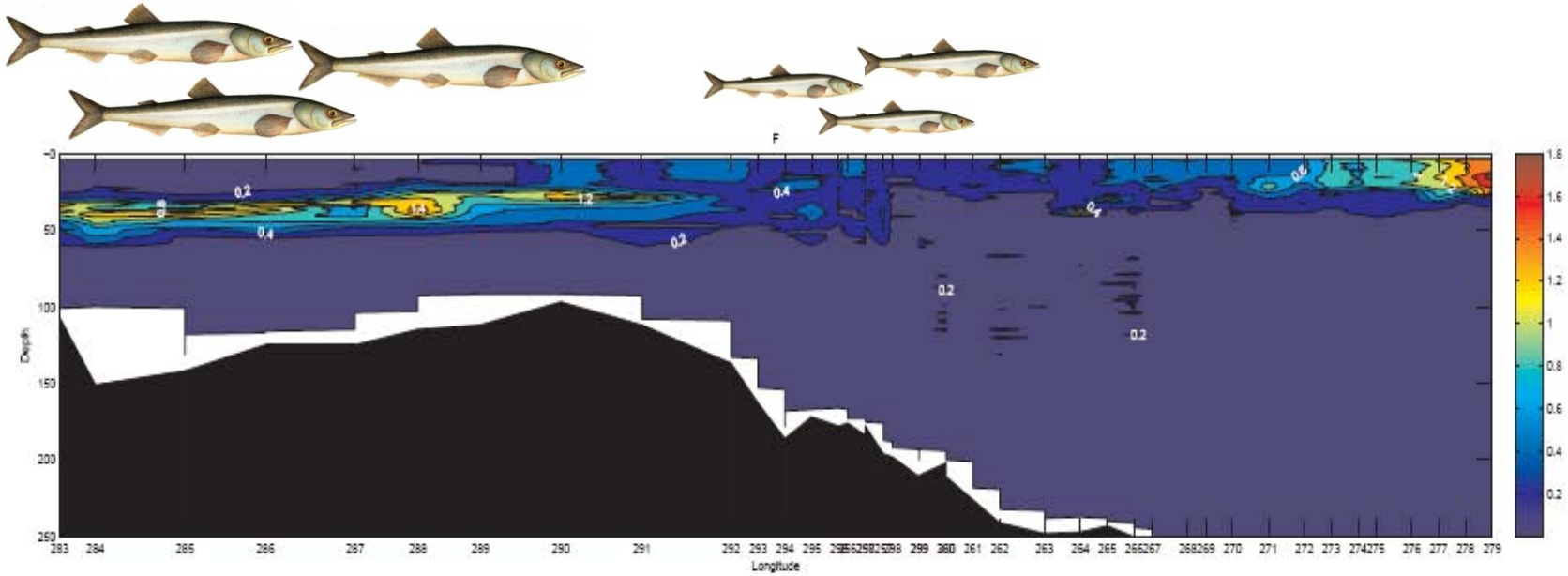


Cruises in 2007-2008 to measure primary production, zooplankton distribution and biomass, benthos, bio-optical properties (using satellite imagery) and fish.

Lead: Sei-Ichi Saitoh

Norway – Norwegian component of the Ecosystem Studies of Sub-Arctic Seas (NESSAS)

3 EoIs: (293, TREBAR; 305, ESSAS; 397: COMPOLECO) – Focus is on the processes controlling biological production and feeding at Arctic fronts and links to sea ice. Cruises were carried out in 2007 and 2008 to Barents and Norwegian Seas.



Lead: Ken Drinkwater

Poland – Climate Change, Seabird Populations and Arctic Terrestrial Ecosystems (CSATE) Project

(EoI 340) Focus on the links between seabirds and terristerial ecology through guano fertilization and its influence on terristerial plants and hence terristrial herbavores.

Work is being carried out in Spitzbergen to quantitatively measure amount of guano and its effects on terristrial ecosystem.

Lead: Lech Stempniewicz

USA – Bering Sea Ecosystem Study (BEST)/Bering Sea Integrated Ecosystem Research Program (BSIERP)

Part of ESSAS EoI (305). Focusing on the processes controlling ecosystem changes in the Bering Sea in light of the recent and ongoing environmental changes.

Cruises have been conducted in 2007 and 2008 and active end-to-end ecosystem modelling is an important component of the programs.

France – Our Polar Heritage Project

EoI 1134. Project is involved in photographing IPY activities.

Lead: Christian Morel (http://www.ourpolarheritage.com/en/accueil.php)

Future

- There has been few joint activities in the past
  -This Workshop is the first one.

  - Hope to have joint meetings to discuss and compare the results from the field programs and other research conducted as part of IPY programs.

  - Use these as a spring board for future cooperation and collaboration.