

ESSAS – Ecosystem Studies of Sub-Arctic Seas

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Introduction

ESSAS is a comparative, ecosystem-based GLOBEC/IMBER regional program.

<u>Goal</u>: to compare, quantify and predict the impact of climate variability on the productivity and sustainability of Sub-Arctic marine ecosystems.





2. Geographical Areas of Main Interest

GLOBEC

Pacific Ocean:

Oyashio; Sea of Okhotsk; Bering Sea

•Atlantic Ocean

Barents Sea; Nordic Seas; Iceland Sea; Greenland shelves; Labrador Sea; Newfoundland/



Labrador shelves; Gulf of St. Lawrence; Hudson Bay

3. Nationally Funded ESSAS Programs

Iceland

- ISE (Iceland Sea Ecosystem) Project

Norway

-Norwegian ESSAS in the Barents Sea -NESSAR (Norway's Ecosystem Studies of Subarctic and Arctic Regions)

USA

-BEST (Bering Sea Ecosystem Study) -BSIERP (Bering Sea Integrated Ecosystem Research Program)

Japan

Japanese ESSAS in the Oyashio

The role of Advection in Sub-Arctic Marine Ecosystems

4. ESSAS Working Groups

4.1. Regional Climate Predictions

• providing quantitative estimates of future climate change in Sub-Arctic seas

- **4.2. Biophysical Coupling**
- determining processes by which climate affects marine ecosystems 4.3. Modelling
 - developing models to facilitate ecosystem comparisons
- **4.4.** Invertebrate Gadoid Interactions

• comparing invertebrate-gadoid interactions in different Sub-Arctic ecosystems



A joint ESSAS-ASOF (Arctic Subarctic Ocean Fluxes) workshop on advection was held in June 2009 in Seattle. Presentations on the different impacts of advection on subarctic and arctic ecosystems were followed by discussions on ways to facilitate collaboration between the two programs.







Advection of low salinity shelf water from West Greenland Shelf affects timing and spatial distribution of Labrador Sea phytoplankton production.



The coastal Oyashio intrusion transports sub-**Arctic copepods to the** mixed water region.

Flow through the Aleutian Passes provide heat, salt, nutrients, zooplankton, larvae to the Bering Sea. The passes are also an important source of mixing.

8. Future ESSAS Activities

•2010 Annual ESSAS meeting: 30 Aug-1 Sept in Reykjavik, Iceland •2010 IMBER IMBIZO: September/October in Crete, Greece •2011 ESSAS Open Science Symposium: May in Seattle, USA.

Barents Sea: Hvingel

variables in the different regions. **Further studies are ongoing.**

<u>7. IPY</u>

ESSAS is leading the international consortium ESSAR (Ecosystem Studies of Subarctic and Arctic Regions)

•Canada, China, Denmark, France, Iceland, Japan, Norway, Poland, US

•Includes studies of sea ice, Arctic fronts, phytoplankton, fish, marine mammals, and seabirds.