

Japanese programs (Arctic Ocean sciences)

- JAMSTEC

R/V Mirai cruise

Joint Western Arctic climate Studies (Japan-Canada-US project)

Sustained mooring observation in the Pacific Arctic Ocean

Automated drifting buoy observation

- Hokkaido University

T/S Oshoro-Maru cruises in the Bering Sea and its adjacent seas

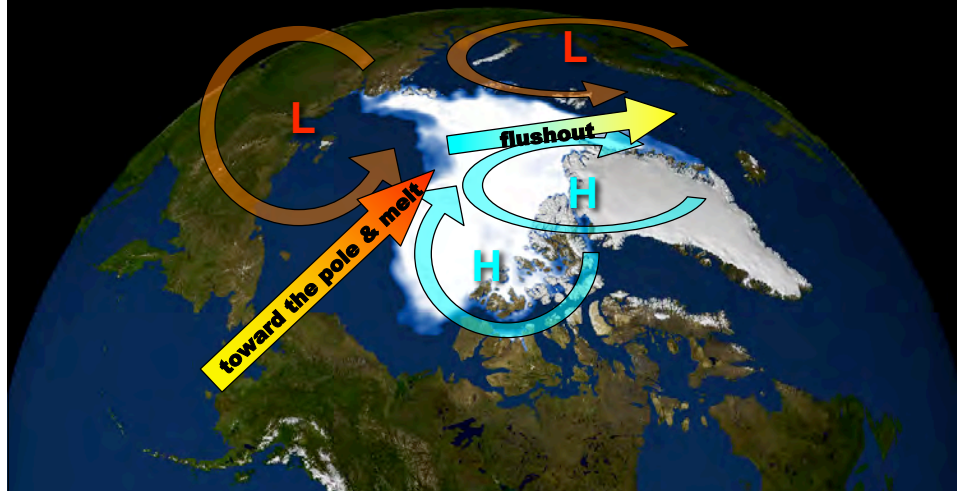
Asymmetric distribution of ice cover in the ocean & land modulates the atmospheric circulation.

→Modulated atmospheric circulation enhances further sea ice reduction

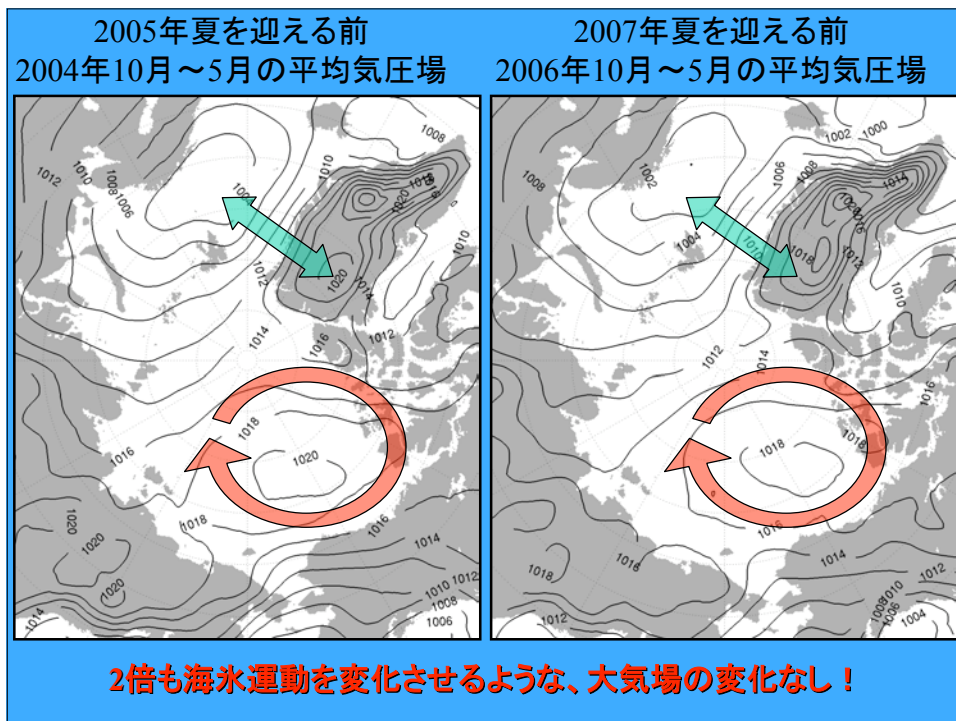
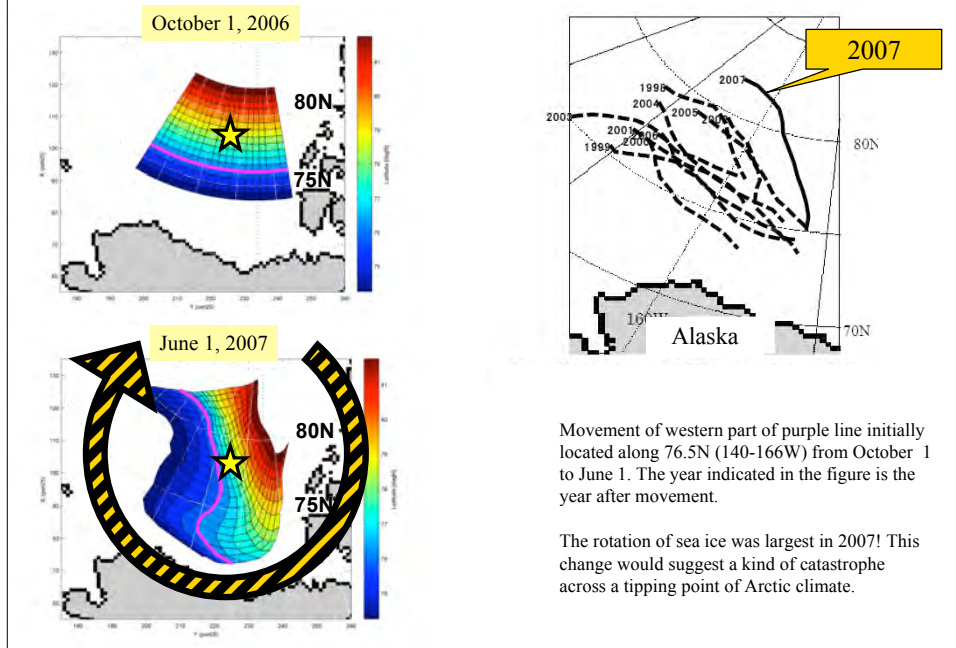
→This positive feedback is essential mechanism to decline sea ice cover.

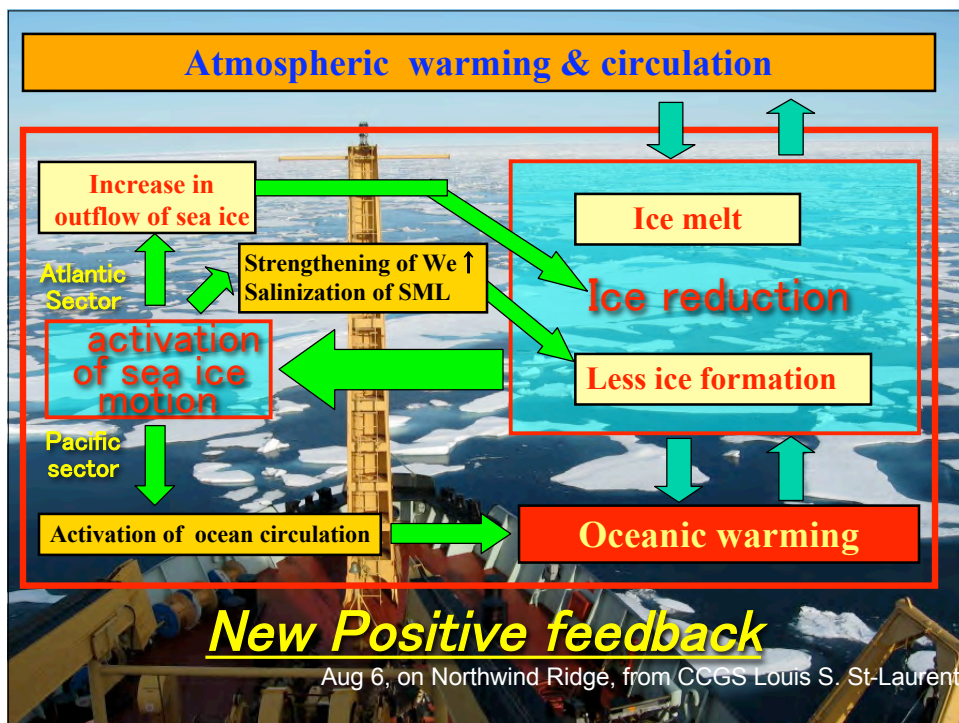
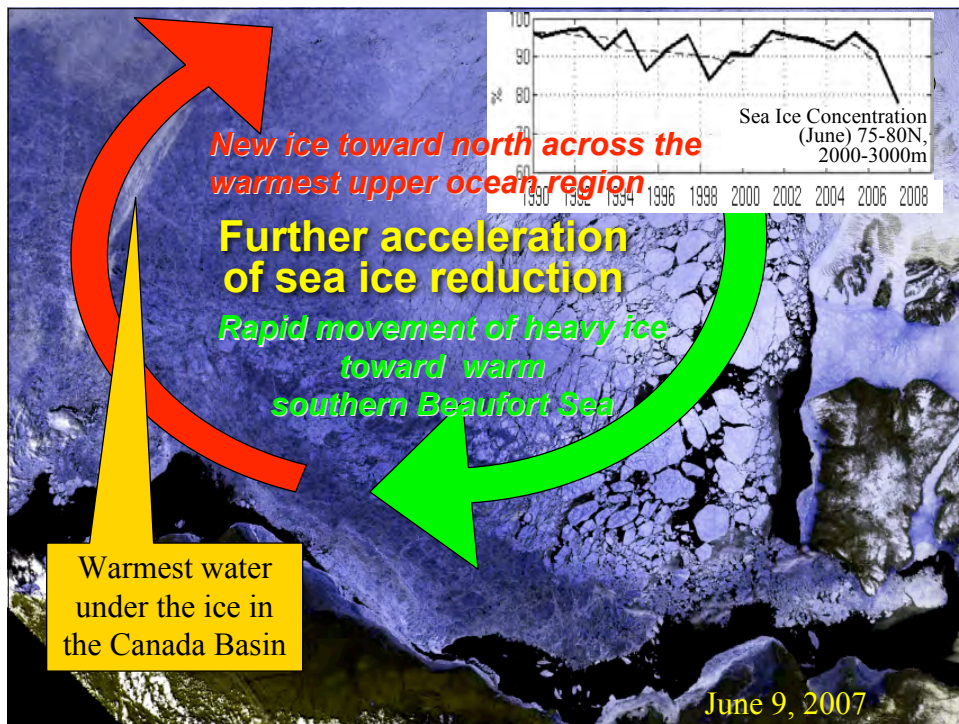
→Further sea ice reduction

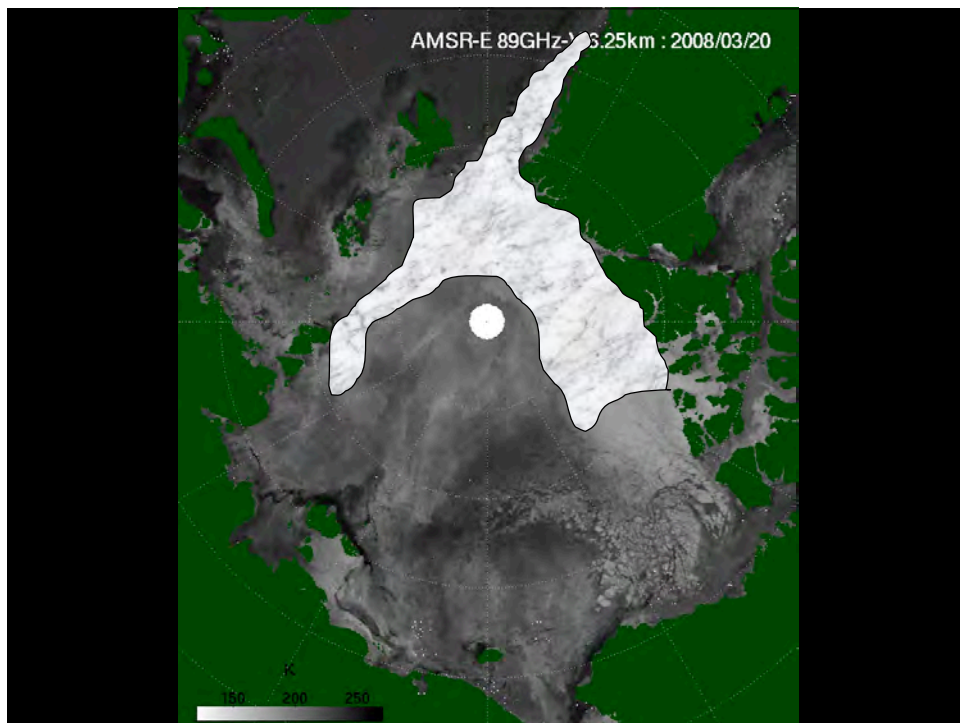
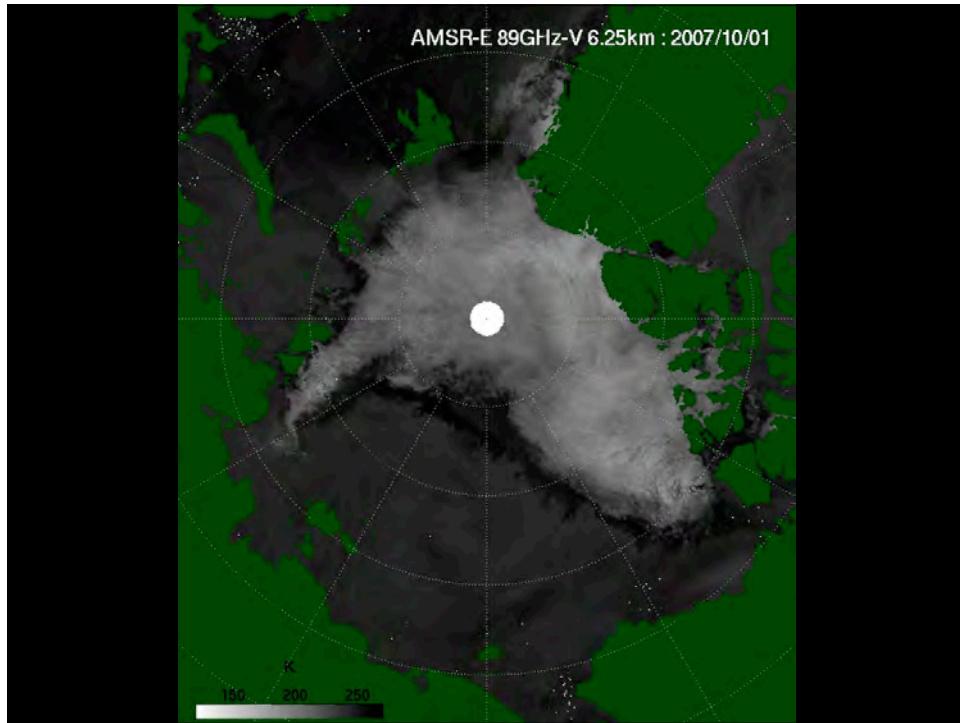
This important feature has not been projected in global climate model!

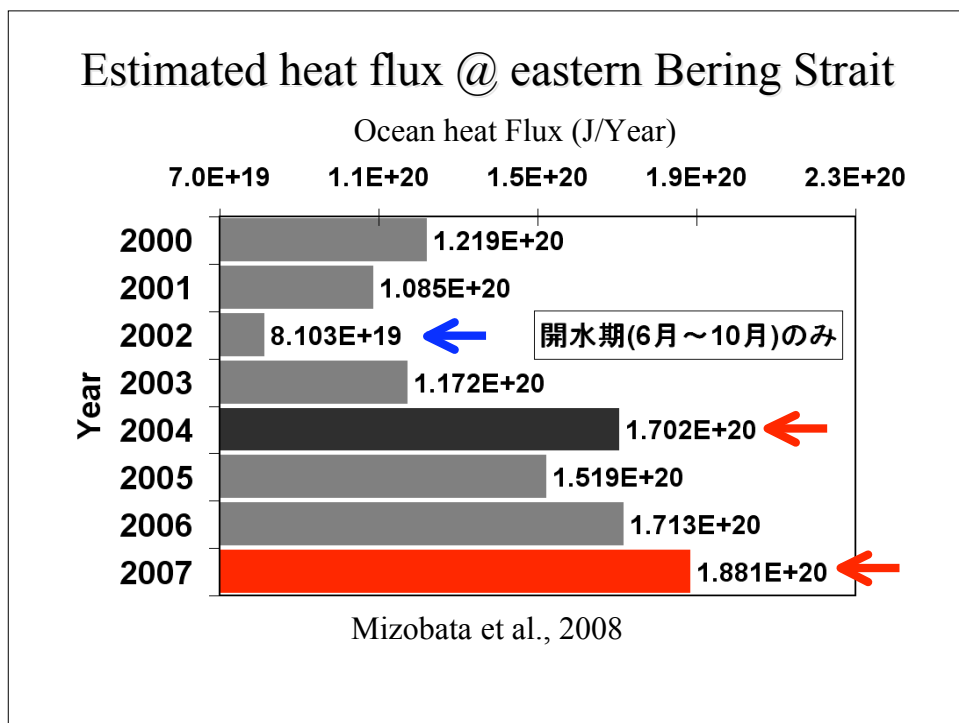
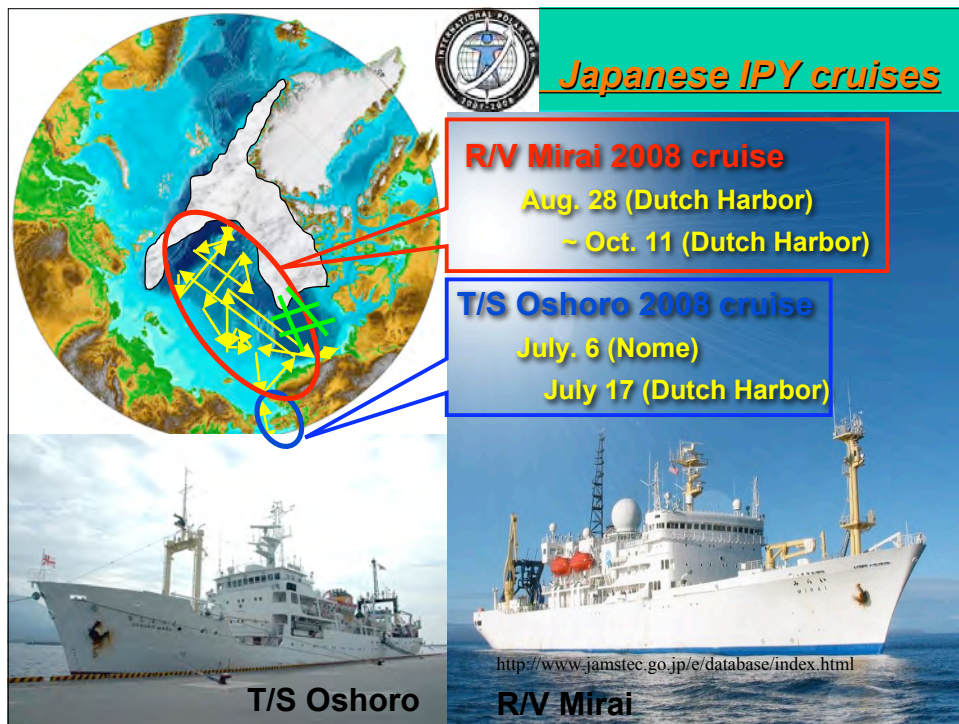


sea ice motion in 2006/2007 winter before melt onset





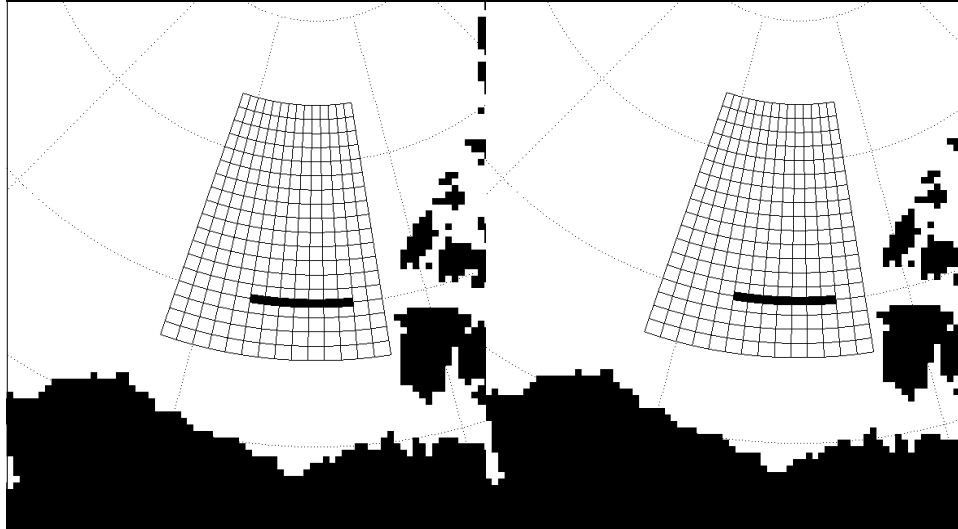




Recorded maximum sea ice motion and deformation

Oct. 1, 2006~Jun. 1, 2007
8 months

Oct. 1, 2007~Jan. 1, 2008
Just 3 months!



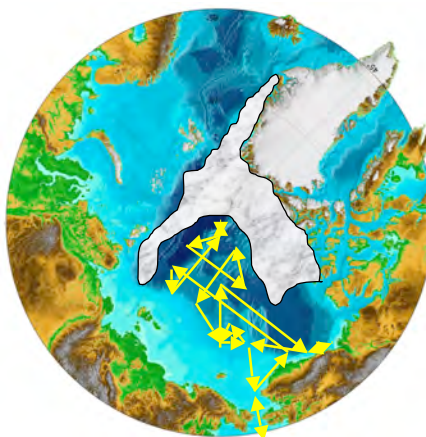
R/V Mirai 2008 cruise August – October, 2008



Revisit to the hydrographic sections Larsen93, AOS94 and Mirai2004 to detect environmental changes in Pacific and East Siberian sector of the Arctic Ocean.

- Hydrography
Hydrographic survey for full span of southern Canada and Makarov Basins.
(temperature, salinity, nutrients, alkalinity, 18O, shipboard ADCP, meteorology, etc..)
- Mooring array in the Chukchi Sea

Quantitative evaluation of ocean heat and salt flux from the Pacific into the Arctic.



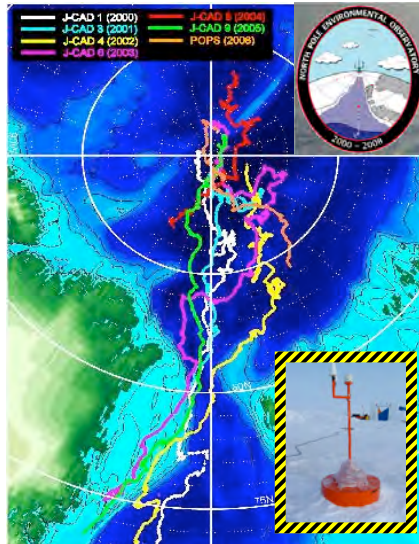
Automated Drifting Buoy Observation



2007: one buoy deployment in the Makarov Basin.

2008: 3~4 buoys are planned to be deployed under international collaboration.

Led by Takashi Kikuchi

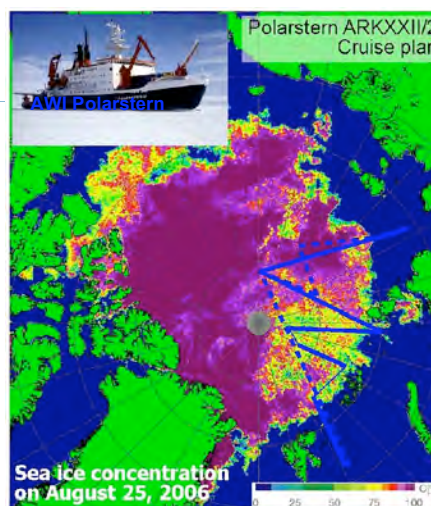


Hydrographic survey using XCTD (~60 stations) aboard Polarstern 2006 cruise



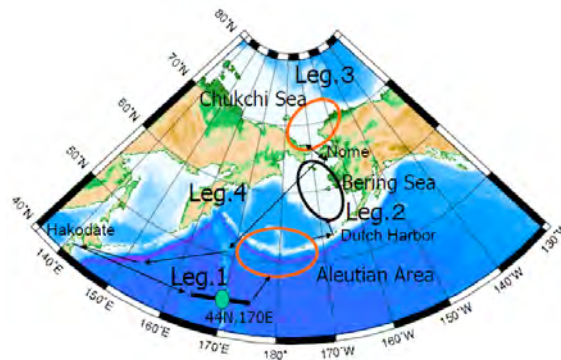
EU IPY project
DAMOCLES

Developing Arctic Modeling and
Observing Capabilities for Long-
term Environmental Studies



***International collaborative research cruises in the
Chukchi and Bering Seas in summer 2007 and 2008***

- Hokkaido University has already sent T/S Oshoro-Marui to the Chukchi Sea and northern Bering Sea in summer 1991 and 1992 and study oceanographic environment and demersal fish community. In the Chukchi Sea and northern Bering Sea, arctic cod, *Boreogadus saida* (Lepechin), is one of key species strongly responding to climate and atmospheric change. We will compare abundance and distribution of arctic cod and the other bottom fishes between in summer 1991/1992 and in summer 2007/2008 and examine affect of recent global warming to arctic and sub-arctic marine ecosystem.



***Cruise plan of T/S Oshoro-Marui
2007-2008***

Ocean Field Campaign for monitoring sea ice and Coccolithophores bloom with near-real time satellite data support from University of Alaska Fairbanks and Japan Aerospace Exploration Agency (JAXA) both in 2007 and 2008 of IPY Years.

