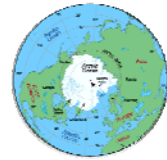




*Science for the European Arctic Policy
A Lunch-time Briefing*



The EU-Arctic Forum

in cooperation with



Understanding the Arctic Region and Assessing Future Developments: Scientific Contributions to the European Arctic Policy

PROGRAMME, CVs & PRESENTATIONS

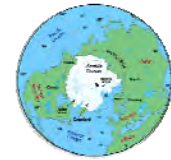
European Parliament
Private Salon, Members' Restaurant
28. October 2010, 13:00 -15:00

**EUROPEAN
POLAR BOARD**





*Science for the European Arctic Policy
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The EU-Arctic Forum
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Konsortium Deutsche Meeresforschung

Understanding the Arctic Region and Assessing Future Developments: Scientific Contributions to the European Arctic Policy

Private Salon, Members' Restaurant, European Parliament
28. October 2010, 13:00 -15:00

At the invitation of Birgit Schnieber-Jastram, MEP

The European Union is in the midst of formulating a European Policy on the Arctic Region. It is now for the European Parliament to take the next step with the forthcoming report on a "Sustainable EU Policy for the High North" by Michael Gahler, MEP.

Against this background, this scientific briefing brings together representatives of some of preeminent polar research institutions in Europe with Members of the EP and representatives of other European Institutions to reflect on current priorities of the scientific community and its links to Europe's future policy on the Arctic Region.

Programme

Welcoming Statement and current status of EP deliberations	Birgit Schnieber-Jastram, MEP
Introduction and Moderation	Carlo Alberto Ricci, Chair, European Polar Board and University of Siena <i>European Polar Research: Major Initiatives and Current Developments</i>
Statement	Paul Nemitz, Head of Unit, Maritime policy Atlantic, outermost regions and Arctic, DG Maritime Affairs and Fisheries, European Commission
Scientific Presentations	Karin Lochte, Director, Alfred Wegener Institute for Polar and Marine Research and Chair, German Marine Research Consortium <i>Melting Ice Sheets and Sea Level Rise: Threats to Coastal Systems</i> Yves Frenot, Director, French Polar Institute Paul Emile Victor <i>Understanding the Arctic and the Role of Observation Systems</i> Jan-Gunnar Winther, Director, Norwegian Polar Institute <i>Changes in Sea Ice - Effects on the Arctic Environment and Shipping</i>
Discussion	



SPEAKERS' CVs

Birgit Schnieber-Jastram **Member of the European Parliament**

1986 - 1994 Member of the Hamburg Parliament, from 1991 - 1994 Chairwoman of the Social Committee and 1994 Deputy Chairwoman of the CDU group;

Since 1992 Member of the Board of the Hamburg CDU;

1994 - 2001 Member of the German Bundestag. From 1998 - 2000 as Chairwoman of the Working Group Work and Social Affairs of the CDU / CSU parliamentary group and from 2000 - Oct. 2001 parliamentary manager of the CDU / CSU parliamentary group;

Oct. 2001 - May 2008 Senator for Social Affairs, Family, Health and Consumer's Protection and from March 2004 - May 2008 Deputy Mayor of the Free and Hanseatic State and City of Hamburg;

May 2008 to June 2009 a member of the Hamburg Parliament;

Since July 2009 Member of the European Parliament.



Karin Lochte **Director** **Alfred Wegener Institute for Polar and Marine Research**



Education and degrees:

- 1971–1976 Technical University of Hannover, Germany. Study of Biology, Chemistry, Philosophy
- 1976 State Exam for High School Teacher in Biology, Chemistry
- 1977 – 1984 Marine Science Laboratories Menai Bridge, University College of North Wales, Bangor, UK. Study of Marine Biology
- 1979 Master of Science in Marine Biology
- 1984 PhD in Marine Biology "Microbiological observations at sea water discontinuities".
- 1994 Habilitation in Marine Biology/Aquatic Microbiology at the University of Bremen, Germany, "Microbial degradation of organic matter in the benthic boundary layer of the deep sea"

Professional experience

1990 - 1994	Research scientist at the Alfred Wegener Institute for Polar and Marine Research, Bremerhaven. Research: Microbial turnover of organic matter in sea ice, water und sediment.
1995 - 2000	Institut für Ostseeforschung Warnemünde, Rostock. Head of department Biological Oceanography. Professor at the University of Rostock for Biological Oceanography and Marine Microbiology. Field of research: Pelagic bacterial processes, nitrogen fixation.
2000 - 2007	Leibniz-Institut für Meereswissenschaften IFM-GEOMAR Head of research unit Biological Oceanography. Professor at the University of Kiel for Biological Oceanography. Field of research: Carbon fixation, nitrogen fixation and microbial remineralisation processes in the water column, special research area: tropical Atlantic.
since Nov. 2007	Director of the Alfred Wegener Institute for Polar and Marine Research in the Helmholtz Association

Carlo Alberto Ricci **Full Professor of Petrology, University of Siena &** **Chair of the European Polar Board**

1966	Laurea cum laude in Geological Sciences at the Università degli Studi di Pisa
1980 to present	Full Professor of Petrology at the Università degli Studi di Siena
1987-2001	Director of the International School Earth and Planetary Sciences
1987-1992	Scientific coordinator of Earth Science Research within the Italian Programma Nazionale di Ricerca in Antartide
1989-2002	National delegate to the Working Group of Geology of the Scientific Committee on Antarctic Research (SCAR)
1992 to present	Member of the Italian National Scientific Committee on Antarctic Research
1993 to present	Editor of <i>TERRA ANTARTICA</i> , An International Antarctic Earth Science Journal
1994 to present	Member and Chairman every two years, of the French-Italian Concordia project steering committee
1997-2001	Vice-President of the Italian National Scientific Committee on Antarctic Research
2002 to present	President of the Italian National Scientific Committee on Antarctic Research
2000 to present	International Union of Geological Sciences representative to SCAR



2000-2004 Treasurer of the 32^o International Geological Congress, Florence 2004
2006 to present Chairman of the European Polar Board (European Science Foundation)
2008 to present Italian national delegate to IASC

Research on igneous and metamorphic petrology, geochemistry, geochronology and structural geology on crystalline basements of: Elba Island (1964-1970), northern Apennines (1967-1976), Alps (1967-1970), Sardinia (1967 to present), Corsica (1975-1978), Provence (1975-1978), Greece (1975), southern Australia (1986-1991), northern Victoria Land (Antarctica) (1986 to present). Author and co-author of more than 100 papers published in national and international journals

Jan-Gunnar Winther
Director, Norwegian Polar Institute (NPI)



2005-present Director, Norwegian Polar Institute
2004-05 Research Director, Norwegian Polar Institute
2002-07 Adjunct Professor at the University Centre in Svalbard (UNIS)
1993 Ph.D. in Civil Engineering, Norwegian Institute of Technology, Trondheim, Norway.
1990/91 Studies at Department of Geography, University of British Columbia, Vancouver, B.C., Canada.
1987 M.S. in Civil Engineering, Norwegian Institute of Technology, Trondheim, Norway.

Key Qualifications

Varied professional practice, mainly research and development, in hydraulic and hydrology engineering from 1988 to 1994. Initially, one year in hydraulic research as a research scholar at the Norwegian Institute of Technology, mainly academic. In the period 1988-94 at an applied research institute (SINTEF) affiliated with the Norwegian Institute of Technology, engaged in research projects related to polar hydrology and satellite remote sensing. Since 1994 Head of the Antarctic Section at the Norwegian Polar Institute (NPI). Besides research, the position includes responsibility for planning, co-ordinating and managing of NPI's and Norwegian research activity in Antarctica together with representation of Norway in various international research and management fora. Considerable experience in cold-regions field research by leading and participating in snow and glaciological research on four Antarctic expeditions (1,5 to 3,5 months each) and a number of 2-4 weeks campaigns in Svalbard. Scientific leader and second in command at the Norwegian Antarctic Research Expeditions in 1996/97 and 2000/01. A number of national and international appointments, among them member of an international committee for reviewing the Netherlands Antarctic Programme,

National Representative to the International Hydrological Programme (UNESCO/IHP) Northern Research Basins, National Representative on Committee of Managers of National Antarctic Programmes (COMNAP), National Delegate and Representative of the Scientific Committee on Antarctic Research (SCAR), National Representative and member of the Steering Committee for European Project of Ice Coring in Antarctica (EPICA), and Expert Reviewer of Intergovernmental Panel on Climate Change (IPCC) WG I Third Assessment Report. Since 1998 Research Leader of a Polar Climate Programme at NPI (20-25 employees), later Research Director (2004-05) and last Director of NPI (2005-). Qualifications equal to Professor competence appointed by external evaluation panel in 2002. From 2002-2007 also Adjunct Professor at the University Centre in Svalbard (UNIS). Fluency in English, fair skills in German. Some Spanish.

Yves Frenot

**Director of Research at CNRS (Centre National de Recherche Scientifique) and
Director, French Polar Institute *Paul-Emile Victor* (IPEV)**

His scientific activity started in 1982 in a laboratory of the University of Rennes. He stayed 14 months at Ile de la Possession, Iles Crozet, to study the soils, the pedogenesis and the earthworm fauna of this subantarctic island. He obtained his PhD in 1986 and was appointed by CNRS as Chargé de Recherches in 1988. Then, he managed several programs in the French subantarctic islands (Crozet, Kerguelen, Amsterdam islands) on the impacts of human activities and climate changes on the subantarctic biodiversity. He worked more precisely on the colonization processes on the glaciers forelands at Kerguelen Islands, initiating numerous international collaborations. He was also involved in several projects of eradication of vertebrate mammals (cattle at Amsterdam Island, rabbit at Kerguelen Islands) in order to study the restoration capacities of these ecosystems. Then, he was particularly involved in the survey of alien species in the French subantarctic Islands and their impact.



From 2003 to 2009 he was deputy director of IPEV and acted as chief scientist at the French Polar Institute. In early 2010, he was nominated director of IPEV.

He has been involved in the French delegation at Antarctic Treaty Consultative Meetings since 2003 and was vice-chair of the CEP, Committee for Environmental Protection (Madrid Protocol) from 2005 to 2009. In 2010, he was elected Chair of the CEP.

European Polar Board Current strategic and Policy activities in support of Research in the Polar Regions



Carlo Alberto Ricci
 Chairman of the European Polar Board

The European Polar Board



-  France
-  Austria
-  Belgium
-  Bulgaria
-  Czech Republic
-  Denmark
-  Estonia
-  Finland
-  Germany
-  Greenland
-  Italy
-  Netherlands
-  Norway
-  Poland
-  Russian Federation
-  Romania
-  Spain
-  Sweden
-  United Kingdom
-  Portugal
-  Switzerland
-  Luxembourg

The European Polar Board is the European Science Foundation's expert committee on science policy in the polar regions. It acts as a **voice** of the European polar research and **facilitator** of cooperation between European national funding agencies, national polar institutes and research organisations from 22 countries.





EPB initiatives for science and polar environmental observations

Towards the Strengthening of European Coordination between Polar Environmental Observatories in the Arctic Region



Overview document
 French Presidency of the Council of the European Union-Principality of Monaco
 Ministerial Conference on Observing Environmental changes and facing their challenges.

- **Europolar ERANET**
- **Infrastructure Mou**
- **Polar Life Call**
- **EU-Polaris**
- **Green paper**
- **Ericon AB**




Identification of observational gaps of the Arctic Ocean and neighbouring continents are very important for obtaining accurate picture of climate change and its effects on European nations and other countries. By establishing a framework for coordination of the European level between the Polar Environmental Observatories in the Arctic region it will ensure positive engagement by international partners and result in significant action by the international community in order to understand and monitor the Arctic environment. Long term research will result in making it possible to assess and understand the Arctic with accuracy and reporting systems that monitor the environmental health, ocean parameters, their impact, variability and ecosystem processes.


 Dr. Gerard Ailhaud
 Chairman
 European Polar Consortium


 Dr. Paul Rippen
 Honorary Director
 European Polar Consortium
 and European Polar Board


 Carlo Alberto Ricci
 Chairman
 European Polar Board



EUROPOLAR ERA-NET

European polar capacity and infrastructures Arctic and Antarctic

The Consortium started in early 2005. Its first action was to carry out a deep survey on the European polar assets and programmes.

The infrastructure survey produced the most comprehensive assessment of the European polar capacity as a whole ever done by the European Commission, demonstrating the impressive polar capacity of Europe as a whole.



MoU "European Polar Framework"

Bruxelles on 24 June 2009 26 partners

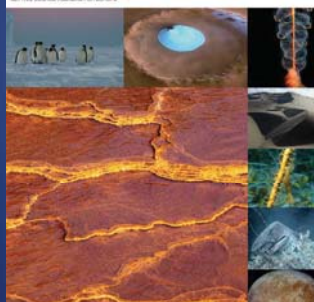
1. General Strategy and Funding Coordination
2. Programmes and Joint Research Calls
3. Infrastructure Coordination and Access
4. Convergence of National Polar Activities of European Scale and Scope



Life in Polar Extreme Environments POLARLIFE

The EPB is making Preparations for a strategic research funding call focussing on Life in Polar Extreme environments which will be open for researchers from across Europe in 2011. It will enable research into the dynamics processes and conditions for life and modifications

Investigating Life in Extreme Environments
A European Perspective



Environmental parameters	Known lower limit for life	Known higher limit for life	Comments
Temperature	-18°C [1,2]	113°C [1,6]	Mean human body temperature 37°C
Pressure	10 ⁻⁴ Pa [1,5]	130 MPa [1,8]	Atmospheric pressure: 101 kPa
pH	Negative [1,7]	13.2 [1,8]	Neutral pH: 7
Salt concentration	None	5 M [1,8]	Human blood saltness: 3.5 %
Water activity	0.7 [1,8]	1.0 [1,8]	
Light	Darkness	Variable	High light levels can cause photo-inhibition and free radical formation
Highly energetic radiation	None	1.5 Mrad [1,10]	1.5 Mrad is 3,000 times the lethal dose for humans



King Pinguin Colony

(EU-POLARIS)
European Platform Of Leading Antarctic Research
InfraStructures



Design study under research infrastructures



Green Paper on the future priorities of Research in the Polar Regions:
To be published in December 2010



European Research in the Polar Regions:
Relevance, strategic context and setting future directions in the European Research Area

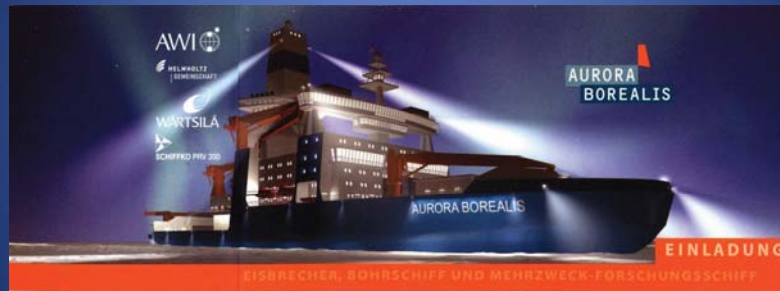
Executive Summary

1. The Relevance of European Research in the Polar Regions.....5
2. Addressing Global Scientific Questions.....8
3. Supporting the Science through World Class Research Infrastructures and logistics.....12
4. Coordinating, structuring and investing in European Research Activities in the Polar Regions.....15
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7. The Polar Regions a critical component in the European Research Area..20

A Strategic Position Paper by the ESF European Polar Board



European Polar Research Icebreaker Consortium AURORA BOREALIS



A European Pan Arctic observing platform from seabed to atmosphere
A Policy tool for international cooperation in the Arctic Region

How EPB can provide add value to European polar programmes and infrastructures coordination?

- Supporting a joint programmes strategy (example: PolarCLIMATE/PolarLIFE).
- Facilitating the access and linkage to new and existing polar research Infrastructures with broad geographic and environmental coverage (enabling trans-national access).
- Supporting the integration of terrestrial and Ocean observing assets in the Arctic region through development of a multilateral MOU
- Developing a flexible framework for cooperation amongst institutions operating research stations and observatories
- Policy advice to European Governments and early warning of polar threats
- Managing call for proposals and review processes

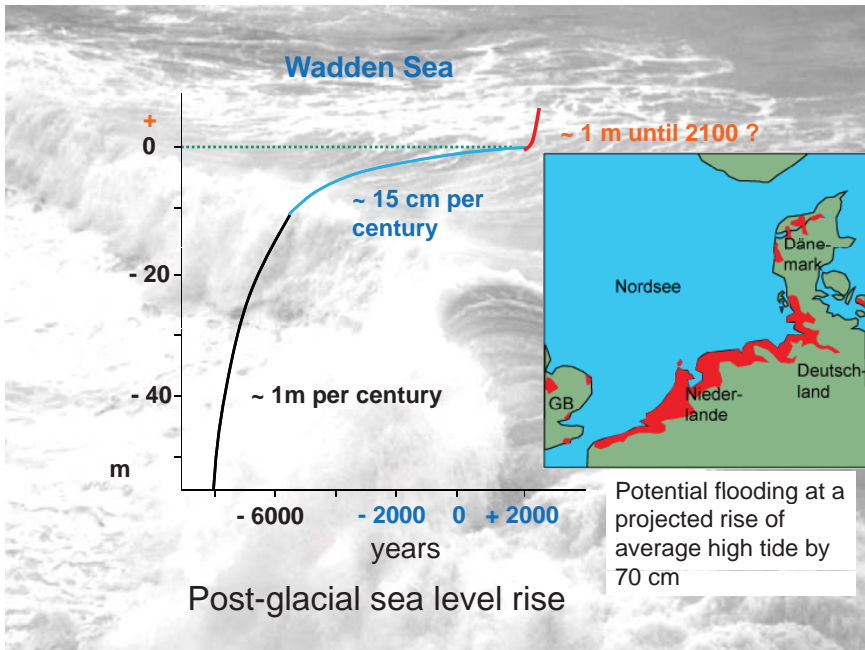


Melting Ice Sheets and Sea Level Rise: Threats to Coastal Systems

Prof. Dr. Karin Lochte
Alfred Wegener Institute for Polar and Marine Research

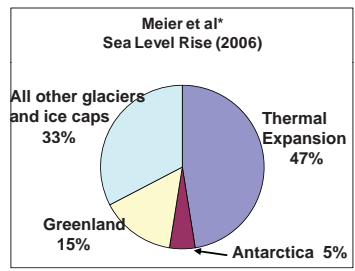
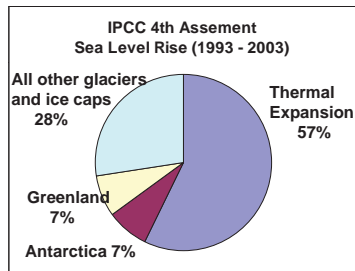
Understanding the Arctic Region and Assessing Future Developments:
Scientific Contributions to the European Arctic Policy
Brussels 28. October 2010

Foto: L. Tiedtke



Contribution of ice to the sea level rise

HELMHOLTZ ASSOCIATION



There huge uncertainties:

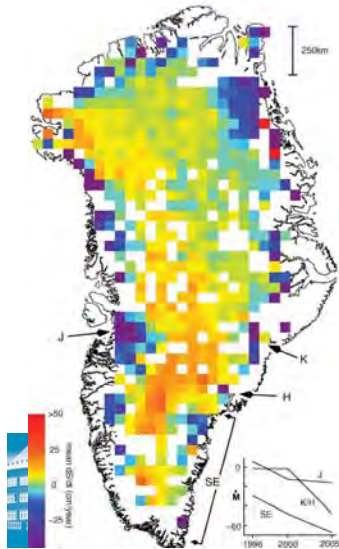
Calculated see level rise, IPCC AR4 2.8 ± 0.7 mm/yr

Contribution of ice, IPCC: 1.2 ± 0.4 mm/yr

Contribution of ice, Meier et al: 1.8 ± 0.5 mm/yr

*Meier et al, Science, 21 July, 2007
Small Glaciers Dominate Sea Level Rise in the 21st Century

**New data of ice melting:
~2.0 mm/year**

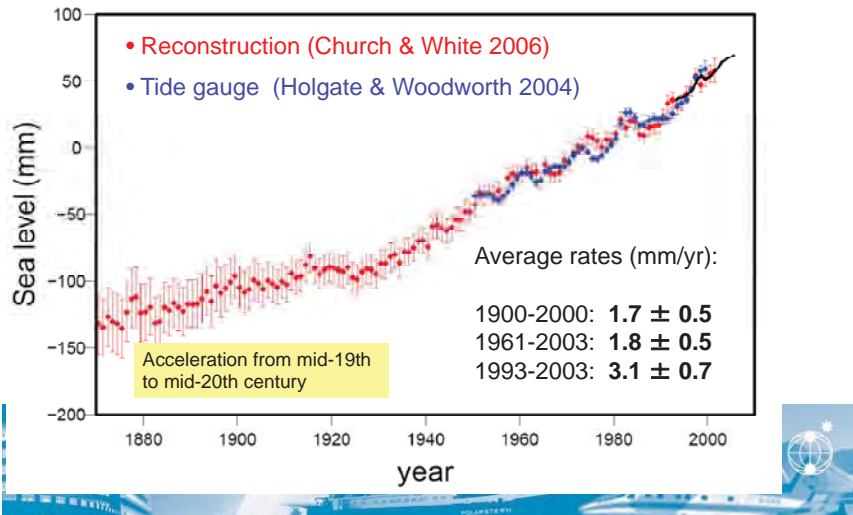


Greenland **gains** mass in the center, but **loses** mass at the edges

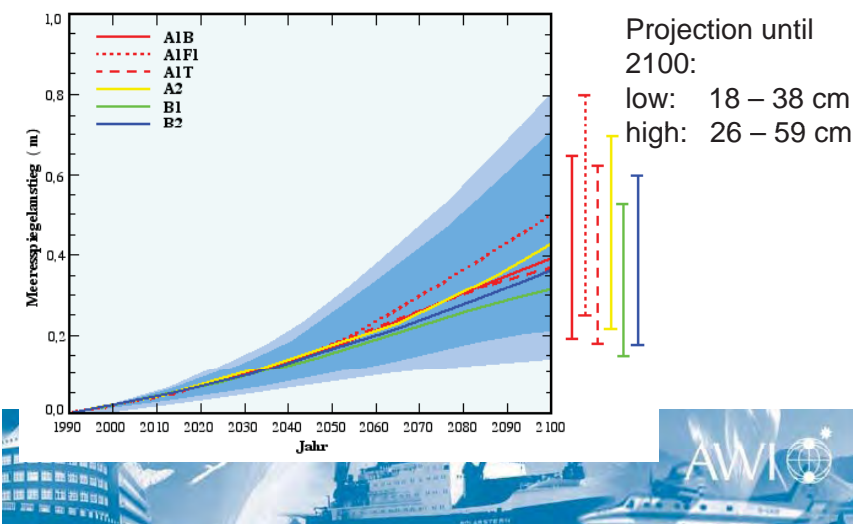
Greenland **loses** Ice masses by increased glacier runoff and melting



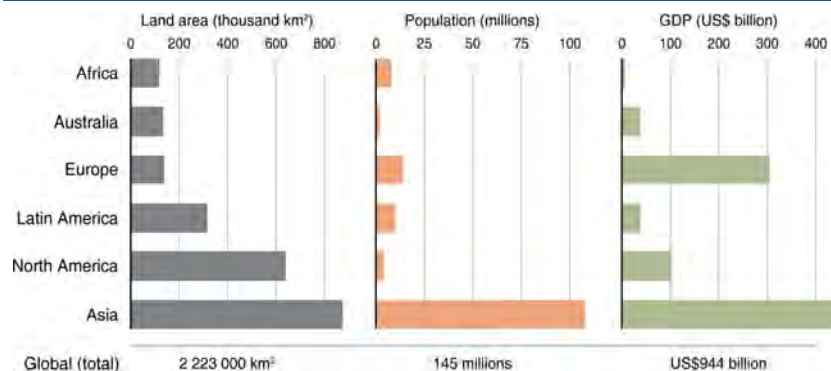
Global sea level rise since 1870



Projection of the Sea level rise



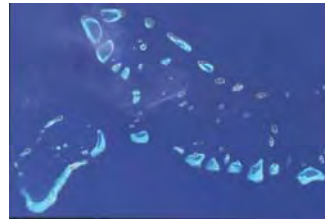
Population, area and economy affected by a 1 m sea level rise



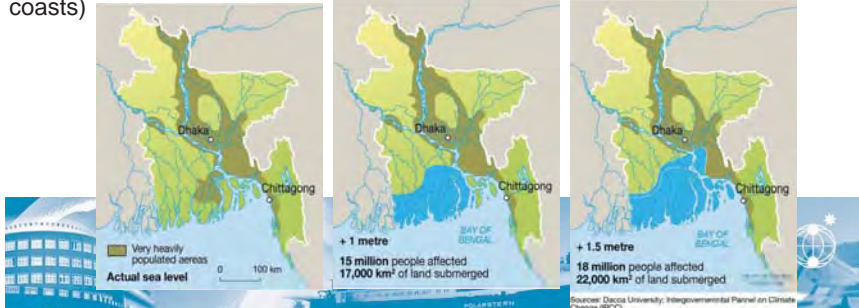
The densely populated megadeltas are especially vulnerable to sea-level rise. More than 1 million people living in the Ganges-Brahmaputra, Mekong and Nile deltas will be directly affected simply if current rates of sea-level rise continue to 2050 and there is no adaptation. (Anthoff, D., et al. (2006))

Most endangered coastal areas...

- Low island states, such as Kiribati, Tuvalu, Marshall Islands and Malediven (right),
- Densely populated river deltas, such as Bay of Bengal (below)

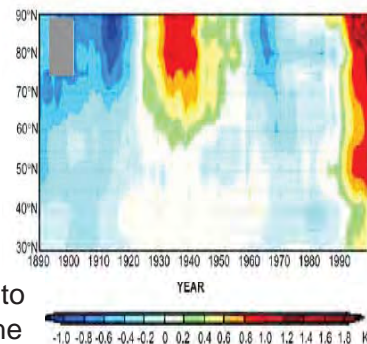


(- but also the Wadden Sea and North Sea coasts)



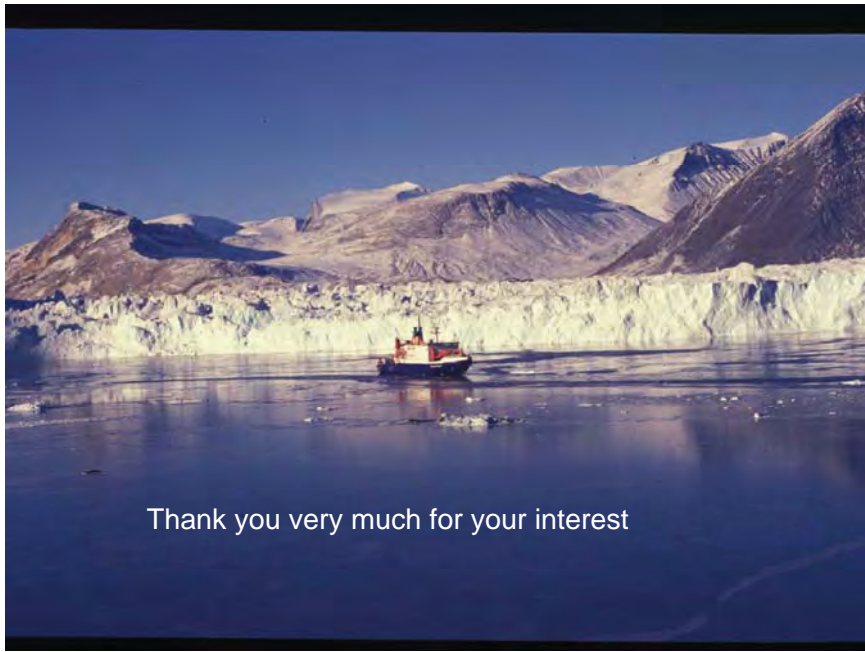
Temperature Variations in the Arctic

Temperature records since 1890 indicate a multidecadal oscillation of air temperature. Will there be a cooling period again? How will anthropogenic impacts affect the future temperature trend?



The future development is difficult to predict. It is essential to observe the changes in the Arctic with adequate methods. The next decade will show in which direction the Arctic system is going to change.





Thank you very much for your interest



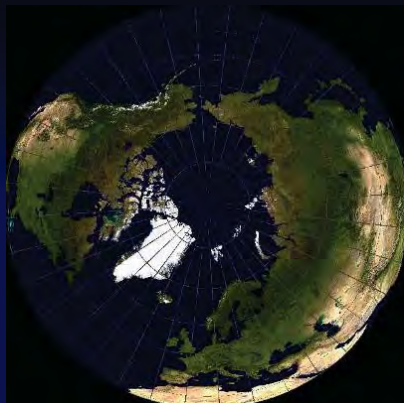
Understanding the Arctic and the Role of Observation Systems



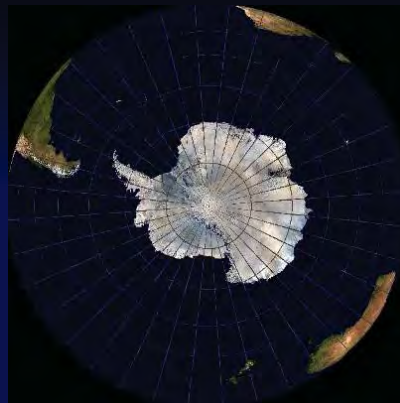
Yves FRENOT, *Director of the French Polar Institute*



North Pole / South Pole two opposed worlds



An ocean



A continent



North Pole / South Pole two opposed worlds



Sovereign countries

- The Arctic Council, 1996:

Canada, Denmark / Greenland / Faroe Islands, Finland, Iceland, Norway, Sweden, The Russian Federation and United States of America + Arctic indigenous communities

Observers : 6 European countries



An « international » area

- The Antarctic Treaty (1959) : A continent for peace and science
- The Madrid Protocol on the protection of the antarctic environment (1991)



North Pole / South Pole two opposed worlds



ARCTIC
About 4 millions people

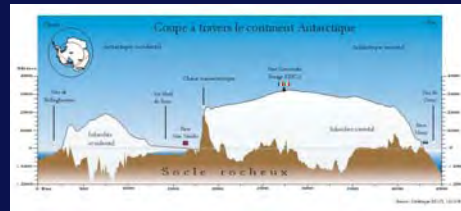


ANTARCTIC
No permanent residents
~ 4000 people in summer
< 2000 people in winter

Science for the
European Arctic Policy
Bruxelles , 28 October 2010



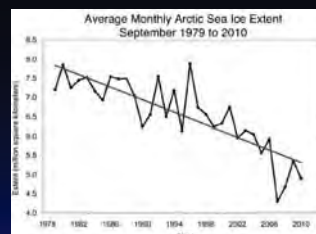
North Pole / South Pole two opposed worlds



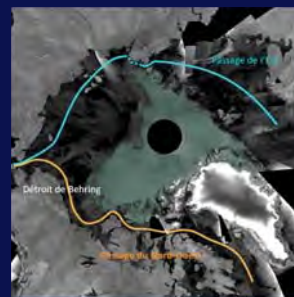
European Arctic Policy
Bruxelles , 28 October 2010



North Pole / South Pole two opposed worlds



Credit: National Snow and Ice Data Center

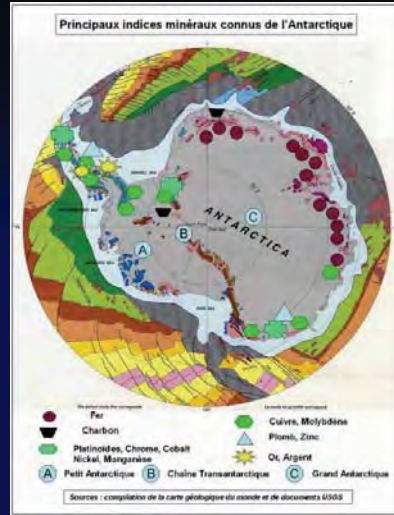


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North Pole / South Pole two opposed worlds



Science for the European Arctic Policy
Bruxelles, 28 October 2010

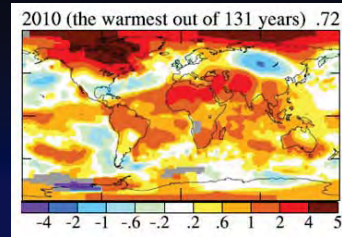


Heberlé & Hocquard, Ecomine, juin 2006

Major scientific challenges

Most of the main environmental issues which are currently under the spotlights take place in the polar areas, namely in the Arctic

- Climate change,
- Loss of biodiversity,
- Pollutions,
- Impacts on human societies
 - economic
 - sociological
 - cultural
 - health



Jan-May Mean Surface Temperature anomaly (°C)

Understanding the current changes in the Arctic needs long-term observations and monitoring



Science for the European Arctic Policy
Bruxelles, 28 October 2010

Observatories in the Arctic

- Collaborations with the Arctic countries
- Europe countries must provide specific expertise
- Need for national / European strategy
- Access to infrastructures is a crucial point
- Data collection must be homogenized and conservation of data must be secured
- Interdisciplinary



Observing the Arctic: The SAON Recommendations and Report

(report from the SAON Initiating Group workshop, Helsinki, Finland 15-17 October 2008)

Recommendation 4:

Recognizing that the Arctic issues are of global concern and that they are open for scientific study by all states, the Arctic Council member states should welcome non-Arctic states and international organizations as partners to the inter-governmental cooperation that will be necessary to sustain and improve Arctic observing capacity, and data and information services.



Svalbard Integrated Arctic Earth Observing System



PLATEFORME INFRAPOLAR : STATIONS EN ARCTIQUE

 = Centres d'activité régionaux scientifiques et logistiques

STATIONS EN ARCTIQUE

-  France: C. Rabot, J. Corbel (AWI-IPEV Base)
-  Greenland & Denmark: Arctic Station, Zackenberg, Sermilik, KISS, Greenland Institute of Natural Resources
-  Germany: Koldenway (AWI-IPEV Base),
-  Italy: Dirigibile Italia
-  Finland: (MIRACLE & FMI sites)
-  Sweden: (Abisko and Swedish SCANNET sites)
-  United Kingdom
-  Russian Federation: Barentsburg, & Tiksi ●
-  Norway: Sverdrup, Svalbard Hub
-  Poland: Hornsund
-  The Netherlands: Poolstation
-  The United States: Barrow, Toolik Lake Summit Station
-  Canada Resolute
-  South Korea- Dasan station
-  Japan Rabben
-  China



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Bruxelles, 28 October 2010

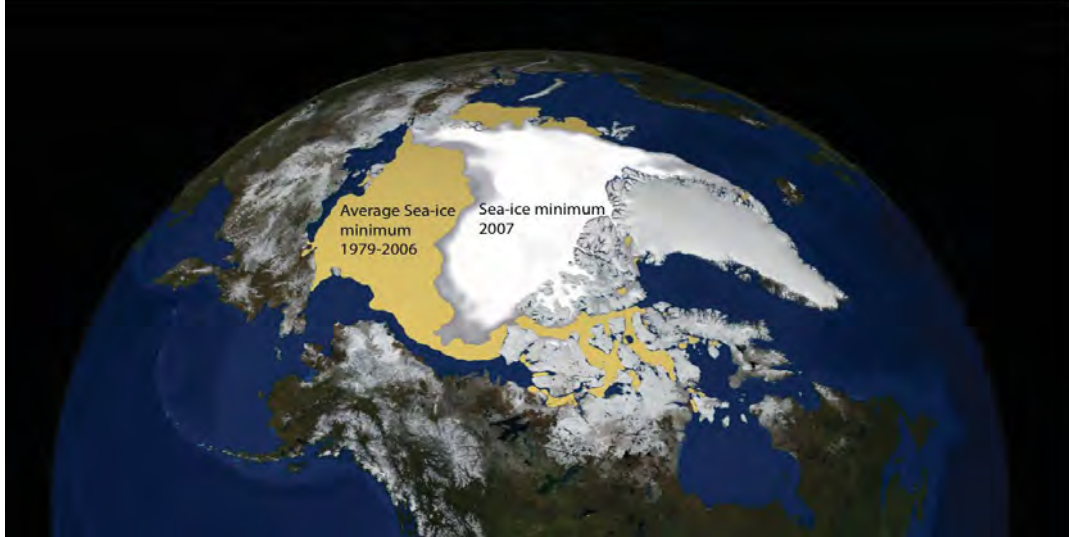
Thank you



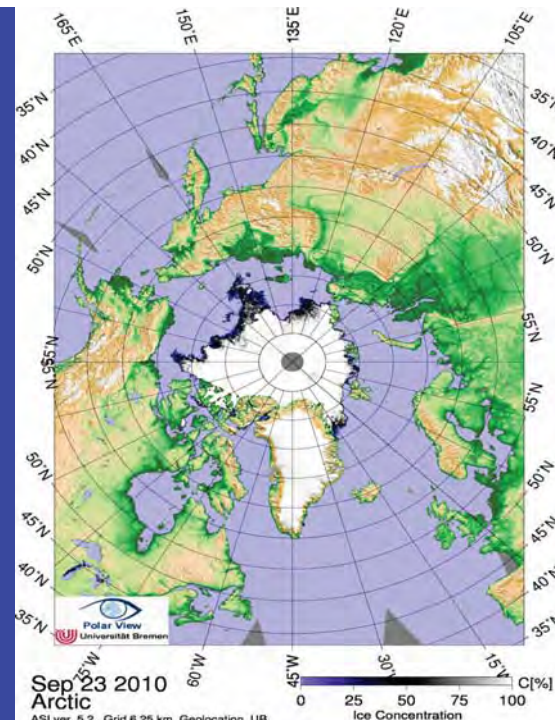
Changes in Sea Ice – Effects on the Arctic Environment and Shipping

Dr. Jan-Gunnar Winther
Director Norwegian Polar Institute

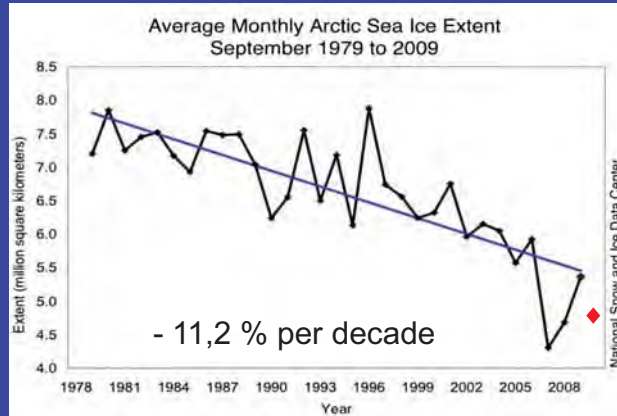
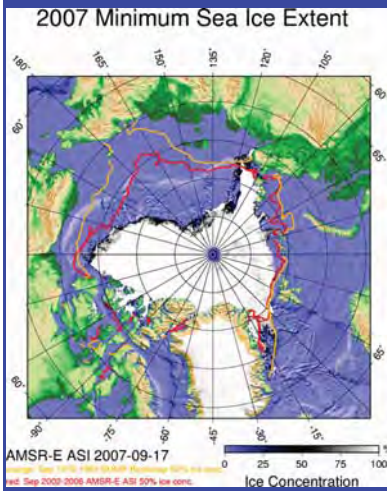
Science for the European Arctic Policy



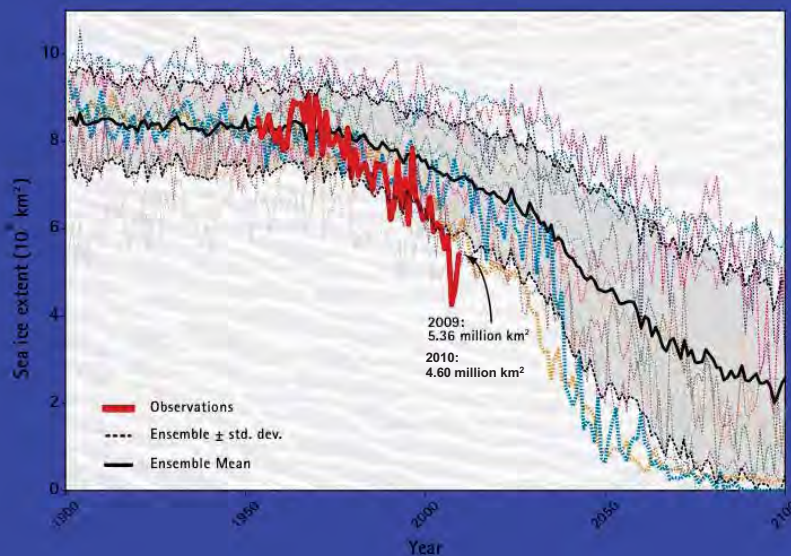
Minimum Arctic Sea-ice Extent from 1979 to 2007



Sea Ice Extent



Observed and modelled sea ice extent in the Arctic



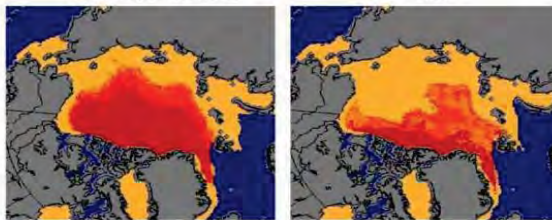


Sea Ice Thickness

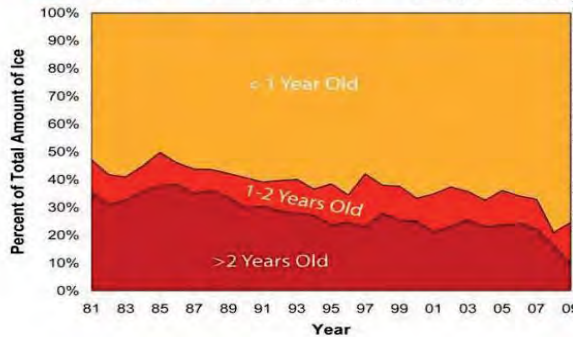
End of February Arctic Sea Ice Age

1981-2000 Median

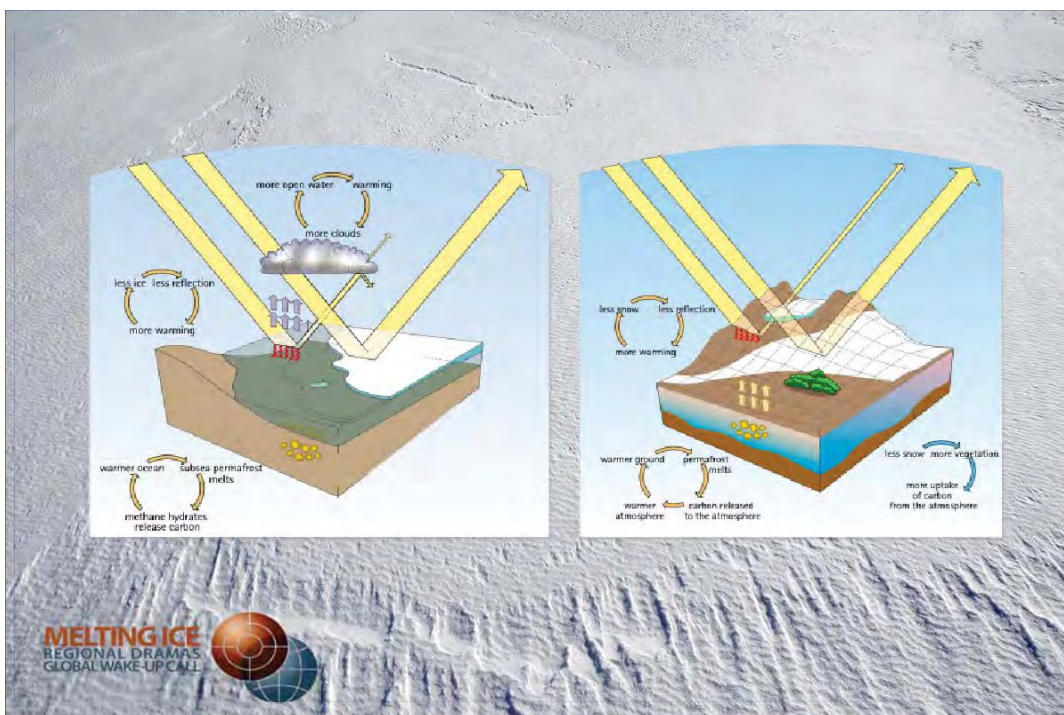
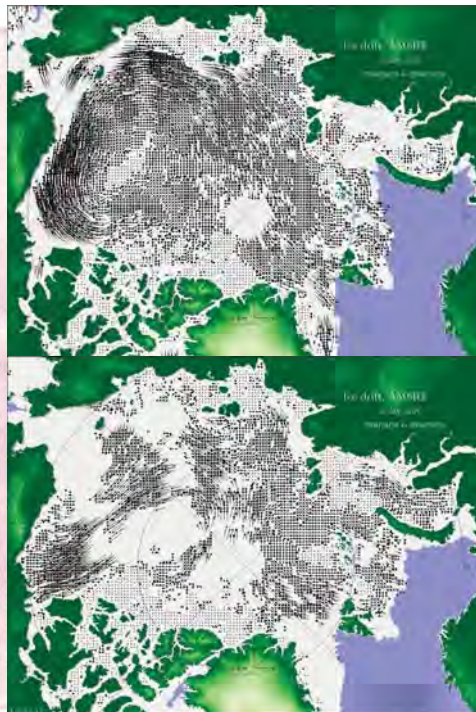
2009



■ First year ice (< 1 Year Old)
 ■ Second year ice (1-2 Years Old)
 ■ Older ice (>2 Years Old)

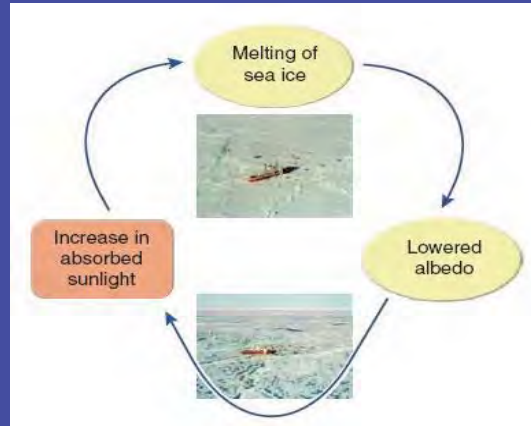
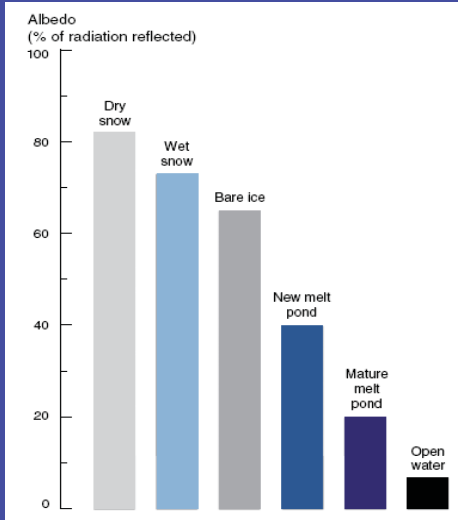


National Snow and Ice Data Center, courtesy J. Misbanik and C. Fowler, Univ. Colorado





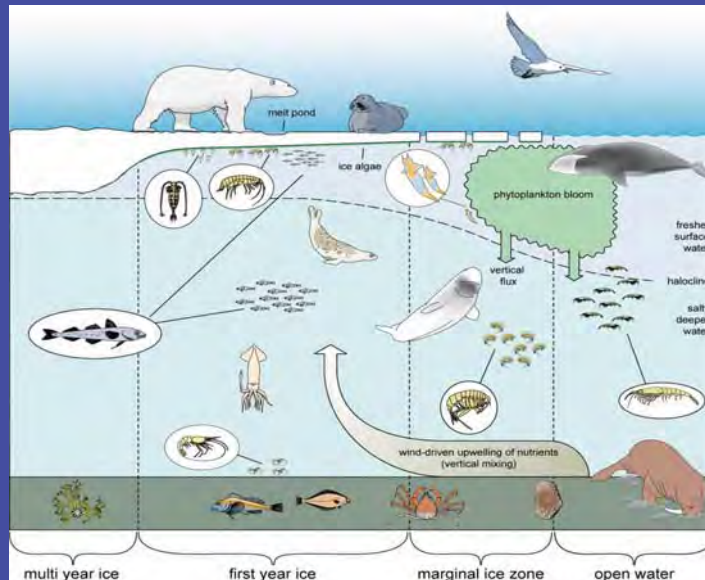
Albedo feedback



From: UNEP Global Outlook for Ice and Snow (2007)/Perovich and others.



How will the future look like?



IMPACTS OF A WARMING ARCTIC

Possible Changes in Fish Distribution

Climate driven changes in marine ecosystems.

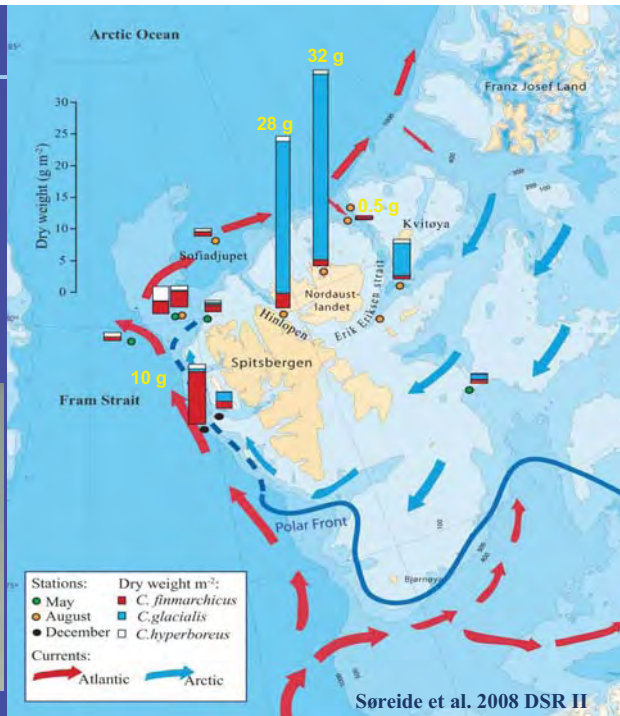


These shifts are governed by (1) changes in oceanic temperatures, (2) salinity, (3) nutrients, (4) changing patterns in North Atlantic Deep Water formation, and (5) interspecies interactions.



BIOMASS

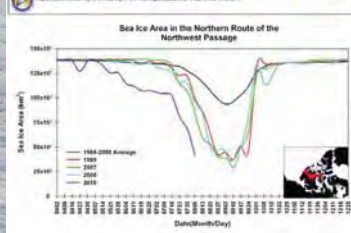
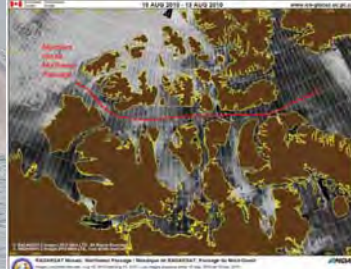
- *C. finmarchicus*
(0.3 – 8.7 g DW m⁻²)
- *C. glacialis*
(0.1 – 30.6 g DW m⁻²)
- *C. hyperboreus*
(0.1 – 2.6 g DW m⁻²)



Cruise tourism in Svalbard



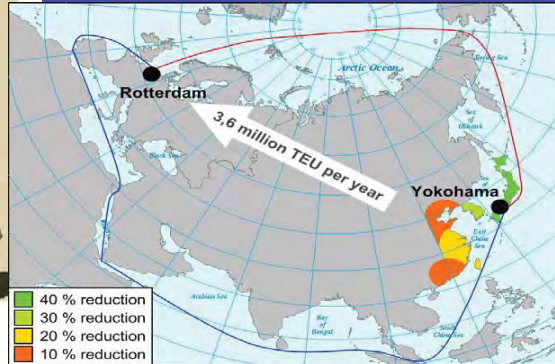
Northwest Passage Sea Ice Conditions Early August, 2010



NSIDC courtesy Howel, Aznew, and Wohlleben, and the Canadian Ice Service



- Northeast passage
- Northwest passage
- Arctic Ocean



Northwest passage

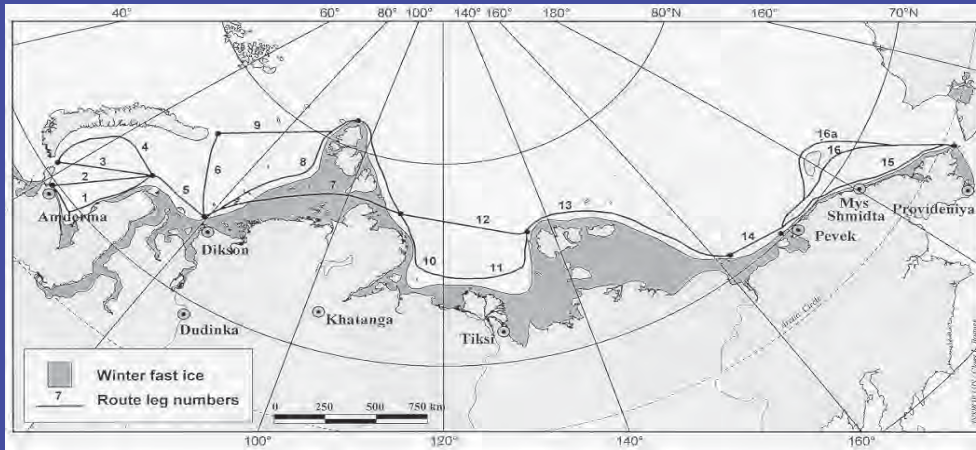


Northwest passage

- Limited savings for shipping to Europe
- Shorter distance between Asia and the east coast of USA, but attractive alternatives exist:
 - The Panama Canal is somewhat longer, but allows for higher average speed, has lower risk and better regularity
 - Combination of boat to the west coast of USA and then railway to the east coast
- Few totally ice-free days (only 2 in 2009), more multiyear sea ice
- Shallow waters and limited sea charts based on modern measurements
- Limited length of sailing season (weeks)
- Large infrastructure investments needed to accommodate transit traffic
- No formalised ice breaker service
 - Coast Guard ice breakers present from May to November, primarily coast guard duty (not ice breaking)
 - Ice breakers are relatively small, not suitable for supporting larger transport vessels



Northeast passage



Northeast passage

- Established sailing route for several decades (although only for destination traffic until very recently)
- Established ice pilot service
- Established ice breaker service
- Monitoring of traffic from operational centre in Murmansk
- National (Russian) regulations exist
- Sub-conclusion: Well arranged for transit, but needs (still) high ice breaker class or dependent on ice breaker service which reduces the profitability



Container versus bulk

	Activity segment				Origin region		
	Container	Dry bulk	Liquid bulk	General cargo	Europe	Asia	North America
No interest	40	8	7	3	29	17	12
Maybe	4	3	4		7	2	2
Interest for Arctic shipping	2	3	4	6	7	2	6

Source : survey conducted by F. Lasserre with 125 shipping companies in North America, Asia and Europe. Answering firms manage 6 723 ships. Container firms that answered represent a 75,23% of world market share in 2008.

Note: Among answering firms in North America, several interested firms are already present in the Arctic, such as Fednav, Oceanex, Nunavut Eastern, Desgagnés. In Europe, among answering firms, only Sovcomflot and Beluga are already present in the region.



2009



2010

SCF Baltica



- Left Murmansk 14 August 2010 with 70 000 tons of gas condensate
- Arrived safely in Ningbo, China 6 September
- Owned by Sovcomflot
- Escorted along route by 2 nuclear icebreakers from Rosatomflot
- First time an Aframax tanker of more than 100,000 dwt has navigated along the NSR
- The aim is to determine the feasibility of delivering energy on a regular, economically viable and safe basis along the Northern Sea Route



2010, cont.

Nordic Barents



- Left Kirkenes 4 September 2010 enroute for Asia
- First ever non-Russian transit of the Northern Sea Route (NSR)
- Carries 41 000 tons of iron ore concentrate
- Ship has high ice-class "1A Super" – required by Russian authorities for NSR-operations
- Will be escorted along route by 1-2 icebreakers from Rosatomflot
- Saves 8 days compared to Suez (or an additional 10-15 days compared to the pirate-free route around Africa)



2010, cont.



The ice-classed vessel “Monchegorsk” is the first cargo vessel to sail the entire Northern Sea Route without icebreaker assistance. “*Monchegorsk*” is also the first ever Norilsk-Nickel vessel to bring metal from the Kola Peninsula to China via the Northern Sea Route.

The Norilsk-Nickel owned vessel sailed from Murmansk on September 15th, sailed via the port of Dudinka on the Taimyr Peninsula to Asia (Shanghai) where it arrived on October 13th.



Conclusions

- Extent and thickness of sea ice have rapidly decreased the last years
 - This tendency is likely to continue causing an almost ice-free Arctic Ocean during summer
 - When this occurs is hard to predict, but it could happen within 10-20 years
 - In the coming years – a transition phase – we will most likely experience variable and demanding conditions
- Even in a future Arctic Ocean with little sea ice, the shipping industry will face several challenges
 - Variable ice conditions, risk for delays
 - Logistical support, search and rescue
 - Bureaucracy
- Shipping industry with large economical advantages will use the Arctic as transportation route the years to come (especially bulk)
 - Regular transit between Asia and Europe lies some years ahead
 - Transportation using the Arctic as destination will dominate (oil, gas, mining, goods for local communities, timber)



Future will bring changes to the Arctic

Thank you for your attention!

