



ACCESS
Arctic Climate Change
Economy and Society



Project no. 265863

ACCESS

Arctic Climate Change, Economy and Society

Instrument: Collaborative Project
Thematic Priority: Ocean.2010-1 "Quantification of climate change impacts on economic sectors in the Arctic"

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PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	



ACCESS NEWSLETTER

Arctic Climate Change
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Issue No. 1
5 September 2011

ACCESS Highlights



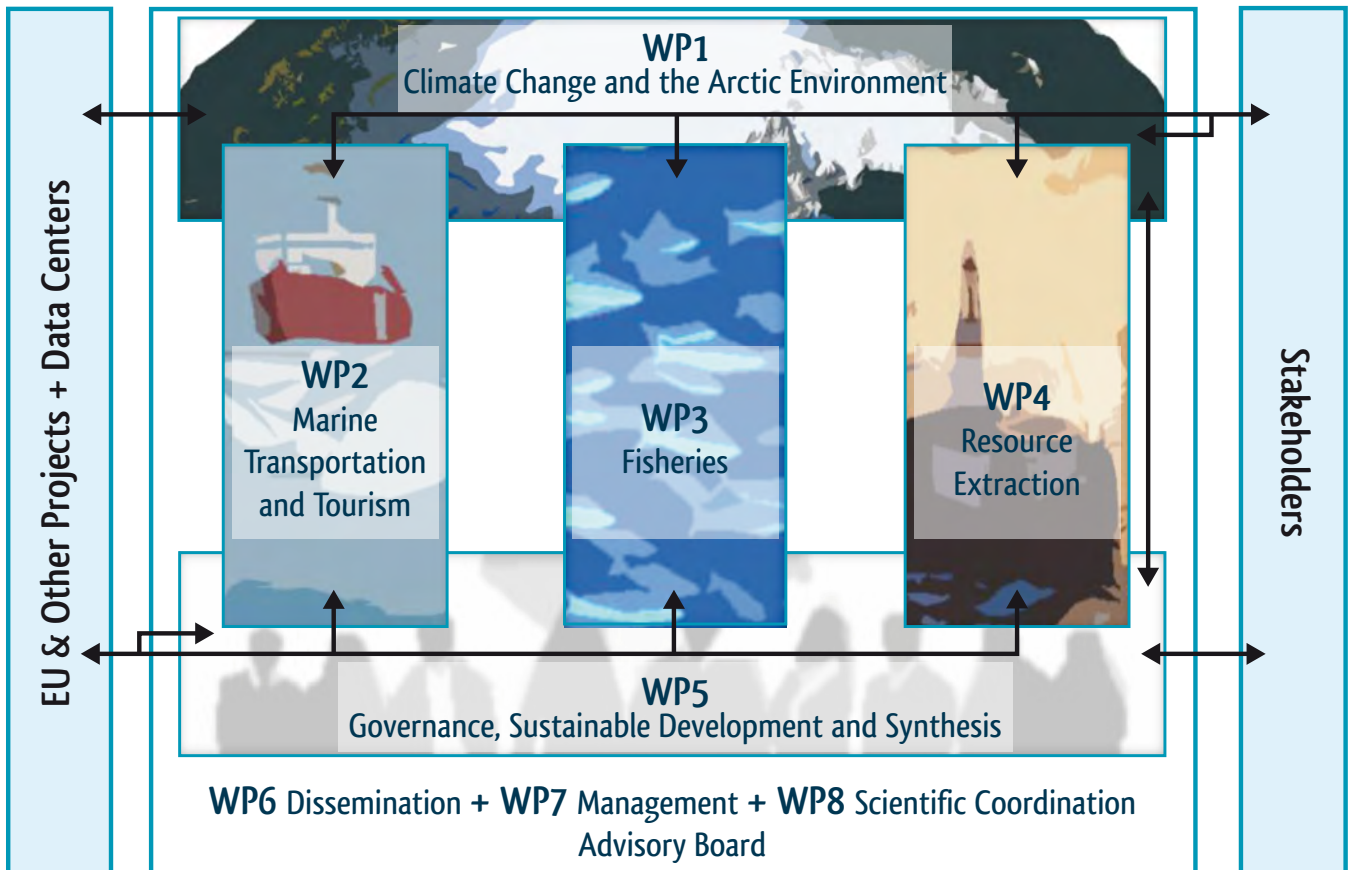
The ACCESS Project began 1 March 2011 with its 'Kick-Off Meeting' in Paris from 8 - 10 March 2011

This newsletter is produced three times each year by consortium of 27 partner organizations from 10 European countries in the 4-year Arctic Climate Change, Economy and Society (ACCESS) project. ACCESS is supported within the Ocean of Tomorrow call of the European Commission Seventh Framework Programme. Objectives of the ACCESS Newsletter are to facilitate international, interdisciplinary and inclusive information sharing of our research highlights about natural and human impact associated with sustainable development in the Arctic Ocean in the context of climate change.



www.access-eu.org





Schematic of the Arctic Climate Change, Economy and Society (ACCESS) project with its integrated work packages (WP) for research, administration and outreach.

WP1 addresses the climate-driven environmental state-change in the Arctic Ocean as the framework for assessing the economic, societal and environmental implications of the emerging human activities with marine transportation (WP2), fisheries (WP3) and energy resource extraction (WP4). Perspectives of Arctic states and indigenous peoples are central to science-policy frameworks for the Arctic. Common Arctic interests among diverse stakeholders, including non-Arctic states and global civil society, also are relevant. WP5 is integrating these economic, social and environmental facets of sustainable development in the Arctic Ocean to reveal options that can be considered by policy makers. Research results of these work packages will be shared broadly via the project website and its related newsletters and flyers (WP6). Overall, project management (WP7) and coordination (WP8) will involve an international and interdisciplinary advisory board along with key stakeholders, other EU projects and various data centers.

- Steering Committee members discussed the interdisciplinary dimensions and international implications of the ACCESS project with officers of the European Commission Directorate-Generals (Energy, Environment, Maritime Affairs and Fisheries, Mobility and Transport) in Brussels in July 2011. The Brussels' meetings also included interactions with the two other projects that were funded for the *Ocean of Tomorrow: Vectors of Change in Oceans and Seas Marine Life, Impact on Economic Sectors* (<http://www.marine-vectors.eu/>) and *Sub-seabed CO2 Storage: Impact on Marine Ecosystems* (<http://www.eco2-project.eu/>). The report from this *Ocean of Tomorrow* meeting will be available as a 'pdf' file on the on the ACCESS website.
- The ACCESS project notes the historic signing of the *Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic* that emerged from the Arctic Council ministerial meeting in Nuuk, Greenland, in May 2011 (<http://www.arctic-council.org/>). Other important Arctic Council developments are described in the *Nuuk Declaration*, including establishment of a Secretariat and criteria for future additions of observers as well as progress with diverse research activities and initiatives. The ACCESS project is working to collaborate effectively with the working groups and task forces of the Arctic Council.
- The ACCESS website (<http://www.access-eu.org>) – with its public archive of information generated during the 4-year European Commission project – is being launched along with the ACCESS Newsletter and Flyer at the WP1 meeting in Bremen from 5-6 September 2011.

Work Package Progress

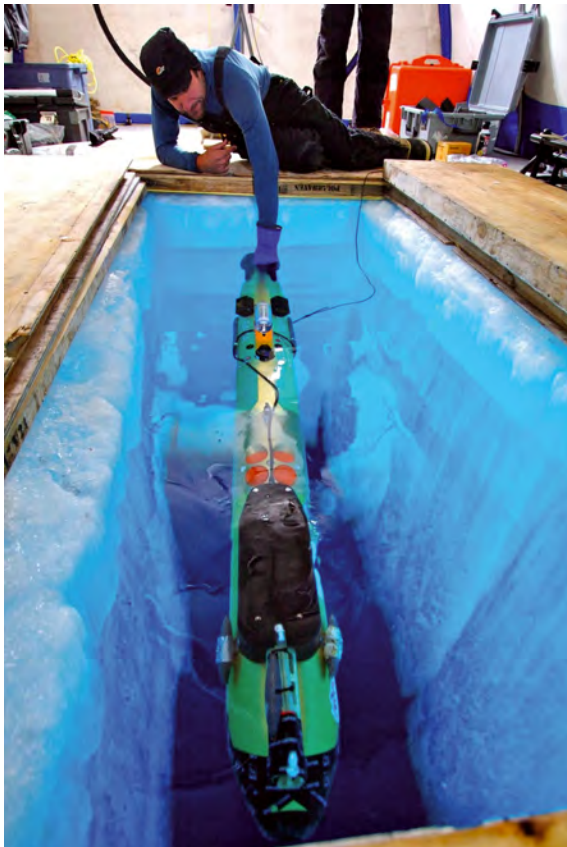
Work Package 1 – Climate Change and the Arctic Environment

The main objective of WP1 is to inform the other WPs about changing ice properties and other physical environmental parameters. Arctic climate projections for the next decades will be improved by better assessments of anthropogenic and natural sources of pollution..

Quantification of climate change impacts on economic sectors and the evaluation of associated risks requires a profound knowledge of the state and the expected changes of sea-ice extent and properties as sea-ice is impacting on all domains related to human activities.

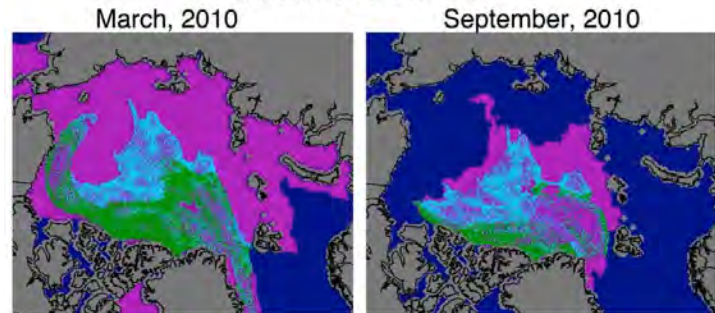
Within work package (WP) 1 the current state of the lower atmosphere, the ocean and the sea-ice is monitored. Several measurement systems are used e.g. weather stations, buoys, floats, satellites, radar, autonomous underwater vehicles (AUV) and submarine sonar. The derived data is put into context of previous measurements. Observations are the key to model validation and improvement.

In addition to the various observations covering several aspects of the atmosphere-ocean-sea ice system, different models are used to simulate the past (e.g. the Arctic warm period in 1920-1940), present and future (from hours to several decades) state of the Arctic climate.

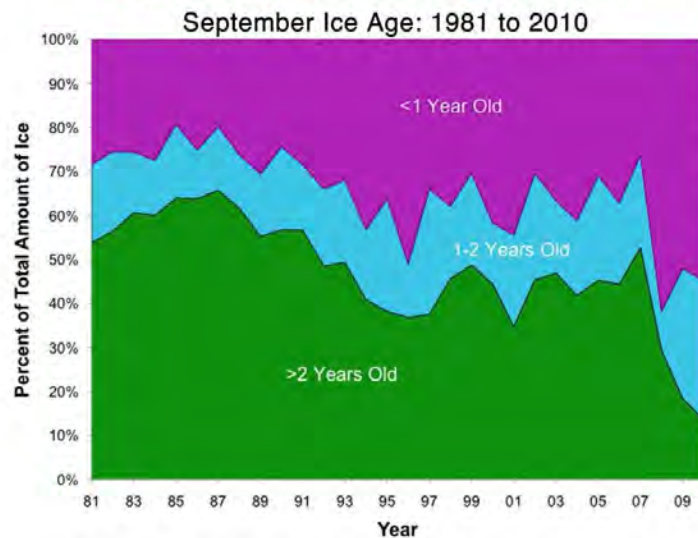


Autonomous Underwater Vehicle (AUV) mapping of Arctic sea ice, providing in situ validation of satellite measurements.

Arctic Sea Ice Age Change Summer 2010



Legend for Arctic Sea Ice Age Change:
■ First-year ice (<1 year old) (purple)
■ Second-year ice (1-2 years old) (cyan)
■ Multiyear ice (>2 years old) (green)



Diminishing sea ice in the Arctic Ocean with first-year sea ice during the winter from the Bering Strait to the Barents Sea, opening year-round access between the North Pacific and North Atlantic (<http://nsidc.org>).

The multi-model approach includes simulating the effects of soot aerosols, green house gases and contaminants. The aim of the models is to achieve a high spatial resolution of the Arctic region with regard to the likely range of ocean-sea ice variability, trends and the probability of extreme events. Another focus of WP1 is the change in weather forecasting capabilities, an issue that is relevant for safe transportation (WP2) and resource extraction (WP4).

WP1 Meeting

5-6 September 2011 in Bremen, Germany – WP1/ACCESS workshop on «Climate Scenarios and Climate Simulations» that intends to deliver to non-climate experts a working knowledge of climate science issues that are important for their research on climate change impacts on different sectors and activities. For additional information contact Dr. Rüdiger Gerdes (Ruediger.Gerdes@awi.de).

Work Package 2 – Marine Transportation and Tourism

The main objective of WP2 is to evaluate the effects of climate change on increased Arctic shipping and tourism, using the results of WP1 and providing recommendations for WP5. We will consider rules and regulations, infrastructure needs, pollution, safety, and socio-economic costs and benefits.

Due to recent climate warming – Arctic sea-ice conditions (thickness and extent) have been reduced by about 50% (see WP1).

One of the possible Arctic seaways, the Northern Sea Route (NSR), came into focus of the western marine transport industry and governments in 1987, when Soviet President Gorbatschow declared the NSR open for international shipping. The reason for the attraction is its 40% shorter distance between Europe and East Asia compared with the Suez Canal Route as well as the possibility of shipping hydrocarbons and other resources out of the Arctic to market.

This message influenced European researchers in the 1990's to investigate commercial, technical and environmental implications of shipping in the Arctic. The results showed that Arctic shipping was technically feasible due to icebreaker support but not economically justified then.



Merging Arctic Ocean trade routes between the North Pacific and North Atlantic for destination and transpolar shipping.

MV Nordic Barents, the first non-Russian vessel to use the Northern Sea Route, escorted here by a Russian icebreaker



Diminishing sea-ice in the Arctic Ocean and emerging shipping activities in and through the new seaway between Europe and Asia are rationale for WP2, which is focusing on the following topics:

- Impact of climate changes on Arctic shipping
- Rules and regulations for marine Arctic transport in view of changing ice conditions
- Infrastructure needs for increased shipping
- Pollution in the Arctic Ocean by increased shipping
- Improvements of safety and economy by Arctic shipping
- Socio-economic aspects of Arctic transport and tourism

Presentations and Publications

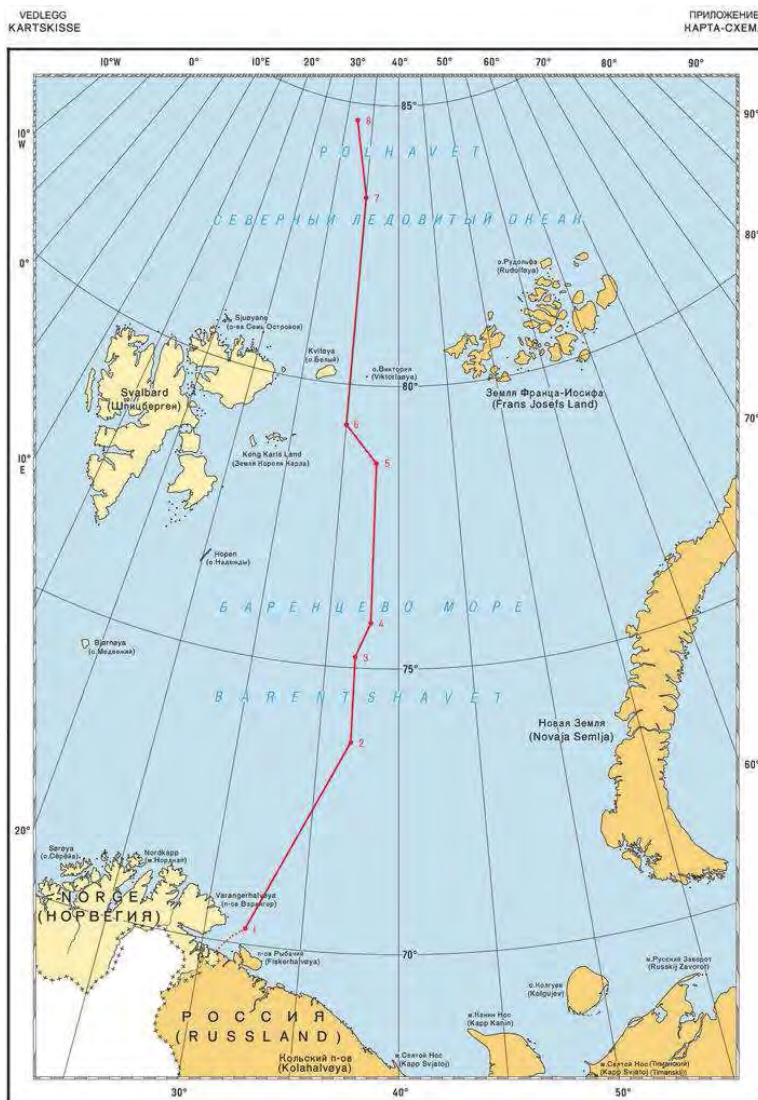
10-14 July 2011 – 21st International Conference on Port and Ocean Engineering under Arctic Conditions, Montreal, Canada, <http://www.poc11.com/>

WP2 Meetings:

31 May 2011 – WP2 Meeting at HSVA in Hamburg
29 November 2011 – WP2 Meeting at NBC in Copenhagen

Work Package 3 – Fisheries

The main objective of WP3 is to estimate and quantify how climate changes impact Arctic fisheries and aquaculture, and the livelihood of communities and economic actors depending of these industries..



Barents Sea ecosystem area, showing the agreed boundary line (red) between the Russian Federation and the Kingdom of Norway (the map is from the Norwegian Ministry of Foreign Affairs), resolving a 4-decade dispute as elaborated in their Joint Statement on Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean from 27 April 2010 (http://www.regjeringen.no/upload/UD/Vedlegg/Folkerett/030427_english_4.pdf).

Presentations and Publications

30 May-1 June 2011 – Regional conferences: The Arctic and the EU: Environmental and Human Challenges. Rovaniemi, Finland, and Stockholm, Sweden.

29 June-2 July 2011 – Annual conference of the European Association of Environmental and Resource Economists in Rome, paper presentation “Price vs. quantity for complex ecosystems – Dealing with non-convexities”

17-19 Sept 2011 – Askö meeting on “Food security and aquaculture development in a globalized world - links and tradeoffs between marine and terrestrial production systems”, Askö Sweden

Specific aims of WP3 are:

- Quantify and illustrate how climate changes impact the fishing activities within the Arctic environment, due to biological and regulatory constraints
- Review effects from climate change on aquaculture production within the Arctic
- Assess the effect from climate change on input and output markets of the Arctic fishing industry
- Evaluate the regional and local effects of climate-related environmental changes on fisheries, focusing on the adaptive strategies in commercial and subsistence fishery
- Review how fisheries management options are influenced by climate changes, given national policies, the legal fishery framework, environmental legislation and national perspectives on integrated ocean management
- Elucidate the behavioral responses from different actors involved in Arctic fisheries, to ecosystem changes and policy interventions as results of climate change
- Map the distribution of marine mammal populations in the Arctic and assess how climate change and human activities influence traditional whaling
- Develop indicators for sustainable development in the Arctic fisheries sector

WP3 Meetings:

8-9 June 2011 at the Beijer Institute in Stockholm, Sweden – This initial planning meeting provided an opportunity for WP3 collaborators (along with several WP5 colleagues) to become acquainted and to discuss their shared activities throughout the ACCESS project.

WP3 Contact

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Arne Eide : arne.eide@maremacentre.com

Work Package 4 – Resource Extraction

The main objective of WP4 is to assess the risks and opportunities associated with the extraction of hydrocarbons from the Arctic Ocean. These assessments will be further considered in view of socio-economic impacts on European and world markets.

The Arctic is undergoing a climatic revolution that will have political, environmental and socio-economic repercussions for Europe and the world. The combination of the melting of the Arctic sea ice and the economic and political attractiveness of non-renewable resources, especially sub-sea hydrocarbons, are giving rise to this transformation.

Even though the rush for Arctic oil and gas has begun it is fair to say that the safe and efficient extraction of these resources still pose many challenges. It is the main objective of WP4 to provide a detailed assessment of the opportunities and multiple risks of hydrocarbon extraction in the Arctic Ocean. In particular to highlight potential environmental

pressures, provide pathways for technological, legal and institutional solutions to known problems, and to analyse the socio-economic impacts of resource extraction activity on European and world markets and societies.

Various partners involved in WP4 have been able to secure additional funding that complements the WP deliverables. These include:

- SAMS and DAMTP: Oil Detection Under Sea Ice (ODSI) Funding agency: Infrastructure Initiative Programme of the EU FP7 programme see HYDRALAB: <http://www.hydralab.eu/>



Arctic commercial assets being deployed during initial freeze up of the ocean

Presentations and Publications

28 March-1 April 2011 – Arctic Science Summit Week 2011 / International Arctic Science Committee: Marine Working Group: Seoul, South Korea.

10-14 July 2011 – 21st International Conference on Port and Ocean Engineering under Arctic Conditions, Montreal, Canada (<http://www.poac11.com/>).

M. André, M. van der Schaar, S. Zaugg, L. Houégnigan, A.M. Sánchez, J.V. Castell (2011). Listening to the Deep: Live monitoring of ocean noise and cetacean acoustic signals. Marine Pollution Bulletin 63: 18–26.

WP4 Meetings:

23 May 2011 in Hamburg, Germany - This initial planning meeting provided an opportunity for WP4 collaborators to become acquainted and to discuss their shared activities throughout the ACCESS project.

20th September – Friday 23rd September 2011 - Meeting of the WP4 partners involved in oil spills and workshop entitled OIL SPILLS IN SEA ICE – PAST, PRESENT AND FUTURE to address oil-ice-water-biology interactions in the Arctic Ocean and associated technologies for detection and impact remediation.

Work Package 5 – Governance, Sustainable Development and Synthesis

The main objective of WP5 is to integrate results of WP 1-4, revealing international and interdisciplinary policy options that can be considered by decision makers to ensure sustainable development and environmental protection of the Arctic Ocean.

The objective of Work Package 5 is to provide an overview of each of the ACCESS sectors of maritime shipping, tourism, fisheries and oil and gas extraction in respect of their relevant regulatory systems, legislation and agreements, and their interaction with the indigenous people (and other stakeholders) in the region.

In particular, WP5 will critically assess the strengths and weaknesses of these systems as they might respond to a significant period of climate change, focussing on governance requirements that derive from science-based assessments.

Specific sectors of maritime shipping and tourism, fisheries and oil and gas extraction (WP 2-4) will be assessed for shortfalls, conflicts and lacunae in current regulations.



The Arctic Ocean is central to indigenous cultures the high north



Arctic Ocean with regard to jurisdictional zones on the sea floor (left: continental shelves and deep sea) and in the overlying water column (right: exclusive economic zones and high seas), as provided by the law of the sea. See: Berkman, P.A. and Young, O.R. 2009. Governance and Environmental Change in the Arctic Ocean. Science 324:339-340.

Presentations and Publications

17-18 March 2011 – Arctic Science, International Law and Climate Protection - Legal Aspects of Marine Science in the Arctic Ocean. German Federal Foreign Office, Berlin, Germany.

21-24 June 2011 – 77th Rose-Roth Seminar on Changes in the High North: Implications for NATO and Beyond. NATO Parliamentary Assembly and Norwegian Parliament, Tromsø, Norway.

21-24 September 2011 – 2nd International Arctic Forum of Dialogue. Russian Geographic Society. Archangelsk, Russian Federation

Berkman, P.A. 2011. Breaking the Ice. European Parliament Magazine. 4 April 2011.

Berkman, P.A. 2011. "Let the North Pole be a Pole of Peace." Global: The International Briefing, 3rd Quarter Issue, pp. 12-15

These assessments will help to define the gaps, overlaps and inefficiencies in current institutions, as well as contribute to addressing regional, national and international stewardship challenges.

WP5 will objectively identify and propose balanced options and elements of integrated policies in line with future sustainable development of the Arctic Ocean, particularly in relation to the law of the sea.

Balanced options will be considered in view of common interests among diverse stakeholders – Arctic states and indigenous peoples most centrally with inclusion of non-Arctic states and civil society more generally.

WP5 Meetings:

10-12 August 2011 at the National Oceanography Centre in Southampton, United Kingdom – Joint WP5 and ACCESS Steering Committee meeting to facilitate ACCESS project integration.

WP5 Contact

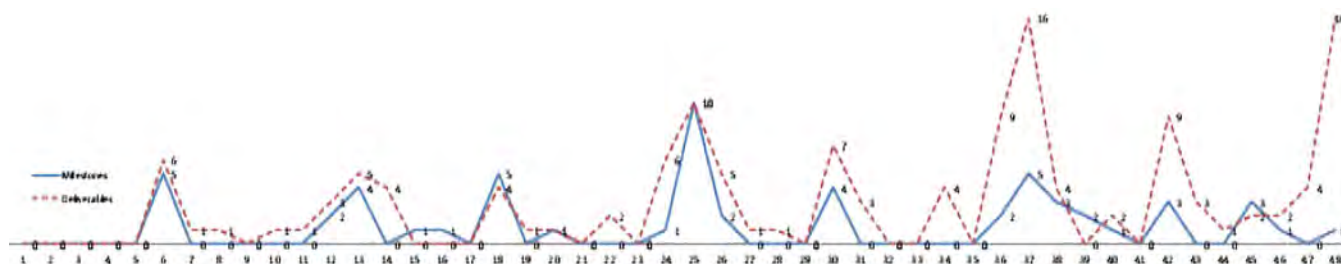
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Anne-Sophie Crépin: asc@beijer.kva.se

Work Package 6 – Dissemination

The main objective of WP6 is to openly share research results from WP 1-5 with policy makers, industrial and academic stakeholders, and the public-at-large via the ACCESS Website , Flyer and Newsletter as well as through other media.

The following table describes the initial international and interdisciplinary framework of the ACCESS project.

CONSORTIUM FOR THE ARCTIC CLIMATE CHANGE, ECONOMIC AND SOCIETY (ACCESS) PROJECT							
ACCESS CONSORTIUM PARTNERS		WORK PACKAGE (WP) PARTICIPATION					
NO.	PARTNER (COUNTRY)	WP1	WP2	WP3	WP4	WP5	WP6
1	UPMC – UNIVERSITÉ PIERRE ET MARIE CURIE (FRANCE)	●	●		●	●	●
2	O.A.SYS. – OCEAN ATMOSPHERE SYSTEMS GMBH (GERMANY)	●	●		●		●
3	NOC – NATIONAL OCEANOGRAPHY CENTRE SOUTHAMPTON (UNITED KINGDOM)				●	●	●
4	INSTITUTE FOR WORLD ECONOMY KIEL (GERMANY)				●	●	
5	UCAM – UNIVERSITY OF CAMBRIDGE (UNITED KINGDOM)	●	●		●	●	●
6	AWI - ALFRED WEGENER INSTITUTE FOR POLAR AND MARINE RESEARCH (GERMANY)	●				●	
7	JSC - JOACHIM SCHWARZ CONSULTING (GERMANY)		●			●	
8	NOFIMA - NORWEGIAN INSTITUTE OF FOOD, FISHERIES AND AQUACULTURE RESEARCH (NORWAY)			●		●	
9	HSVA - THE HAMBURG SHIPMODEL BASIN (GERMANY)		●		●		
10	NORWEGIAN POLAR INSTITUTE (NORWAY)	●					
11	MET NO – METEOROLOGICAL INSTITUTE (NORWAY)	●	●		●	●	●
12	FASTOPT GMBH (GERMANY)	●	●		●		
13	SAMS – THE SCOTTISH ASSOCIATION FOR MARINE SCIENCE (UNITED KINGDOM)	●	●		●		
14	BEIJER INSTITUTE OF ECOLOGICAL ECONOMICS (SWEDEN)			●		●	●
15	SHIRSHOV INSTITUTE OF OCEANOLOGY, RUSSIAN ACADEMY OF SCIENCE (RUSSIAN FEDERATION)	●	●		●	●	
16	IMPAC OFFSHORE ENGINEERING GMBH (GERMANY)				●		
17	UNIVERSITY OF CATALUNYA (SPAIN)		●	●	●	●	●
18	DLR – GERMAN AEROSPACE CENTRE (GERMANY)		●		●		
19	AARI – ARCTIC AND ANTARCTIC RESEARCH INSTITUTE (RUSSIAN FEDERATION)	●	●				
20	ESRI – ECONOMIC AND SOCIAL RESEARCH INSTITUTE (IRELAND)		●				
21	UNIVERSITY OF LAPLAND (FINLAND)			●			
22	SINTEF F&H (NORWAY)			●	●		
23	CICERO (NORWAY)	●	●		●		
24	STIFTELSEN SINTEF (NORWAY)				●		
25	EWI – SCIENTIFIC INSTITUTE OF ENERGY COLOGNE (GERMANY)				●		
26	LE CERCLE POLAIRE (FRANCE)					●	
27	NBC – NORDIC BULK CARRIER A/S (DENMARK)		●				



ACCESS timeline of milestones (solid blue line) and deliverables (dashed red line) from WP 1-5 combined, showing regular peaks of productivity for dissemination every 4-6 months, from Month 1 to Month 48.

Future Activities and Initiatives

International Arctic Research Collaboration

Building on the success of the SEARCH (<http://www.arcus.org/search/searchscience/>) for DAMOCLES (<http://www.damocles-eu.org/>) collaboration – initial discussions are underway with the SEARCH coordinators as well as with the National Science Foundation and National Oceanic and Atmospheric Administration to facilitate complementary transatlantic collaboration with the ACCESS programme. These discussions also involve ISAC (<http://www.arcticchange.org/>) along with Arctic-Net (<http://www.arcticnet.ulaval.ca/>) in Canada. In addition, planning is underway for the “Responding to Change” workshop that will be convened at the Queen’s University, School of Policy Science, in Kingston, Ontario, tentatively in November 2011 (<http://www.iarc.uaf.edu/workshops/2011/international-collaboration-in-arctic-science>).

Conference: Oil Spills in Sea Ice – Past, Present and Future

This conference will be convened at the Istituto Geografico Polare “Silvio Zavatti” in the Villa Vitali in Fermo, Italy, from 20-23 September 2011 (<http://www.oilspillinice.net>).

International Polar Year (IPY) Meeting – From Knowledge to Action – Montreal, April 2012

The final synthesis meeting of the IPY will be convened in Montreal, Canada, from 22-27 April 2012 (<http://www.ipy2012montreal.ca/>). Please see the IPY website for additional information and registration. Several sessions in this IPY meeting are being convened by principal investigators in the ACCESS project.

SESSION. 1.4.1. NATURAL RESOURCE EXPLORATION, EXPLOITATION AND COMMERCIAL ACTIVITIES INCLUDING TOURISM

Convenor: Lawson Brigham (United States) - lwb48@aol.com

Co-convenors: Andrii Fedchuk (Ukraine).

While continental Antarctica is shielded from resource exploitation by the 1991 Protocol on Environmental Protection of the Antarctic treaty, the Arctic is becoming increasingly attractive to developers as global demand for natural resources explodes and access is facilitated by sea ice recession. The modernization of the Arctic is driven by booming exploration/exploitation of oil and gas deposits, large mining projects, new shipping routes for intercontinental and destination shipping, the projected laying of intercontinental communication cables, the search for new fish stocks, increased popularity of polar destinations for tourism, etc. . In Antarctica, tourism is the main commercial activity in terms of scale and influence. What have we learned on these issues during the International Polar Year? This session will focus on exploitation of natural resources, as well as socio-cultural effects and political implications of commercial pursuits in the Polar Regions. The session is particularly concerned with multidisciplinary aspects of interrelationships between human activities management and observed environmental changes (e.g., increased access to new pristine areas by ships due to climate warming) with emphasis on the need for scientific information and regulation. Presentations that demonstrate practical management and regulatory options within the context of diversification, and that propose schemes for the prioritizing of human activities in the Polar Regions are particularly welcome.

SESSION 1.5.3. ADVANCES IN TECHNOLOGY IN POLAR RESEARCH, INCLUDING SUBGLACIAL EXPLORATION

Convenor: Jeremy Wilkinson (United Kingdom) - Jeremy.Wilkinson@sams.ac.uk

Co-convenors: Denis Samyn (Belgium).

New technological developments in scientific sensors, data processing techniques and deployment platforms are providing unparalleled access to polar data that address problems of global significance. Although the polar regions remain isolated and harsh environments for human measurements, automated systems were used extensively during IPY to provide detailed year round data over large areas. We invite contributions to this session that report the latest technological developments for polar measurements, including subglacial exploration. These might include autonomous underwater vehicles that can penetrate the ocean depths and make measurements beneath sea ice and within ice shelf cavities; automatic systems for detailed ice, oceanographic and atmospheric measurements; robotic land and airborne sensor platforms; sophisticated new radar, lidar and seismic geophysical techniques that can provide data from within the ice sheets and from the Earth’s crust below them and the ocean; quantitative satellite borne sensors; and state-of-the-art biological techniques that provide clues to the origin of polar life and ecosystem complexity.

SESSION 2.2.7. SUSTAINABLE ARCTIC DEVELOPMENT: INTEGRATED PERSPECTIVES

Convenor: Paul Arthur Berkman (United Kingdom) – pb426@cam.ac.uk

Co-convenors: Oran R. Young (United States) and Sandra Rodrigues Balão (Portugal).

The Arctic Ocean is undergoing an environmental state change from a permanent sea-ice cap to a seasonally ice-free sea, fundamentally transforming opportunities and challenges across the marine and terrestrial North Polar Region. Natural and social science projects from the International Polar Year 2007-2008 reveal interdisciplinary perspectives on globalization, geopolitical strategies, military activities, resource extraction, transport and tourism in the Arctic. Rather than fragmented approaches for the Arctic, sustainable development and environmental protection (the «common Arctic issues» in the 1996 Ottawa Declaration that established the Arctic Council) require integrated strategies, such as ecosystem-based management and marine spatial planning. Practical considerations of institutional interplay and common interests are especially relevant to the holistic objectives of this session.

Comments and suggestions for the ACCESS Newsletter are most welcome

For further information, please contact Paul Arthur Berkman: berkman@bren.ucsb.edu