

STRATEGIC ENVIRONMENTAL IMPACT ASSESSMENT OF DEVELOPMENT OF THE ARCTIC

The EU in the Arctic, the Arctic in the EU





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INTRODUCTION

Rapid development of the Arctic, as well as the challenges and opportunities that it brings, demand an effective use of science-based information, influential and fast reactions from the decision- and policy-makers as well as pro-active work by relevant communication and research centres. The greatest challenges to our common future have to be addressed in advance by those who will tackle them.

EU IN THE FRONTLINE OF CO-PRODUCTION OF ARCTIC KNOWLEDGE

The **co-production of knowledge** through science-policy interaction is seen as necessary to fully comprehend the impact of the EU policies on the future of the Arctic region. Increasing awareness, understanding and knowledge about the Arctic and its changing political, socio-economic and environmental landscape requires policy-makers to participate in and benefit from **multidimensional dialogue** and information exchange between the EU officials, science and civil society. With the project presented in this brochure, the EU combined science-based information with the **views and perspectives of Arctic stakeholders** and took on a frontline role in carrying out global-level impact assessments for policy-makers in the Arctic.

The **STRATEGIC ASSESSMENT OF DEVELOPMENT OF THE ARCTIC** focusing on seven main trends provides (i) key messages regarding the development of the Arctic regions, (ii) suggestions for future development of the EU Arctic policy framework, and (iii) key thematic findings and recommendations regarding the EU policies affecting the Arctic.

The **ASSESSMENTS IN POLICY-MAKING: CASE STUDIES FROM THE ARCTIC COUNCIL** presents tools for increasing the quality of decisions and policies regarding the Arctic, and described cases from the Arctic Council.

EUROPEAN ARCTIC INITIATIVES COMPENDIUM serves as an inventory of current initiatives, projects and policies of significance to the Arctic.

GAP ANALYSIS defines what policy-makers need to know about the Arctic, where that information is located, and how can it be made available.

NETWORK FEASIBILITY ANALYSIS presents potential services and products provided for the use of the European Union by the EU Arctic Information Centre.

The Strategic Environmental Impact Assessment of development of the Arctic (12/2012 – 6/2014) was a Preparatory Action project financed by DG Environment of the European Commission. The project was carried out by a network of 19 leading Arctic research and communication centres and universities in Europe with extensive activities in and knowledge of the Arctic.

THE ASSESSMENT

The ‘Strategic Assessment of Development of the Arctic: Assessment Conducted for the European Union’ report considers the trends and developments taking place in the European Arctic today. That includes a view to 2030, with an emphasis on the uncertainties. The analysis has been conducted on the basis of seven themes focused on change. The implications of Arctic changes for the European Union as well as the role of EU policies and actions in the Arctic are examined. The European Arctic is understood here as the part of the circumpolar Arctic located between Greenland and northwest Russia (Figure 1).

The report is the main outcome of the ‘Strategic Environmental Impact Assessment of development of the Arctic’, a project funded by the European Commission and carried out by a network of 19 European research and communication institutions specialised in Arctic affairs, led by the Arctic Centre, University of Lapland. It contributes to the EU Arctic Information Centre initiative. All project partners participated in the assessment work, but the results and findings are the sole responsibility of the authors of the Strategic Assessment of Development of the Arctic report. The full version of the report is available at www.arcticinfo.eu.

The objective of the assessment was to “assess the impacts of development in the Arctic and of EU policies affecting the Arctic region on the political, economic and environmental landscape of the EU and the Arctic region.” The assessment work, conducted between April 2013 and May 2014, proved highly challenging owing to its broad scope and the ambitious programme of stakeholder involvement.

Enhancing dialogue between Arctic actors, experts and EU policy-makers was a focus. Therefore, involving Arctic stakeholders through workshops, an online questionnaire and direct outreach comprised a key component of the study. The authors developed recommendations by building on ideas proposed by stakeholders.



Figure 1: European Arctic as Defined in the Strategic Assessment of Development of the Arctic and accordingly to the Arctic Human Development Report (AHDR).

Source: Arctic Portal, 2014.



DEVELOPMENT OF THE ARCTIC: KEY MESSAGES

1. Arctic environmental and socioeconomic changes are driven primarily by climate change and the global economy, with demand for resources remaining a key driver of economic developments. Nevertheless, other factors, such as regulatory frameworks, prove to be critical in many cases.
2. Climate change has profound impacts on Arctic biodiversity, landscape and livelihoods, but limited influence on current and expected industrial, economic and social developments.
3. Current economic and social developments are generally moderate and expectations for the near-term are modest. However, even a modest increase in economic activities requires a response.
4. Arctic developments are closely interconnected.
5. The European Union is affected by the changes in the Arctic.



THE EU ARCTIC POLICY FRAMEWORK: **SUGGESTIONS FOR FUTURE DEVELOPMENT**

The EU policy towards the Arctic is an evolving process. Building from previous policy statements, there is a prospect that a comprehensive policy framework stating EU interests and goals will be formulated. In that regard, this section puts forward a set of suggestions derived from stakeholder input, the analysis of EU policies and the Strategic Assessment of Development of the Arctic report's thematic recommendations.

1. The EU is encouraged to continue and to reinforce investment in gaining knowledge and better understanding of Arctic changes and their implications.
2. Constructive engagement of Arctic actors in EU decision-making should be enhanced.
3. Diversity within the Arctic region needs to be taken into account.
4. The EU should pay special attention to the European Arctic.
5. An EU policy framework for the Arctic needs to adapt to the complex landscape of governance in the region.
6. Co-operation with Arctic partners within venues of Arctic regional governance remains, despite the challenges involved, a key priority both in the European Arctic and at the circumpolar level.

STRATEGIC ASSESSMENT OF DEVELOPMENT OF THE ARCTIC



EU POLICIES AFFECTING THE ARCTIC: KEY THEMATIC
FINDINGS AND RECOMMENDATIONS



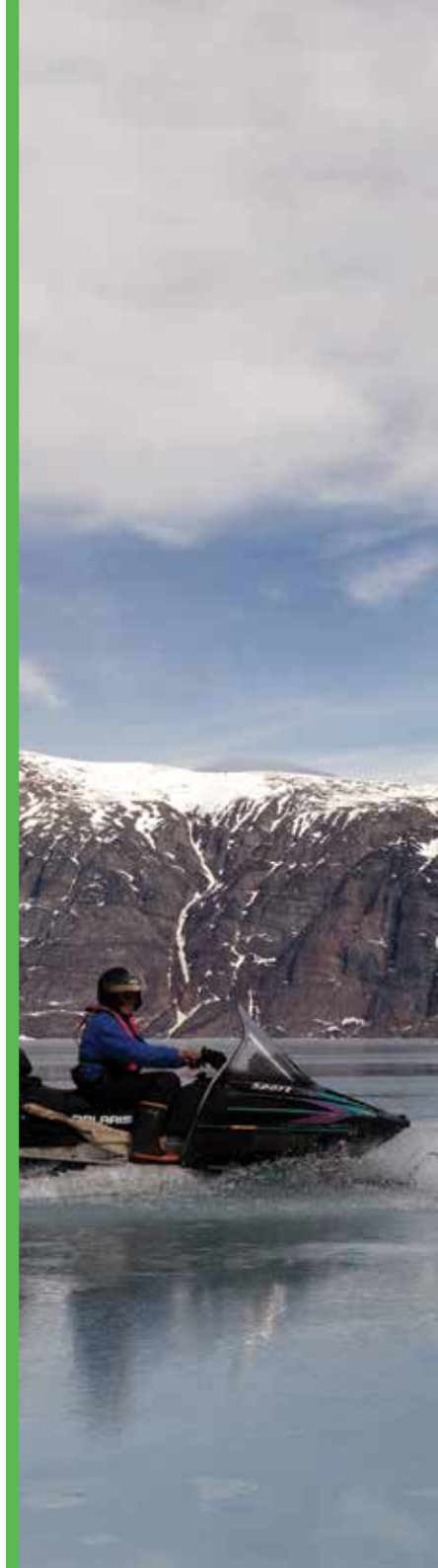
CLIMATE CHANGE IN THE ARCTIC

Due to climate change, the Arctic is the most rapidly changing region on Earth. There is clear evidence that change has already occurred due to emissions of greenhouse gases and aerosols from human activities, which affect the fundamentals of the Arctic ecosystems and the lives of the Northerners. Over the second half of the 20th century, warming in the Arctic led to increased loss of snow cover in spring and summer and simultaneously increased snowfall during boreal autumn and winter. Arctic sea-ice change has been linked to changes in mid-latitude weather patterns that increase the probability of extreme weather events, such as droughts, floods and heat waves in summer and cold snaps in winter. The warming trend also appears to result in increased precipitation in northern Europe. The sea level rise is also one of the main concerns.

The EU can influence Arctic climate change by limiting its own emissions, including short-lived climate forcers, and championing an effective and broad global climate agreement. The EU has made progress in curbing GHG emissions, partly through policy measures in energy, transport and efficiency improvements, and has set targets for further gains in the period to 2030. The EU, as a key actor in the UNFCCC negotiations, can highlight the Arctic within international processes and support any potential initiatives coming from the Arctic Council. Eventually, the EU is in a good position to support adaptation in the region (inter alia, via the EU's 2013 Adaptation Strategy).

The EU is encouraged to increase its efforts and contributions to enhance sustained observation activities in the Arctic in order to improve understanding of climate change mechanisms and effects in the region. This can be done by, for example, using the framework of European Research Infrastructure Consortia or Horizon 2020 infrastructure funding.

Current satellite-based earth observation systems do not fulfil user needs for communication and monitoring. The EU should address this shortcoming through EU-funded satellite programmes. Both for decision-making in the near term and for long-term guidance for Arctic adaptation and sustainable development, climate indicators specific to the Arctic should be identified and corresponding data obtained. Moreover, in the European Arctic, there is a clear role for the EU in moving gradually from adaptation planning to implementation and undertaking concrete actions.





CHANGES IN ARCTIC MARITIME TRANSPORT

Arctic maritime transport is still dominated by internal and destination traffic (including cruise tourism), highly interlinked with extraction of Arctic resources. This is likely to remain the case in the coming decades. Trans-Arctic shipping is slowly emerging, but there are major constraints for its rapid expansion. The EU may gain access to new resources and growing trade. European ship owners and maritime industries expect economic gains. However, the Arctic is a frontier region for shipping with high risks and various environmental concerns.

The EU influences Arctic shipping by contributing to shaping international standards and regulations, legislating on member states' responsibilities as port or flag states and building up Arctic maritime infrastructure such as through its satellite programmes.

The EU should contribute to improved regulation of Arctic shipping by supporting high standards in the Polar Code, supplemented by additional measures to address invasive species, heavy fuel oil and emissions to air. The European Commission should follow the current discussions on heavy fuel oil within the Protection of Arctic Marine Environment working group of the Arctic Council.

The EU should also consider stronger involvement in international co-operation on maritime infrastructure and research. Examples of possible contributions are hydrographic mapping, better sea-ice, meteorological and oceanographic observations and forecasts, ship surveillance, communication systems, and search and rescue capabilities. EU support to the Galileo and Copernicus programmes and its SafeSeaNet and CleanSeaNet initiatives are important in this context. More support for monitoring is needed in order to improve the understanding of environmental conditions and the impacts of shipping as well as to find effective measures to reduce negative impacts. There is also wide scope for technological innovation in ship design, emission and waste reductions, cleaning hulls and ballast water in Arctic conditions.

CHANGING NATURE OF ARCTIC FISHERIES AND AQUACULTURE

Fishing is a vital economic activity in the Arctic. Fisheries are characterised by fluctuations that may be exacerbated by climate change. Arctic coastal states are currently exploring possibilities for establishing a fisheries management regime in the Arctic Ocean, even though it seems unlikely that large-scale fisheries will be established in the area in the future. Aquaculture production is growing fast and becoming a crucial part of the economy in many Northern communities.

The EU is a major consumer of Arctic fish and is keen to ensure good co-operation with Arctic states in the sustainable management of marine living resources. The EU influences Arctic fisheries via food safety standards, legislation related to the port state and flag state responsibilities of its members, and participation in international and regional regulatory frameworks.

The EU can improve management in the light of the Common Fisheries Policy reform and contribute to enhanced co-operation, information sharing and research, with inclusion of local and traditional knowledge. EU efforts to combat illegal, unreported and unregulated fishing should be further strengthened. The EU should address the need to reduce fishing capacity by decreasing incentives for economically unsustainable fisheries.





DEVELOPING OIL AND GAS RESOURCES IN ARCTIC WATERS

While interest in Arctic offshore hydrocarbon exploitation has increased in recent years, actual developments have been slow to follow, with major differences across the Arctic region. Critical factors that EU decision-makers need to take into account are the local benefits of resource development, risks, responding to which requires appropriate regulations, as well as gaps in knowledge and research efforts.

Meeting the growing demand of EU citizens for energy in a safe and environmentally responsible manner is a key challenge for EU institutions. The EU has limited, but multifaceted, functional competences that enable it to play a role in promoting high standards for resource development including through support for developing technologies specific for Arctic application, efforts to address climate change and relations with Arctic partners.

Funding and investment frameworks can facilitate high standards for regulators and industry to ensure that Arctic hydrocarbon developments are environmentally and socially responsible. It is recommended that the EU increase its support for research on the Arctic environment and relevant technology advances. This would improve risk assessment related to oil and gas developments in Arctic waters and foster technology developments particular to the region such as oil spills in ice conditions. Cross-disciplinary research programmes are an important mechanism, such as within the Horizon 2020 programme. Despite numerous challenges, the EU should continue and strengthen energy dialogues with non-EU Arctic partners within existing forums. One option would be to include energy issues in the Northern Dimension Policy.

MINING IN THE EUROPEAN ARCTIC

The European Arctic is currently experiencing an upsurge in mining activities, but future developments will be highly sensitive to mineral price fluctuations. The EU is a major consumer and importer of Arctic raw materials. As the EU is concerned about the security of supply, it encourages domestic mineral extraction, among others, via its Raw Materials Initiative.

Both Arctic communities and industry call for enhanced information flows, as well as improved and more inclusive decision-making frameworks. It is recommended that the EU should adopt a more integrated and transparent view and clearly articulate its interests related to mining in the European Arctic. Building trust and facilitating mechanisms to enhance dialogue with the residents of the North, including indigenous peoples, is an important element of such integration. Information platforms may be based, for example, on INSPIRE infrastructure for spatial information in Europe (designed to contribute to environmental decision-making) or the outcomes of projects like Promine (which mapped European mineral resources). The EU could also support the collection and sharing of mining data and knowledge, for example via the Horizon 2020 programme or the European Innovation Partnership on Raw Materials.

The EU regulatory framework could better contribute to harmonising environmental, economic and social assessments, paying special attention to local social issues and indigenous rights. This could be partly done within the current reform of the EU environmental impact assessment legislation. The EU, as a major global actor, can also influence international governance, standard-setting and co-operation to facilitate increased responsibility in mining activities.





ACTIVITIES AFFECTING LAND USE IN THE EUROPEAN ARCTIC

Globalisation and indirectly climate change have increased the pressures on developing new mining projects, transport routes and renewable energy. At the same time, tourism and traditional livelihoods such as reindeer husbandry require large areas of pristine nature, which other activities may adversely affect.

The planning of new activities must respect the needs, culture and livelihoods of local and indigenous communities, including land rights. Proper assessment of social impacts is essential in order to mitigate conflicts between different values and interest groups. When European Arctic land-use issues are considered, EU policy-makers should pay particular attention to the aspects of human well-being and social sustainability, public participation and indigenous rights. This is especially important when these elements differ from the needs and values typical of the more densely populated areas in the south.

There is a need for enhanced information exchange between Arctic local and regional actors and EU institutions. Stronger inclusion of social aspects and challenges in the EU frameworks for impact assessment as well as in dialogue with Arctic partners including Russia is advised.

SOCIAL AND CULTURAL CHANGES IN THE EUROPEAN ARCTIC

The Strategic Assessment of Development of the Arctic report's overview of the region's sociocultural landscape includes innovative and growing Arctic cities, thinning-out rural areas, demographic challenges, and dependence on extractive and primary industries. Indigenous peoples often experience these elements in distinct manners.

The EU has a number of programmes that support socioeconomic development and co-operation in the North, as well as relevant transport policies and environmental regulations. When designing and carrying out relevant policies, the EU decision-makers should take into account: the region's intra-regional and core-periphery connectivity; power structures, social conflicts and cultural diversity; human-nature interactions; as well as the state of innovation, entrepreneurship and education.

An EU focus on entrepreneurship and innovation within co-operation and cohesion programmes should be continued and strengthened, with greater attention to gender issues and indigenous peoples. In particular, the activism of dynamic indigenous youth should be supported. Intra-regional accessibility and connectivity, including challenging cross-border projects, must not be neglected in the light of a focus on core-periphery connections within frameworks such as the Trans-European Transport network. The special characteristics and needs of Arctic cities and their importance for regional development need to be taken into account in EU policies and programmes.



ASSESSMENTS IN POLICY-MAKING: CASE STUDIES FROM THE ARCTIC COUNCIL



COMMUNICATION CHANNELS TO BRIDGE THE GAP BETWEEN SCIENTISTS, POLICY MAKERS AND STAKEHOLDERS

Global and regional assessments, primarily environmental, have become increasingly common elements in international, national and even local policy and decision making. As large-scale environmental problems and their consequences cross borders and know no jurisdictional limits. Addressing them requires cooperation among countries, interaction between scientists and policy makers, and inclusion of actors from all levels of the scale, from the local to the global. One form of responding to these challenges has become assessments as organized efforts to harness scientific information to inform policy makers both from private and public sectors at all stages of decision-making. In addition, the reasoning behind assessments supposes that a better understanding of impacts of human actions, decisions and behaviours, presented with options for alleviation of these impacts, can provide incentives for political, social and economic decision makers to carry out their policies in a more sustainable way.

Therefore, the number and importance of assessments is expected to increase even further in the future along with greater demands put on natural resources by the growing population and effects of industrialization and globalization, thus calling for concerted actions based on sound and scientifically grounded information to mitigate negative effects of these developments.

The assessments are often viewed through products they deliver, frequently in the form of a report or publication. However, they can be better understood as social processes, embedded in particular institutional settings, within which expert knowledge related to a policy problem is framed, integrated, interpreted, and presented in documents to inform decision making. Assessments constitute communication channels to bridge the gap between scientists and policy makers and are a key interface between science and policy. As such they may influence the formulation, implementation and evaluation of public policy, hence they are also of interest to business, nongovernmental organizations and regulatory offices.

The aim of the report is to shed more light on the influence of assessments in policy-making. The report consists of two parts. The first one defines the main concepts related to assessments and distinguishes between their various types. The second part focuses on the Arctic Council, its role in the knowledge production and the assessment activities conducted under its auspices.

The report can be downloaded from the website: www.arcticinfo.eu/assessment-in-policy-making

EUROPEAN ARCTIC INITIATIVES COMPENDIUM



INVENTORY OF **CURRENT INITIATIVES, PROJECTS AND POLICIES** OF SIGNIFICANCE TO THE ARCTIC

The European Union Arctic Initiatives Compendium includes flagship programmes, projects and policy initiatives undertaken by Member States and actors operating within states belonging to the European Union (EU), as well as enterprises undertaken by European states such as Norway and Iceland and territories such as Greenland that are highly relevant in the context of the European Arctic. In many cases they are strongly linked to the EU, for example, the European Research Area (ERA).

The compendium inventories recent relevant reports on European Union infrastructure, competencies and policies in the Arctic. The compendium summarises European Union involvement in international, regional and intergovernmental agreements and regulatory that have influence in Arctic governance. This includes research and research related agreements, as well as EU supported infrastructures of significance to the Arctic. The compendium describes EU instruments, institutions and policy areas with Arctic applications, demonstrating the scope of EU investment in the Arctic and European citizens resident in the Arctic. Additionally, the compendium identifies recent and ongoing EU endeavours in addressing major Arctic trends through the various instruments at its disposal. More than 65 endeavours are listed, including project details such as budget, partners and areas covered, as well references to their relevance in addressing a particular trend, such as for example climate change or increased mining activities in the Arctic. Finally, the compendium offers an abridged overview of structural initiatives undertaken by European Union countries, which include, where relevant, commercial and industrial initiatives.

These initiatives demonstrate a high level of capacity building within the European Arctic. Arctic initiatives do not necessarily operate exclusively in the Arctic, and that not all initiatives undertaken in the Arctic self-identify as Arctic, for example regional programmes in the northernmost Scandinavian municipalities. The compendium takes into account that not all knowledge about the Arctic is produced by research projects. Although scientific research remains a central tenet in understanding the Arctic, the EU is contributing substantial resources to sustainable arctic development through a variety of instruments and with initiatives that affect how the Arctic is known.

The report can be downloaded from the website: www.arcticinfo.eu/compendium

GAP ANALYSIS



WHAT DO POLICY-MAKERS NEED TO KNOW ABOUT THE ARCTIC? WHERE IS THAT INFORMATION AND HOW CAN IT BE MADE AVAILABLE?

The Gap Analysis Report offers an illustrative snapshot of users' Arctic information needs. The results help to identify and analyze the Arctic information needs of stakeholders and policy-makers and to serve highlight information and communication gaps. Surveyed respondents addressed information needs in a wide range of thematic areas such as living in the Arctic, investing, working and travelling in the Arctic, as well as governing and understanding the region.

In the area of living in the Arctic, indicated information needs focused on local communities, changes in indigenous lifestyles, Northern culture and education, changes to food security, spread of disease, demographic information, and environmental impacts. Strengthening communication exchange regarding communities in the Arctic and cultural aspects was suggested.

In the area of investing in the Arctic, limited information on i.e. evaluating business opportunities in the region, understanding environmental conditions and infrastructure, environmental impacts of mining, and oil and gas sector, as well as ice conditions and permafrost was noticed. More communication on existing national and EU legislation requirements (mining, maritime transport, and oil and gas exploitation), international standards, and corporate sustainability was advised.

The respondents also lack the information in the area of working in the Arctic, especially working opportunities, management, rights, as well as "impacts of land use strategies on innovation" and "working opportunities in SMEs of rural business". Communication on business and employment to assist foreign entrepreneurs was desired.

In the area of travelling in the Arctic, the information is needed on the variety of topics such as navigational safety, strategies evaluating (and regulating) environmental and socioeconomic risks and impacts of Arctic shipping, research and consultation processes regarding tourism and hospitality. Strengthening communication on societies and culture, tourism and travel opportunities in the Arctic, as well as maritime transport, was seen as beneficial.

Information needed regarding governing the Arctic included governance structures for environmental risk prevention, risks of resource extraction activities and their impacts on wildlife and local communities, potential oil spills, survival of invasive species in ballast water or on ship hulls, but also ways of governing urbanization, demographic shifts, and migrations. Respondents suggested communication on topics like land use, permitting process for mining projects in other countries, search and rescue (infrastructure, procedures, general incident preparedness and participation of foreign companies in response actions).

To understand the Arctic better, respondents need useful, timely and synthesized information mainly on climate change, society and culture, maritime transport, and mining. The information needed concern i.e. mapping of vulnerable species and habitats; greenhouse gas and short-lived climate pollutant monitoring; long-range monitoring and observations (including sea ice thickness and motion); natural variability, as well as present and past (geologic) climate changes.

The report can be downloaded from the website: www.arcticinfo.eu/gap-analysis

EU IN THE ARCTIC

7. October 2008

European Parliament resolution on Arctic governance

8. December 2009

Council of the European Union conclusions on Arctic Issues

26. June 2012

Joint Communication to the European Parliament and the Council. Developing a European Union policy towards the Arctic region: progress since 2008 and next steps

12. May 2014

Council of the European Union conclusions on developing a European Union policy towards the Arctic Region

20. January 2011

European Parliament resolution on a sustainable policy for the High North

20. November 2008

European Commission Arctic communication

12. March 2014

European Parliament joint motion for a resolution on the EU strategy for the Arctic



ARCTIC CIRCLE



NETWORK FEASIBILITY ANALYSIS

NEED FOR BETTER ACCESS, DIALOGUES AND DISSEMINATION OF INFORMATION ABOUT THE ARCTIC

The proposed EU Arctic Information Centre (EUAIC) is a modern structure that enhances effective use of scientific information and practitioners' knowledge in public and private decision making in the Arctic. The EUAIC is designed to operate as a so called "boundary organization" between different knowledge groups and it aims at offering information products. Through its services the proposed EUAIC would guarantee improved awareness and understanding of the Arctic in the EU, and the EU in the Arctic.

Rapid economic development and environmental changes in the Arctic result in a considerable increase in demand among various stakeholders for information about the region. Recent studies show that awareness of the Arctic is modest, and at the same time information is urgently requested by EU institutions, EU Member States, the private sector, scientists and other stakeholders operating and interested in the Arctic.

Despite the EU's investments in research and development programmes addressing the Arctic, and regardless of the Arctic excellence institutions funded by European states at the national level, the produced information is dispersed among various projects and organizations. The lack of overall institutional memory about results and completed projects means that this information is not readily accessible for effective use by stakeholders who need it for their decisions and actions. Additionally, the produced information is often too technical and thus these stakeholders do not consider it to be useful and applicable.

Scientific information alone cannot give comprehensive answers about Arctic development. There is also a need for deep understanding of the values and knowledge possessed by the people who have long experience of living, working in the Arctic. In order to come up with influential strategies, plans and decisions, or for social licensing of new investments, it is crucial to build bridges between scientists, policymakers and the private sector by facilitating multidimensional dialogues to gain access to the full spectrum of information and to increase trust between these knowledge groups.



PROPOSAL FOR THE EU ARCTIC INFORMATION CENTRE

We propose establishment of the EU Arctic Information Centre as a collaborative structure of European Arctic excellence institutes that have expertise, skills and contacts on Arctic issues and which are committed to filling the recognized information gap between the EU and the Arctic.

The proposed EU Arctic Information Centre will improve (1) access, (2) dialogues and (3) dissemination of relevant and updated Arctic information and knowledge within and outside the EU. The EU Arctic Information Centre will support the formulation and continuation of the EU's Arctic policy and help to guarantee its coherence. The EU Arctic Information Centre can provide a number of services to support improved knowledge about the Arctic such as:

- Think tanks for producing briefing papers, factsheets and knowledge brokering
- Documentation of the discussion in the form of reports useful for decision making
- Clearing house on the EU's Arctic initiatives
- Impact assessments to compile scientific and stakeholders' knowledge
- Serving the Commission in its various Arctic needs.

Additionally, the network members of the Preparatory Action project recognize the need for an intergovernmental panel for the EU Member States and EU institutions. Established by the EU and supported by the network of Arctic expertise institutions, i.e. EU Arctic Information Centre, the panel would facilitate discussions about EU policies regarding the Arctic region, EU Arctic Strategy, and Arctic initiatives in the EU and its Member States.

The EU Arctic Information Centre would have its hub, the Central Office, in the European Arctic in Rovaniemi at the Arctic Centre of the University of Lapland. Locating a core activity in the European Arctic demonstrates that the EU is an Arctic actor. The idea of the EU Arctic Information Centre does not overlap or compete with any other existing Arctic organization.

The report can be downloaded from the website: www.arcticinfo.eu/nfa

Factsheets

Factsheets produced as a part of the Strategic Assessment of Development of the Arctic have been primarily designed as a background material for consultations with Arctic stakeholders.

Strategic Assessment of Development of the Arctic: Assessment Conducted for the EU

FACTSHEET

Climate Change in the Arctic

Overview

The Arctic is the most rapidly changing climate region on Earth. There is clear evidence of change that has already occurred due to emissions of greenhouse gases and aerosols from human activities. These affect the fundamentals of Arctic ecosystems and the lives of its inhabitants. The Arctic is a particularly fragile region where strong ecosystem feedbacks accelerate changes compared with other regions – an effect called "Arctic amplification". Changes in the Arctic ecosystem dynamics have global consequences.

Today we see clear evidence of significant changes in Arctic landscapes and marine environments. Climate changes are affecting the Arctic cryosphere (areas where water is in solid form, e.g. ice sheets, glaciers, snow and permafrost), hydrology, habitats and species. Examples of impacts include the formation of new wetlands and lakes due to melt water and the rapid draining of lakes and loss of freshwater resources due to permafrost degradation.

Changes in temperature, sea ice cover, snow cover and water regimes are linked to the loss of important habitats for Arctic species, as well as shifts in the species composition due to landscape transformations, which in turn impact on people's livelihoods (Figure 1).

Figure 1: Climate Change in Arctic: Drivers and Impacts

Observed changes:

- Warming of land and sea
- Melting glaciers
- Permafrost degradation

Impacts in the Arctic:

- Loss of ecosystems and biodiversity
- Changes in species composition
- Changes in the timing and magnitude of future traffic levels

Policy Responses (Including EU):

- EU legislation and adaptation
- Energy policies
- Research funding

Strategic Environmental Impact Assessment of Development of the Arctic

This document is a strategic environmental assessment of Arctic issues and EU policies. Stakeholder input informs the analysis of trends and the role of the European Union in shaping Arctic development. It will feed into recommendations to EU policymakers and be published in the Strategic Assessment of Development of the Arctic Report in spring 2024. The European Commission project is implemented by a network of 23 institutions led by the Arctic Centre in Rovaniemi and is linked to the EU Arctic Information Centre initiative.

Website: www.arcticinfo.eu

Strategic Assessment of Development of the Arctic: Assessment Conducted for the EU

FACTSHEET

Changes in Arctic Maritime Transport

Overview

Maritime transport in the Arctic has increased in recent years. The growing traffic is closely linked to the development of economic activities within the Arctic and the support of raw materials such as petroleum and minerals. Arctic cruise tourism is also growing. A few ships have made transit voyages between Europe and Asia.

Definitional shipping in the Arctic is expected to expand, as is transit traffic, later. However, there is considerable uncertainty regarding the timing and magnitude of future traffic levels. Questions must be asked: reliable and profitable to reach large volumes.

The sector for expanded maritime transport is determined by many factors and there is much inherent uncertainty. Mailing summer sea ice expands the area of navigable waters and extends the sailing season. Difficults in critical infrastructure ranging from ports to navigational maps, communication means, and search and rescue capabilities present significant challenges that must be overcome. Safety of navigation is a serious concern for ships operating in harsh conditions and remote areas far from salvage.

There is concern about environmental damage to areas that so far have been effectively protected from human influence by sea ice. On the other hand, Arctic voyages may lead to lower costs, growing trade and economic benefits to ship owners, ports and maritime industries delivering this and equipment.

This factsheet highlights changes in Arctic maritime transport. Its drivers, conditions, possible impacts and relevance to the European Union. It provides an overview of relevant aspects for elaboration in the consultation process.

Figure 1: Drivers and Impacts

Drivers:

- Climate change
- Global demand for fish
- Overfishing and depletion of fish stocks elsewhere
- Traditionally of management and regulations
- Fishing vessels and practices
- Insufficient knowledge of species and ecosystem effects
- Asaqua

Impacts:

- Biodiversity, species change and effects on ecosystems
- Increased removal of fish biomass, migratory linkages, introduction of exotic species
- Physical changes to ocean climate and chemistry
- Intensity of seabed disturbance from bottom trawling
- Potential pollution from fishing vessels

Policy Responses (Including EU):

- Shaping drivers and mitigating impacts
- Sector-specific policies
- Environmental policies
- Economic and trade policies
- Research funding

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FACTSHEET

Changing Nature of Arctic Fisheries?

Overview

Fisheries and aquaculture make crucial contributions to the world's well-being and prosperity. In addition to an important food source, the fisheries sector provides livelihoods and income, both directly and indirectly. According to the UN Food and Agriculture Organization (FAO), fish and fishery products are among the most traded food commodities worldwide. While capture fisheries production remains stable, aquaculture production keeps on expanding. Aquaculture is set to remain one of the fastest growing animal food-producing sectors. This factsheet highlights some of the issues in relation to sub-Arctic capture fisheries, aquaculture and their relevance to the European Union.

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- Climate change
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- Overfishing and depletion of fish stocks elsewhere
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- Fishing vessels and practices
- Insufficient knowledge of species and ecosystem effects
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FACTSHEET

Developing Oil and Gas Resources in Arctic Waters: The Final Frontier?

Overview

Exploration of hydrocarbons in the Arctic region has many faces: Alaska holds most of the region's oil reserves, while reserves in Russia are dominated by natural gas; onshore resources have been producing for decades while offshore is largely a frontier region. What is common is that the development of the Arctic's offshore hydrocarbon resources faces an uncertain future.

Many parts of the Arctic Ocean are becoming more accessible due to improved technologies, as well as diminished sea ice due to climate change.

Investment in the Arctic Ocean are becoming more accessible due to improved technologies, as well as diminished sea ice due to climate change. However, interest in exploring offshore oil and gas in the Arctic has grown in recent years, while progress continues in development of onshore resources. Largely untapped to date, the resource base is significant yet the technical and environmental aspects and high costs of operating in extreme conditions present particular challenges to developing the Arctic's offshore oil and gas resources.

Investment in and development are influenced by global markets, energy demand and policies concerned with economic development, energy security and climate change, among other dynamic variables. So the extent and timing of oil and gas exploitation in the Arctic is not easy to predict. Yet it is clear that these resources may have important influences on the Arctic environment, economies and societies. The prospect of oil and gas exploitation also has implications for the European Union (EU) economic, political and environmental landscape.

This factsheet highlights offshore oil and gas resource exploration, its drivers, possible impacts and relevance in relation to the European Union. Nevertheless much of the discussion about the factors motivating oil and gas developments, impacts and role of the EU are also applicable to onshore hydrocarbon resources.

Figure 1: Main Socio-Cultural Trends, Drivers and Impacts

General drivers:

- Demographic shifts and urbanisation
- Changes in livelihoods and lifestyles
- Resource dependence on primary sector and public services
- Increasing rates of suburban and rural migration
- Increasing complexity of governance

Main trends:

- Demographic shifts and urbanisation
- Changes in livelihoods and lifestyles

Main implications of socio-cultural changes:

- Social disintegration, changing family structures, loss of traditional culture and language, reduction of vitality
- Community vulnerability, pressure towards resource extraction and development, loss of public services, environmental impacts
- Positive effect on Arctic human capital and development, addressing rural and urban employment
- Development of agriculture and local economies, higher, change roles of public and non-governmental services

Policy Responses (Including EU):

- General drivers and EU policies
- Research funding

Strategic Environmental Impact Assessment of Development of the Arctic

This document is a strategic environmental assessment of Arctic issues and EU policies. Stakeholder input informs the analysis of trends and the role of the European Union in shaping Arctic development. It will feed into recommendations to EU policymakers and be published in the Strategic Assessment of Development of the Arctic Report in spring 2024. The European Commission project is implemented by a network of 23 institutions led by the Arctic Centre in Rovaniemi and is linked to the EU Arctic Information Centre initiative.

Website: www.arcticinfo.eu

Strategic Assessment of Development of the Arctic: Assessment Conducted for the EU

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Mining in the European Arctic

Overview

The European Arctic contains vast amounts of mineral resources. Mining activity in the Arctic is intensifying in response to growing global demand. Mining contributes to economic development, but not without consequences: mining can have considerable impacts on the physical environment, land use and societies.

While mining is often significant for national economies, it is in local Arctic communities that the environmental, economic, and socio-cultural impacts are mostly felt. In these communities, attractive resource industries may be viewed both as an opportunity for wealth creation as well as a threat to people's livelihoods. Extracting minerals in the Arctic is both challenging and expensive. It is complicated by the extreme environment, remoteness, lack of roads and limited availability of skilled labour. Yet there is a boom underway as high market prices and improved technology have triggered activity by mining companies.

This factsheet deals with the increasing mining activity in the European Arctic (areas between Greenland and Northwest Russia). Notably, this trend is developing so quickly that reliable data are hard to obtain. Our focus is mainly on traditional mineral ores.

Figure 1: Increase in Arctic Mining Activity: Drivers and Impacts

Drivers:

- Global demand for minerals
- Technological advances
- Climate change
- Resource policies

Observed changes:

- Changes in land use and water
- Loss of ecosystems
- Changes in livelihoods and lifestyles

Policy Responses (Including EU):

- General drivers and EU policies
- Research funding

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Increasing Land-Use Pressures in the European Arctic

Overview

Globalisation processes such as greater mobility and economic integration fuel human activities which are putting pressure on land use in the European Arctic including forestry, hydrocarbon and mineral extraction, energy and transport developments, urbanisation, tourism and nature conservation.

Land-use changes may bring positive economic and negative environmental impacts as well as challenges to social structures and traditional livelihoods such as reindeer herding, hunting and fishing. People are also drawn to the peak, quiet and pristine nature of the Arctic as a year-round leisure destination. Today, the Arctic region faces conflicts between various human activities that influence one another and complex space.

This factsheet addresses issues related to various land uses in the European Arctic. It provides a generalised overview of economic, environmental and political impacts of the selected land use changes and their main drivers (Table 1).

What is Putting Pressure on the European Arctic Landscape?

Main Driver: Globalisation

Economic factors are putting significant pressure on Arctic land use. Global demand for resources is increasing the presence of multinational business and bringing investment, trade and technological innovation.

Figure 1: Economic Factors and Land-Use Pressures in the European Arctic

Drivers:

- Global demand for resources
- Increasing complexity of governance

Observed changes:

- Changes in land use and water
- Loss of ecosystems
- Changes in livelihoods and lifestyles

Policy Responses (Including EU):

- General drivers and EU policies
- Research funding

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Strategic Assessment of Development of the Arctic: Assessment Conducted for the EU

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Social and Cultural Changes in the European Arctic

Overview

Arctic societies – both indigenous and non-indigenous inhabitants – are considered to be highly resilient and adaptive, yet today's rate and magnitude of change challenges adaptive capacity. Change is driven by increased accessibility, government policies, global cultural change and recognition of indigenous peoples' rights. Globalisation and world markets are also important drivers in the Arctic social transformation.

Climate change influences societies and cultures in some locations, and its impacts are predicted to grow in coming decades. These changes create both opportunities and challenges and occur along local, regional and global dimensions.

This factsheet highlights the trends in social and cultural change in the European Arctic, their drivers, implications and relevance to the European Union (Figure 1).

Figure 1: Main Socio-Cultural Trends, Drivers and Impacts

General drivers:

- Demographic shifts and urbanisation
- Changes in livelihoods and lifestyles
- Resource dependence on primary sector and public services
- Increasing rates of suburban and rural migration
- Increasing complexity of governance

Main trends:

- Demographic shifts and urbanisation
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Main implications of socio-cultural changes:

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- Community vulnerability, pressure towards resource extraction and development, loss of public services, environmental impacts
- Positive effect on Arctic human capital and development, addressing rural and urban employment
- Development of agriculture and local economies, higher, change roles of public and non-governmental services

Policy Responses (Including EU):

- General drivers and EU policies
- Research funding

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Available at www.arcticinfo.eu

Highlighted Projects

Six projects as an example of the EU contribution to Arctic research.



Arctic Climate Change, Economy and Society www.arcticinfo.eu/access

Instrument: ACCESS is an European Project supported within the Ocean of Tomorrow call of the European Commission Seventh Framework Programme. It assesses the diverse impacts of climate change in the Arctic region.

EU Contribution: 15,078,494 €

Duration: 48 months

Start Date: 1/03/2011

Consortium: 22 institutions participating, representing 9 European countries and the Russian Federation

Project Coordinator: Jean-Claude Gascard (project coordinator)
Michael Karcher (scientific and technical project manager)

Project Web Site: <http://www.access-eu.org>

Key Words: Arctic, Climate Change, Economy, Society, Governance

The Project

Arctic Climate Change Economy and Society (ACCESS) is a European Project supported within the Ocean of Tomorrow call of the European Commission Seventh Framework Programme.

Arctic climate change will have significant impacts on both marine ecosystems and human activities in the Arctic, which in turn will have important socio-economic implications for Europe. ACCESS will evaluate Arctic climate change scenarios and their impact on specific economic sectors and human activities over the next decade. Particular attention will be given to environmental sensitivities and sustainability in the Arctic domain. ACCESS will also engage in close cooperation with indigenous people and other key stakeholders by means of a Stakeholders / End-users Forum and an Advisory Board.

Main mission and aims

ACCESS will make 30 years projections based on climate change scenarios for assessing the evolution of human activities such as marine transportation (including tourism, fisheries, oil and gas extraction) in the Arctic with special attention dedicated to environmental sensitivities and sustainability. ACCESS is also focusing on Arctic governance and strategic policy options. ACCESS is composed of 5 working groups:

- A first group will focus on monitoring and modelling Arctic climate change involving ocean, atmosphere and sea-ice.
- A second group will study the opening to marine transportation of the northern passages, north of Europe and Siberia (North-East passage) and through the Canadian Archipelago (North-West passage) as well as the impact of these transportation activities on marine ecosystems and society.
- A third group will examine how climate change impacts on Arctic fisheries, aquaculture and livelihood, mainly in the sub-Arctic sectors such as the Barents Sea.



Barents Media Sphere www.arcticinfo.eu/barents

Instrument: The Barents Mediasphere is a Kolatic ENPI CBC project under priority People to People Co-operation and Identity Building. It aims to increase the visibility of the Barents Region by promoting cooperation between journalists and increasing cross-border communication in the region.

EU Contribution: 345,000 €

Duration: 28 months

Start Date: 25/08/2012

Consortium: Arctic Centre at the University of Llandudno, GTR Muzam, Barents Observer, and Barents Press International (BPI) as Associate Partner

Project Website: www.barentsmediasphere.org

Key Words: Barents, Media, Cross-Border Communication

The Project

The Barents Mediasphere project promotes communications in the Barents region. It helps journalists network across borders and find new points of view on the development of the northern parts of Finland, Russia, Norway and Sweden. Barents Mediasphere project is unique in a sense that it enhances and creates practical possibilities for cross border information flow in Barents region. In this way it helps regional identity building. Very important is the fact that Russian and Nordic journalists are equal partners and participants in the project and they learn to understand better each other. This reduces misunderstandings which are potentially harmful for all cross border cooperation in the North. The project can use the contacts and networks established during over 20 years of voluntary journalist cooperation in the region. Barents Mediasphere is noteworthy as it is likely to be the only information and media project in Arctic regions which is promoting personal contacts, mobility and reporting possibilities among media. This way its results can reach the local population and make a difference.

Barents Mediasphere is not a research project strictly sensu but in order to make Arctic research understandable for the local population the local media is a key. If media has better understanding about the region as a whole it can also better put wider regional developments and research news into context.

Main Mission and Aims

The Barents Mediasphere aims to increase the visibility of the Barents Region by promoting cooperation between journalists and cross-border communication in the region. The project provides information on media in the Barents region, product media content, and organizes courses and meetings for journalists.



International Network for Terrestrial Research and Monitoring in the Arctic www.arcticinfo.eu/interact

Instrument: Only comprehensive multi-disciplinary network of terrestrial research stations in the north to build capacity for research and monitoring in the northern-arctic and beyond.

EU Contribution: 9,800,000 €

Duration: 36 months

Start Date: 1/01/2011

Coordinator: Terry V. Callaghan terry.callaghan@met.no

Executive Secretary: Margareta Johansson margareta.johansson@met.no

Secretary: Hanna Pylkkanen hanna.pylkkanen@met.no

Project Web Site: <http://www.interact.org>

Key Words: Arctic, Network, Terrestrial, Research, Monitoring

The Project

INTERACT, an EU-funded infrastructure project, is a growing circum-arctic network of almost 60 terrestrial field bases in northern Europe, Russia, US, Canada, Greenland, Iceland, the Faroe Islands and Scotland. INTERACT is actively building capacity for research and monitoring in the European Arctic and beyond, and is offering access for hundreds of researchers at numerous research stations through its Transitional Access program.

INTERACT is the only comprehensive multi-disciplinary network of terrestrial research stations in the North and it is led by EU funding. Of all the existing and developing organisations in the Arctic and beyond, INTERACT through EU funding is the only one that is implementing agreed monitoring and research activities throughout the North. INTERACT is a one-stop shop for information in the Arctic and adjacent high alpine areas. INTERACT has received enormous national, regional and global visibility and is now contributing to processes such as SAMM (Sustaining Arctic Observing Networks), ICAP II (Third International Conference on Arctic Research Planning), GEO (Group on Earth Observations).

Main aims / Characteristics

- To build capacity for identifying, understanding, predicting and responding to diverse environmental changes through joint research activities for capturing and storing data.
- Building capacity for predicting change, linking the modelling communities to respond to change.
- INTERACT facilitates multidisciplinary networking.



Kolarctic www.arcticinfo.eu/kolarctic

ICE Project - Arctic Expo Centre Nuclear Powered Icebreaker Lenin

Instrument: To develop new science centre exhibitions

Total Cost: 2,200,000 €

EU Contribution: Arctic Centre provided 1.2 Millions Euro from Kolarctic ENPI CBC EU program

Duration: 36 months

Start Date: 15/2/12

Consortium: Lead partner is the Arctic Centre of the University of Llandudno in Bournemouth, Finland. Other partners are Arctic Expo Centre of Aalborg in Denmark, Russia and Poland in Tomsk, Russia and Norway

Project Web Site: www.icebreakerlenin.com

Key Words: Nuclear icebreakers, Arctic Ocean, Russian Arctic, the Northern Sea Route, nuclear icebreaker Lenin


The Project

The Arctic has become the focus of the world during the last decade. An emerging interest for the Arctic can be seen in relation to natural resources such as oil and gas reserves, mineral extraction and also the Arctic as a new transportation corridor between Europe and Asia. A common denominator for this new interest is ice. The Arctic region has experienced a diminishing ice cover due to climate change. As a result the Arctic is now seen as a region with new possibilities.

The ICE project focuses on the Arctic through icebreakers and icebreaking. Russia has the world's only nuclear-powered icebreaker fleet that was built to assist the development of the Russian Arctic. Icebreaker Lenin was the first nuclear-powered icebreaker in the world and today a new generation of icebreakers is under construction.

One aim of the project is to develop a common exhibition element that will be shared between the exhibition venues in Russia, Finland and Norway. This element will be focusing on the ecology of the Arctic. Ocean highlights the polar bear as a symbol of extreme adaptation and climate change vulnerability.

The overall objective of the ICE project is to develop new science centre exhibitions and to facilitate for a better mutual understanding of local and cross-border concerns. The goal is to raise awareness on issues related to the Arctic marine environment, local development, climate change, globalization and the future of the region.



Arctic NGO Forum www.arcticinfo.eu/ngo

Instrument: NGO Forum is a platform for NGOs concerned with Arctic environmental issues

EU Contribution: 300,000 €

Duration: 1/07/2011

Start Date: 30 months

Consortium: 47 partners

Project Coordinator: The Forum is coordinated jointly by GPO-Arendal (Norway) and Ecoys (The Netherlands)

Other persons are: GPO-Arendal
John Crump (john.crump@pda.no)
Sally
Hans-Bokhorst (hans.bokhorst@ecoy.nl)

Project Web Site: www.arcticngoforum.org

Key Words: Arctic, NGO, Environment, Information sharing, Policy dialogue

The Project


The Arctic NGO Forum is a platform for NGOs concerned with Arctic environmental issues. The organizations meet twice a year, once for an internal meeting and once by organizing a larger workshop related to the state of the Arctic environment with NGO and stakeholder participation.

The NGO Forum is unique international undertaking, uniting environmental organizations from all around the circumpolar region with the common goal of share information and experience, and jointly engage in policy dialogue on pressing environmental issues. It is creating an international network that amplifies the voices of organizations working on environmental issues in the Arctic. Forum members also support similar initiatives, including those that support the voices of the Arctic's indigenous Peoples.

The Forum is facilitated by GPO-Arendal and Ecoys and funded by the European Commission. NGO participants have no contractual arrangements with either the facilitating organizations or the Commission. Participation is strictly voluntary.

Main mission and aims

The Forum's mission is to provide a consistent way for NGOs concerned with Arctic environmental issues to get together, exchange ideas, knowledge and perspectives and provide advice to the global Arctic community. The creation of this platform allows NGOs the possibility to strengthen their positions and gain access to policy makers.



PAGE21 www.arcticinfo.eu/page21

Changing Permafrost in the Arctic and its Global Effects in the 21st Century

Instrument: Large-scale integrating collaborative project under the ENV call topic "Vulnerability of Arctic permafrost to climate change and implications for global GHG emissions and 'frozen dinner'" (ENV2011.1.3.1)

Total Cost: 2,260,000 €

EU Contribution: 1,351,900 €

Duration: 48 months

Start Date: 01/12/2011

Consortium: 18 partners from 11 countries

Project Coordinator: The Alfred Wegener Institute for Polar and Marine Research (Germany)

Project Web Site: <http://page21.eu>

Key Words: permafrost, arctic, climate change, carbon

The Project

The northern permafrost region contains approximately 50% of the estimated global belowground organic carbon pool and more than twice as much as contained in the current atmospheric carbon pool. The sheer size of this carbon pool, together with the large amplitude of predicted arctic climate change implies that there is a high potential for global-scale feedbacks from arctic climate change if these carbon reservoirs are destabilized. Nonetheless, significant gaps exist in our current state of knowledge that prevents us from producing accurate assessments of the vulnerability of the arctic permafrost to climate change.

PAGE21 will aim to understand and quantify the vulnerability of permafrost environments to a changing global climate, and to investigate the feedback mechanisms associated with increasing greenhouse gas emissions from permafrost zones.

Main mission and aims

PAGE21 key objectives are:

- To improve our understanding of the processes affecting the size of the arctic permafrost carbon and nitrogen pools through detailed field studies and monitoring, in order to quantify their size and their vulnerability to climate change.
- To produce, assemble and assess high-quality datasets in order to develop and evaluate representations of permafrost and related processes in global models.
- To improve these models accordingly.
- To use these models to reduce the uncertainties in feedbacks from arctic permafrost to global change, thereby providing the means to assess the feasibility of stabilization scenarios, and
- To ensure widespread dissemination of our results in order to provide direct input into the ongoing debate on climate-change mitigation.



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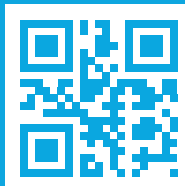
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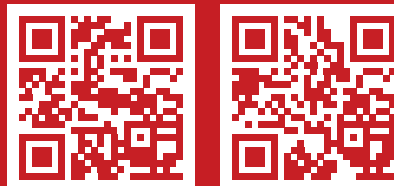
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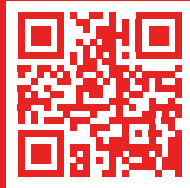
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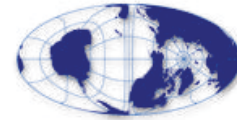
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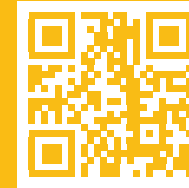
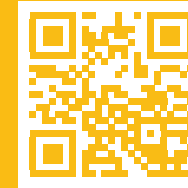
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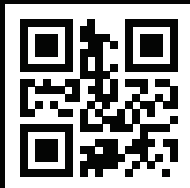


Tromsø Centre for Remote
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The initiative of

EU Arctic Information Centre

Increase knowledge, improve efficiency.

The Council requests the Commission to consider the options proposed by this project to establish an EU Arctic Information Centre to promote efficient access to Arctic information, to facilitate dialogues and to communicate on Arctic issues.

(Council of the European Union conclusions on developing a European Union Policy towards the Arctic Region, 12 May 2014)

[The European Parliament] reaffirms its support for, and urges the Commission to proceed with, the establishment of the EU Arctic Information Centre as a networked undertaking with a permanent office in Rovaniemi, with reference to the Preparatory Action 'Strategic environmental impact assessment of the development of the Arctic'.

(European Parliament Joint Motion for a Resolution on the EU strategy for the Arctic , 12 March 2014)

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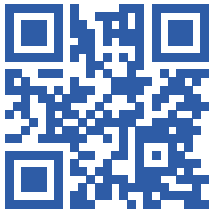
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