

Arctic Council

Arctic Marine Strategic Plan 2014-2024

Protecting Marine and Coastal Ecosystems in a Changing Arctic

1. INTRODUCTION.....	2
1.1 BACKGROUND	2
1.2 SCOPE.....	3
1.3 CONTEXT	3
2. VISION	7
3. GOALS.....	7
4. PRINCIPLES AND APPROACHES	8
5.1 ECOSYSTEM BASED MANAGEMENT.....	8
5.2 PRECAUTIONARY APPROACH	9
5. CHALLENGES AND OPPORTUNITIES IN A RAPIDLY CHANGING ARCTIC	11
5.1 RESILIENCE OF MARINE ECOSYSTEMS	11
5.2 RISKS TO THE ARCTIC MARINE ENVIRONMENT	11
5.3 HUMAN WELL-BEING AND ADAPTIVE CAPACITY.....	12
5.4 CURRENT AND FUTURE ENVIRONMENTAL STATE, PRESSURES AND IMPACTS.....	13
6. STRATEGIC ACTIONS	14
6.1 ADVANCE ECOSYSTEM BASED MANAGEMENT.....	14
6.2 ENABLE A PRECAUTIONARY APPROACH TO MARINE RESOURCE USE	15
6.3 IMPLEMENT AND COMPLY WITH INTERNATIONAL AND REGIONAL COMMITMENTS,.....	15
6.4 BUILD THE PARTICIPATORY CAPACITY OF ARCTIC INHABITANTS.....	16
6.5 COOPERATION ON UNDERSTANDING AND KNOWLEDGE AVAILABILITY.....	17
7. IMPLEMENTATION	18

1. Introduction

1.1 Background

Arctic marine and coastal ecosystems are places of abundant natural resources and are widely intact. They provide diverse services that people from within and outside the Arctic benefit from.

Unprecedented and transformative changes are occurring within the Arctic climate, ecosystems and to its social and economic framework. Some of the changes now occurring may already be crossing natural thresholds from which there will be no returning, while others can be shaped by the decisions and actions taken now by the region's residents, decision and policy makers as well as within the global community.

The Arctic Council's Arctic Marine Strategic Plan (AMSP) over the next ten years aims to provide a strategic framework for advancing actions to protect the Arctic marine and coastal ecosystems and to advance sustainable development in the region. The AMSP focuses on the importance of the sustainable use of resources, economic development and environmental protection. It articulates the Arctic Council's desire to act on climate change, to improve cooperative capacity addressing adaptation, resilience, and combined effects of Arctic change on ecosystems and people, and to strengthen the Arctic Council to meet new challenges and opportunities¹.

The Arctic Marine Strategic Plan

The Arctic Marine Strategic Plan was conceived at a meeting of the Arctic Council in Inari, Finland, in 2002. Arctic Council Ministers signed a declaration recognizing that "...existing and emerging activities in the Arctic warrant a more coordinated and integrated strategic approach to address the challenges of the Arctic coastal and marine environment..."

The Council thus agreed "...to develop a strategic plan for protection of the Arctic marine environment under leadership by PAME". In fulfilment of this agreement, the first Arctic Marine Strategic Plan was developed in cooperation with Arctic Council member states, permanent participants, working groups and observers. It was published in 2004 and informed the work of the Arctic Council Working Groups on a 10 years' time-frame.

The present revised version of the AMSP builds on the 2004 plan and sets forth the rationale, frameworks, and strategic actions that will guide the work of the Arctic Council Working Groups for another decade.

Note: Towards end of developing process add text describing process, motivation, and possibly main thrust of the revised plan

The AMSP also addresses the need to shape Arctic change by recognising that sustainability must be achieved on the basis of a resilient Arctic environment and resilient Arctic societies, and that these twin goals can only be achieved together. The activities identified in the AMSP target the ability for an integrated, strategic, and proactive handling of Arctic change in relevant policies and practices,

¹ Arctic Council Kiruna Declaration 2013. Published at <http://www.arctic-council.org/index.php/en/document-archive/category/5-declarations>

contributing to the operationalization of the Arctic Council's mandate to foster sustainable development in the Arctic region.

The speed, pervasiveness, and the diversity of drivers of Arctic change create new threats and opportunities for sustainable development in the Arctic. Realisation of the opportunities that result from changes in the Arctic is dependent on the integration of human well-being and environmental concerns, and relies on strong strategic and adaptive capacity. The Arctic Council strongly supports an Ecosystem Based approach to management and it was a cornerstone of the first AMSP released in 2004. Since then, the Arctic Council and its Working Groups have made significant progress on reinforcing the use of Ecosystem Based Management in the Arctic region. This updated AMSP builds on those achievements as well as incorporating recent findings from different Arctic Council products.

1.2 Scope

The Arctic Marine Strategic Plan covers all Arctic marine areas and relates to all key activities affecting Arctic marine ecosystems; therefore it also considers coastal zones, river basins and other areas that are connected to Arctic marine ecosystems. The AMSP also addresses influences on the Arctic marine environment regardless whether they originate from within or outside the region, recognising that Arctic marine areas are connected to the rest of the world through physical, biological and human interactions. Arctic Council member states will each define their own relevant arctic areas.

1.3 Context

1.3.1 Sustainability

The Arctic Council was established with a mandate to take cooperation on Arctic affairs beyond the environment, with particular emphasis on sustainable development, adopting the 1987 Brundtland Commission definition as development which meets the needs of the present without compromising the ability of future generations to meet their needs, and highlighting the importance and interdependency of economic, social, cultural and environmental aspects².

The aim of the 2004 AMSP was to build on internationally recognized approaches to ocean management and further the implementation of existing international instruments to achieve the sustainable development of the Arctic marine environment. The 2004 Plan explicitly referred to the Earth Summit in 1992, where the need to manage human activities within the context of entire ecosystems and to address environmental, social and economic objectives was widely endorsed. The 2004 Plan also build on the World Summit on Sustainable Development (WSSD 2002) reconfirmation of the United Nations Convention on the Law of the Sea (UNCLOS) to provide a legal framework for all ocean activities and, further, that such key concepts as the precautionary approach and ecosystem based management are recognised approaches to sustainable ocean management. The present 2nd iteration of the AMSP considers the development and implementation of these approaches during the last decade.

² Arctic Council Framework Document for the Sustainable Development, published online at <http://www.arctic-council.org/index.php/en/document-archive/category/4-founding-documents>

The 2014-24 AMSP identifies strategic actions based on findings in relevant regional and global assessments. In doing so the Arctic Council is providing international leadership on the global sustainable development agenda, following the 2012 United Nations Conference on Sustainable Development (Rio +20) and its conclusions in the document 'The Future We Want'³. This AMSP embraces the Rio + 20 recognition that protecting and managing the natural resources is essential for achieving sustainable social and economic development. The AMSP identifies strategic actions aimed at protecting the values and services provided by viable Arctic ecosystems.

The strategic actions identified in the present AMSP promote the implementation of international instruments and commitments to achieve sustainable development, such as UNCLOS, the International Maritime Organization (IMO) Conventions and Protocols, specifically the development of an international code of safety for ships operating in polar waters (Polar Code), the UN Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), specifically its Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets, and others⁴. Implementation of the present AMSP may also help Arctic states to demonstrate action under relevant instruments such as the United Nations Environment Programme (UNEP) Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) and the United Nations Food and Agriculture Organization (FAO) Action Plans. The Plan also provides the opportunity to Arctic nations to work with the United Nations Environment Programme (UNEP) managed initiative The Economics of Ecosystems and Biodiversity (TEEB), and to build regional capacity for engagement with the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES).

Furthermore, the AMSP recognizes the importance of regional and sub-regional cooperation in facilitating the implementation of environmental provisions and targets in UNCLOS and other global ocean commitments. The AMSP may therefore also be relevant for initiatives by regional instruments such as the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), the Barents Regional Council (BRC), the European Union's Marine Strategy Framework Directive, as well as relevant sector-specific regional organisations like regional fisheries management organisations (RFMOs) such as the North-East Atlantic Fisheries Commission (NEAFC) and the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (CCBSP).

An essential component of sustainability is people's opportunities to participate in decision making processes and to influence their future. A strategic approach to managing Arctic marine ecosystems will need to take into account that Arctic sustainability can only be achieved with a broad alliance of civil society, indigenous peoples, governments and the private sector. The strategic activities of the AMSP contribute to building and sharing knowledge and building capacity that enables involvement of Arctic stakeholders.

³ Published online at <http://sustainabledevelopment.un.org/futurewewant.html>

⁴ The Convention for the International Trade in Endangered Species (CITES), the Convention on Migratory Species (CMS), the Convention on Wetlands of International Importance (RAMSAR), the Convention on the Prevention of Marine Pollution (London Convention), the Stockholm Convention on Persistent Organic Pollutants, the Convention on Long-range Transboundary Air Pollution (CLRTAP) and the Gothenburg Protocol, the Montreal Protocol on Substances that Deplete the Ozone Layer, and the Minamata Convention on Mercury.

SWIPA 2011 Key Findings

1. The past six years (2005–2010) have been the warmest period ever recorded in the Arctic. Higher surface air temperatures are driving changes in the cryosphere.
2. There is evidence that two components of the Arctic cryosphere – snow and sea ice – are interacting with the climate system to accelerate warming.
3. The extent and duration of snow cover and sea ice have decreased across the Arctic. Temperatures in the permafrost have risen by up to 2 °C. The southern limit of permafrost has moved northward in Russia and Canada.
4. The largest and most permanent bodies of ice in the Arctic – multiyear sea ice, mountain glaciers, ice caps and the Greenland Ice Sheet – have all been declining faster since 2000 than they did in the previous decade.
5. Model projections reported by the Intergovernmental Panel on Climate Change (IPCC) in 2007 underestimated the rates of change now observed in sea ice.
6. Maximum snow depth is expected to increase over many areas by 2050, with greatest increases over Siberia. Despite this, average snow cover duration is projected to decline by up to 20% by 2050.
7. The Arctic Ocean is projected to become nearly ice-free in summer within this century, likely within the next thirty to forty years.
8. Changes in the cryosphere cause fundamental changes to the characteristics of Arctic ecosystems and in some cases loss of entire habitats. This has consequences for people who receive benefits from Arctic ecosystems.

1.3.2 A Changing Arctic

Assessments carried out over the last decade under the auspices of the Arctic Council⁵ have documented that the direct and interacting effects of climate change, sociocultural change, and economic change in the Arctic will put an unprecedented strain on the viability of the Arctic marine environment while at the same time presenting development opportunities for people and economies.

The Arctic is at the forefront of *global climate change*. The Intergovernmental Panel on Climate Change (IPCC) has concluded in its Fourth Assessment Report (IPCC 2007) that average Arctic temperatures have increased at almost twice the global average rate in the past 100 years. Depending on global progress in reducing greenhouse gas emissions IPCC's Fifth Assessment Report forecasts Arctic temperatures to rise by between ... and ... by the year 2100, compared to ... [today or pre-industrial] [*at time of IPCC AR5 publication Sep 2013 add numbers here, using RCP spread. Consider using the – relatively RCP-independent—2050 values instead if they are listed*]. The ACIA and SWIPA assessments (see sidebars) conclude that the impacts of climate change are already occurring in the Arctic and that more profound changes are to come as the planet continues to warm. While the exact impacts on biodiversity and ecosystems are still uncertain, current trends and assessments point to major transformative changes in ecosystems within a human life span, including loss of entire habitats, such as multi-year sea ice (ABA 2013). The changes predicted in these assessments have also concluded that human infrastructure will be at risk and have documented how a changing Arctic plays a key role in the global climate system, global economies, and people worldwide. SWIPA (2011) concludes that “Everyone who lives, works or does business in the Arctic will need to adapt to changes in the cryosphere”.

⁵ the 2004 Arctic Human Development Report (AHDR 2004), the Arctic Climate Impact Assessment (ACIA 2005), the Snow, Water, Ice and Permafrost in the Arctic assessment (SWIPA 2011), the Arctic Biodiversity Assessment (ABA 2013), and the Arctic Resilience Interim Report (2013)

Rapid **industrial development** is another significant driver of change for the Arctic Ocean and coasts. The Arctic was once a region that was of little interest to global affairs but it is now becoming an area of increasing interest due to its abundant natural resources and new opportunities for shipping (AHDR 2004, AMSA 2011). Increasing large scale activities such as near-shore and off-shore fisheries, on shore and off-shore hydrocarbon development, mining for minerals, and shipping, can lead to development opportunities but can also pose increased threat to the environment.

Together with climate and economic change widespread **social and cultural change** occurring in many Arctic societies will affect traditional and indigenous peoples' ways of life with potential repercussions for the marine environment. Arctic peoples have proven to be highly adaptable at securing their livelihood in a dynamic and challenging environment. However, the rate, magnitude and diversity of current and expected changes now occurring in the region challenge the adaptive capacities of Arctic communities (AHDR 2004, Arctic Resilience Interim Report 2013). Responding to the array of changes and their impacts can cause behaviour changes affecting the use of the marine environment and can add to the stresses on ecosystems caused by climate change and increased industrial activity.

Alone or in combination, the different aspects of change create accelerating pressures on Arctic marine ecosystems, putting at risk the delivery of ecosystem services. The impacts of climate change exert by far the most serious and pervasive pressure to Arctic biodiversity, and are exacerbated by other drivers, such as ocean acidification⁶ and locally increasing commercial activity such as resource and infrastructure development, shipping, tourism, fishing and aquaculture. Among the pressures stemming from this mix of drivers are habitat degradation, fragmentation and loss, population declines as a result of isolation, reduced ranges, cumulative impacts of stressors of pollution, human use, and invasive species, as well as species loss leading to disruption of food webs and ecosystem function.

The multitude of environmental and human aspects of Arctic change emphasises the need for place-specific implementation of an integrated and participatory ecosystem approach to managing the Arctic marine environment. The potential for interaction of drivers causing cascading effects and the crossing of thresholds prompt a focus on resilience (Arctic Resilience Interim Report 2013), which is the ability of a system to respond to change and develop while

9. The observed and expected future changes to the Arctic cryosphere impact Arctic society on many levels. There are challenges, particularly for local communities and traditional ways of life.

10. There are also new opportunities. Transport options and access to resources are radically changed by differences in the distribution and seasonal occurrence of snow, water, ice and permafrost in the Arctic. This affects both daily living and commercial activities.

11. Arctic infrastructure faces increased risks of damage due to changes in the cryosphere, particularly the loss of permafrost and land-fast sea ice.

12. Loss of ice and snow in the Arctic enhances climate warming by increasing absorption of the sun's energy at the surface of the planet. It could also dramatically increase emissions of carbon dioxide and methane and change large-scale ocean currents. The combined outcome of these effects is not yet known.

13. Arctic glaciers, ice caps and the Greenland Ice Sheet contributed over 40% of the global sea level rise of around 3 mm per year observed between 2003 and 2008. In the future, global sea level is projected to rise by 0.9–1.6 m by 2100 and Arctic ice loss will make a substantial contribution to this.

14. Everyone who lives, works or does business in the Arctic will need to adapt to changes in the cryosphere. Adaptation also requires leadership from governments and international bodies, and increased investment in infrastructure.

15. There remains a great deal of uncertainty about how fast the Arctic cryosphere will change in the future and what the ultimate impacts of the changes will be. Interactions ('feedbacks') between elements of the cryosphere and climate system are particularly uncertain. Concerted monitoring and research is needed to reduce this uncertainty.

⁶ Arctic Ocean Acidification report (complete citation once available)

maintaining important functions and values⁷. In implementing an ecosystem approach to managing the Arctic marine environment in light of rapid change and uncertainty such a focus on resilience is strengthened through risk management, strategic assessments, the strengthening of adaptation capacity and the application of the precautionary approach.

2. Vision

The Arctic Council's vision for the Arctic marine environment is:

Healthy and productive Arctic marine ecosystems that support environmental, sociocultural and economic values for current and future generations, recognizing that human well-being is dependent on viable Arctic ecosystems.⁸

3. Goals

The goals of the 2014-2024 Arctic Marine Strategic Plan are to

- Goal 1 **Foster a healthy marine environment with resilient ecosystems that provide services to people**
- Goal 2 **Advance sustainable use of the marine environment by reducing environmental risks and pressures from human activities**
- Goal 3 **Advance Promote the health and well-being of Arctic inhabitants by increasing their capacity to adapt to a changing Arctic.**
- Goal 4 **Improve understanding of the state of the environment, current and expected stresses and impacts.**

⁷ Definition of resilience (from Resilience Alliance glossary <http://www.resalliance.org/index.php/index.php?id=639>, accessed May 2013): "Resilience is the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks."

⁸ The revised vision incorporates the scientific insight and emerging political consensus that human welfare and development depends on the sustained provisioning of vital biophysical services (see e.g. Secretary-General's High-Level Panel on Global Sustainability report: http://www.un.org/gsp/sites/default/files/attachments/GSP_Report_web_final.pdf). This new paradigm is currently informing the discussion at the UN Sustainable Development Process (Rio +20 implementation) formulating sustainable development goals post 2015. See e.g. Nature 495, March 2013, pp 305-307 (<http://sustainabledevelopment.un.org/content/documents/844naturesjournal.pdf>)

Principles of Arctic ecosystem based management identified by the Arctic Council Expert Group on Ecosystem Based Management

1. EBM supports ecosystem resilience in order to maintain ecological functions and services.
2. EBM recognizes that humans and their activities are an integral part of the ecosystem as a whole, and that sustainable use and values are central to establishing management objectives.
3. EBM is place-based, with geographic areas defined by ecological criteria, and may require efforts at a range of spatial and temporal scales (short-, medium- and long-term).
4. EBM balances and integrates the conservation and sustainable use ecosystems and their components.
5. EBM aims to understand and address the cumulative impacts of multiple human activities (rather than individual sectors, species or ecosystem components).
6. EBM seeks to incorporate and reflect, to the extent it is relevant, expert knowledge including scientific, traditional and local knowledge.
7. EBM is inclusive and encourage participation at all stages by various levels of government, indigenous peoples, stakeholders (including the private sector) and other Arctic residents.
8. Transboundary perspectives and partnerships can contribute significantly to the success of EBM efforts.
9. Recognizing that ecosystems and human activities are dynamic, that the Arctic is undergoing rapid changes, and that our understanding of these systems is constantly evolving, successful EBM efforts are flexible and adaptive.

4. Principles and Approaches

The Arctic Marine Strategic Plan is consistent with the rights and obligations covered under applicable regional and international agreements. It is acknowledged that the UN Convention on the Law of the Sea is the recognized legal framework for implementing this Strategic Plan. Furthermore, the AMSP implements the Arctic Council's founding principles, including sustainable development, ecosystem based management and the precautionary approach that are recognised by the UN sustainable development agenda. The AMSP will aid the Arctic Council in preparing for the challenges and opportunities posed by a rapidly changing Arctic marine environment, and increasing human use. Its strategic actions are aimed at protecting Arctic marine ecosystems.

5.1 Ecosystem Based Management

Ecosystem based management is increasingly implemented worldwide in recognition that traditional single-sector and single-resource approaches to management are inadequate. In acknowledging this the 2012 United Nations Conference on Sustainable Development (Rio +20) re-affirmed the significance of ecosystem based management. The Arctic Council has also embraced ecosystem based management, and has through an expert group recently identified principles, needs, and opportunities to operationalize ecosystem based management in the Arctic (see sidebar). Ecosystem based management is the foundation for achieving the goals of this Arctic Marine Strategic Plan (see section 3).

Ecosystem based management is a management framework that seeks to balance competing priorities. The framework integrates the social, subsistence, commercial, cultural, and ecological values and seeks to balance trade-offs associated with maintaining the sustainability of the marine environment in the presence of multiple human uses. While ecosystem based management integrates the range of values, the ecosystem aspect is recognising that without ecosystem viability there is no means to assure sustainable social or economic development; hence the term "ecosystem based". The primary goal of ecosystem based management is therefore to support ecosystem resilience in order to maintain ecological functions and ecosystem services.

The implementation of ecosystem based management progresses along the -partly iterative- sequence of: identifying the ecosystem, describing the ecosystem, valuing the ecosystem, setting ecological objectives, assessing the ecosystem, and managing human activities. Many concrete practices operationalizing these steps are developed

locally, and are therefore outside the remit of the Arctic Marine Strategic Plan.

The Council's expert group on ecosystem based management has identified the process and knowledge needs, as well as Arctic-wide actions, for advancing ecosystem based management. Their primary focus is on actions aiming at the availability and coordination of knowledge for the use in integrated ecosystem assessments. They also target the identification and sharing of best practices and lessons learnt. In addition, Interactions between places on one hand and trends and impacts of regional drivers on the other emphasize the need for region-wide assessments, for example scenarios of climate change. The present Arctic Marine Strategic Plan advances the integration and sharing of knowledge enabling the implementation of Arctic marine ecosystem based management.

Ecosystem based management works with long term objectives and links the slower and complex dynamics of ecosystems to the faster pace of human activities through iterative and adaptive management. The rapid and transformational changes taking place in the Arctic marine environment pose a challenge to such common practice as they defy the use of historical conditions as benchmarks for future-oriented management objectives. Objectives and indicators for Arctic marine ecosystem based management need to be informed by knowledge of trajectories of change and need to accommodate uncertainty in understanding the future ecosystem state. This necessitates added focus on maintaining a range of response options securing valuable ecosystem services. Such forward-looking aspects are contributed by a management focus on ecosystem resilience - the ability to respond to change and develop while maintaining important functions and values. This strategic plan therefore identifies actions to understand and build the resilience of Arctic marine ecosystems.

5.2 Precautionary Approach

The 2012 United Nations Conference on Sustainable Development (Rio +20) has re-emphasized the importance of the precautionary approach for fostering sustainability, and the Arctic Council has urged its member states to apply and enforce the approach through appropriate laws and controls⁹.

A definition of the precautionary approach is provided in the 1992 Rio Declaration on Environment and Development, stating "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".

Comments- Below text to be shortened

Many decisions in environmental management and spatial planning are based directly or indirectly on risk assessment. In practicing the ecosystem approach risk is an integral aspect: management measures target driver-specific pressures to reduce the risk of individual and cumulative environmental effects, impacts on vulnerable ecosystem components and services, and potential loss of future management options important for sustainable development. Additionally, assessment of risk aims to deploy resources to priorities of the highest ecosystem, social, cultural, economic, and policy risks, therefore providing guidance for effective and efficient practical measures based on existing scientific knowledge, legislation, and technologies.

⁹ Arctic Council Tromsø Declaration 2009. Published at <http://www.arctic-council.org/index.php/en/document-archive/category/5-declarations>

Risk analysis and management approaches are explicitly used in a variety of management areas such as business, engineering, and human health and safety. From the context of ecosystem based management, social and economic development coupled with directional change and natural variability in ecosystem processes introduces uncertainties about ecosystem sustainability objectives. Using an ecosystem based risk management approach (EBRM), ecosystem risks are managed by identifying, analysing, and evaluating environmental factors to determine if management strategies are meeting agreed ecosystem management risk criteria. Such an EBRM approach has recently been conceptualised by the International Council for the Exploration of the Sea (ICES)¹⁰, on the basis of the UNEP guide to marine and coastal ecosystem based management¹¹ and the ISO 31000 standard for risk management and risk assessment techniques¹² (Figure 2).

By identifying strategic activities that enable risk analysis and management within an overall ecosystem approach the Arctic Marine Strategic Plan facilitates the application of the precautionary approach in the management of the Arctic marine environment.

¹⁰ Cormier, R., *et al.* 2013. Marine and coastal ecosystem-based risk management handbook. ICES Cooperative Research Report No. 317. 60 pp.

¹¹ UNEP. 2011. Taking Steps toward Marine and Coastal Ecosystem-Based Management – An Introductory Guide. UNEP Regional Seas Reports and Studies No. 189. 68 pp.

¹² ISO. 2009. Risk Management Principles and Guidelines. International Organization for Standardization. ISO 31000:2009(E).

5. Challenges and Opportunities in a Rapidly Changing Arctic

Each of the goals of the Arctic Marine Strategic Plan presents both challenges and opportunities for Arctic States and stakeholders. The overall aim of the goals is to promote sustainability in a rapidly changing Arctic marine environment by addressing both how to respond to the current situation and how to prepare for the future.

5.1 Resilience of Marine Ecosystems

Goal 1: Foster a healthy marine environment with resilient ecosystems that provide services to people

Arctic ecosystem services are of local, regional and global importance. A central goal of the Arctic Marine Strategic Plan is to promote the resilience of marine and coastal ecosystems to Arctic change and to ensure that people can continue to benefit from the services that flow from healthy ecosystems with viable populations of species and intact habitats. Building this resilience requires operationalizing an ecosystem approach to managing the Arctic marine and coastal environment that is forward-looking, place-based and integrates a precautionary approach.

Arctic biodiversity is an irreplaceable asset¹³ and is made up of thousands species of algae, microbes, and animals, including unique Arctic marine mammals, fish species, and birds, some of which form the largest bird colonies on the planet¹⁴. Arctic ecosystem services are integral to the well-being of Arctic peoples. Arctic communities are concentrated along coastlines granting access and harvest of the diverse wildlife of the productive marine and coastal ecosystems. The Arctic marine and coastal environment also provides services to the global economic and climate systems, benefiting people outside the Arctic (Figure 1).

The AMSP advances the resilience of marine and coastal ecosystems and the connected values and services through integrated ecosystem based management (EBM). EBM identifies important ecological areas, implements protective management regimes that evaluate, maps, and internalises ecosystem services into management and economies. EBM also serves to manage the risks of individual and cumulative effects of human activities through precautionary and spatial management, which improves the knowledge base and the participatory capacity of stakeholders. By adding focus on the coordinative and adaptive ability of institutions, on pan-Arctic habitat persistence and connectivity, and by considering scenarios of anticipated change the AMSP promotes the proactive building of marine ecosystem resilience to rapid change as the underpinning “development” component of Arctic sustainable development.

5.2 Risks to the Arctic Marine Environment

Goal 2: Advance sustainable use of the marine environment by reducing environmental risks and pressures from human activities

Reducing risks associated with marine resource use in the Arctic through risk assessment and management is a central goal of the Arctic Marine Strategic Plan.

¹³ Conservation of Arctic Flora and Fauna (CAFF). 2013. Arctic Biodiversity Assessment: Report for Policy Makers. CAFF, Akureyri, Iceland.

¹⁴ CAFF 2013. Arctic Biodiversity Assessment. Status and trends in Arctic biodiversity. Conservation of Arctic Flora and Fauna, Akureyri

Improved access, growing global demand for natural resources, and national economic priorities are driving an increase in industrial scale resource extraction and shipping activities in the Arctic. However, despite an opening up of the Arctic, its waters and coastlines remain places of high risk for commercial activities such as shipping, mining, and oil and gas extraction. Presence of sea ice for many months of the year, long periods of darkness, perilous weather conditions, and a lack of infrastructure all increase risks¹⁵. A number of factors make Arctic ecosystems vulnerable to mechanical and chemical pressures associated with extractive industries, transportation, and chemical pollution. Any impacts on ecosystems from human activities will locally amplify those exerted by climate change and its related effects, potentially putting unprecedented strain on the viability of the Arctic marine ecosystems in the years to come^{16,17}.

Risk assessment has a critical role to play in helping businesses, governments and communities manage uncertainties and minimise risks¹⁸. Identification of risk from specific human activities and analysis of their potential individual or combined impact on environment, on social and cultural values, and on available options for adaptation and economic development, are elements of risk assessment that are furthered by the strategic actions identified in the AMSP.

5.3 Human Well-Being and Adaptive Capacity

Goal 3: Promote the health and well-being of Arctic inhabitants by increasing their capacity to adapt to a changing Arctic.

Promoting Arctic human development is a priority of the Arctic Council. The well-being of many Arctic coastal residents is dependent on the health of the Arctic marine and coastal ecosystems. Healthy marine and coastal ecosystems can also support people's ability to adapt to social, economic and environmental change. The AMSP aims to strengthen the well-being of Arctic communities through measures such as building local capacity and knowledge, and advancing adaptive capacity.

Sustaining and improving the well-being of Arctic peoples is critically dependent on the resilience of their communities. Arctic community resilience in the face of climate change can be advanced by implementing adaptation measures that decrease vulnerability to specific threats. For example, moving a freshwater supply away from an eroding shoreline, or establishing an ice monitoring and forecasting system to provide better information to seal hunters in more dynamic ice conditions. In light of the anticipated magnitude and complexity of Arctic change, navigating whole-sale transitions rather than responding to individual threats can sometimes foster community resilience more effectively; assisting a community to shift from a sealing to a fishing-based livelihood is an example for such a transition.

Adaptation requires the making of informed choices and trade-offs that will themselves drive aspect of change. The well-being of Arctic people thus rests on their capacity to monitor, assess and understand the possible trajectories and consequences of change, and to identify and participate in the

¹⁵ Arctic Marine Shipping Assessment 2009 Report. Arctic Council, April 2009.

¹⁶ Conservation of Arctic Flora and Fauna (CAFF). 2013. Arctic Biodiversity Assessment: Report for Policy Makers. CAFF, Akureyri, Iceland

¹⁷ AOA report (complete citation once available)

¹⁸ Arctic Opening: Opportunity and Risk in the High North. Chatham House-Lloyd's Risk Insight Report. Emmerson C. and Lahn G., 2012. Published online at <http://www.chathamhouse.org/publications/papers/view/182839>

implementation of adaptation strategies¹⁹. These aspects of community resilience are advanced through building adaptive capacity – the factors and processes that enable local stakeholders to make informed and situation specific choices and participate in decision making and implementation. Next to this, adaptive capacity of Arctic communities is facilitated by access to healthy natural, cultural and social environments²⁰.

In an Arctic where a considerable amount of change is driven from human activities at the global scale human well-being and adaptive capacity will be determined by the ability of institutions to connect between governance levels, to be closely connected to the place where problems and solutions are realised, and to be able to coordinate flexibly and adaptively in the face of high levels of uncertainty²¹.

5.4 Current and Future Environmental State, Pressures and Impacts

Goal 4: Improve understanding of the state of the environment and of current and expected stresses and impacts

Taking policy actions at both international and national levels is dependent on an understanding of the state of the environment, of current and emerging pressures and their impact, and of trajectories of change. Furthering the understanding of Arctic marine ecosystems, human use, and related trends necessary for improved decision making is another important goal of the AMSP.

The increasing industrial activity in the Arctic region, the impacts of climate change and ocean acidification are creating pressures on the marine environment that may be new altogether or have increased magnitude, occur more often or at more places. In combination they have the potential to produce cumulative impacts compromising the viability of the marine environment or aspects thereof, especially along coastlines where diverse uses compete for space and where Arctic communities are concentrated. Effective ecosystem based management is dependent on knowledge and understanding of ecosystem components and takes into consideration cumulative impacts.

Uncertainty is introduced by a lack of understanding of the combined and interacting effects of changes on the complex marine environment. It limits people's capacity to analyse and understand patterns of change and use this understanding to make informed decisions. Making such informed decisions is dependent on addressing and reducing uncertainty through improving the knowledge base, for example by extending time series and density of observations, by advancing understanding of ecosystem dynamics, and by refining the significance of scenarios of future conditions.

¹⁹ Arctic Council (2013). Arctic Resilience Interim Report 2013. Stockholm Environment Institute and Stockholm Resilience Centre, Stockholm. Published online at <http://www.arctic-council.org/arr/>

²¹ Arctic Governance Project, 2010. Arctic governance in an era of transformative change: critical questions, governance principles, ways forward. Published online at <http://www.arcticgovernance.org>

6. Strategic actions

This Strategic Plan sets out a range of actions that can be undertaken by the Arctic Council through its subsidiary bodies and member states, in collaboration with other regional and global organizations. Strategic actions were selected according to the goals, principles and approaches outlined above, taking into consideration the environmental protection and sustainable development mandates of the Arctic Council in their global context. This Plan's conceptual framework and strategic actions are also guided by the key findings and recommendations of key Arctic Council reports published over recent years²². The strategic actions in the AMSP focus on promoting a viable Arctic marine environment that support environmental, sociocultural and economic values. They also acknowledge the importance of resilient ecosystems and human well-being for the development of current and future generations.

Note: The strategic activities are compiled on the basis of the recommendations of Arctic Council products compiled in Annex 1, and with attention to the above sections on context, challenges and opportunities, and principles, as well to the remit of the AC WGs. They need to be refined in coordination with emerging or existing AC WG workplans and strategies as well as upcoming implementation plans of e.g. the AOR and ABA. The initial draft below lays out the objectives and outcomes of such activities and refinement needs to focus on exactly how they are pursued, if the activity is endorsed.

6.1 Advance Ecosystem Based Management

1. Facilitate advancement of EBM in the Arctic through cooperation between working groups on activities and initiatives.
2. Prepare integrated ecosystem status reports for Arctic LMEs and establish and update an Arctic inventory of such reports.
3. Identify Arctic ecosystem services of particular importance to local communities and sub-regional economies. Facilitate their evaluation and mapping through tools suitable for integrating ecosystem services into EBM and spatial and economic planning.
4. Develop scenarios projecting the future state of the Arctic marine environment, including its people, considering the impacts of relevant drivers of change, to inform integrated ecosystem assessments.
5. Identify interactions between ecosystems, such as with coastal zones and freshwater, that are relevant for EBM,
6. Develop a Pan-Arctic inventory of shared species, including fish, which are, or may in future be considered for commercial harvest.
7. Identify priority places for a network of marine protected areas in the Arctic that provides functional connectivity for biodiversity in light of anticipated climate changes and considers areas of biological, ecological, cultural and societal significance.
8. Pursue development of a Pan-Arctic Framework for a network of Marine Protected Areas
9. Compile an inventory of use objectives, ecological objectives, and indicators relevant to EBM, and assess how they can promote the implementation of EBM in Arctic LMEs. Facilitate a

²² See Annex 1 to this document for a listing of key findings and recommendations

process of experts and practitioners that elaborates on the practical implementation of developing and applying such objectives and indicators in an arctic EBM context.

10. Develop guidelines and best practices for undertaking integrated ecosystem assessments in Arctic LMEs.

6.2 Enable a Precautionary Approach to Marine Resource Use

1. Characterise the pressures on LME components, functions, and services of ecological and societal significance, considering impacts from climate change, ocean acidification, pollution, and human use. Prioritise LMEs and their elements that are under most pressure.
2. Identify or develop tools and methodologies for assessing cumulative pressures, impacts, and risks on Arctic ecosystems, ecosystem components, functions, and services in a place-specific manner so that they can be included in integrated ecosystem assessments.
3. Characterise the sensitivity of LME components, functions, and services of ecological and societal significance to priority individual or cumulative pressures and impacts.
4. Identify measures available to avoid, reduce, or mitigate pressures and risks on LME in an EBM context, and assess their effectiveness for addressing the use objectives of Arctic LMEs.
5. Facilitate the development of Arctic-specific spatial assessments and approaches that avoid, reduce, or mitigate the risk of human uses and support the resilience of components, functions, and services of ecological and societal significance by establish an expert process that develops recommendations on marine spatial management best practices.
6. Review existing risk assessments methodology and recommend best practices for ecosystem based management in the Arctic.
7. Assess the risks of relevant industrial activities in the Arctic considering the likelihood of short term and long term environmental effects and impacts.
8. Catalogue relevant industry standards and best practices in a publicly accessible database. Assess their strength and shortcomings to a short-term and long-term precautionary management of Arctic environmental risk and identify gaps. Building on this work, coordinate a participatory process of key stakeholders (regulators, industry, PPs, ENGOs, academia) that develops Arctic best practises or standards for sectors.

6.3 Implement and Comply with International and Regional Commitments,

1. Support work at the IMO and other international organizations with recognized competence to promote and advance safe, secure, and environmentally sound shipping.
2. Encourage research into ballast water management systems that are effective in Arctic conditions
3. Explore, within an appropriate time after the mandatory Polar Code has been adopted, collaborative approaches to encourage effective implementation of any future related IMO measures for the Arctic, including the possible development at IMO of port state control guidelines and/or initiatives within existing port state arrangements.
4. Explore and support ways to advance control measures for the use and carriage of heavy fuel oil (HFO) in Arctic waters, where appropriate.
5. Support work to address black carbon emissions from shipping in Arctic waters and encourage research that advances technical definitions, measurement standards and mitigation options.

6. Consider approaches to address safety and environmental concerns with respect to types of vessels that, due to their size, routes, and nature of activity, may not be subject to the Polar Code.
7. Assist Arctic states that are party to the CBD to fulfil or exceed their commitments under the Aichi Targets to conserve at least 10 per cent of their coastal and marine areas by 2020 through facilitation and coordination of national and international efforts.
8. Work towards enhancing the safety of Arctic shipping lanes, including with the IMO, by conducting an analysis of existing and emerging Arctic shipping lanes and identifying gaps in infrastructure and mapping.
9. Explore options and facilitate actions to establish an international status for the area in Northwest Greenland/Northeast Canadian Archipelago as a refuge for ice-associated species.
10. Support and enhance international efforts and cooperation to identify, assess and reduce existing and emerging harmful contaminants.
11. Promote cooperation with non-Arctic states to address threats on the staging and wintering grounds and the migrating corridors of migratory species, for example through working towards multi-lateral and bi-lateral agreements under the Convention on the Conservation of Migratory Species of Wild Animals.
12. Undertake an assessment of the offshore oil and gas industry's compliance with applicable domestic regulations and monitoring programmes.
13. Assess the degree to which best industry and international standards of the offshore oil and gas industry are expressed in national laws and regulations in the Arctic.
14. Placeholder- *action item related to emergency and response needed*

6.4 Build the Participatory Capacity of Arctic Inhabitants

1. Aim to provide the latest scientific, human development and economic information produced in the context of the AMSP via the internet in plain language and translated into common Arctic languages, and as maps wherever suitable; develop websites with two-way communication that allow for public commenting and adding of local information.
2. Promote oceans education through appropriate institutions and organizations, such as the University of the Arctic.
3. Encourage the development of mechanisms to enhance local involvement in the collection and monitoring of marine information, and in the application of local and traditional knowledge in local EBM processes.
4. Encourage coastal community involvement in local ecosystem based management.
5. Facilitate coastal community exchanges between Arctic countries through relevant programmes to improve sharing of knowledge and experiences relevant for participation in EBM.
6. Promote sub-regional and local involvement in scenario planning exercises to improve the relevance of scenarios for communities.

6.5 Cooperation on Understanding and Knowledge Availability

1. Promote and facilitate the enhancement of scientific cooperation relating to the Arctic marine environment.
2. Develop a priority knowledge needs list for ecosystem based management in the marine Arctic; facilitate support for dedicated ecosystem based management research programmes that consider ecosystem resilience and adaptation, for example through IASC; facilitate support for pan-Arctic monitoring of identified indicators and pressures, for example through CBMP and SAON.
3. Develop sharing formats and platforms for ecological, cultural, societal and economic data relevant for ecosystem based management.
4. Develop best practices for incorporating relevant local and traditional knowledge into EBM activities. Establish a database where such knowledge is compiled and accessible to relevant local processes.
5. Encourage pilot projects between two or more Arctic states that showcase implementation of EBM in the Arctic.
6. Assess the Arctic-wide value of Arctic ecosystem services that have significance outside the region.
7. Establish a process that develops scenarios of possible Arctic futures and makes them available for use by coastal sub-regional and communities.
8. Encourage the development of ice detection, monitoring and forecasting programs for Arctic waters at a scale where they can inform local and commercial activities.
9. Regularly summarise the emerging scientific knowledge on marine impacts and environmental, livelihood, and economic effects of climate change and Arctic Ocean acidification and make this knowledge available to the public and to relevant global institutions and instruments such as the UNFCCC.
10. Conduct a strategic integrated assessment focusing on long term sustainable development of the Arctic marine and coastal environment and adaptation options for people, taking into account changes in climate, societal and economic development.
11. Advance the goals of the AMSP through fostering partnerships, cooperation and collaboration among governments, indigenous peoples' organizations, academia, communities, industry, international bodies, international/regional organisations, and non-governmental organisations.

7. Implementation

The AMSP 2014-2024 addresses both the short-term and long-term challenges and opportunities facing the region. The implementation of strategic actions should be determined to a large degree by the assessment of the risks and benefits, the collective political ability to act, the financial implications and the capacity (knowledge, facilities and effort) available to address the required objectives at any given time.

The AMSP promotes collaborative work and recognizes that working regionally offers an economy of scale, particularly for such joint efforts as research, monitoring, assessment and technical cooperation. It can also improve policy and program coordination, and help to promote compliance. Achieving the AMSP goals will require coordination and cooperation among Arctic Council working groups, and States will need to look to their national agencies and to outside governments and organisations for support and participation.

Two critical factors for the success of the AMSP are strong institutional support and effective engagement of stakeholders. Implementation of the AMSP and engagement of stakeholders will be carried out through the existing structures and mechanisms of the Arctic Council. That include, biannual Arctic Council meetings, Senior Arctic Officials (SAOs) meetings, the activities of the Arctic Council working groups, expert groups and task forces, where applicable, and its permanent participants and observer members. Each working group, under the overall direction of the SAOs, is expected to implement those activities of the AMSP that relate to its specific objectives.

[Note: towards the end of the development process add here the mandate and overview of current strategic objectives of the respective WGs]

Working group work plans are approved on a biannual basis by the Arctic Council, on the recommendation of the SAOs, with the active participation of the permanent participants. These biannual work plans will identify, through coordination among the working groups, the lead responsibility for strategic actions and any contribution required from other working groups. Regular progress reports to the Arctic Council on the implementation of this Strategic Plan will be provided by PAME and the other working groups. Subject to direction from SAOs and Arctic Council Ministers, PAME, in collaboration with all Arctic Council subsidiary bodies, will also lead a review of the Strategic Plan in 2020 *[MS note: change date as agreed]*, or another date specified by the Council, to determine its adequacy in light of the results of ongoing assessments and national and regional reporting. Under the direction of SAOs, PAME will also, in consultation with other Arctic Council working groups and permanent participants, develop a communication plan to support understanding and involvement in the implementation of this Strategic Plan.

[Note: towards the end of the development process add here further detail on the communications plan]

Acknowledgement: This first draft of a revised 2nd version of the Arctic Council Arctic Marine Strategic Plan was authored by Dr. Martin Sommerkorn, WWF Global Arctic Programme, on assignment by the PAME WG of the Arctic Council. It is designated for transparent further development within a dedicated Arctic Council process coordinated by PAME.

Note: Figures are suggestions and examples only at this point

Figure 1. Ecosystem services and human well-being (from MA 2005)

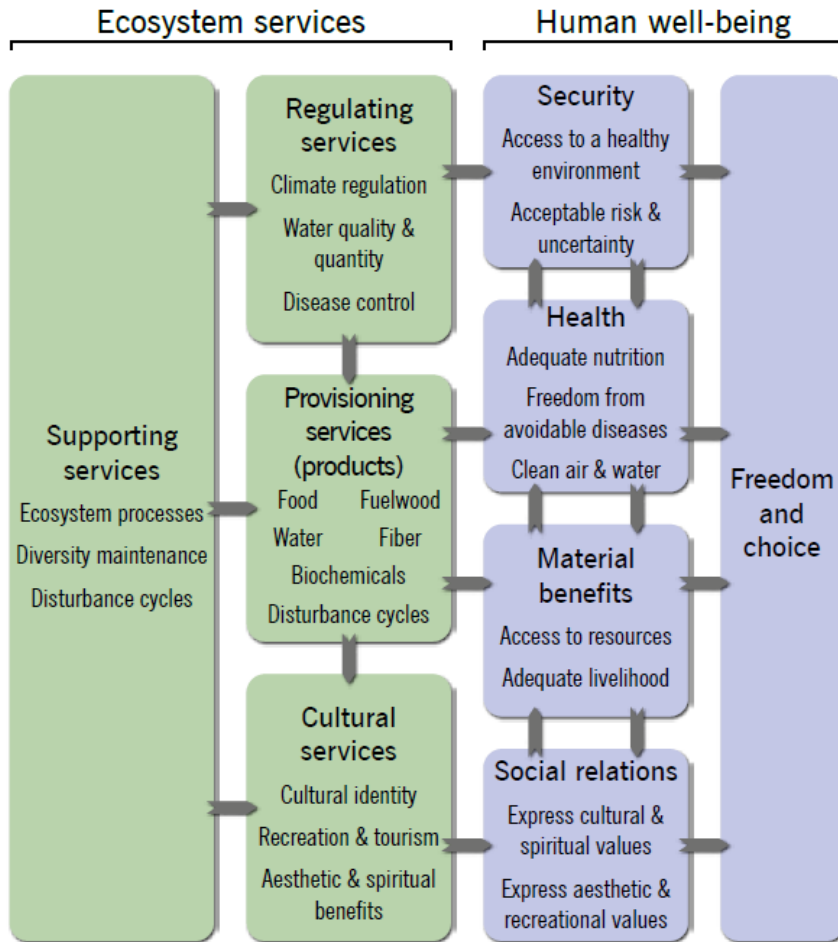


Figure 2. Ecosystem based risk management process

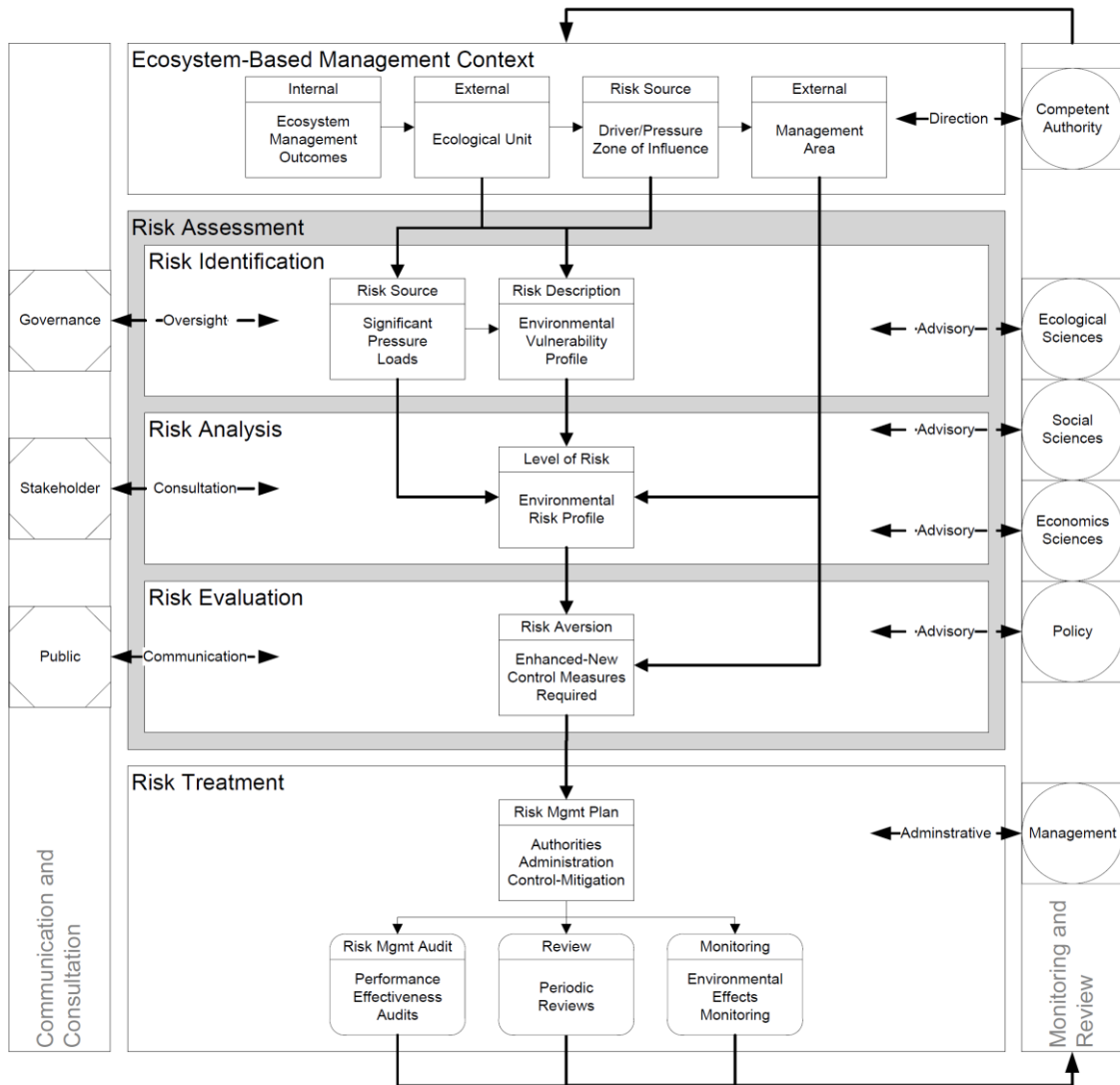


Figure 2.1. Ecosystem-based, risk management process (adapted from ISO 31000).

Figure 3. Interactions across scales in the complex system comprised of the physical environment ecosystems and people

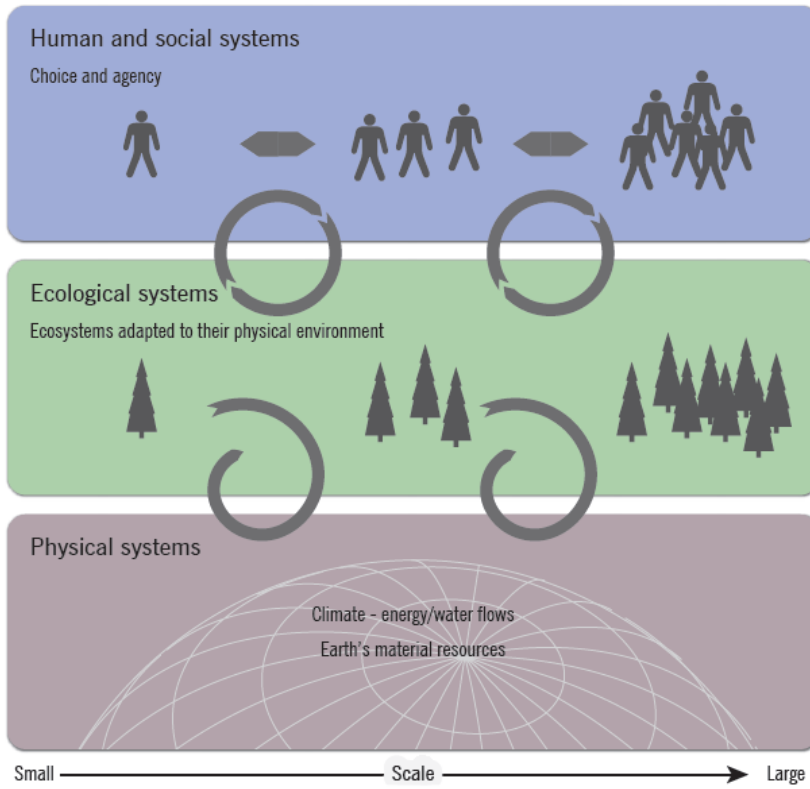


Figure 4. DPSIR framework

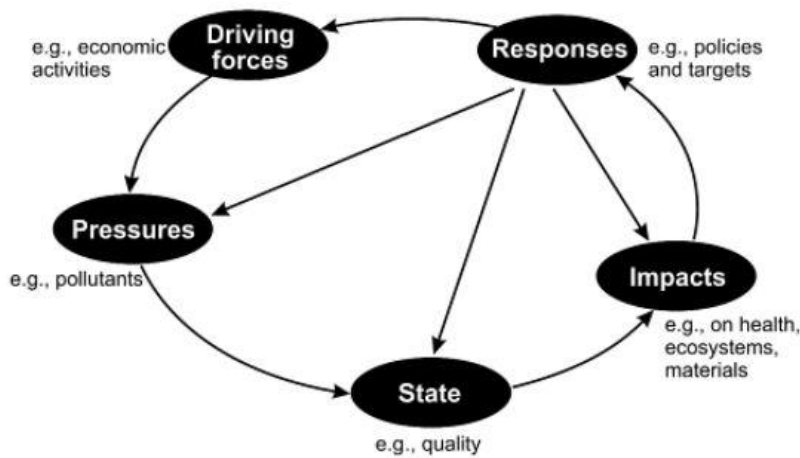


Figure 8.1. DPSIR framework for reporting on environmental issues (courtesy of the EEA).

Figure

