

## MONUMENTS AND SITES AND THEIR SETTINGS IN THE ARCTIC REGIONS

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### **Introduction**

This paper describes a Nordic cooperation project that has the aim of improving the protection and management of cultural heritage environments in the Arctic areas of Greenland, Svalbard and Iceland. It has been a basic premise of the project that the monuments and sites are seen as an integrated part of each cultural environment and cannot exist in a meaningful way without the inclusion of the natural setting. An additional aim of the project is to encourage and stimulate good management of monuments and sites together with their settings, all around the circumpolar Arctic area. I am indebted to my project partners Joel Berglund from Greenland/Denmark, tór Hjaltalín from Iceland and Ina Rognerud from Norway for their equal share in the successful completion of the project, which I led.<sup>1</sup>

### **The Nordic region**

The Nordic region consists of the independent countries of Denmark, Finland, Iceland, Norway and Sweden, together with the autonomous territories of Greenland and the Faroe Islands, which are part of the Kingdom of Denmark, and Åland, a part of the republic of Finland. The total Nordic population is around 24 million. Denmark, Norway and Sweden are monarchies, while Iceland and Finland are republics, but common to them all is a democratic constitution and the fact that the heads of state have little actual power.

The five Nordic countries have many differences, but also many common points of history and current interest. They also have a desire to work together as an entity where this is appropriate in order that the five small units can achieve more as one body than they would be able to do alone. One of the means of assisting cooperation is the governmental body known as the Nordic Council of Ministers, established in 1971. The Council works in many fields of cooperation, including the labour market, trade and industry, agriculture,

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<sup>1</sup> The full project report was published by the Nordic Council of Ministers at the end of August 2005. A shorter version appears on their website. This paper is adapted from the report.

IT, culture, transport and education.<sup>2</sup>

### **The Nordic Arctic landscape**

Of particular interest to the Nordic countries is their connection with the Arctic regions. Denmark's autonomous region Greenland is the world's largest island and is mostly covered (85%) by a huge inland ice sheet up to 3 500 m thick in the centre. Only the coastal rim is free of snow and ice during the summer and only c. 57 000 people live on this island which is nearly twice the size of Tibet with its population of 2.7 million and a little less than the Democratic Republic of the Congo (Zaire) with its over 60 million. Norway owns the High Arctic archipelago of Svalbard, of which Spitsbergen is the largest island. Svalbard has no indigenous population, but has been used for hunting, trapping and mining by various groups continually since the 17<sup>th</sup> century. It has also historically been used as a starting point for expeditions attempting to get to the North Pole, since it stretches to 81°N. Both Norway, Sweden and Finland have areas of their mainland at the same latitudes as Alaska and Siberia, and where the reindeer herders known as Sami have traditionally roamed. Iceland lies just below the Arctic Circle, but is famed for its magnificent ice caps as well as its spectacular volcanic activity.

For the purposes of this project, the three areas Greenland, Iceland and Svalbard were chosen (see map).

### **Protecting Arctic monuments and sites in their setting**

In 1999 the Nordic Council of Ministers produced the *Nordic Action Plan for cultural heritage and environmental protection in the Arctic – Greenland, Iceland and Svalbard*.<sup>3</sup> This outlined 14 different themes that were recommended to be deepened into projects which should all result in actions and blueprints for actions. The themes covered such subjects

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<sup>2</sup> See the Nordic Council of Ministers' website at [www.norden.org](http://www.norden.org)

<sup>3</sup> TemaNord 1999:25, Nordic Council of Ministers, Copenhagen, Denmark.

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as tourism, erosion, environmental surveillance, bottom trawling, gene modification and the protection of flora, fauna, geological occurrences and monuments and sites. One of the latter projects emphasised the importance of work with cultural environments in the Arctic, and was entitled *Representative selection of Arctic cultural environments*. Two goals were outlined for the project: it should on the one hand suggest actions for sustainable management, and on the other select a representative number of cultural environments for particular attention in these Arctic regions. In addition it was hoped that the result would be able to serve as a stimulation and a model for other Arctic areas around the globe.

The three project regions are very different in many ways; Greenland is entirely polar in the north, the traditional home of the Polar Eskimos with their polar-bearskin trousers, dogsleds and kayaks. In the far south there are small, hardy trees and bushes in the most-favourable spots, together with grass which supports a limited amount of sheep farming. Svalbard is also High Arctic, with 60% covered by glaciers, and with only in places a very limited vegetation of grasses, mosses and small Arctic flowers. The total darkness of the winter days is outweighed by the total lightness of the summer nights, but no indigenous population has managed to settle here even far back in history. Iceland is a small, but hardy country with a population coverage of about 3 persons per square km, although about 4/5 of the country is mostly uninhabitable and the population is relatively concentrated to the coastal areas. Average annual temperatures range between 0° and 11°C, and sheep and horse farming dominate the perception of the settled landscape.

On the other hand the three regions are also characterised by many common traits, not least of which is the striking way in which the cultural heritage witnesses to adaptation to a cold climate and survival under often marginal conditions. It mirrors how the populations through time have utilized local resources, established industries and developed farming, always in close contact and interaction with the natural forces. The natural conditions have defined how and where the houses and settlements could be built, how many people could survive in any one area, and the innovations and adaptations that had to be developed in order for life to be supported under often amazing circumstances judged by our modern eyes. The nature was lived with, not fought against or modified for optimal living as we are inclined to do today in harsh environments. Where nature did not provide trees, houses had to be constructed without them. Where central heating was neither possible nor yet introduced, the snow or the earth could provide enough insulation from the freezing winter temperatures to support

human life. Without the possibility of growing food, fish and land fauna served as both meat, bread (dried fish) and vegetable (herbivore stomach contents) sources.

### **Cultural environments**

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It was an aim of the project to emphasise the common history of the three chosen areas, and this was done through the obvious emphasis on hunting, trapping and fishing through the ages. *Greenland* was originally visited and “settled” 4500 years ago by tiny groups of Eskimos who arrived from the American mainland across the narrow strait which now separates the north-east Canadian islands from the far north-west of Greenland. They gradually spread down the east and west coasts of Greenland, but came and went (or died out) in waves. When the Norse (popularly known as Vikings) first arrived in south Greenland at the end of the 10<sup>th</sup> century, there were no Eskimos living there. A new group arrived around this time in the north-west again, and the two cultures gradually met. Just before the Norse established themselves for a period of 400-500 years in Greenland, they had moved to *Iceland* from western Norway, settling this island as the first.

*Svalbard* saw neither Eskimos nor Norse settlers, and was left more or less in peace until the early 17<sup>th</sup> century, when whaling in the summer season developed on a grand scale. As animal stocks were gradually and severely reduced, fluxes of hunters and trappers came and went through the following centuries, arriving mainly from north-west Russia (Pomors) and Norway. At the beginning of the 20<sup>th</sup> century prospecting and mining for various minerals became an international area of competition, while scientific and exploratory expeditions from various countries also left their mark.

The selected representative cultural environments mirror diverse activities which have been carried out in the Arctic over time, and encompass in this way a broad range of what can be called typical and characteristic development traits in each region. Selection of the representative cultural environments has had its foundation in common Nordic history, since the three regions are a natural part of this. In Greenland the selection has in addition included Eskimo (= pre modern-day Greenlandic) cultural environments, since these obviously represent an important part of Greenland’s history

The project picked out the following cultural environments as being of prioritised importance for each area, using the following criteria:

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Historical importance

- Suitability for presenting universal heritage values
- Degree of authenticity in the totality and the separate parts
- Exemplification of relevant threats and recommended actions
- Situation and accessibility

The last four chosen cultural environments are: *the island landscape north-west of Nuuk*, which is a compound environment that illustrates the Eskimo reality in the 18<sup>th</sup> century, the arrival and departure of a period of Danish and German missionaries in the 18<sup>th</sup>-19<sup>th</sup> centuries, and finally the decline of the settlements. The *North-East Greenland National Park* is an extreme example of the interrelation of nature and cultural heritage, with traces of the oldest paleo-Eskimo cultures, the later Thule Eskimo culture, Norwegian and Danish trapping activity from the first half of the 20<sup>th</sup> century, and traces of activities during World War II and from expedition and exploration history. *Ilulissat Isfjord*, which became World Heritage in 2004, has huge natural values and is also the site of dwelling places which can be traced back to around 4500 before present time. *The Norse Western Settlement in the Nuuk administrative region* is an extensive area, of which 800 km<sup>2</sup> are specially protected and contain five larger Norse ruin complexes and early-Eskimo sites from later phases in the area.

### **Cultural environments in Greenland**

Eight representative cultural environments in Greenland were singled out for prioritised attention according to the above-mentioned criteria. Two of these, *Qassiarssuk/Brattahlid* and *Igaliku/Garðar* are Norse sites of international historic significance. The former is the site where the first immigrants from Iceland established themselves under the leadership of Erik the Red in 985 AD, and it was also from here the first western voyages to the North American continent took place around the year 1000. *Igaliku/Garðar* also lay within the Norse Eastern Settlement and was the site of the first bishopric to be established in Greenland. In addition to these important Norse sites, the settings also include Eskimo semi-subterranean house ruins and 20<sup>th</sup> century sheep farms, as well as modern concessions to the increasing tourism to the area. The most important management challenge at these sites today is to obtain a successful combination of protection of the sites and their settings together with a reasonable adaptation to the needs of tourism.

*Sissarluttoq* is a ruin complex of 20 buildings that illustrates a special Norse farm entity from the Greenlandic Norse settlements. The various small, separate building ruins are monuments in their own right, but would only tell a fraction of the story without the setting that is still intact around them.

The fourth chosen cultural environment is *Narsarsuaq*, also in south Greenland. This is an example of 20<sup>th</sup> century heritage, which is a common period for important monuments and sites in the polar regions. *Narsarsuaq* was originally established by American forces to serve as a hospital base and stepping stone back to the USA for injured soldiers in Europe during World War II and during the Korean War in the early 1950s. The site is now an international base and transport centre for tourism to south Greenland, which it is important to maintain and develop, but again at the same time as the heritage values and setting are not unduly compromised.

### **Cultural environments in Iceland**

Seven representative cultural environments were chosen for Iceland. Together they illustrate the various ways of life that it has been possible to carry out on this sub-Arctic volcanic island. In addition to representing farming and fisheries, they also give an indication of administrative circumstances and historically important cultural periods.

Two of the chosen environments, *Keldur á Rangárvöllum* and *Tyrfingsstaðir á Kjálka*, are half of the total of four turf or sod farm complexes which still remain in Iceland, and they are typical for the farming environment which was usual in the country up to the 20<sup>th</sup> century. In the absence of sufficient and suitable wood for building material, turf was substituted, being both plentiful and with good insulating properties. On the negative side, turf walls require regular maintenance and replacement through the years, and such buildings will rapidly disintegrate once they become abandoned. These turf houses are a very typical part of the tourist impression of Iceland, and for this reason as well, a few are certain to be maintained. However, it is equally important to preserve the setting and not just buildings alone in a museum or other foreign setting.

*Selatangar* is a well-preserved fishing village which is representative for the fishing culture which was typical for Iceland through the centuries, where open fishing boats were used. *Þingeyrar/Vatnsdalur* was a cultural and administrative centre for both church and secular power in Mediaeval times, and also more recently. *Árneshreppur á Ströndum* is an entire administrative region on the west coast of Iceland which is now mostly deserted and has today only

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56 inhabitants. In this area well-preserved ruins of farms, fishing factories and trade centres are found, monuments and sites that range in time from the earliest settlement of Iceland and up to the 20<sup>th</sup> century. *Gásar ved Eyjafjörð* consists of remains from the best-preserved Mediaeval harbour in the country, while *Helgustaðir ved Reyðarfjörð* is an example of a cultural environment from mining activities. Mining has never had great importance in Iceland, but the export of Iceland spar has had an interesting history. During the 19th century Iceland spar crystals were vital for the production of prisms for the scientific and other markets. The closing of the mine in 1872 led to a dearth of nicol prisms on the market and caused the President of the Royal Society in England to write asking for the mine to be opened again. In the period 1870-1920 crystals from the mine at Helgustaðir were used in almost all microscopes and other instruments using polarised light. Mines in South Africa and Siberia gradually took over the market until the production of Polaroid plates in the 1930s replaced the prisms. The Helgustaðir mine was protected as natural heritage in 1975, but the mine itself and its setting also need to be appropriately managed.

### **Cultural environments in Svalbard**

Six representative cultural environments were chosen on the Norwegian Arctic archipelago of Svalbard.

The site *Haudegen* was established as a meteorological station by German forces during World War II. It was important for both sides in the war in Europe to obtain weather observations from the Arctic, and the Haudegen station was built in a hidden and remote spot in the north-west of Svalbard. A tendency to slightly warmer and wetter weather conditions at the present time is increasing the decay of the main house and radical steps need to be taken if the station is to be preserved. *Bjørnhamna* is an early 20<sup>th</sup> century trapping station with a main hut and small, simpler huts with trapping equipment spread around the nearby territory. The hunting activity and its territory was necessarily totally integrated with the natural surroundings, and it is important to preserve not only the main hut, but also as many of the smaller huts as possible and to present this cultural environment as a complete entity.

*Ebeltoftamma* is a complex cultural environment with a diverse cultural heritage representing several historical periods in Svalbard and various types of activities. Ruins and remains from 17<sup>th</sup> century whaling, 18<sup>th</sup>-19<sup>th</sup> century Russian (Pomor) trapping, later Norwegian trapping, and a German geophysical station from 1910-14 are all to be

found here. Increasing coastal erosion and human impact from tourism and education visits are the main threats to the location. The cultural environment of *Ny-Ålesund* contains Svalbard's largest collection of protected buildings. It was established in 1916 as a coal-mining settlement, was closed down for this purpose in 1963 and is today rapidly developing as an international research station, with China, France, Germany, Great Britain, Italy, Korea, Japan, the Netherlands, Sweden and Norway all running their own research stations there. The challenge for the protection of the historical buildings and their setting is to try to combine protection and development in a reasonable way.

*Smeerenburg–Virgohamna* is another complex cultural environment containing Svalbard's most important sites from 17th century whaling and expedition/exploration history from the turn of the last century. The area has been a goal for cruise tourism for more than 100 years. Finally *Tunheim on Bjørnøya* (Bear Island) in the Svalbard group is another and more primitive coal-mining settlement that was closed down in 1930. The locality has not been changed by further development, but has suffered greatly from degrading impact by the harsh weather conditions, as well as to some extent from unknown persons collecting souvenirs or materials for other use.

### **Understanding the threats**

Previously it was always thought that the cold and dry climate in the polar areas preserved the cultural heritage almost without problems. As more and more work was done on the monuments and sites in the areas, this picture was greatly changed and expanded. The cultural environments in the three regions in question here are exposed to a number of common processes which accelerate their degeneration. These are listed below and are divided according to whether they are the result of human influence or natural degeneration. The threat picture varies somewhat within the three areas of Greenland, Iceland and Svalbard.

#### Human influence:

Many of the challenges resulting from human influence are a consequence of the level of activity the area is subject to, in the form of population expansion or regression, together with the accompanying development of the area. This can result in such challenges as:

- Development projects for industry, housing and leisure cabins
- The development of roads and other infrastructure

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- Ploughing and new cultivation of land areas, the use of modern farming machines, planting of forest and heavy grazing
- Establishment of horse-riding paths
- Well-intentioned, but mistaken clearing up which removes historical remains and values.

Also a population moving from outlying areas to more central areas with a resulting whole or partial lack of maintenance and care of monuments and sites in the districts is a challenge with regard to a satisfactory protection of cultural environments in parts of our wider area, for example regarding the maintenance of turf buildings in Iceland, or the removal of encroaching vegetation in south Greenland or Iceland. In cases where owners no longer can or will take care of cultural environments, it is a challenge to create enthusiasm and understanding at a local level. The continuation of knowledge and the process of increasing awareness of the cultural values in such cases is of crucial importance.

The growth within tourism that can be seen in many parts of the world leads in these Arctic areas often to degradation of sites and their settings in the form of wear and tear on the landscape and ruins, souvenir collection, rubbish and, in some cases, various degrees of destruction in either conscious or unconscious form. Also the research sector can in certain cases lead to increased pressure on areas, and its activities can give negative impacts on monuments and sites and their settings.

Human activity which has resulted in monuments and cultural environments in Greenland and Svalbard has traditionally been limited to the more easily accessible coastal areas. This means that localities where it is now relatively easy to go ashore, more likely than not are places which were also used earlier, often over long time and by several "generations" of visitors. It is therefore a challenge to adjust and accept today's wishes to visit and use such areas to the need to protect monuments and sites and their settings at the individual localities.

Because of their Arctic nature, wear and tear on the ground is a problem at many localities, since the vegetation regenerates extremely slowly or not at all, and this results in an extremely vulnerable surface layer. Changes in the ground vegetation cover can thereby lead to erosion caused firstly by human traffic, followed by the effects of wind and water.

Natural degeneration:

Natural degeneration involves first and foremost influence through climatic factors and processes which are particularly related to, or particularly strong in, the Arctic areas. These include the freezing/thawing cycle, ice splitting, strong winds with ice- or sand-blasting effects, and increasing erosion along the coasts.

In Svalbard and parts of Greenland light buildings are exposed to destruction caused by polar bears. In Iceland and southern Greenland domestic animals such as horses and sheep cause degeneration and destruction of cultural environments. Microclimatic conditions can give relatively great heat effect, for example where the midnight sun shines on wind-protected parts of a structure and this results in damage and deterioration which one would not necessarily expect in Arctic areas, for example damp, rot and fungal damage.

Monuments and sites and their settings may also be exposed to long-transported pollution, in addition to the fact that certain cultural environments may in themselves present sources of pollution or damaging drainage to the environment or be visually disturbing elements. Any future climate warming will also probably have great effects on the cultural environments in these areas, for example in the form of increased coastal erosion. Less sea ice to subdue waves, more storms and more precipitation will have large negative effect along these coasts.

**Defining appropriate responses**

The project group was also asked to recommend actions for sustainable management of cultural environments in the Arctic. We made a point of producing recommendations of a general character that are fundamental principles adjusted to the various levels and sectors within the management system concerning cultural heritage in the Arctic. The principles are intended as directions and will need to be adjusted to the individual cultural environments according to their separate premises and local conditions. The recommended actions are targeted towards four different levels: 1) Authorities and interested parties on the local level. 2) Regional authorities. 3) National authorities. 4) Common Nordic cooperation.

To local authorities and interested parties emphasis on the **compilation of detailed and action-directed plans for the care of cultural environments** is recommended, with clear placement of responsibility and priority definition, as well as a plan for following up. These should as far as possible prepare the way for participation, influence, responsibility and commitment from the local community. In the plans

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principles should be outlined for actions at the localities that may include some of the following:

### 1 Visitor traffic and possible actions:

The desirability of actions within the cultural environment must always be carefully assessed, but in certain cultural environments simple adjustments should perhaps be made, such as the erection of signs, building of walkways, platforms and similar, and possibly the creation of pathways or marked routes to lead the public.

### 2 Use and development of localities

Active use and exploitation of existing buildings and structures should be assessed where this will not be to the detriment of the heritage itself or the setting's heritage values. Certain cultural environments should be assessed for use as training and education in, for example, traditional building and craft methods, perhaps in combination with a museum/visitor centre

### 3 Reconstruction/restoring to an earlier historical stage

The building of reconstructions in connection with cultural environments must be assessed carefully in advance by professional heritage personnel. Reconstructions built on the basis of factual knowledge, so-called copies, together with the restoration/rebuilding of selected elements in a cultural environment, may be appropriate.

Other recommended actions:

- **Increased investment in information brochures and video/dvd in order to increase the level of knowledge among the local population, where such exists, and visitors to the various cultural environments.** Where suitable, and not necessarily in immediate connection to the cultural environment, the use of creative forms of information should be considered, where information is combined with, for example, adventure experience, art, use of multi-media, models, etc. in order to demonstrate the cultural environment.
- **That guiding in connection with the cultural environments be connected to a running status reporting on the cultural environments** by, for example, the use of simple reporting forms. The reporting should be coordinated by the local management authority, and must be followed up and evaluated.

**To regional authorities emphasis on area and management plans in order to steer the development of high-priority cultural environments in the Arctic is recommended.**

Area and management plans should give directions and premises for how cultural environments should be protected and developed in accordance with the distinctive character of the locality and its original building tradition where this is relevant, and should be revised at least every fifth year. Area and management plans should contain regulations regarding the compilation of plans for regular care of the heritage and cultural environment on the local level.

Other recommended actions:

- **A greater degree of regulation in connection with cultural environments in the Arctic in order to prevent irreversible human impact on localities with intensive or increasing visitor amounts.** This can include such actions as: The establishment of specially-protected areas, perhaps where landing is not permitted, with the possibility of total protection as in nature reserves in order to protect cultural environments, an obligation to report to the authorities for all visitors to especially protected areas, or the introduction of closed zones in connection with certain cultural environments or parts of these.
- **An obligatory educational programme for guides in each region.** Heritage values and protection principles must be included.
- **Increased research and associated information activities regarding cultural environments.** The research must be followed up by the responsible heritage authorities, and the results must be made centrally available.
- **That the responsible authorities compile an information strategy/plan for handling the cultural environments in each region.** This should lay the premises concerning the compilation and distribution of information, desired strategies, cooperation with industries, etc. It should be regularly updated, for example every third year. Information about heritage, cultural environments, natural resources and the natural environment should, where this is possible and suitable, be collected and presented in a larger forum/centre at a central place.
- **Increased cataloguing, mapping and documentation activities in connection with cultural environments in the Arctic, together with the establishment of fixed routines for analysis and interpretation of the data.**<sup>4</sup>

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<sup>4</sup> It is recommended in our project that the responsible authorities

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To national authorities it is recommended that:

- **National heritage authorities themselves assess whether the legislation, in all relevant aspects, functions satisfactorily and is coordinated, or whether there is a need for changes.** Weak legislation can be an incentive to work for better tools through revision of the laws. The representative cultural environments in the project report should be considered for legal protection if they are not already protected.
- **The term cultural environment be included in the legislation and be used in management and administration in all the regions.** As far as possible the term should have the same meaning and connotations in all the regions.
- **That a special protection unit with responsibility for fixed heritage and cultural environments be established in Greenland.**

Common Nordic actions:

**Increased cooperation on heritage and cultural environments across the Nordic borders was recommended.** A forum should be established to increase awareness of cultural environments and for information exchange between the Nordic countries. This can give the possibility for direct exchange of experience and form a basis for compiling common management strategies. It was also recommend that common conferences, network building, databases, further education and lectures for management authorities be held in the regions.

## **Conclusion**

The final report from this project group will be distributed to all relevant authorities and interested parties in the three areas and within the Nordic cooperation system. It is hoped that the recommended actions are both concrete and viable enough to guide and stimulate wherever necessary to better protection and management of the monuments and sites **and** their settings in these areas. The report contains a summary in English, and we hope that it can be of use also in other parts of the entire Arctic region.

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## **Abstract**

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follow the actions suggested in the Nordic Council of Ministers' Action Plan project 9: *Miljøovervåking av ferdselsstiasje – Grønland, Island og Svalbard* (TemaNord 2003:530). [Environmental surveillance of traffic impacts – Greenland, Iceland and Svalbard].

A 3-nation project concerning heritage environments in the Scandinavian Arctic has recently been completed for The Nordic Council of Ministers. The project aimed to define heritage environments within the three regions Greenland, Iceland and Svalbard and to suggest actions for sustainable management. Typical for such Arctic heritage environments is the close interaction between the monuments and sites and their settings, between the nature and the culture.

Monuments and sites, with their integrated settings, are in these regions exposed to many common threats, and heritage management meets many common challenges based on changes and impacts. The challenges caused by humans are often a consequence of the increasing level of activity the areas are exposed to. However, movement away from the districts is also a pronounced tendency in parts of the regions. The three regions are characterised by a polar or sub-polar climate, which means that large areas, and therefore also the heritage, are exposed to detrimental effects of, for example, permafrost, erosion and a vulnerable vegetation cover, as well as degradation caused by fauna.

It is hoped that the results of the project may be applicable for the management of monuments and sites and their settings around the entire circum-Arctic region.

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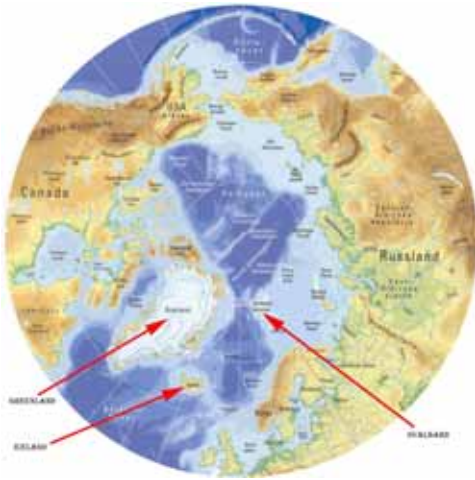


Fig.1 Map of the Arctic region with Greenland, and Iceland Svalbard.



Fig.2 The Norse church ruins at Qassiarssuk /Brattahlid. A reconstructed Eskimo semi-subterranean dwelling to the right of the ruins, and a modern building far right. Paths for tourism between the various Norse ruins can be clearly seen.



Fig.3 A well-preserved turf farm building in Iceland. The little available wood is used for the front gables and roof-supports, while the long walls and the roofing materials are sod which necessarily divides a large building into adjoined sections.

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Fig.4 The trapping hut Bjornhamna in Svalbard is Situated beside the small lake on the large spit of land Centre picture .Despite its barren appearance, the area provided all that a wintering trapper needed to live and work in relative comfort.



Fig.5 Characteristic landscape in Iceland during sheep roundup time .Both terrain vehicles and horses are used.