

## POLAR HERITAGE

Two major causes of deterioration of heritage sites in the polar areas – human impacts and natural forces – are not new threats. However, the situation today is that both of these threats are increasing at a pace not seen before. The new wave of tourism to the remotest areas of the world also includes the previously shielded regions of the Arctic and Antarctic. This has brought benefits to cultural heritage protection by the spread of information and interest which, in turn, leads to support back home for heritage conservators and managers working with polar heritage places. On the other side of the picture is the often unavoidable wear and tear on these fragile sites, as well as increased access by unplanned visits, which unfortunately in extreme cases can inflict unthinking or intentional damage.

Greater access to heritage places is also a result of the warmer summers over the last decade or so, producing less sea ice and longer shipping seasons. Previously the ice acted as a barrier, preventing ships from approaching more remote shores and regions. The clear indications of climate change around the world are expected to have a particular effect on polar areas. Increasing temperatures, increased precipitation as rain during the summer months, more storms and less sea ice to moderate the impacts of wave action, are already inflicting damage and destruction to Arctic heritage places. It is unfortunate in this regard that most heritage places were established by the sea at the time, which usually was the easiest, and in many cases the only access to the region, if only during a very short period in summer. Coastal erosion has always taken place, and sites have been lost into the sea, but the rate of loss today is increasing alarmingly and protective measures for sites are often not viable.

The two case studies presented here address these problems and challenges, the one from the Norwegian Arctic archipelago of Svalbard and the other from the north-west Canadian coast. They stand as examples of many other similar cases around the Arctic.

### **'Haudegen' – A German Marine Weather Station in Svalbard – slowly decaying!**

During World War II, because meteorological data for the North Atlantic were not available from foreign weather services, Germany maintained several weather stations in the Arctic. Between September 1941 and September 1945 the German Navy and the German Air Force had their own stations installed on Spitsbergen and Hopen (Svalbard), East Greenland and Franz Josef Land.

Station 'Haudegen' at Wordiebukta (Wordie Bay) in Rijpfjord on Nordaustlandet, Svalbard operated from 1944 to 1945 and is the only German station that was not destroyed after its detection. The base hut was erected 150 m from the shore on the western foothill of Lookout Rock, using six prefabricated walls and trusses in a pattern of cubes 3 m x 3 m x 2.2 m. The hut was also given a double thickness of walls, floor and roof covered with a tarpaulin.

The completed hut measured 6 m x 9 m, and consisted of the team leader's room, a dormitory with seven beds, a mess-hall, kitchen, battery-charging room, wireless room with three beds, workshop, porch and toilet, store for coal and wood, and outer porch. Solid boxes were used to make a table and benches in the mess hall, and they also served as shelves for a library of about 200 books and for various supplies. The hut was surrounded by a walkway, which was built of stacked provision cases covered by

canvas. With this insulation the hut was strengthened against being blown away during heavy westerly winter storms. Camouflage netting was draped over the entire building and the nearby weather screen. During winter the snow cover totally concealed the station within the landscape.

A small wooden hut was built close to the station to house the hydrogen generating plant. It had two rooms, one for the plant and another for a sauna that was also used as a laundry. The hydrogen was needed for the daily meteorological radiosonde balloon ascents to investigate the meteorological conditions in the upper air. A depot and an emergency radio station were located in another small hut made from empty wooden boxes covered by sheet metal and rocks. This was situated on Lookout Rock, 80 m east of the station and 100 m above it.

Unfortunately, the roof of the base hut was not waterproof. The painted tarpaulin cover became porous with rain and frost and the material of the walls also proved to be unsatisfactory during the first cold period. Moisture formed on the inside as impermeable hardboard material was used instead of the wood used in earlier versions of these prefabricated cubes.

When the sun returned and the snow disappeared, the camouflage was set up again and a military lookout was established on Lookout Rock. Electrically detonated mines were also installed around the station.

On 7 May 1945 the men of 'Haudegen' were informed of Germany's surrender. Weather observations however were continued, transmitting without code to become part of the world meteorological service. When the men finally surrendered to the captain of a Norwegian sealer, they were ordered to leave behind provisions and clothing for four men for three months, so that the 'Haudegen' base could be used as a future refuge hut. So its location in one of the outermost areas of Svalbard saved the station from being destroyed. The windows and the door of the hut were carefully barricaded against polar bears, and the military installations, especially the mines, were disabled.

In 1985 an expedition from the Norwegian Defence Museum (Oslo) salvaged artefacts from the weather station 'Haudegen'. The station buildings were still there, but showed signs of damage by bears, visitors and weather. Provisions and equipment had been ransacked and scattered around the entire area. The kitchen stove and the radio equipment had been stolen, while the books of the extensive library were thrown around the mess-hall. Only some less significant artefacts were left in the vandalised emergency radio hut. The lifeboat remained undisturbed on the beach south of the station, and a metal box with the station logbook and other documents were unearthed nearby and taken to Oslo.

Today 'Haudegen' is in a bad state and will continue to decay slowly. Its earlier isolation is now shattered and it has become one of the scheduled tourist sites for cruises to Svalbard, being visited almost every two years depending on ice conditions. Although the Cultural Heritage Act for Svalbard protects all places and material dating from before 1946, and the Tourist Regulations emphasise heritage protection, this is not observed by every private expedition. Polar bears and the natural elements continue to attack the buildings. Today, 'Haudegen' is the only existing German overwintering station in the Arctic and it represents a modern type of prefabricated hut, which other countries used later in modified forms during the International Geophysical Year (1957-1958).

Something must be done soon to protect the station and to preserve it as polar cultural heritage.

A project financed by the Fritz-Thyssen-Foundation has now been established to document 'Haudegen'. Unpublished diaries, pictures and even film in the private possession of the expedition leader's family are being analysed to describe the station at the time of its operation. The site's current condition is to be recorded with the help of geodetic methods and photography, during a proposed field expedition. This information will be used for future decisions and actions regarding the site's conservation in co-operation with the Norwegian authorities.

### **Climate change in the western Canadian Arctic threatens cultural resources**

In 2001 the Intergovernmental Panel on Climate Change ([www.ipcc.ch](http://www.ipcc.ch)) stated that:

Climate change in the Polar Regions is expected to be among the largest and most rapid of any region on Earth, and will cause major physical, ecological, sociological, and economic impacts, especially in the Arctic.

The recent trend towards warmer weather in the Arctic is magnified in the Beaufort Sea area in the western Canadian Arctic. The Beaufort Sea extends eastward from the north coast of Alaska, USA, north of Canada's Yukon Territory to the Mackenzie River Delta, north of Canada's Northwest Territories.

The western Canadian Arctic has warmed by 1.5° C over the past 100 years. Global circulation models predict further warming of the global atmosphere throughout the 21<sup>st</sup> century. In the Canadian Arctic, winter temperatures are expected to rise by 5° C–10° C, summer temperatures will increase 2° C–5° C, and precipitation will increase by 15%–25%.

The observations of Arctic residents, being based on traditional knowledge, reinforce this scientific analysis. The Inuvialuit, Inuit of the western Canadian Arctic, have said that they can no longer predict the weather. These indigenous people are highly dependent on living off the land, harvesting game, fish and plant materials in a traditional manner. Over recent decades they have observed increasingly intense late summer and autumn storms that have brought sea level surges and a battering of shorelines by the steadily thinning sea ice.

The shores of the Beaufort Sea are largely made up of sedimentary deposits bound together by permafrost. As warmer temperatures erode this permafrost, the rate of slope failure and shoreline erosion increases. In recent years, erosion has consumed more than 10 metres of shore in some areas of the Beaufort Sea region. Rising sea levels will have a long-term impact as well. The hamlet of Tuktoyaktuk, the main transportation hub for the western Canadian Arctic, has suffered severe erosion and flooding despite three attempts at shore stabilisation and protection since 1976. The recent exposure of Inuvialuit graves along the receding shoreline has upset the community.

A consequence of climate warming in the region is a decrease in the extent and mass of Arctic sea ice and an increase in the length of the melt season. This has had a damaging effect on seal populations and inevitably will impact on polar bears that feed on them along the margins of the permanent ice pack. Changes have been noticed in the migration patterns and breeding cycles of other mammals, birds and sea life. Further ecological, economic and sociological impacts are expected as the Northwest Passage becomes more easily navigable across the north of America and commercial shipping and other water traffic becomes more viable.

In response to these changes many agencies and institutions are stepping up their Arctic study programs and initiating new ones. McGill University in Canada has started a program to study and monitor the deterioration of ground ice in the Beaufort Sea region. Using photogrammetric methods and global positioning surveys (GPS) in the field, they have computed increased horizontal coastal retreat rates of 0.67 m to 1.03 m a year from 1954 to 2000. One focus for study is Herschel Island, one kilometre off the Yukon coast.

Herschel Island was named in 1826 by the noted Arctic explorer, Sir John Franklin, after the British scientist, Sir John Herschel. There is evidence of human occupation at least 1000 years before Franklin arrived. The Inuvialuit name for the island is Qikiqtaruk.

Late in the 19<sup>th</sup> century, in relentless pursuit of the depleting stocks of whales in the North Pacific, whalers discovered one of the last refuges in the Beaufort Sea of the prized Bowhead whale. Bowheads were coveted for their baleen, or whalebone, the 'plastic' of the time. American commercial whalers found a good harbour at Pauline Cove on Herschel Island and established a settlement there in 1890 amongst the Inuit, who provided necessary survival skills and local foods such as fish and Caribou.

In 1893–94, at the height of Beaufort Sea whaling, it is estimated that there were 1500 people over-wintering on the island. Today there are 13 standing structures that date to 1893, as well as over one hundred Inuit and whalers' graves and the archaeological remains of prehistoric dwellings. One of the most ancient and rich archaeological sites has been named the 'Washout Site' because of its destruction in the 1980s by encroaching waves.

The south-facing slopes above Pauline Cove have suffered severe slumping due to melting ground ice. A large Inuit graveyard at the base of one slope has taken the brunt of this activity, known as 'solifluction'. An active layer of melted silts is sliding down over sub-surface ice, tumbling and exposing coffins. Extreme surface water run-off is adding to this damage.

Violent late summer and autumn storms have endangered a number of structures from the historic settlement, along the spit of Pauline Cove. Sea ice has been driven up against the Northern Whaling and Trading Company Store, leading to the dismantling of a sheet-metal clad shed along the west side of the building in 2000. The floor frame of the shed was left in place, along with industrial, neoprene sand bags, in an attempt to stabilise the low-lying shore of the spit, which is being reshaped and eroded. This effort proved in vain and in 2003 the building and adjacent Canada Customs Warehouse were braced, lifted and moved back from the shore. These buildings will need to be moved further back in 2004 as well as a hunters' and travellers' survival cabin.

If weather patterns continue in the current direction a decision will eventually have to be made about the value and viability of conserving the heritage resources on Herschel Island and in other areas of the Arctic. It is hoped that environmental studies will call attention to and help predict the impacts of this climate change and allow for better planning for the protection and long term care of polar heritage.

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'Haudegen' Station in Nordaustlandet (Svalbard), spring 1945 (photo in possession of E. Dege, Kiel)



Northern Whaling and Trading Company Store, Pauline Cove, Western Canada Arctic, prior to dismantling of shed addition in 2000