Assessing the risk of climate change impacts on Antarctic heritage values

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Working Paper submitted by Argentina, New Zealand, Norway and the United Kingdom

***Summary***

Climate change may have negative impacts upon heritage sites in Antarctica with implications for their management. Argentina, New Zealand, Norway and the United Kingdom have commenced work to assess the risk of climate change on Antarctic heritage values, including through the development of a climate change risk assessment tool. The co-authors recommend that the CEP:

1. Note the identified key considerations and proposed next steps;
2. Discuss the suggested proposal to progress the implementation of the CCRWP action to assess the risk of climate change impacts on Antarctic heritage values; and
3. Provide an indication of interest in being involved in the development of a climate change risk assessment tool.

***Context***

Climate change in Antarctica, and the associated impacts, is an issue of concern to the Antarctic Treaty Consultative Meeting (see Resolution 8 (2021)). In 2010, the Antarctic Treaty Meeting of Experts on Climate Change developed several recommendations, many of which were relevant to the work of the CEP. To make progress on these Recommendations, the Parties adopted the Climate Change Response Work Programme (CCRWP) through (Resolution 4 (2015)) and updated it in 2016 (CEP XIX Final Report, Appendix 2). The Subsidiary Group on Climate Change Response (SGCCR) was established in 2017 to facilitate the efficient and timely implementation of the [CCRWP](https://documents.ats.aq/ATCM39/att/atcm39_att072_e.doc). Climate change remains a Priority 1 issue on the CEP Five-Year Work Plan.

The CCRWP issue ‘*Climate change impacts to the built (human) environment resulting in impacts on natural and heritage values*’ contains the following gap/needs and actions that are directly relevant to Antarctic heritage:

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| **Gap/Need** | * Understanding how the abiotic terrestrial environment will change and how this might impact/ result in impacts on environmental or heritage values; * Understanding what conservation/remedial interventions might be applicable to counteract these impacts. |
| **Action** | * Assess the risk of changes in climate change to HSM/heritage ASPA. |

Climate change may have negative impacts upon heritage sites within Antarctica, including Historic Sites and Monuments (HSMs) and heritage protected by Antarctic Specially Protected Areas (ASPAs). From the "SCAR Antarctic Climate Change and Environment (ACCE) Review Report" of 2009 and its subsequent updates, the necessary scientific knowledge is available to determine the different impacts that have been observed in different regions of Antarctica. Climate warming-induced changes in the permafrost layer, soil hydrology, weather patterns (rainfall, sea levels, ice cover and duration) and environmental conditions may cause damage to the foundations and fabric (e.g., structural supports, cladding, insulation, etc.) of historic buildings and mechanical deterioration of materials (i.e. freeze-thaw cycles in concrete or destructive impacts from wind). The impacts of climate change also may cause species of penguins and seals to move to different sites that may inadvertently impact on heritage sites. Furthermore, changes in temperature and humidity may facilitate the growth of microorganisms (including fungi and bacteria) capable of degrading wood and/or other organic materials within historic huts and other structures of heritage value. Consequently, Antarctic heritage sites and structures may be vulnerable to the impacts of climate change and further work and/or the development of a climate change risk assessment tool may help facilitate an appropriate management response.

***Recent developments and key considerations***

During the 2021-22 intersessional period, Argentina, New Zealand, Norway and the United Kingdom commenced discussions concerning the best way to deliver the action on Antarctic heritage sites that was specified in the CCRWP. When considering an assessment of the risk of climate change impacts to Antarctic heritage values, the following key considerations were noted:

1. The assessment of the risk of climate change to Antarctic HSMs and heritage protected by ASPAs is a substantial task and initial efforts might best be focussed on the development of a method for undertaking such assessments.
2. Climate change is impacting heritage globally and it may be useful to review work or assessments developed for use in other parts of the world, including in particular experiences from the Arctic, to inform potential work undertaken within an Antarctic context.
3. Engaging and working with Polar Heritage Experts to help inform the process is likely to enhance the proposed work. This might include, but not be limited to, engagement with the respective Polar Heritage Experts of individual Parties, the [International Polar Heritage Committee](http://scanmail.trustwave.com/?c=13647&d=xKaY4mp3diQtl2gvmcDkpTJ4wCoCoSDgNvrdvtiQCA&u=http%3a%2f%2fiphc%2eicomos%2eorg%2f) and relevant SCAR research groups.
4. There are several related parallel streams of work currently underway that may be complimentary to any focus on heritage that should be kept in mind. For example, under the same issue in the CCRWP, there is an action that states, “*National operators to assess the risk of change in climate (e.g. permafrost) to their infrastructure and environmental consequences.*” This is currently being discussed by the COMNAP Environmental Protection Expert Group and it may be useful to work closely with this group as thinking develops.
5. SCAR is currently undertaking research to understand future climate change around Antarctic (e.g., the SCAR Scientific Research Programme AntClimNow). It would likely prove useful to seek up to date knowledge on this research as projections for likely climate change impacts may support the development and use of a risk or vulnerability assessment.
6. Consideration should be given to how an assessment tool might support existing guidance and management material, including the *Guidelines for the assessment and management of heritage in Antarctica*, *Revised Guidelines for Environmental Impact Assessments in Antarctica* and any relevant ASPA/ASMA or HSM management plans.
7. As part of the work, it may be useful to consider how monitoring and mitigation measures may support any assessment of risk to climate change, and if such information would be more usefully placed in existing guidance material.

***Next Steps***

In order to progress the development of an assessment of the risk of climate change impacts to Antarctic heritage values, noting the considerations above, the following work plan is proposed.

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| **Year** | **Steps** |
| Year 1 | * Review existing work * Connect with other relevant experts and work streams * Develop a draft climate change risk assessment tool for Antarctic heritage |
| Year 2 | * Consult and finalise the risk assessment tool |

***Recommendations***

Argentina, New Zealand, Norway and the United Kingdom recommend that the CEP:

1. Note the identified key considerations and proposed next steps;
2. Discuss the suggested proposal to progress the implementation of the CCRWP action to assess the risk of climate change impacts on Antarctic heritage values; and
3. Provide an indication of interest in being involved in the development of a climate change risk assessment tool.