



Archaeological Research for World Heritage Sites Grant Report

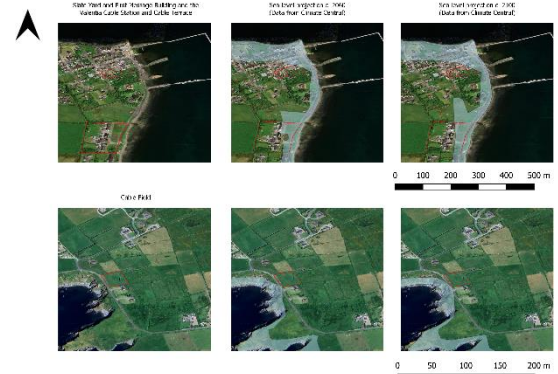
Recipient name:	Dr Cathy Daly
Discipline and subject area:	Archaeological Research for World Heritage Sites
Year awarded:	2023
Title of project:	World Heritage Tentative List Climate Risk Scoping Study

Summary of findings:

This report documents the work undertaken in PHASE ONE of the World Heritage Tentative List Climate Risk Scoping Study. The research was undertaken by Carrig Conservation International Ltd. (Carrig) in collaboration with Dr Will Megarry of Queens University Belfast. The work was undertaken between June and October 2023.

The final report provides an assessment of heritage values and significance for the World Heritage Tentative List properties under four aspects of value: evidentiary, associative, functional, and sensory. The assessment considers the presence of these aspects in relation to features of significance and assigns a low, medium, or high rating. The assessment was refined through stakeholder consultation, and the qualifiers of authenticity, integrity, rarity, and condition. Site visits and further primary research and consultation will be necessary to finalise this preliminary assessment in PHASE TWO.

Risk assessment involves understanding hazards, exposure, vulnerability, and resilience. Climate drivers influenced by climate change can increase or decrease environmental hazards. Historic climate data, climate projections and hazard mapping are presented in the report for each TL site. Potential climate change impacts were identified, and a preliminary list of priority impacts was created for further research and consultation.



Please outline the objectives of the project.

The objectives for Phase One of the Climate Change Risk scoping study for the World Heritage Tentative List (WHTL) were outlined in the funding application. These were:

I. Producing downscaled climate models under various emissions scenarios and over key timeframes. Downscaled climate models and available hazard mapping datasets e.g. coastal flooding and flood risk (OPW) will be applied to ascertain the exposure of the sites to projected future climate change under high and medium emissions scenarios.



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2. Extraction of key values and attributes from WHTL statements of Outstanding Universal Value (SoOUV). Key values will be extracted from this SoOUV and associated tangible, intangible and procedural attributes identified.

Please describe the methodology used in conducting the research.

Climate Change Risk Assessment (CCRA) offers a systematic approach to assess and better understand the potential risks posed by climate change to a historic place. The aim of the assessment is to identify and prioritise the potential risks for a particular site and this can subsequently be used to develop a Climate Change Adaptation Plan.

Phase One (this study) follows the first two of eight steps proposed by the Adapt Northern Heritage Risk Management Process, 'Defining Historic Places' and 'Establishing Hazards'. The Adapt Northern Heritage risk management process offers three working levels: Standard, Advanced and Advanced Plus. The Standard work package has been followed for this study based on the project objectives and resources. The guidance recommends completing an assessment at the Standard level first before progressing onto the Advanced level if necessary. The methodology is informed by Statements of Outstanding Universal Value furnished by DHLGH for each site and additional secondary research including historic climate data, future climate projections, and GIS mapping of hazards. Primary research included a stakeholder survey on existing impacts and Email consultation on draft values analysis.

Please outline the findings of your research and/or milestones achieved.

I. Heritage Values and Significance

The analysis in this project utilised the methodology outlined by Fredheim and Khalaf, is a snapshot in time and is likely to evolve.

The following features of significance were identified and evaluated across the WHTL:

- Built heritage: Structures & monuments
- Cultural landscape
- Archaeology: Sub-soil - features, artefacts and ecofacts
- Natural heritage

Four aspects of value were adopted as per the Fredheim and Khalaf (2016) methodology and are defined as Evidentiary, Associative, Functional or Sensory Value

- For this preliminary desktop CCRA, each feature of significance (e.g. Built heritage: structures and monuments) was first described in relation to the presence of the above four aspects of value. For each feature between two and three aspects were generally found to be present; for example the feature 'Built Heritage' frequently had evidentiary and sensory values described. While aspects that contribute to the Outstanding Universal Value (OUV) of the properties are considered of primary importance for this CCRA, they are not the sole focus of the assessment and additional aspects important for the management and conservation of the site are also assessed here.
- The described values need to be refined using the conditions of Authenticity and Integrity which are required by the Operational Guidelines for the Implementation of the World Heritage Convention (2021).

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- Having described each aspect of value present and refined the relative significance, an assessment of low, medium or high was then assigned.
- It should be noted that this qualitative assessment is based on the current understanding of the assessors, as such it is intended as a guide to understanding heritage values present and should not be seen as definitive. Values also evolve over time and this represents a snap-shot from the period of the assessment.

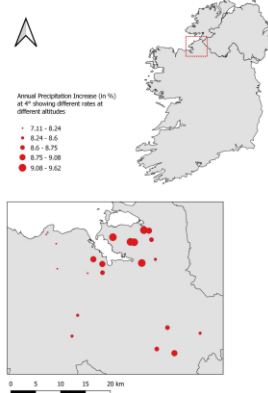
2. Hazard Identification

Met Eireann provided climate change projection data which was mapped in GIS for the location of each site under two Global Warming Scenarios for the period 2070-2100. This provides a site-specific set of climate change projections from which exposure to climate hazards can be more accurately evaluated.

Where available hazard mapping datasets were also utilised for the site locations e.g. Sea Level Rise/coastal flooding. Due to time constraints it was not possible to access the GIS data sets for Ireland however online maps were used as approximate aids. Historic climate data for each site was also compiled in order to establish existing patterns which relate to current condition.

The Climate Change Sectoral Adaptation Plan (CCSAP) for built and Archaeological Heritage of Ireland identified potential impacts of projected climate change. Utilising current concerns of stakeholders (online survey) as starting point, and considering the geographical locations and attributes of each WH TL property, we prepared a preliminary list of priority impacts. This Phase One scoping study provides a starting point for discussions and the aim is to refine and amend it following further research and consultation in Phase Two of this project.

Site	At 2° Celsius			At 4° Celsius		
	Maximum Temperature (Increase in °C)	Minimum Temperature (Increase in °C)	Precipitation (Change in %)	Maximum Temperature (Increase in °C)	Minimum Temperature (Increase in °C)	Precipitation (Change in %)
A4	1.0817	1.2315	5.49	2.0896	2.2350	9.62
A6	1.0808	1.2304	5.43	2.0535	2.2089	9.58
A7	1.0775	1.2287	5.41	2.0520	2.2032	9.55
A7	1.0802	1.2301	5.49	2.0584	2.2077	9.71
A8	1.0897	1.2358	5.57	2.0717	2.2151	9.79
A9	1.0886	1.2355	5.52	2.0552	2.2089	9.69
A9	1.0871	1.2367	4.59	2.0559	2.2059	9.26
A9	1.0822	1.2386	4.56	2.0559	2.2059	9.57
A8	1.0779	1.2288	4.84	2.0525	2.2055	9.53
A1	1.0762	1.2283	4.83	1.9980	2.2017	9.52
A8	1.0801	1.2318	4.63	2.0861	2.2150	9.65
A2	1.0709	1.2201	4.46	1.9839	2.2120	9.23
A7	1.0631	1.2127	4.37	1.9680	2.1968	9.00
A2	1.0631	1.2127	4.37	1.9680	2.1968	9.00
A6	1.0796	1.2287	4.36	2.0506	2.2097	9.35
A6	1.0794	1.2283	3.85	2.0506	2.2086	7.11
A7	1.0940	1.2366	4.08	2.0555	2.2120	9.30
A2	1.0814	1.2389	4.11	2.0572	2.2085	9.25
A6	1.1142	1.2680	4.58	2.0607	2.2097	9.79
A6	1.1087	1.2632	4.58	2.0576	2.2045	9.74
A4	1.1078	1.2600	4.57	2.0537	2.2008	9.68
A2	1.1186	1.2705	4.56	2.0704	2.2075	9.32
Average	1.0872	1.2375	4.69	2.0563	2.2022	9.64



Please provide details of the dissemination of the outcomes from this project.

Conference paper and publication - the aim will be to present the project at a conference in 2024. A number of social media posts via Twitter incorporating #ClimatEireitige and @RIADawson were posted during the project.

Internal dissemination for NMS and TL steering groups was achieved in a number of ways:

1. Draft report list of key values and attributes was circulated by email for comment amongst stakeholders.
2. Online survey of stakeholders was undertaken to engage them further with the topic and elicit their personal experience of climate impacts on the sites. This in turn was utilised to inform the final report.
3. Downscaled climate models for each site (including constituent parts) exploring future climate until 2100 under two emissions scenarios provided to stakeholders in a final report together with a high-level overview of possible climate change impacts.
4. Daly to present findings to a meeting of steering group for Royal Sites on October 27th online.



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How will you continue to communicate the results of your project and what are your publication plans?

Presentation and possible publication planned for 2024

How did the award enhance your professional development?

The grant enabled collaboration between Carrig and Dr Megarry which brought additional skills and enabled the completion of the project in a timely manner.

What plans do you have to further your proposal/project?

This project represents phase one of a climate risk assessment, it outlines hazards and possible priority impacts for all TL properties. We would aim to obtain further funding to complete Phase 2 in which we will further explore these issues in relation to individual properties, including community consultation, more in depth stakeholder engagement, an assessment of adaptive capacity at each site and detailed site-specific climate risk assessments and management recommendations.