

CLIMATE CHANGE AND HISTORIC ENVIRONMENT

It is widely accepted that climate change caused by greenhouse gas emissions is already occurring, and changes are predicted to become more extreme in the near future.

The impacts of climate change on built heritage and archaeology have been previously underreported, but we must recognise the risks and take action to preserve and manage our heritage for future generations. The important role that our historic environment has for culture, leisure, tourism and identity make this all the more pertinent.

The direct risks posed to Northern Ireland's heritage are likely to come from altered precipitation and temperature patterns and extreme weather events. Hot, dry summers and wet, mild winters will cause increased erosion of vulnerable buildings of heritage value and buried archaeology. Alterations of water tables causing land subsidence, increased strength of storms and coastal erosion will also present challenges to the built heritage.

Further indirect impacts may arise from our reactions to the causes and effects of climate change, for example energy efficiency measures and fittings to deal with extreme rainfall may damage the heritage value of buildings.

Northern Ireland lacks information about the vulnerability of the historic environment to the effects of climate change. In the short-term we need to understand the risks posed, and to then move forward with a strategy for sensitively and practically preserving and managing our buildings and archaeology. We cannot afford to take a passive role and allow our sites of historic significance to deteriorate or be completely lost.

KEY RECOMMENDATIONS:

-  We need to produce **vulnerability maps**, describing the likely future changes in local climate and the associated impacts on the historic environment.
-  Alterations to buildings that allow them to cope with altered weather (e.g. new drainage systems) should be **done sensitively and not detract from the building**. This also applies to changes made to buildings to allow them to comply with energy efficiency targets.
-  The impact of **flood defences on marine archaeology** and maritime heritage should be taken into account in the planning of individual projects
-  Northern Ireland should invest in the testing and use of technology which is used to **monitor, assess and predict** the effects of climate change on built heritage and archaeology.
-  **Community groups should be engaged to help track changes** in coastal areas, and can be important in identifying coastal erosion threatening archaeological sites

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Background to the issue

Current predictions suggest that the Northern Ireland climate will be greatly altered in the near future. The predictions suggest that we will experience higher temperatures in winter and summer, with less rainfall in summer and more in winter. Sea levels are also expected to rise, and coastal erosion to get worse. Research has identified a number of impacts of climate change on our historic environment. These are both direct (i.e. caused by climate change) and indirect (caused by our reactions to climate change).

Direct impacts on archaeology and built heritage:

- Increased erosion of stone buildings through more frequent and intense rainfall and through extreme heating during summer.
- Wetter, milder winters could also result in buildings becoming covered in algae, which promotes retention of water and deeper penetration of salts that are harmful to stone, thus causing more erosion.
- Subsidence of buildings caused by changes in groundwater patterns puts their very structure at risk.
- Hotter, drier summers will make it more difficult to maintain grounds and gardens historically associated with significant buildings.
- Coastal erosion is likely to be exacerbated by rising sea levels, exposing buried archaeology. Sites of built heritage importance that are near the coast could also be at risk as the land erodes further.
- Buried (*in situ*) archaeology can be damaged by more frequent drying of soils in summer (due to higher temperatures and lower rainfall) and loss of vegetation that protects the soil from erosion

Indirect impacts on archaeology and built heritage:

- Man-made coastal flood defences can cause disruption to archaeology of estuaries and floodplains
- Energy efficiency requirements, if insensitively imposed on historic buildings, may ignore the value of traditional methods and materials, thus doing more harm to the buildings.
- Development of energy sources (e.g. wind turbines) in important landscapes can be detrimental to perceptions of place and the aesthetic, cultural, amenity and tourism value of historic landscapes.