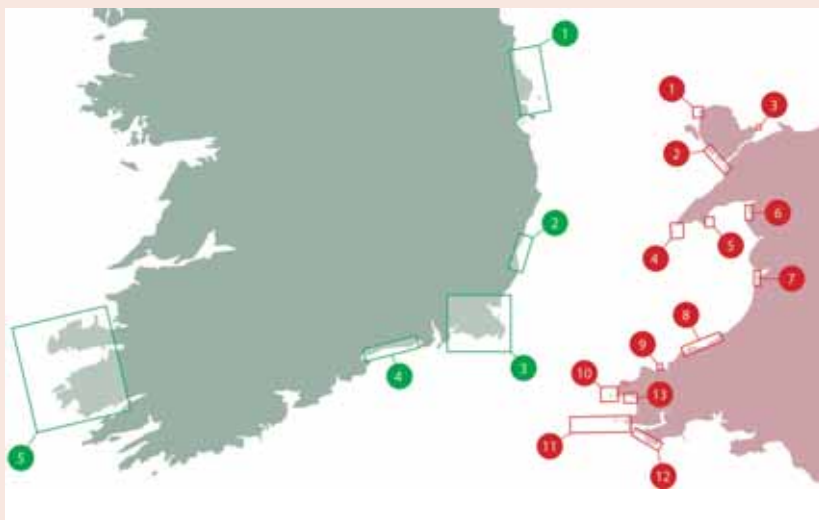


# LOSING THE EDGE GAINING GROUND

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**CHERISH (Climate, Heritage and Environments of Reefs, Islands and Headlands) is a five-year (2017–2021), €5.2 million EU project, funded through the Ireland Wales Co-operation Programme 2014–2020, bringing together a cross-disciplinary team from the Royal Commission on the Ancient and Historical Monuments of Wales; the Discovery Programme, Ireland; Aberystwyth University: Department of Geography and Earth Sciences; and Geological Survey Ireland. The team are undertaking investigations at several iconic coastal locations to raise awareness and understanding of the past, present and future impacts of climate change on the rich cultural heritage of the Irish and Welsh regional seas and coast.**

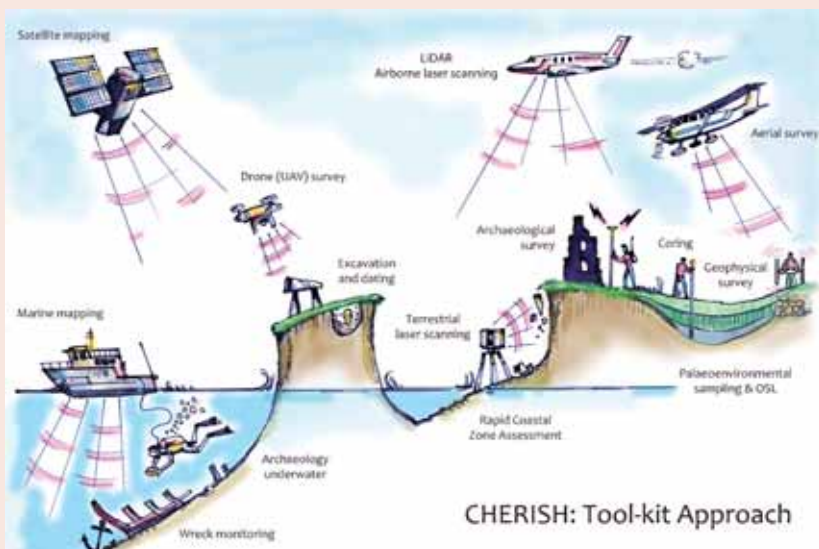


CHERISH study areas have been selected based on knowledge and data gaps (particularly islands and remote headlands) and priority 'at risk' areas. Crown Copyright: CHERISH Project

The overarching aims of CHERISH are to target data and knowledge gaps and raise awareness of threatened heritage in remote coastal locations. Through a range of techniques including terrestrial and aerial laser scanning, geophysical survey, seabed mapping, palaeoenvironmental sampling and excavation, we are establishing highly accurate baseline data and a transferrable 'tool-kit' and recording standard to assist future monitoring and understanding of climate change impacts on heritage sites. All data generated is open access, providing timely management information and scientific data to landowners, property managers, policy makers and coastal communities. In some cases, our work is pre-emptive preservation by record in the face of inevitable loss; other cross-disciplinary techniques such as palaeoenvironmental sequencing, luminescence dating and documentary research are being used to establish records of past environments, storminess and extreme weather events, providing a long-term context to current and near future risks and an insight into the nature of climate extremes faced by past communities.

**CASE STUDY:  
DINAS DINLLE COASTAL HILLFORT, GWYNEDD**

Dinas Dinlle coastal hillfort in Gwynedd, North Wales, occupies a prominent glacial hillock overlooking a beach and low-lying former wetlands and saltmarsh. The hillfort would conventionally date from the Late Bronze or Iron Age (c. 1200BC–AD 43) while Roman finds from erosion features on site, together with a prominence in early medieval Welsh literature and folklore, suggest a potentially longer history. In the early 20th-century the monument formed part of the Dinas Dinlle golf course, and a Second World War seagull trench built into the northern slopes of the fort formed part of the defence for nearby RAF Llandwrog, now Caernarfon Airport. Today Dinas Dinlle dominates a small coastal village with a seasonal holiday trade and is crossed by the Wales Coast Path.



An integrated approach to survey on land and under the sea. This graphic best describes the multidisciplinary approach to coastal and maritime recording that CHERISH employs in Wales and Ireland. Crown Copyright: CHERISH Project

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Early maps and the curve of the defences suggest the fort was once entirely enclosed but today nearly all the western defences have been lost to the sea – the result of storms and intense rainfall that has led to the collapse of the cliff face. Map regression suggests 20–40 metres of the western side of the fort have been lost over the last 100 years and with climate change projections (UKCP18) for increased storminess, sea level rise, warmer, wetter winters and hotter, drier summers, this is set to increase.

Dinas Dinlle is a baseline monitoring site for the CHERISH project. Work has included gathering highly accurate (centimetre and sub-centimetre) 3D data to monitor the eroding cliff edge using techniques such as terrestrial laser scanning and UAV survey. This will provide an accurate baseline for future monitoring and, with analysis of historical documents such as aerial photographs and mapping, will enable us to reconstruct as accurately as possible erosion rates over the past 150 years. Repeat monitoring visits by CHERISH and a team of dedicated local residents also take place to see how seasonal and storm impacts are affecting the monument. Through this we were able to record a major cliff collapse affecting the southern defences of the monument in February 2019.

As well as monitoring Dinas Dinlle, CHERISH work is also about increasing our knowledge and understanding of it. In the area around the hillfort, sediment coring from the surrounding wetlands and luminescence dating of the sand spit at Morfa Dinlle will help reconstruct past environments and climate change using the physical, biological and chemical evidence trapped within layers of sediments. At the monument itself, new earthwork and geophysical surveys have greatly increased our understanding of the archaeological remains at the site, with numerous possible roundhouses and other anomalies identified inside the fort, several of which are situated very close to the eroding clifftop and which are now the focus for a community excavation in August 2019.

Under full supervision and following months of planning and training, the CHERISH team also went 'over the edge' in June 2019 to record and date features exposed in the eroding cliff-face, including the hillfort ditch exposed during the cliff collapse in February 2019. Initial results have been extremely interesting, bringing into question the way Dinas Dinlle was constructed. The southern ditch appears to have not been 'built' but instead utilised a pre-existing natural feature formed through complex hydrological processes during the end of the last glacial period around 12,000 years ago. We eagerly await the results of luminescence dating to shed more light on this.

Our work at Dinas Dinlle and our other study areas continues until the end of 2021. To find out more about the CHERISH project and for day-to-day news and features please visit our website ([www.cherishproject.eu](http://www.cherishproject.eu)), Facebook (Cherish Project) and Twitter pages (@CHERISHproj)



Dinas Dinlle is owned by the National Trust. It is protected as a Scheduled Monument whilst the cliff face itself is a Site of Special Scientific Interest, designated for the geological importance of exposed glacial sediments. Crown Copyright: RCAHMW AP\_2014\_0877



Fresh cliff collapse below the southern hillfort ditch, recorded on 14 Feb 2019, was exacerbated by intense rainfall funnelling water along the fort's ditch. Crown Copyright: CHERISH Project 2019



Don't look down! Battling with heights and ropes to investigate and record eroding features in the exposed cliff face of Dinas Dinlle. Crown Copyright: CHERISH Project 2019