

Nuachtlitir

CHERISH

News

WRECK

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FOREST

CHERISH

Newid Hinsawdd a Threftadaeth yr Arfordir
Climate Change and Coastal Heritage
Athrú Aeráide agus Oidhreacht Chultúrtha

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Front Cover: Our new Climate change impacts illustration produced for us by Carys-ink. See page 29 for more details.

Clúdach Tosaigh: Ár léaráid nua ar an tionchar atá ag nó a bheidh ag athrú aeráide, a léirigh Carys-ink dúinn. Féach leathanach 29 le haghaidh tuilleadh sonraí.



CHERISH fieldwork
at Buckspool Down,
Pembrokeshire.

Obair allamuigh CHERISH
ag Buckspool Down,
Pembrokeshire.

WELCOME

to Issue 6 of CHERISH News

Welcome to the sixth issue of the CHERISH newsletter, written during exceptional times for us all. In line with Government advice, CHERISH travel, events and fieldwork in Ireland and Wales have been put on hold. However, we have plenty of 'homework' to do and have been spending the time at home catching up on data processing and report writing.

Compiling this issue has therefore provided a perfect opportunity to update you on the CHERISH story so far, drawing on the highlights of our work over the past three years. We are also excited to showcase some wonderful new project illustrations we recently commissioned.

For day-to-day news and features, don't forget to look at our website, Facebook and Twitter pages, details of which can be found below.

FÁILTE

chuig Eagrán 6 de nuacht CHERISH

Fáilte chuig an séú heagrán de nuachtlitir CHERISH, a scríobhadh le linn tráthanna a bhí thar a bheith eisceachtúil dúinn uile. De réir chomhairle an Rialtais, tá taisteal, imeachtaí agus obair allamuigh CHERISH curtha ar an méar fhada. Mar sin féin, tá go leor 'obair bhaile' le déanamh againn agus bhíomar ag caitheamh ár gcuid ama sa bhaile ag teacht suas le próiseáil sonraí agus le tuarascálacha a scríobh.

Dá bhrí sin, tugadh deis iontach dúinn, leis an eagrán seo a chur le chéile, chun tú a choinneáil ar an eolas faoin scéal CHERISH go dtí seo, ag tarraingt ar bhuaicphointí dár gcuid oibre le trí bliana anuas. Táimid ar bís freisin a thaispeáint roinnt léaráidí tionscadail iontacha nua a choimisiúnaigh muid le déanaí.

Maidir le nuacht agus gnéithe laethúla, ná déan dearmad féachaint ar ár suíomh gréasáin, leathanaigh Facebook agus Twitter, agus tá sonraí fúthu le fáil thíos.



www.cherishproject.eu



CHERISH Project



@CHERISHproj

ABOUT CHERISH / EOLAS FAOI CHERISH

CHERISH is a six-year Ireland-Wales project, bringing together four partners across two nations: 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 project began in January 2017 and will run until December 2022. It will benefit from €4.9 million of EU funds through the Ireland Wales Co-operation Programme 2014-2020.

CHERISH is a truly cross-disciplinary project aimed at raising awareness and understanding of the past, present and near-future impacts of climate change, storminess and extreme weather events on the rich cultural heritage of our sea and coast. We link land and sea and employ a variety of techniques and methods to study some of the most iconic coastal locations in Ireland and Wales. These range from terrestrial and aerial laser scanning, geophysical survey and seabed mapping, through to palaeoenvironmental sampling, excavation and shipwreck monitoring.

Is tionscadal sé bliana idir Éire agus an Bhreatain Bheag é CHERISH, a thugann ceithre chomhpháirtí ó dhá náisiún le chéile: Coimisiún Ríoga um Shéadchomharthaí Ársa agus Stairiúla na Breataine Bige; an Clár Discovery, Éire;

Our new CHERISH joint-nation project map: This fabulous new illustration by Carys-ink of our working areas draws out our individual study sites in great detail, set against the living landscapes and seascapes of Ireland and Wales. During the first year of the project we worked hard with agencies, stakeholders, landowners and local groups to finalise our joint-nation working areas on the basis of knowledge and data gaps, priority areas of erosion risk and potential for collaboration. Visit the 'Activities' section of our project website for a clickable map where you can learn more about each study area.

Ollscoil Aberystwyth: An Rannóg Thíreolaíochta agus Domhaneolaíochta; agus Suirbhéireacht Gheolaíochta na hÉireann. Cuireadh tús leis an tionscadal i mí Eanáir 2017 agus leanfaidh sé ar aghaidh go dtí Nollaig 2022. Cuirfidh an tAontas Eorpach maoiniú de luach €4.9 milliún ar fáil trí Chlár Comhair na hÉireann-na Breataine Bige 2014-2020.

Is tionscadal thar a bheith trasdisciplíneach é CHERISH atá dírithe ar fheasacht agus tuiscint a mhúscailt faoin tionchar a bhí, atá agus a bheidh ag an athrú aeráide, stoirmeacha agus adhaimsir ar oidhreacht chultúrtha shaibhir ár bhfarraige agus ár gcósta. Cruthaímid nasc idir

an talamh agus an fharraige, agus úsáidimid teicnící agus modhanna éagsúla chun staidéar a dhéanamh ar roinnt de na suíomhanna cósta is aitheanta in Éirinn agus sa Bhreatain Bheag. Áirítear ina measc seo scanadh léasair talún agus aeir, suirbhéireacht gheoifisiceach agus mapáil ghlinneall na farraige, agus sampláil phailéachomhshaoil, tochailt agus monatóireacht ar longa báite.

Ár léarscáil nua don tionscadal comh-náisiúin CHERISH: Leis an léiriú iontach nua seo le Carys-ink ar ár réimsí oibre, tarraingítear ár suíomhanna staidéir aonair go mion, le tírdhreacha agus muirdhreacha beo na hÉireann agus na Breataine Bige sa chúla. Le linn na chéad bhliana den tionscadal d'oibríomar go crua le gníomhaireachtaí, geallsealbhóirí, úinéirí talún agus grúpaí áitiúla chun ár réimsí oibre comh-náisiúin a thabhairt chun críche ar bhonn eolais agus bearnaí sonraí, ceantair atá i mbaol creimthe thromchúisigh, agus a bhfuil deiseanna comhoibrithe acu. Tabhair cuairt ar an gcuid 'Gníomhaíochtaí' ar shuíomh gréasáin ár dtionscadail le haghaidh léarscáil in-chliceáilte a fheiceáil inar féidir leat níos mó a fhoghlaim faoi gach ceantar staidéir.



Illustration © 2020 Carys Tait / Carys-ink.com

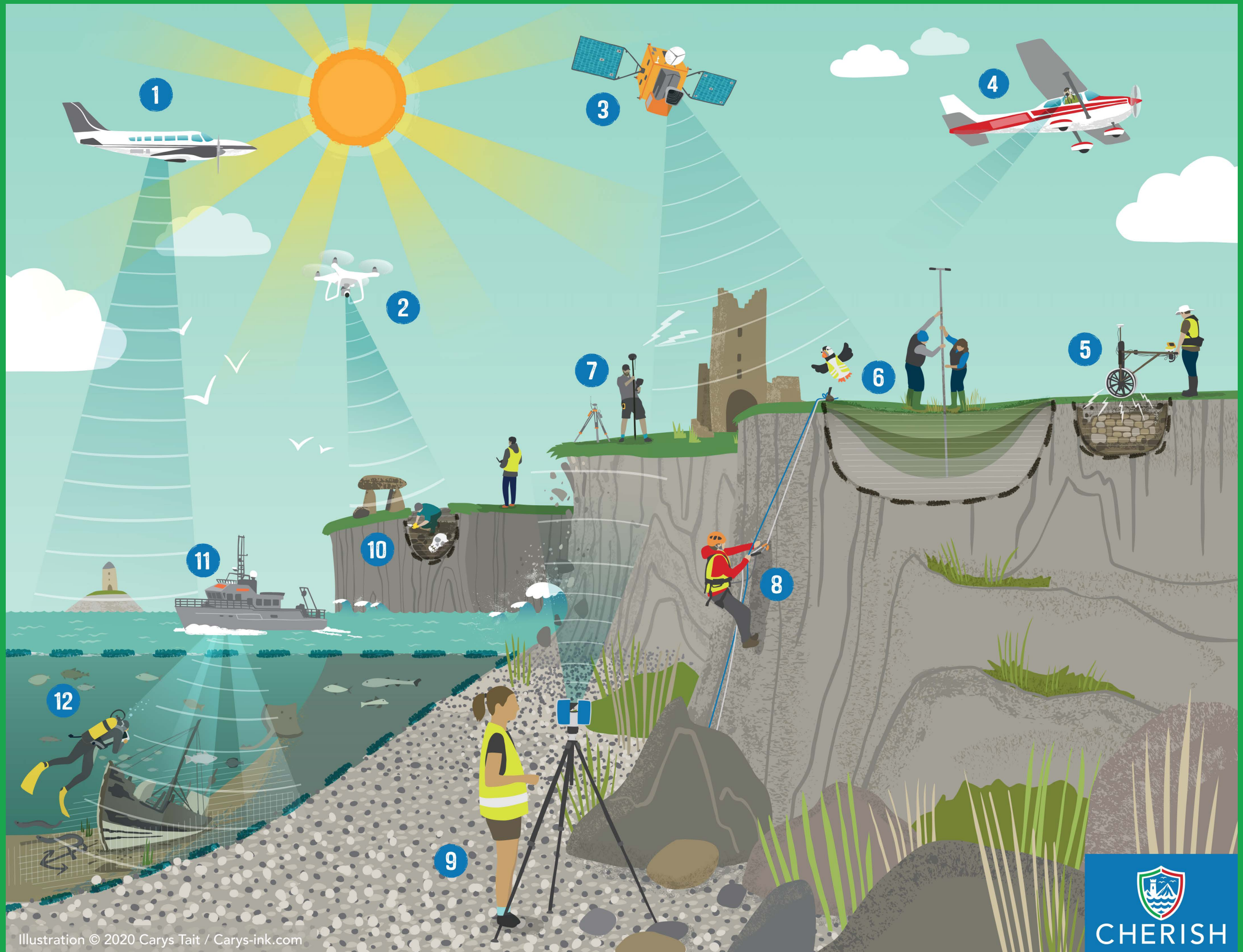
Our new CHERISH 'toolkit' graphic by Carys-ink illustrates our integrated and multidisciplinary approach to survey on land and under the sea. Even individual team members are recognisable!

KEY:

- 1 LiDAR: Airborne laser scanning
- 2 Unmanned Aerial Vehicle (UAV or Drone) survey
- 3 Satellite mapping
- 4 Aerial survey
- 5 Geophysical survey
- 6 Coring
- 7 Precision survey
- 8 Erosion monitoring
- 9 Terrestrial laser scanning
- 10 Excavation, sampling and dating
- 11 Marine mapping
- 12 Underwater archaeological survey

Ar ár ngrafach 'sraith straitéisí' nua CHERISH le Carys-ink léirítear ár gcur chuige comhtháite agus ildisciplíneach i leith suirbhéireachta ar thalamh agus faoin bhfarraige. D'aithneofa na baill foirne aonair fiú!

- 1 LiDAR: Scandh léasair ar eite
- 2 Suirbhé ó Aerfheithicil gan Foireann (UAV nó Ladrann)
- 3 Mapáil satailíte
- 4 Suirbhé aeir
- 5 Suirbhé geofisiceach
- 6 Croíleacú
- 7 Suirbhé beachtais
- 8 Monatóireacht ar chreimeadh
- 9 Scandh léasair talún
- 10 Tochailt, sampláil agus dátú
- 11 Mapáil mhara
- 12 Suirbhé seandálaíochta faoi uisce



THE STORY SO FAR: THE FIRST THREE YEARS OF CHERISH JANUARY 2017–DECEMBER 2019

The first three years of CHERISH have seen an exhilarating and multi-faceted investigation into landscapes and seascapes across both nations. The team have been deployed far and wide to coastal wetlands, sand dunes and islands, dramatically eroding promontory forts, estuarine abbeys and the hulks of remote shipwrecks. Some of the team have even spent weeks at sea surveying the seabed to reveal hidden landscapes and lost shipwrecks. We've also undergone hours of training to ensure our safety whilst working, and to ensure we're up to date with the latest techniques such as UAV survey and computer modelling. New and illuminating scientific data is starting to clarify our understanding of coastal and island archaeology, environments, and weather over the millennia.

We've also met some wonderful people and wildlife! Here are some of our highlights.

Sa chéad trí bliana de CHERISH rinneadh imscrúdú spreagúil agus ilghnéitheach ar thírdhreacha agus ar mhuidhreacha sa dhá náisiún. Rinneadh an fhoireann a imlonnú i bhfad agus i gcéin chuig bogaigh chósta, dumhcha agus chuig oileáin, chuig dúnta ceann tíre atá á gcreimeadh go gothach, chuig mainistreacha inbhir agus chuig seanchabhlacla de longa báite atá ar an iargúil. Tá seachtainí caite ag cuid den fhoireann ar muir ag déanamh suirbhéireachta ar ghrinneall na farraige chun tírdhreacha faoi cheilt agus longa báite caillte a nochtadh. Chuamar faoi uaireanta oiliúna freisin chun ár sábháilteacht a chinntiú agus muid ag obair, agus chun a chinntiú go bhfuilimid suas chun dáta leis na teicnící is déanaí ar nós suirbhé UAV agus samhltú ríomhairí. Tá sonraí eolaíocha nua spreagthacha ag teacht chun cinn lena dtugtar soiléiriú dár dtuiscint ar sheandálaíocht chósta agus oileáin, ar thimpeallachtaí agus ar an aimsir thar na mílte bliain.

Bhuail muid le roinnt daoine agus fiadhúlra iontach freisin! Seo cuid dár mbuaicphointí.

AN SCÉAL GO DTÍ SEO: AN CHÉAD TRÍ BLIANA DE CHERISH EANÁIR 2017–NOLLAIG 2019

A race against tide. It was all hands on deck in October 2019 as the CHERISH team from Aberystwyth University, Discovery Programme and the Royal Commission, as well as colleagues from the Nautical Archaeological Society, recorded a newly exposed wreck. It is thought to be that of the Maria on The Warren beach near Abersoch on the Llŷn Peninsula.

Rás in aghaidh na taoide. Bhí gach uile dhuine ar deic i mí Dheireadh Fómhair 2019 nuair a tháifead foireann CHERISH ó Ollscoil Aberystwyth, an Clár Discovery agus an Coimisiún Ríoga, chomh maith le comhghleacaithe ón gCumann Seandálaíochta Loingseoireachta, long báite tar dóibh é a nochtadh. Ceaptar gurb é an Maria ar thrá Warren in aice le Abersoch ar Leithinis Llŷn.

SURVEY and INVESTIGATION

SUIRBHÉ agus IMSCRÚDÚ

189 km² Maritime survey and **8** shipwrecks surveyed

16.8 km² LiDAR commissioned over **6** Welsh Islands resulting in new island archaeology maps

15.3 km² UAV photogrammetry surveys of the coast edge in Ireland

39 Sites and monuments with new terrestrial geospatial data for future monitoring

30 UAV surveys of archaeological monuments

90 metres of core material from **16** sites in Ireland and Wales

More than **200** pollen and diatom samples processed and counted to help reconstruct past environments and significant environmental or climatic events

18 radiocarbon dates obtained and **55** Optically Stimulated Luminescence (OSL) dates in progress to provide robust and targeted chronologies

4 Excavations

14 Geophysical surveys

2265 New and enhanced Historic Environment Records

6025 New archaeological aerial photos for Ireland and Wales

Suirbhé muirí ar **189 km²** agus **8** long báite a ndearnadh suirbhé orthu

Rinneadh **16.8 km²** LiDAR a choimisiúnú i **6** Oileán Bhreatnach agus mar thoradh air sin táirgeadh léarscáileanna seandálaíochta oileáin nua

15.3 km² de shuirbhéanna fótagrafaíochta UAV ar imeall an chósta in Éirinn

39 Láithreán agus séadchomharthaí le sonraí geospásúla talún nua le haghaidh monatóireachta sa todhchaí

30 suirbhé UAV ar shéadchomharthaí seandálaíochta

90 méadar de bhunábhar ó **16** láithreán in Éirinn agus sa Bhreatain Bheag

Próiseáladh agus rinneadh níos mó ná **200** sampla pailine agus diatóim a chomhaireamh chun cabhrú le comhshaoil den am atá thart agus imeachtaí suntasacha comhshaoil nó aeráide a athchruthú

Fuarthas **18** dáta radacarbóin agus **55** dáta Lonrachta Spreagtha go hOptúil (OSL) ar siúl chun croineolaíocht láidir spriocdhírthe a sholáthar

4 Thochailt

14 Suirbhé geoifisiceach

2265 Taifead Comhshaoil Stairiúil nua agus feabhsaithe

6025 Aerfótagraf seandálaíochta nua d'Éirinn agus don Bhreatain Bheag

A key part of CHERISH has been the establishment of baseline monitoring sites across Ireland and Wales. For each site we have gathered highly accurate data from the air, land and sea and we will revisit each site at least once during the lifespan of the project. Such detailed monitoring and the resulting datasets are essential to fully understand and quantify change. Since CHERISH began we've experienced devastating storms and record droughts and the impacts of this have been seen at a number of our monitoring sites. For example, the *Sunbeam* wreck at Rossbeigh in Co. Kerry was found to have moved over 2.5 kilometres from its previous position as a result of winter storms over 2017–18. At Dinas Dinlle hillfort in Gwynedd we recorded a dramatic cliff collapse in early 2019, the result of prolonged and heavy rain, which clearly exposed the sand filled inner ditch of the fort and led to our 2019 cliff-face excavations.

Cuid lárnach de CHERISH ba ea suíomhanna monatóireachta bunlíne a bhunú ar fud na hÉireann agus na Breataine Bige. Bhailíomar sonraí an-chruinn ón aer, ón talamh agus ón bhfarraige do gach suíomh agus tabharfaimid cuairt arís ar gach láithreán uair amháin ar a laghad le linn shaolré an tionscadail. Tá monatóireacht mhionsonraithe den sórt sin agus na tacair sonraí a leanann astu riachtanach chun athrú a thuiscint agus a chainníochtú go hiomlán. Ó thosaigh CHERISH tharla stoirmeacha tubaisteacha agus triomaigh nach fhacthas riamh agus tá an tionchar a bhí acu le feiceáil ag roinnt dár suíomhanna monatóireachta. Mar shampla, aimsíodh gur bhog raic *Sunbeam* ag Ros Beithe i gContae Chiarraí os cionn 2.5 ciliméadar óna suíomh roimhe seo mar thoradh ar stoirmeacha geimhridh i rith 2017-18. Ag cnocán Dinas Dinlle in Gwynedd thaifeadamar titim shuntasach aille go luath in 2019, de dheasca báistí fada agus troime, a nocht go soiléir díog istigh den dún a bhí líonta le gaineamh agus mar thoradh rinneamar ár dtochailtí ar aghaidh na haille in 2019.



The Sunbeam, Co. Kerry in July 2017 was partially buried with only portside and starboard framing elements exposed. By October 2018 it had broken up and moved over 2.5 kilometres.

Adhlacadh an Sunbeam go páirteach i gContae Chiarraí i mí Iúil 2017 agus ní raibh ach gnéithe frámaíthe bhord na sceathraí agus bhord na heangaí le feiceáil. Faoi Dheireadh Fómhair 2018 bhí sé briste suas agus bhog sé thar 2.5 ciliméadar.

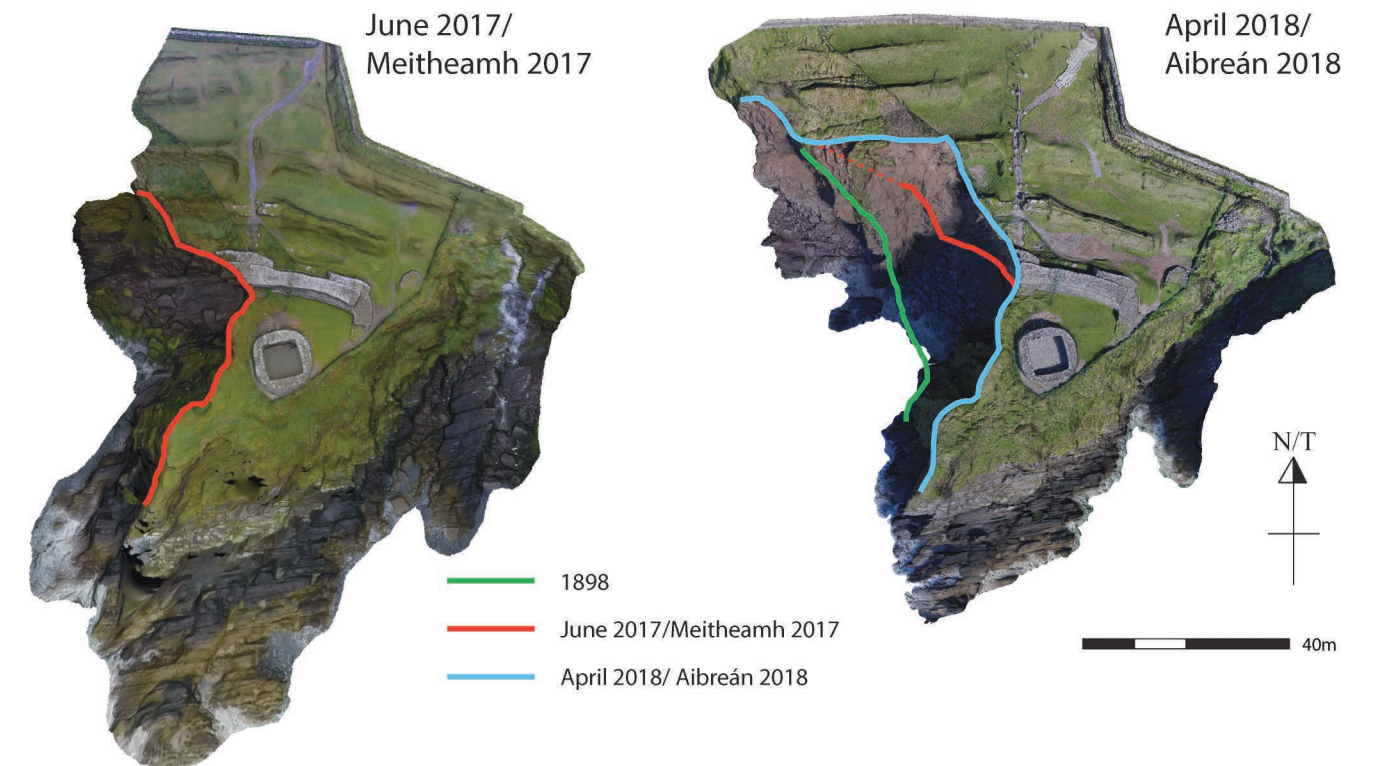


These UAV images of Dinas Dinlle hillfort in Gwynedd show the cliff-face before (June 2018) and after (February 2019) collapse revealing the sand filled inner ditch of the fort. After periods of prolonged rain the ground becomes saturated, which causes water to emerge from the cliff-face at the interface between the underlying soft and hard sediments. The emerging water exacerbates gravitational slumping and the degradation of the softer sediments.

Sna híomhánna UAV seo de dhún cnoic Dinas Dinlle in Gwynedd taispeántar aghaidh na haille roimh an titim (Meitheamh 2018) agus tar éis na titime (Feabhra 2019) inar nochtadh díog laistigh den dún líonta le gaineamh. Tar éis tréimhsí báistí fada éiríonn an talamh sáithithe, rud a fhágann go dtagann uisce amach as aghaidh na haille ag an gcomhéadan idir na dríodair bhoga agus chrua. Leis an uisce a thagann amach, spreagtar an sciorradh imtharraingteach agus an díghrádú de na dríodair níos boige.

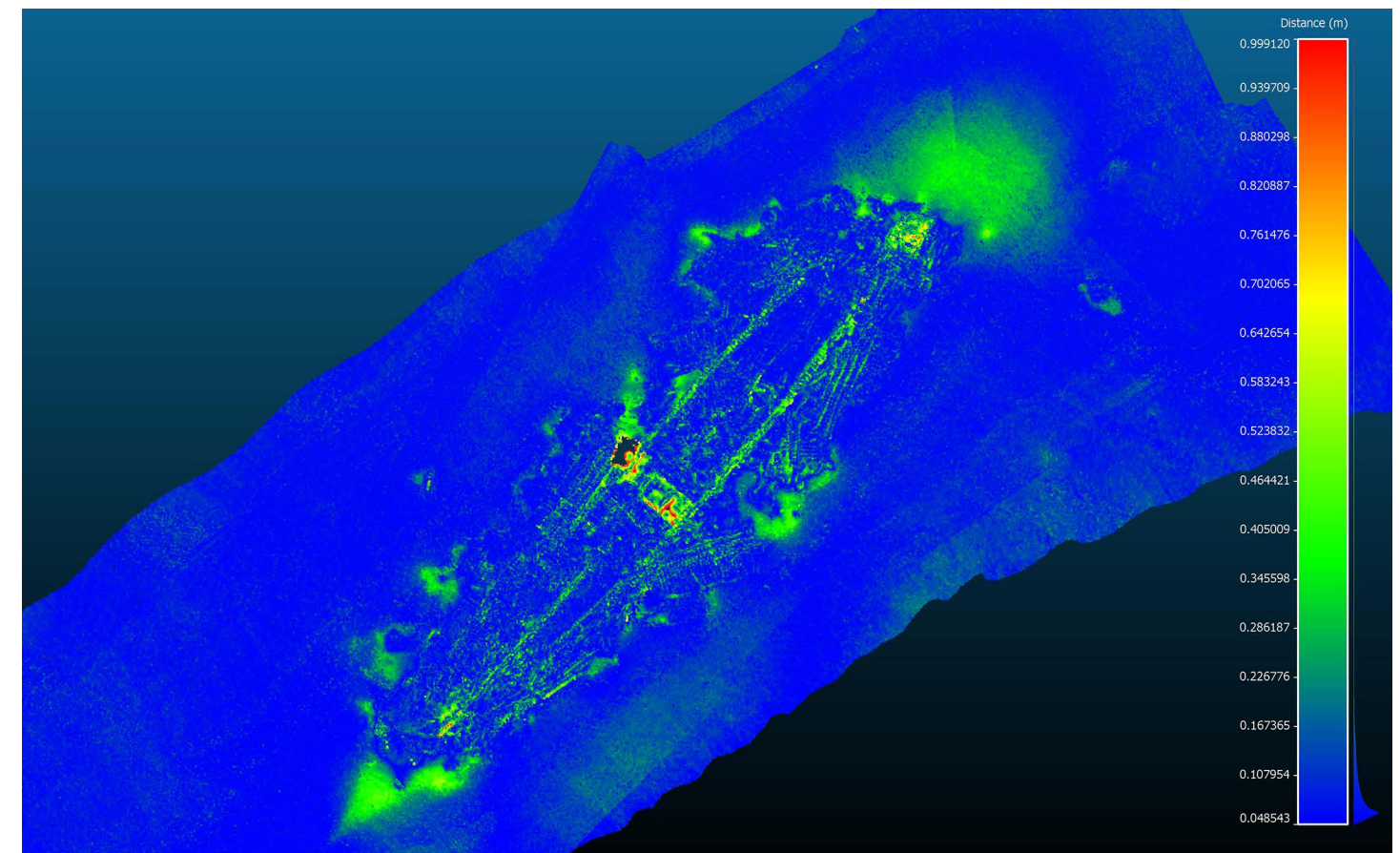
At a number of sites and monuments we've started to quantify change, such as at Dunbeg promontory fort in Co. Kerry where we have charted the loss of land on the western side of the fort. Here, comparison of datasets from UAV surveys in June 2017 and April 2018, calculates a minimum loss to the monument of 3,000 metres³ as a result of Storms Ophelia and Eleanor. In the intertidal zone, we've also been able to assess coastal change in remarkable detail through UAV survey. Using the time-series data collected during the CHERISH lifetime, and comparing to older data, we've started to build a picture and pattern of rapid erosion in both Rosslare and Kilpatrick Beach in Ireland. Likewise, under the sea at the SS *Manchester Merchant* in Dingle Bay, Co. Kerry, comparison of INFOAR 2009 and CHERISH 2019 maritime survey datasets indicates there has been up to 0.5 metres of change in exposure at the bow and stern of the vessel and up to 2 metres elevation change in the centre of the wreck where the ships boilers are breaking down in response to wave and storm action. This reinforces the message that even though we don't see it normally, large change is occurring.

I roinnt suíomhanna agus séadchomharthaí tá tús curtha againn le hathrú a chainníochtú, mar shampla ag dún ceann tíre an Dúna Bhig i gContae Chiarraí áit a ndearnamar taifeadadh ar chailliúint talún ar an taobh thiar den dún. Ansin, i gcomparáid idir tacar sonraí ó shuirbhéanna UAV i mí an Mheithimh 2017 agus i mí Aibreáin 2018, ríomhtar íoschailteanas don séadchomhartha de 3,000 méadar³ mar thoradh ar na Stoirmeacha Ophelia agus Eleanor. Sa chrios idirthaoideach, bhíomar in ann athrú cósta a mheas go mion trí shuirbhé UAV. Agus úsáid á baint againn as sonraí na sraithe ama a bailíodh le linn shaolré CHERISH, agus iad a chur i gcomparáid le sonraí níos sine, táimid tar éis pictiúr agus patrún de chreimeadh tapa a fheiceáil i Ros Láir agus ar Thrá Chill Phádraig in Éirinn. Mar an gcéanna, faoin bhfarraige ag an SS *Manchester Merchant* i mBá Dhaingean Uí Chúis, Co. Chiarraí, i gcomparáid idir tacar sonraí suirbhéanna muirí INFOAR 2009 agus CHERISH 2019 tugtar le fios go bhfuil athrú suas le 0.5 méadar tagtha ar an nochtadh ar ghob agus deireadh na loinge agus suas le 2 mhéadar athrú airde i lár na raice ina bhfuil coirí na loinge ag briseadh síos mar thoradh ar ghníomh na tonnta agus na stoirmeacha. Treisítear leis seo an teachtaireacht, cé nach bhfeicimid í de ghnáth, tá athrú mór ag tarlú.



Model generated from UAV imagery charting the loss of land on the western side of Dunbeg Fort, Co. Kerry, following Storm Ophelia in October 2017 and Eleanor in January 2018.

Samhail a gineadh ó íomháineachas UAV lenar rianaíodh cailliúint talún ar an taobh thiar de Dhún an Dúna Bhig, Co. Chiarraí, tar éis Stoirm Ophelia i mí Dheireadh Fómhair 2017 agus Stoirm Eleanor i mí Eanáir 2018.



Elevation difference of the SS *Manchester Merchant* which lies at a depth of 11 metres and is particularly vulnerable due to its location within the exposed Dingle Bay, Co. Kerry.

Difríocht airde ar an SS *Manchester Merchant* atá suite ag doimhneacht de 11 méadar agus atá thar a bheith leochaileach mar gheall ar a shuíomh laistigh den Bhá Dhaingean Uí Chúis, Co. Chiarraí, atá an-nochta.

CHERISH has also made some exciting new discoveries during monitoring and walkover surveys in our study areas. During the summer drought of 2018 we undertook aerial reconnaissance using a light aircraft which resulted in some exciting new discoveries including an interesting concentric hilltop enclosure near Abersoch on the Llŷn Peninsula and a defended enclosure near Marloes in Pembrokeshire. Both are likely to be of later prehistoric date.

Tá fionnachtana nua spreagúla déanta ag CHERISH le linn suirbhéanna monatóireachta agus siúil inár gceantair staidéir. Le linn thriomach an tsamhraidh in 2018 thugamar faoi réamhshuirbhé ón aer ag baint úsáide as aerárthach éadrom a raibh roinnt fionnachtana nua spreagúla mar thoradh air, lena n-áirítear imfhálú suimiúil ar bharr cnoic in aice le Abersoch ar Leithinis Llŷn agus imfhálú cosanta in aice le Marloes in Pembrokeshire. Is dóigh go bhfuil dáta réamhstairiúil níos déanaí ag an bpéire.



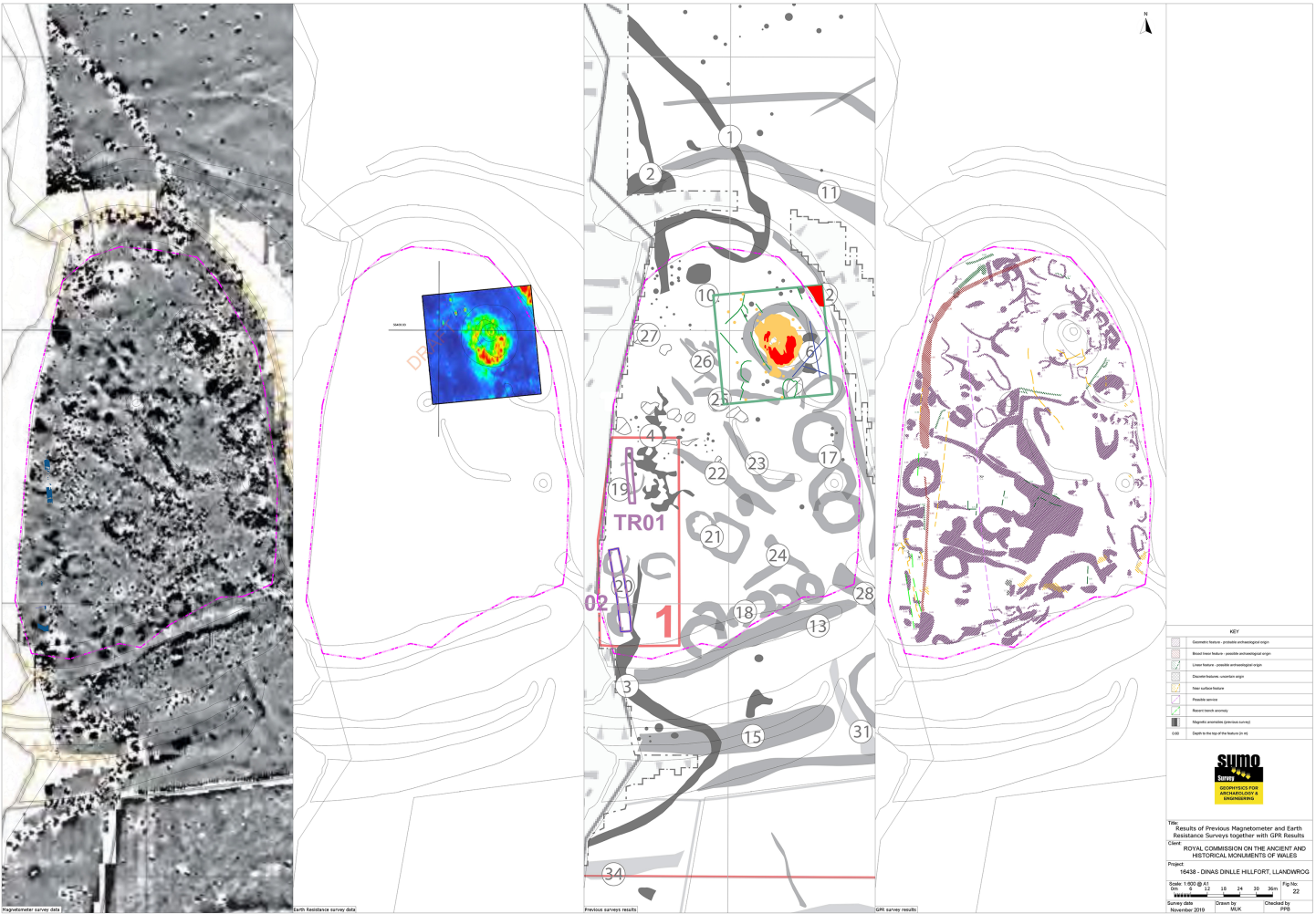
Emerging from the fields. The buried ditches of a defended enclosure near Marloes, Pembrokeshire, was discovered as a cropmark in the summer of 2018 during CHERISH aerial reconnaissance.
Ag teacht amach as na páirceanna. Thángthas ar dhíoga adhlactha d'imfhálú cosanta gar do Marloes, in Pembrokeshire, mar bharrachomhartha sa samhradh sa bhliain 2018 le linn réamhshuirbhé aeróige CHERISH.

In Ireland, walkover survey of islands such as Ireland’s Eye have identified new promontory forts, whilst analysis of LIDAR datasets for the Waterford coast has identified circular enclosures at Islandhubbock, Co. Waterford.

In Éirinn, sa réamhshuirbhé ar oileáin ar nós Inis Mac Neasáin, aithníodh dúnta cheann tíre nua , agus in anailís ar thacair sonraí LIDAR do chósta Phort Láirge, aithníodh imfháluithe ciorclacha ag Oileán Hoboc, Co. Phort Láirge.

More detailed studies are also in progress to increase our understanding of threatened sites where loss is happening and inevitable. Using our own magnetometry cart we have undertaken geophysical survey at a number of sites in Ireland including Glascarrig motte, Co. Wexford; Ferriter’s promontory, Co. Kerry; Bull Island, Co. Dublin, and Woodstown, Dunabrratin, and Ballynarrid, Co Waterford. We’ve also commissioned a number of geophysical surveys across Wales and have explored different geophysical techniques in order to get the most out of a single site. For example, at Dinas Dinlle hillfort we have commissioned three different forms of geophysics – magnetometry (gradiometer) survey, resistivity survey and ground penetrating radar – to provide us with the best picture of what lies beneath the ground at this eroding monument.

Tá staidéir níos mionsonraithe ar siúl freisin chun ár dtuiscint ar shuíomhanna atá faoi bhagairt a mhéadú ina bhfuil caillteanas ag tarlú agus dosheachanta. Ag baint úsáide as ár gcairt mhaighnéadaiméadrachta féin rinneamar suirbhé geoifisiceach ar roinnt suíomhanna in Éirinn lena n-áirítear móta Ghlascarraig, Co. Loch Garman; Ceann tíre Phiarais, Co. Chiarraí; Oileán an Bhulla, Co. Bhaile Átha Cliath, agus Baile na Coille, Dún na mBreatan, agus Baile an Airid, Co Phort Láirge. Rinneamar roinnt suirbhéanna geoifisiceacha a choimisiúnú ar fud na Breataine Bige agus rinneamar iniúchadh ar theicnící geoifisiceacha éagsúla d’fhonn an leas is fearr a bhaint as láithreán amháin. Mar shampla, ag dún cnoic Dinas Dinlle tá trí chineál geoifisice éagsúil coimisiúnaithe againn – suirbhé maignéadmhéadracht (grádmhéadair), suirbhé friotachais agus radar treáite talún – chun an pictiúr is fearr a sholáthar dúinn ar cad atá faoin talamh ag an séadchomhartha creimthe seo.

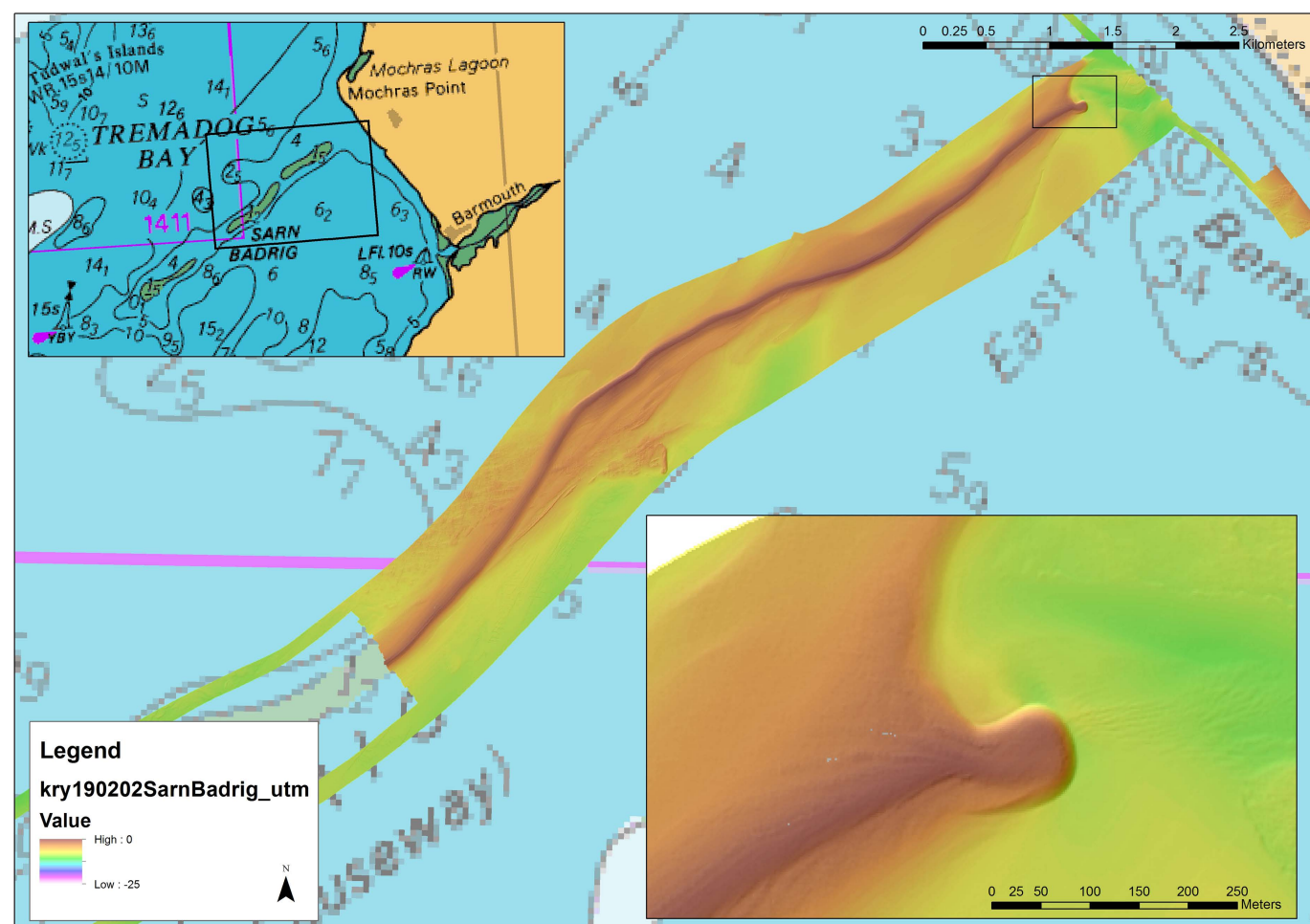


Data and interpretive plot showing different geophysical survey techniques used to good effect at Dinas Dinlle. A combination of magnetometry, resistivity and GPR (Ground Penetrating Radar) geophysical surveys have revealed countless archaeological features previously unknown about such as several stone-built roundhouses, trackways and interior boundaries.
Sonraí agus breacadh léirmhínte a thaispeánann teicnící suirbhéireachta geoifisiceacha éagsúla a úsáidtear go héifeachtúil ag Dinas Dinlle. Le teaghlaim de mhaighnéadracht, friotachas agus suirbhéanna geoifisiceacha GPR (Radar Treáite Talún), nochtadh gnéithe seandálaíochta iomadúla nach raibh eolas orthu roimhe seo ar nós roinnt tithe cruinne cloiche, rianta agus teorainneacha inmheánacha.



In Wales new analytical earthwork surveys have also been completed for Dinas Dinlle hillfort and Castell Bach, Caerfai and Porth y Rhaw promontory forts.

Sa Bhreatain Bheag tá suirbhéanna créfoirt anailiseacha nua curtha i gcrích freisin maidir le dún cnoic Dinas Dinlle agus dúnta ceann tíre Castell Bach, Caerfai agus Porth y Rhaw.

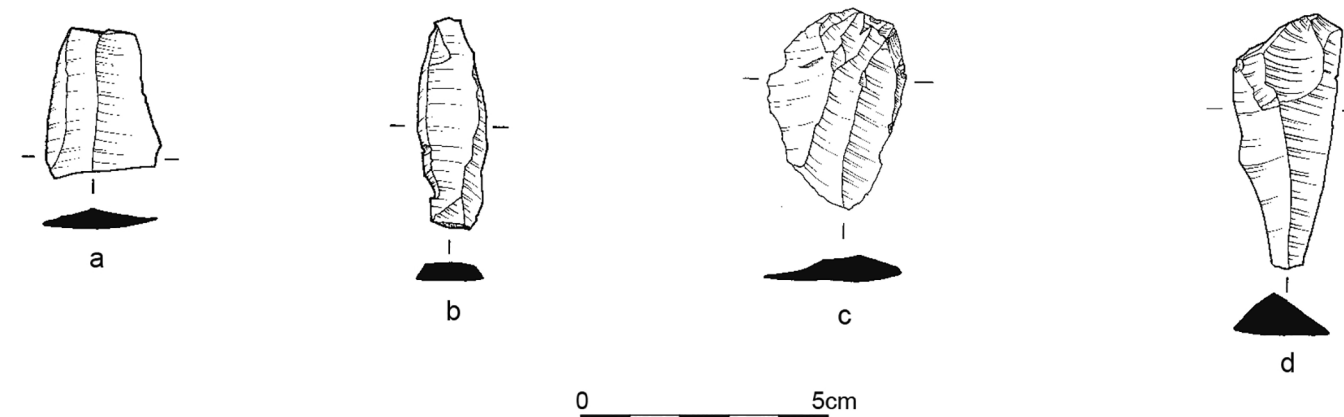


On the shallow Sarn Padrig reef in Wales, our mapping has resulted in nautical charts being updated, enabling safer passage through these waters. Bathymetry recorded by CHERISH in 2019 show a continuous ridge (main image) compared to previously charted mounds (inset, top left). The sand bar (inset bottom right) was also not previously recorded and helps indicate a very dynamic environment.

Ar an sceir éadomhain Sarn Padrig sa Bhreatain Bheag, rinneadh cairteacha farraige a nuashonrú de bharr ár mapála, rud a fhágann go bhféadtar dul níos sábháilte trí na huiscí seo. Le bataiméadracht a thaifead CHERISH in 2019, taispeántar droim leanúnach (príomhíomhá) i gcomparáid le dumhcha a ndearnadh cairteacha díobh roimhe seo (intlís, barr ar chlé). Níor taifeadadh an barra gainimh (intlís ar bun ar dheis) roimhe seo ach an oiread, agus cabhraíonn sé le timpeallacht an-dinimiciúil a léiriú.

Most CHERISH work doesn't break the ground surface, but on those sites clearly under threat and least understood we've undertaken a series of excavations, some dangling from ropes! At Dinas Dinlle we uncovered one of the largest and best-preserved roundhouses ever seen in Wales; it is unfortunately located close to an encroaching cliff-face (see CHERISH newsletter Issue 5, pages 24-33). On the remote Grassholm Island with an audience of gannets, we uncovered the surprisingly intact and well-built wall face of one of the island's houses. On the eroding Henllwyn Isthmus on Bardsey Island, we've undertaken detailed section recording and sampling. Here Mesolithic flints have been recovered and analysed, along with bone from what we initially thought were a series of cremation burials but are in actual fact animal in origin and represent domestic debris associated with occupation on the isthmus. We are now waiting for radiocarbon dates to provide a date for this.

I bhformhór obair CHERISH, ní bhristear dromchla na talún, ach ar na suíomhanna sin is léir a bhfuil faoi bhagairt agus a thuigimid an méid is lú fúthu, rinneamar sraith tochairtí, cuid acu crochta ó rópaí! Ag Dinas Dinlle, d'aimsíomar ceann de na tithe cruinn is mó agus is fearr-chaomhnaithe a chonacthas riamh sa Bhreatain Bheag; ar an drochuair tá sé suite gar d'aghaidh aillte atá ag cúngú (féach nuachtlitir CHERISH Eagrán 5, leathanaigh 24-33). Ar an Oileán iargúlta de Grassholm le lucht féachana de ghainéid, fuairéamar aghaidh bhalla de cheann de thithe an oileáin, agus iontas na n-iontas, bhí sé dea-thógtha agus slán. Maidir le Henllwyn Isthmus atá ag creimeadh ar Oileán Bardsey, rinneamar taifeadadh agus sampláil mhionsonraithe ar chodanna. Aisghabhadh agus rinneadh anailís ar bhreochlocha Méisiliteacha, mar aon le cnámh ón méid a cheapamar i dtosach a bhí ina shraith adhlactha créamtha ach i ndáiríre tá siad de bhunadh ainmhióch agus is ionann iad agus smionagar baile a bhaineann le háitiú ar an gcuing. Táimid ag fanacht anois ar dhátaí radacarbóin chun dáta a sholáthar dó seo.



Henllwyn, Barsdey Island. Mesolithic flint finds recovered from the eroding section. a – Bladelet, b – Small point, c – Utilised flake, d – Broken point. (Drawing by Ian Dennis)

Henllwyn, Oileán Barsdey. Aimsithe breochlocha Méisiliteacha a athaímsíodh ón gcuid creimthe. a – Seamaide beag, b – Pointe beag, c – Sleantach inúsáidte, d – Pointe briste. (Líníocht le Ian Dennis)

The work undertaken by the CHERISH palaeo team from Aberystwyth University has investigated a number of different impacts of climate change on heritage sites in Ireland and Wales. We've visited over sixty different sites in the past three years; unfortunately there's not enough time to work at them all so we've had to narrow them down to around twenty. Since the project began, we have collected some 90 metres of core material from sixteen different sites. We've cored coastal lakes perched on a floating pontoon on Anglesey, we've waded

San obair a rinne an phailéafhoireann CHERISH ó Ollscoil Aberystwyth rinneadh imscrúdú ar roinnt tionchair éagsúla a bhfuil ag athrú aeráide ar láithreáin oidhreacht in Éirinn agus sa Bhreatain Bheag. Thugamar cuairt ar níos mó ná seasca láithreáin éagsúil le trí bliana anuas; ar an drochuair níl i ndóthain ama chun obair a dhéanamh orthu go léir agus mar sin bhí orainn iad a chúngú go dtí timpeall is fiche. Ó cuireadh tús leis an tionscadal, tá thart ar 90 méadar de bhunábhar bailithe againn ó sé shuíomh dhéag dhifriúla. Rinneamar lochanna cósta a bhí crochta ar phontún ar snámh in Inis Mór a chroileacú, chuamar go

deep into bogs and meres for those all-important palaeoenvironmental samples in Pembrokeshire and Co. Kerry, and we've even cored the clifftop sand dunes at Stackpole, Pembrokeshire and experimented by coring the hillfort ramparts at Dinas Dinlle. It's been a fantastic experience to visit and work in some of the most spectacular and atmospheric locations around our coastline and we've been privileged to visit beautiful islands not normally accessible. It's not all been fun and sightseeing – we have put in some very long and tiring days in the field, we've braved hailstorms and the biting cold of February, torrential rain in exposed location, dangled over cliff edges, got sunburnt, wet and very dirty – particularly on Grassholm among the Gannets!

domhain isteach i bportaigh agus i bhfoireacha le haghaidh na samplaí pailéachomhshaoil uile-thábhachtacha sin in Pembrokeshire agus i gContae Chiarraí, agus rinneamar fiú na dumhcha ar bharr aille a chroíleacú ag Stackpole, Pembrokeshire agus rinneamar turgnamh trí rampair dhúnta cnoic ag Dinas Dinlle a chroíleacú. B'éispéireas iontach é cuairt a thabhairt agus oibriú i gcuid de na suíomhanna is iontaí agus is atmaisféaraí timpeall ár gcósta agus bhí sé de phribhléid againn cuairt a thabhairt ar oileáin áille nach mbíonn inrochtana de ghnáth. Ní raibh na laethanta lán le spraoi agus le fámaireacht - bhí roinnt laethanta an-fhada agus tuirsiúla curtha isteach againn ar an láthair, thugamar dúshlán na stoirmeacha clocha sneachta cráite agus an fhuachta fheanntaigh de mhí Feabhra, fuarlach báistí in áit nochta, crochta os cionn imill na n-aillte, dóite ag an ngrian, fliuch agus an-salach - go háirithe in Grassholm i measc na ngainéad!



Patrick and Sarah retrieving cores.
Patrick agus Sarah ag aisghabháil croileacán.

Our cores have already shown us Holocene sea-level and salinity changes at Llyn Maelog, lake development during the Early Iron Age and episodes of sand movement at Llyn Coron from the Aberffraw dune system, and we are currently reconstructing vegetation histories for some of our key sites. The lockdown has unfortunately interrupted the processing of numerous Optically Stimulated Luminescence samples (OSL dating) where we aim to date the deposition of sand at key sites where radiocarbon dating cannot be used. The technique measures the amount of natural radioactivity that has accumulated in buried sand grains, and by employing some complex physics, calculates when individual grains of sand last saw the light of day. Samples from Llyn Coron & Rhuddgaer on Anglesey and Borth in Ceredigion have already provided some intriguing results, and we eagerly await getting back in the laboratory to finish off the samples from Dinas Dinlle to find out when the spectacular roundhouses were entombed in sand.

Helen retrieving OSL
(Optical Stimulated
Luminescence)
samples from the cliff
face at Dinas Dinlle.



Helen ag aisghabháil
samplaí OSL
(Lonracha
Spreagtha go
hOptúil) ó aghaidh na
haille ag Dinas Dinlle.

Lenár gcroíleacáin, taispeánadh athruithe cheana féin ar leibhéal na farraige agus salandacht Holoicéineach ag Llyn Maelog, forbairt locha le linn na hIarannaoise Luath agus teagmhais de ghluaiseacht ghainimh ag Llyn Coron ón gcóras dumhcha Aberffraw, agus táimid ag athchruthú stair fásra le haghaidh chuid dár bpríomhshuíomhanna. Ar an drochuair, chuir an dhianghlasaíl isteach ar phróiseáil a lán samplaí Lonracha Spreagtha go hOptúil (dátú OSL) áit a bhfuil sé mar aidhm againn sil-leagan gainimh a dhátú ag príomhshuíomh nach féidir dátú radacarbóin a úsáid. Tomhaistear leis an teicníc an méid radaighníomhaíochta nádúrtha atá carntha i ngráinní gainimh atá adhlactha, agus trí fhisic chasta a úsáid, agus ríomhtar an uair dheireanach a chonaic gráinne aonair gainimh solas

an lae. Tá roinnt torthaí spésiúla curtha ar fáil cheana féin ag samplaí ó Llyn Coron & Rhuddgaer ar Anglesey agus Borth in Ceredigion, agus táimid ag tnúth go mór le filleadh ar ais sa tsaotharlann chun na samplaí ó Dinas Dinlle a chríochnú ionas go bhféadfaimis a aimsiú cathain a bhí na tithe cruinne iontach adhlactha le gaineamh.

OUTREACH and ENGAGEMENT

FOR-ROCHTAIN agus IDIRCHADREAMH

1 Website <http://www.cherishproject.eu/en/>

1733 Facebook followers

934 Twitter followers

69 CHERISH talks (**22** Public talks and **47** Conference presentations)

8 Vessel Open Days

16 Guided Walks

1 Beach clean

3 Sessions at International Conferences

13,000 People engaged (face to face)

5 CHERISH Newsletters

1 Community Excavation involving **50** volunteers

5 Day schools and training events

6 Virtual online site tours and models, and **1** 3D printed model

1 Suíomh Gréasáin <http://www.cherishproject.eu/en/>

1733 leantóir Facebook

934 leantóir Twitter

69 caint CHERISH (**22** caint phoiblí agus **47** Cur i láthair comhdhála)

8 Lá Oscailte ar Long

16 Siúlóid Treoraithe

1 Ghlantachán trá

3 Seisiún ag Comhdhálacha Idirnáisiúnta

13,000 Idirchaidreamh le daoine (duine le duine)

5 Nuachtlitir CHERISH

1 Tochailt Pobail ina raibh **50** saorálai páirteach

5 imeacht scoil lae agus oiliúna

6 thuras agus samhail fhíorúil de láithreáin ar líne, agus **1** shamhail clóite in 3D

Community engagement is a fundamental part of CHERISH. Over the first three years we have been very active giving talks to the public in a variety of venues across Ireland and Wales including museums, rural village halls, a pub and four primary schools. We have led coastal and island guided walks and litter picks over many of our sites, in sometimes challenging weather conditions and have also organised day schools and seminars introducing people to the project and its key themes. One main highlight, particularly for the student attendees, was the two-day aerial survey school we held in Dublin in June 2019. Here attendees got first-hand experience of UAV survey and took to the air in a light aircraft above the Boyne valley and Hill of Tara.

Cuid bhunúsach de CHERISH is ea rannpháirtíocht an phobail. Bhíomar an-ghníomhach le linn na chéad trí bliana ag tabhairt cainteanna don phobal in ionaid éagsúla ar fud na hÉireann agus na Breataine Bige lena n-áirítear músaeim, hallaí sráidbhailte tuaithe, teach tábhairne agus ceithre bhunscoil. Táimid tar éis siúlóidí treoraithe cósta agus oileáin agus bailiúcháin bhruscair a threorú thar go leor dár suíomhanna, i ndálaí aimsire dúshlánacha uaireanta agus tá scoileanna lae agus seimineáir eagraithe againn freisin ag cur daoine in aithne don tionscadal agus dá phríomhthéamaí. Ba phríomh-bhuaicphointe amháin, go háirithe do lucht freastail na mac léinn, ná an tsuirbhéireacht scoile aeróige de dhá lá a reáchtáladar i mBaile Átha Cliath i mí an Mheithimh 2019. Anseo fuair lucht freastail taithí phearsanta ar shuirbhé UAV agus chuaigh siad suas san aer in aerárthach éadrom os cionn ghleann na Bóinne agus Cnoc na Teamhrach.



Our UAV workshop at Digital Past 2020 allowed users from across the UK and beyond to participate in a morning of discussions and exercises involving the use of UAVs for survey and monitoring.

Lenár gceardlann UAV ag Digital Past 2020, tugadh deis d'úsáideoirí ó gach cearn den Ríocht Aontaithe agus níos faide i gcéin páirt a ghlacadh i maidin díospóireachtaí agus cleachtaí inar baineadh úsáid as UAVanna le haghaidh suirbhéireachta agus monatóireachta.



Toby alongside fellow aerial photographer Damian Grady from Historic England (second from right) and delegates of the 2019 Aerial Photography School in Ireland.

Toby in éineacht lena chomhghrianghrafadóir aer Damian Grady as Historic England (an dara duine ó dheas) agus toscairí ón Scoil Aer-Ghrianghrafadóireachta 2019 in Éirinn.

Staying actively engaged with the international climate change and cultural heritage community is also hugely important to CHERISH. We have organised scientific sessions at international conferences in Barcelona, Dublin and Newcastle and have presented to audiences in countries across Europe such as Italy, Poland, Switzerland, the Netherlands, Orkney Islands and even Stockport!

Tá sé an-tábhachtach do CHERISH fanacht i dteagmháil go gníomhach leis an bpobal idirnáisiúnta um athrú aeráide agus oidhreacht chultúrtha. D'eagraíomar seisiúin eolaíochta ag comhdhálacha idirnáisiúnta in Barcelona, Baile Átha Cliath agus sa Chaisleán Nua agus thugamar cur i láthair do lucht féachana i dtíortha ar fud na hEorpa cosúil leis an Iodáil, an Pholainn, an Eilvéis, an Ísiltír, Inse Orc agus fiú Stockport!

2019 saw the first CHERISH community excavation at Dinas Dinlle hillfort in Gwynedd where fifty volunteers from the local area were able to take part in the excavation. The excavation culminated with an open day and over 400 visitors learnt about the site and the effect that climate change and erosion is having on it, also having the opportunity of a guided tour of the trenches. The excavation featured in local and national news.

In 2019 rinneadh an chéad tochailt phobail CHERISH ag an dún cnoic Dinas Dinlle in Gwynedd áit a raibh caoga saorálaí ón gceantar áitiúil in ann páirt a ghlacadh sa tochailt. Críochnaíodh an tochailt le lá oscailte agus d'fhoghlaim os cionn 400 cuairteoir faoin láithreán agus an éifeacht atá ag athrú aeráide agus creimeadh air, agus tugadh an deis dóibh turas treoraithe timpeall na dtrinsí freisin. Bhí an tochailt le feiceáil sa nuacht áitiúil agus náisiúnta.



Over 400 members of the public enjoyed tours of Dinas Dinlle during the excavations in 2019. Bhain níos mó ná 400 ball den phobal taitneamh as turais ar Dinas Dinlle le linn na dtoghailtí in 2019.

Open days have also happened in Ireland, often coinciding with events such as the National Heritage Week and over 1,000 people have stepped aboard the GSI survey vessels to learn about the maritime work of CHERISH.



The 2nd Port Dunmore East Seascouts on board the RV Keary celebrating European Maritime Day and the Dunmore East Harbour Festival.

An Dara Scabhta Muirí de Chalafort Dhún Mór ar bord an RV Keary ag ceiliúradh Lá Muirí na hEorpa agus Féile Chuan Dhún Mór.

Tharla laethanta oscailte in Éirinn freisin, go minic i gcomhráth le himeachtaí mar an tSeachtain Náisiúnta Oidhreacht agus tháinig os cionn 1,000 duine ar bord na long suirbhéireachta GSI chun foghlaim faoin obair mhuirí CHERISH.

Social media and digital technology have allowed us to reach wider audiences, to tell our story and those of our study sites across the world. We’ve had some great engagement and viewing figures so far, a Facebook post on the stunning Illauntanig has reached over 41,431 people, had 5,735 engagements, 81 comments, 242 shares and 313 reactions. Likewise, a video of Dinas Dinlle has reached over 35,000 people and has been viewed over 13,000 times. As nearly all our work uses the latest digital technologies, we’re able to use data gathered to create engaging and informative products such as our 3D Sketchfab models of sites which allow users to take virtual tours from the comfort of their own homes.

Leis na meáin shóisialta agus an teicneolaíocht dhigiteach, tugtar deis dúinn lucht féachana níos leithne a bhaint amach, chun ár scéal agus na scéalta dár suíomhanna staidéir ar fud an domhain a insint. Bhí roinnt figiúirí móra rannpháirtíochta agus féachana againn go dtí seo, bhreathnaigh os cionn 41,431 duine ar phostáil Facebook maidir leis an Oileán tSeanaigh iontach, fuair an phostáil 5,735 rannpháirtíocht, 81 trácht, 242 scair agus 313 imoibriú. Mar an gcéanna, tá os cionn 35,000 duine sroichte ag físeán de Dinas Dinlle agus breathnaíodh air níos mó ná 13,000 uair. De réir mar a úsáideann beagnach ár gcuid oibre uile na teicneolaíochtaí digiteacha is déanaí, táimid in ann sonraí a bhailítear a úsáid chun táirgí tarraingteacha agus faisnéiseacha a chruthú ar nós ár samhlacha suíomhanna 3D Sketchfab a ligeann d’úsáideoirí turais fhíorúla a thógáil ó chompord a dtithe féin.

SketchfabEXPLOREBUY 3D MODELSFOR BUSINESSSearch 3D models

Castell Bach Promontory Fort - July 2018
3D Model

CBHC_RCAHMWPRO

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SUGGESTED 3D MODELS

Caer Bentir Castell Bach...
CBHC_RCAHMW
0 59 1

Dinas Dinlle Coastal For...
CBHC_RCAHMW
0 211 2

Caer Bentir Porth y Rha...
CBHC_RCAHMW
0 45 2

Caerfai Camp Promonto...
CBHC_RCAHMW
0 104 0

Caer Bentir Caerfai Cam...
CBHC_RCAHMW
0 37 0

Porth y Rhaw Promonto...
CBHC_RCAHMW
0 35 0

LOAD MORE

During lockdown we have uploaded 3D models of several of our most threatened sites to Sketchfab.
Le linn na dianglasála tá samhlacha 3D de roinnt de na suíomhanna is mó atá faoi bhagairt againn uaslódáilte ar Sketchfab.



How is Climate Change affecting our Coastal Heritage?

Warmer global temperatures will lead to:

- 1 Rising sea levels impacting on all aspects of coastal heritage as a result of flooding and storm surges.
- 2 A rise in sea temperature bringing new marine species and pests affecting underwater and intertidal heritage.

Hotter, drier summers will lead to:

- 3 Drying out of cliff faces increasing the risk of destabilisation and collapse affecting heritage sites on the coast edge.
- 4 The discovery of new heritage sites visible as parchmarks and cropmarks.

Warmer, wetter winters will lead to:

- 5 The ground becoming saturated increasing the risk of flooding, landslides and erosion at heritage sites.

More frequent extreme weather, such as storms will lead to:

- 6 Turbulent seas damaging heritage on the seabed and foreshore.
- 7 Erosion and loss at the coast edge from wave action.
- 8 Breaches in coastal barriers leading to flooding.
- 9 The movement of sand reshaping dune systems but also revealing hidden heritage.
- 10 Structural damage to buildings

Cén tionchar atá ag an Athrú Aeráide ar Oidhreacht ár gCósta?

Mar thoradh ar theochtaí domhanda níos teo beidh:

- 1 Leibhéil na farraige ag dul i bhfeidhm ar gach gné d'oidhreacht an chósta de bharr tuilte agus sitheadh stoirme.
- 2 Ardú i dteocht na farraige ag tabhairt speicis agus lotnaidí mara nua a rachaidh i bhfeidhm ar an oidhreacht faoin uisce agus ar an oidhreacht idirthaoideach.

Mar thoradh ar shamhraí níos teo agus níos tirime beidh:

- 3 Triomú d'aghaidheanna na n-aillte, agus méadaítear an baol de dhíchobhsú agus titim, a rachaidh i bhfeidhm ar láithreáin oidhreacht ar imeall an chósta.
- 4 Suíomhanna oidhreacht nua a fhionnadh mar chomharthaí pár agus marcanna loiscneacha.

Mar thoradh ar gheimhrí níos teo agus níos fliche beidh:

- 5 An talamh a bheith ar maos in uisce, rud a mhéadóidh an riosca tuilte, sciorthaí talún agus creimeadh ag láithreáin oidhreacht.

Mar thoradh ar adhaimsir níos minice, ar nós stoirmeacha:

- 6 Déanfaidh farraigí suaite dochair don oidhreacht ar ghrinneall na farraige agus ar an gcladach.
- 7 Beidh creimeadh ar imeall an chósta agus caillfear talamh de bharr gníomhaíochta na dtionnta.
- 8 Beidh sárúithe ar bhacainní cósta a bheidh mar chúis le tuilte.
- 9 Le gluaiseacht an ghainimh, déanfar na córais dumhcha a athmhúnlú chomh maith le hoidhreacht cheilte a nochtadh freisin.
- 10 Déanfar damáiste struchtúrach d'fhoirgnimh.

Climate change impacts along the coastlines of Wales and Ireland. Familiar monuments from both nations including the coastal forts of Dinas Dinlle (foreground) and Dunbeg (background) and Ballinskelligs castle, Kerry (lower right, above horse rider) bring real case studies to life in an imaginary landscape.

Bíonn tionchar ag athrú aeráide ar chóstaí na Breataine Bige agus na hÉireann. Leis na séadchomharthaí aitheanta ón dá náisiún lena n-áirítear dúnta cósta Dinas Dinlle (tosach) agus an Dúna Bhig (cúlra) agus caisleán Bhaile an Sceilg, Ciarraí (ar dheis níos ísle, os cionn marcach capall), cuirtear beocht sna cás-staidéir i dtírdhreach samhailteach.

CHERISH IN FOCUS / DÍRIÚ AR CHERISH

Providing a more in-depth look at certain aspects of CHERISH, including study sites, survey techniques, and the team.

Léargas níos doimhne a sholáthar ar ghnéithe áirithe de CHERISH lena n-áirítear láithreáin staidéir, teicnící suirbhéireachta, agus an fhoireann.

Aerial view of Ballinskelligs Abbey and Tower House.
Amharc ón aer de Mhainistir & Túrtheach Bhaile an Sceilg

CHERISH STUDY SITES: BALLINSKELLIGS, COUNTY KERRY / LÁITHREÁIN STADÉIR CHERISH: BAILE AN SCEILG, CONTAE CHIARRAÍ

Ballinskelligs Bay is located on the western seaboard of Ireland, nestled on the south-western extent of the Iveragh Peninsula facing the vast Atlantic Ocean. It has played a pivotal role in Kerry's monastic landscape and is closely linked with the UNESCO World Heritage Site of Skellig Michael, which lies just off the Ballinskellig coast. The monastery of Skellig Michael was transferred here in the mid-eleventh century due to hazardous conditions on the Skellig rock and the priory of the Arroasian Canons of the Order of St Augustine was founded here around 1210 and retained possession of Great Skellig. The priory comprises a number of buildings relating to various periods from the thirteenth century until it was disbanded in 1578. There is also an ancient settlement some 120 metres to the northwest of Priory.

The priory's exposed coastal location has meant it has been the subject of much restoration work by the Office of Public Works. Erosion has affected the fragile site since at least the eighteenth century and has resulted in the destruction of several buildings and much of the south-east side of the monastery and graveyard. A substantial seawall, revetted by groynes, protects the site, but may well have contributed to the increased erosion of the ancient settlement to the north-west of the priory.

Tá Cuan Bhaile an Sceilg suite ar chósta thiar na hÉireann, suite ar an taobh thiar theas de Leithinis Uíbh Ráthaigh os comhair an Aigéin Atlantaigh fhairsing. Bhí ról lárnach aige i dtírdhreach mainistreach Chiarraí agus tá dlúthnasc aige leis an Láithreán Oidhreachta Domhanda EOCNA de Sceilg Mhichíl, atá suite díreach amach ó chósta Bhaile an Sceilg. Aistríodh mainistir Sceilg Mhichíl anseo i lár an aonú haois déag mar gheall ar dhálaí guaiseacha ar an gcarraig agus bunaíodh príóireacht an Chanónaigh Arroasiaigh ón Ord Agaistín Naofa anseo timpeall 1210 agus choinnigh sé seilbh ar Sceilg Mhichíl. Sa phríóireacht, cuimsítear roinnt foirgneamh a bhaineann le tréimhsí éagsúla ón tríú haois déag go dtí gur scoireadh í i 1578. Tá lonnaíocht ársa ann freisin timpeall 120 méadar siar ó thuaidh ón bPríóireacht.

Mar gheall ar shuíomh na príóireachta ar chósta nochta, rinne Oifig na nOibreacha Poiblí go leor oibre athchóirithe uirthi. Bhí tionchar ag creimeadh ar an láithreán leochaileach ón ochtú haois déag ar aghaidh, ar a laghad, agus mar thoradh air sin scriosadh roinnt foirgneamh agus cuid mhaith den taobh thoir theas den mhainistir agus den reilig. Tugann an balla mara, agus sraodbhalla de ghradhana, cosaint don láithreán, ach b'fhéidir gur chuir sé leis an gcreimeadh méadaithe den lonnaíocht ársa siar ó thuaidh ón bpríóireacht.

Ballinskelligs Beach where GSI have undertaken coastal UAV survey.

Trá Bhaile an Sceilg, áit ar thug Suirbhéireacht Gheolaíochta na hÉireann faoi shuirbhéireacht aerfeithicle gan fhoireann (UAV) ar an gcósta.

McCarthy's castle is located to the north of the Abbey on the tip of a narrow promontory of land that juts into the sea. This tower house is thought to be sixteenth century in date and associated with the McCarthy family who were chieftains in Cork and Kerry. The castle ruins remain largely intact; however, the southern corner is badly damaged with a breakthrough in the wall, partly due to exposure to the sea and also to the fact that the wall is thinner here due to the location of the tower's mural stair in this corner.

The promontory and land around the castle suffers badly from erosion and has changed substantially in living memory, with some of this change often attributed to the twentieth-century construction of the concrete pier at the end of the promontory. Excavations were undertaken here in 1988 and 1991 by John Sheehan of the University College Cork where two external lean-to structures with pitched-cobble floors were uncovered which post-date the primary occupation period of the castle. These floors are believed to be the remains of a fish curing station which is supported by archival evidence that mentions the establishment of a fishery at Ballinskelligs by Sir William Petty.

Tá caisleán Mhic Cárthaigh suite ó thuaidh ón Mainistir ar bharr ceann tíre chaoil a ghobann amach san fharraige. Ceaptar go bhfuil ag an túrtheach seo ón séú haois déag agus go raibh baint aige le clann Mhic Cárthaigh a bhí ina dtaoisigh i gCorcaigh agus i gCiarraí. Tá fothracha an chaisleáin fós slán den chuid is mó; rinneadh damáiste dona don chúinne theas, áfach, le briseadh sa bhalla, mar gheall ar nochtadh don fharraige i bpáirt agus freisin toisc go bhfuil an balla níos tanaí anseo mar gheall ar shuíomh mhúrstaire an túir sa chúinne seo.

Téann an creimeadh i bhfeidhm go dona ar an gceann tíre agus ar an talamh timpeall an chaisleáin agus tá athrú mór tagtha air de réir chuimhne na ndaoine, agus is minic a dheirtear go bhfuil cuid den athrú seo mar thoradh ar thógáil na cé coincreite san fhichiú haois ag deireadh an cheann tíre. Rinne John Sheehan ó Choláiste na hOllscoile, Corcaigh tochtailtí anseo i 1988 agus i 1991 agus thángthas ar dhá struchtúr claonseantáin seachtracha le hurláir dhoirneogach claonta a théann níos faide siar in am roimh príomháitiú an chaisleáin. Creidtear gur iarsmaí de stáisiún leasúcháin éisc iad na hurláir seo a dtacaíonn fianaise chartlainne leis sin ina luaitear gur bhunaigh Sir William Petty iascach ag Baile an Sceilig.



CHERISH terrestrial laser scan 3D data showing the remains of McCarthy's Castle, complete with ghostly figures captured during scanning!

Sonraí 3D scanta léasair talún CHERISH ina léirítear iarsmaí de Chaisleán Mhic Cárthaigh, chomh maith le cruthanna taibhsiúla a gabhadh i rith an scanta!



CHERISH has utilised various components of the CHERISH toolkit in the recording of the Ballinskelligs landscape and its built heritage. In 2018, the team from the Discovery Programme carried out terrestrial laser scanning of McCarthy Castle and a UAV survey along the west shore of the bay encompassing the area from the Priory to the Castle. UAV survey was also undertaken at the nearby Cill Rialaig ecclesiastical enclosure and the whole area was complimented by a walkover intertidal survey. In 2019, CHERISH staff from Aberystwyth University collected cores from three locations in the bay and staff from GSI gathered an additional 8 kilometres of coastal UAV survey focused on the north and west sides of the bay.

Bhain CHERISH úsáid as comhpháirteanna éagsúla den tsraith straitéisí CHERISH chun tírdhreach Bhaile an Sceilig agus a oidhreacht thógtha a thaifeadh. In 2018, rinne an fhoireann ón gClár Discovery scanadh léasair thalún ar Chaisleán Mhic Cárthaigh agus suirbhé UAV feadh chladach thiar an bhá d'fhonn an cheantair ón bPrióireacht go dtí an Caisleán a chumhdach. Rinneadh suirbhé UAV freisin ag imfhálú eaglasta Chill Rialaig in aice láimhe agus chomh maith leis sin, rinneadh réamhshuirbhé idirthaoideach den limistéar iomlán. In 2019, bhailigh foireann CHERISH ó Ollscoil Aberystwyth croileacáin ó thrí shuíomh sa chuan agus bhailigh baill foirne ó GSI 8 gciliméadar bhreise de shuirbhé UAV cósta dírithe ar thaobhanna thuaidh agus thiar na bá.



Percussion coring of the submerged landscape at Ballinskelligs. Croileacú cnagtha de thirdhreach báite ag Baile an Sceilig.

CHERISH laser scan and UAV surveys have resulted in 3D point clouds and Digital Surface Models that have provided extremely detailed measured plans of the priory, castle and the wider Ballinskelligs Bay coastal landscape. Across much of this coastal landscape surveys have identified parts of the coastline that are most at risk from coastal erosion by quantifying rates of change and loss for Ballinskelligs' heritage sites and the Bay as a whole. With this information we have also been able to enhance the National Monuments Service Sites and Monuments Record for the area, and will continue to contribute towards the development of site management plans. Warmer mean temperatures and the resulting rise in sea levels, leading to the continued loss of the coastal margin, is one of the main threats to the area and its heritage going forward.

Recreating the past environments of our sites is also a hugely important part of our work, and this is no exception here where a tree stump from the nearby Inny strand has been analysed. Analysis has provided information on the past environment of the area and suggests a Bronze Age forest was once present in the north of the bay. The continuation of buried peats beyond the present low water mark indicates that the forest once covered the area that denotes much of the intertidal zone today. Basal dates of the peat cores extracted by the CHERISH team will help inform the formation date and phases of the wetlands here, and will provide insights into the environmental and climate records for the Bay since the Neolithic Period.

Mar thoradh ar scanadh léasair CHERISH agus suirbhéanna UAV, cruthaíodh néalphointí 3D agus Samhlacha Dromchla Digiteacha, lenar cuireadh pleananna tomhaiste an-mhionsonraithe ar fáil den phríóireacht, den chaisleán agus den tírdhreach cósta níos leithne de Bhá Bhaile an Sceilig. I gcuid mhaith den suirbhé seo ar thírdhreach cósta, sainaitníodh codanna den chósta is mó atá i mbaol ó chreimeadh cósta trí rátaí athraithe agus caillteanais do shuíomhanna oidhreachta Bhaile an Sceilig agus den Bhá ina iomláine a chainníochtú. Leis an bhfaisnéis seo bhíomar in ann feabhas a chur ar Thaifead Láithreán agus Séadchomharthaí na Seirbhíse Séadchomharthaí Náisiúnta don cheantar, agus leanfaimid orainn ag cur le pleananna bainistíochta láithreáin a fhorbairt. Mar gheall ar mheánteochtaí níos teo agus ar an ardú i leibhéil na farraige dá bharr, cailltear an corrlach cósta ar bhonn leanúnach, agus is é seo ceann de na príomhbhagairtí don cheantar agus dá oidhreacht amach anseo.

Cuid an-tábhachtach dár gcuid oibre freisin is ea timpeallachtaí ár suíomhanna a athchruthú, agus ní aon eisceacht é seo nuair a rinneadh anailís ar ghrágán crainn ó Thrá na hUíne in aice láimhe. Ina theannta sin, leis an anailís, cuireadh faisnéis ar fáil maidir le timpeallacht an cheantair san am atá thart agus tugann sí le tuiscint go raibh foraois i dtuaisceart na bá le linn na Cré-umhaoise. Le leanúint na móna adhlaclach atá níos doimhne ná an marc íseal uisce atá ann faoi láthair, tugtar le fios gur chlúdaigh an fhoraois an limistéar de chuid mhaith den chrios idirthaoideach inniu. Cuideoidh dátaí bunaidh na gcoíleacán móna a bhain foireann CHERISH le dáta foirmithe agus céimeanna na mbogach anseo, agus tabharfaidh siad léargas ar thaifid chomhshaoil agus aeráide na Bá ón Tréimhse Neoiliteach.

OUR TOOL KIT APPROACH: SURVEY TECHNIQUES / ÁR GCUR CHUIGE DE SHRAITH STRAITÉISÍ: TEICNÍCÍ SUIRBHÉIREACHTA

CHERISH archaeologist Dan Hunt discusses CHERISH's use of Digital Archaeology before and during lockdown

As archaeologists, we are usually most at home outside looking for new sites and artefacts to advance our understanding of the past. Unfortunately, in the current situation, being outside is not possible but this is not to say that our work has come to a grinding halt. Whilst being outdoors does form a core part of our work, there are many things we have been doing to continue our work from the comfort of our own homes. This has included a lot of preparing and processing data collected since the project started in 2017 as well as using remote methods to continue to investigate the landscapes of some of our project areas. At the heart of all of this work is digital technology which continues to develop and advance archaeology as a scientific discipline.

As a project looking at the threats of climate change on coastal heritage it was important that we adopted modern techniques in order to record, monitor and further our understanding of some of our most endangered sites around the coast. This is being achieved by using a whole host of different techniques, beautifully illustrated in our new 'techniques' graphic (see pages 6–7).

Much of this work involves the use of digital technologies such as UAVs, satellites and GPS, terrestrial laser scanning and aerial laser scanning to record archaeological sites as they currently appear. Using this technology, we can gather data and information for archaeological sites faster and in more detail than ever before. Recording in digital not only speeds up our work but makes it easier to carry out more complex analysis, reconstruct sites and publicise the results through forums such as social media. Working in this way is especially important during these strange times where the only way to access and explore archaeology for both us as archaeologists and the public is through our computer screens. But how is this possible, how can we 'do' archaeology from the comfort of our own homes using digital data and what has CHERISH been up to

Déanann seandálaí CHERISH, Dan Hunt, plé ar an úsáid a bhaineann agus a bhain CHERISH as an tSeandálaíocht Dhigiteach roimh agus i ndiaidh na dianghlása

Mar sheandálaithe, is gnách go mbíonn muid is compordaí lasmuigh ag cuardach suíomhanna agus déantúsán nua chun ár dtuiscint ar an am atá thart a chur chun cinn. Ar an drochuair, sa staid reatha, ní féidir a bheith amuigh ach níl sé sin le rá go bhfuil deireadh curtha lenár gcuid oibre. Cé gur cuid lárnach dár gcuid oibre é a bheith amuigh faoin aer, tá go leor rudaí á dhéanamh againn chun leanúint lenár gcuid oibre ó chompord ár dtithe féin. Áiríodh leis seo go leor sonraí a ullmhú agus a phróiseáil a bailíodh ó cuireadh tús leis an tionscadal in 2017 chomh maith le modhanna cianda a úsáid chun leanúint ar aghaidh ag imscrúdú tírdhreacha de roinnt dár limistéir thionscadail. Ag croílár na hoibre seo go léir tá teicneolaíocht dhigiteach a leanann uirthi ag forbairt agus ag cur chun cinn na seandálaíochta mar dhisciplín eolaíoch.

Mar thionscadal ag féachaint ar bhagairtí an athraithe aeráide ar oidhreacht chósta bhí sé tábhachtach go nglacfaimis teicnící nua-aimseartha d'fhonn ár dtuiscint ar chuid de na suíomhanna is mó atá i mbaol timpeall an chósta a thaifeadadh, agus chun monatóireacht a dhéanamh orthu agus iad a chur chun cinn. Tá sé seo á bhaint amach trí úsáid a bhaint as líon mór teicnící éagsúla, a léirítear go hálainn inár ngrafaic nua 'teicnící' (féach leathanach 6–7).

Baineann go leor den obair seo le teicneolaíochtaí digiteacha a úsáid ar nós UAVanna, satailítí agus GPS, scanadh léasair talún agus scanadh léasair aeir chun suíomhanna seandálaíochta a thaifeadadh mar atá siad faoi láthair. Agus an teicneolaíocht seo á húsáid againn, is féidir linn sonraí agus faisnéis a bhailiú do shuíomhanna seandálaíochta ar bhealach níos tapa agus níos mionsonraithe ná riamh. Ní amháin go gcuireann taifeadadh i bhfoirm dhigiteach dlús lenár gcuid oibre ach bíonn sé níos éasca anailís níos casta a dhéanamh, suíomhanna a athchruthú agus na torthaí a phoiblíú trí fhóiraim mar na meáin shóisialta. Tá modh oibre seo tábhachtach go háirithe le linn na n-amanna aisteacha seo nuair is é an t-aon bhealach dúinn, mar sheandálaithe

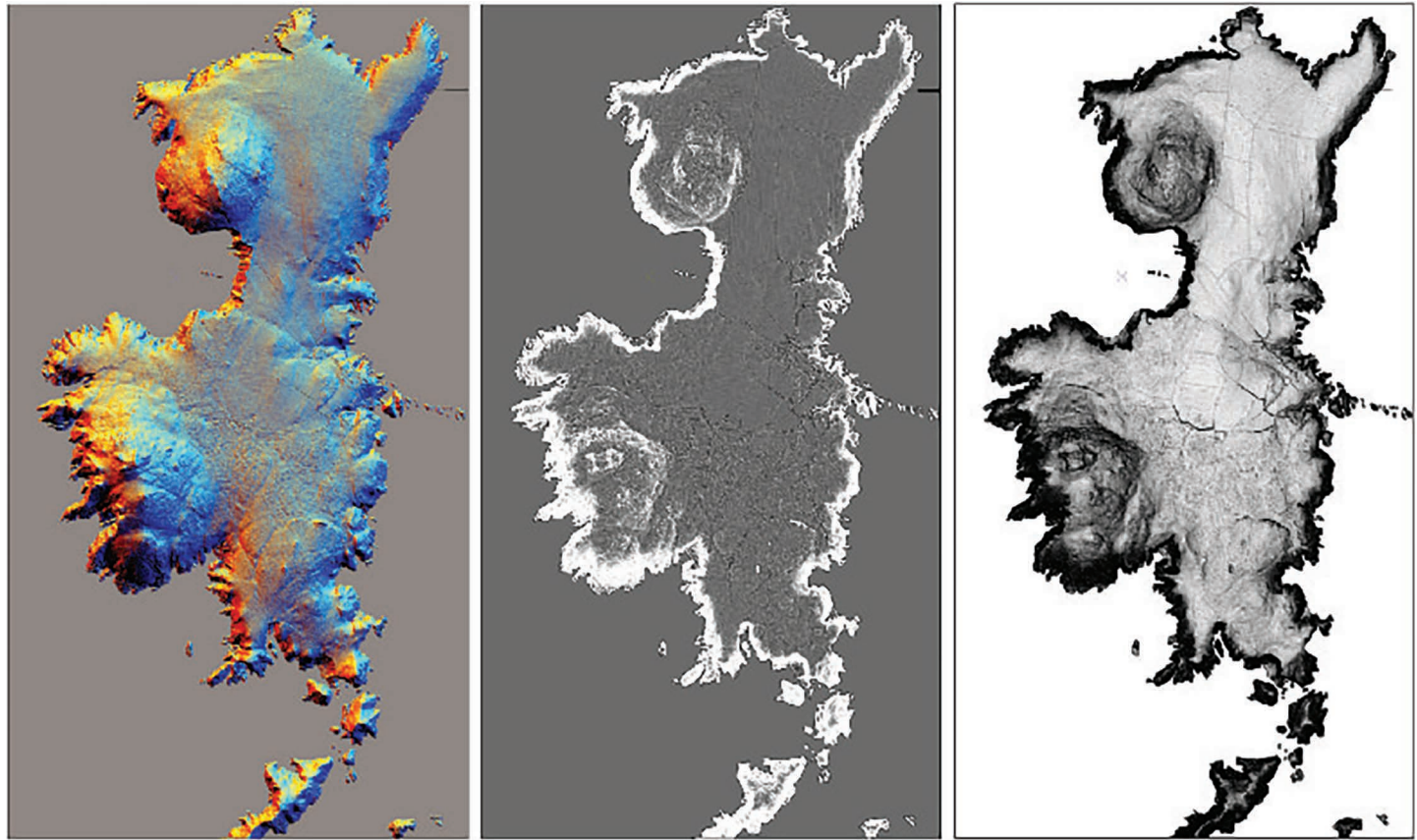
digitally since the project began? Being stuck inside has allowed some of the CHERISH team to reflect on a few of the digital things that we have been up to over the last few years.

One of the first digital pieces of work CHERISH undertook was the acquisition, processing and interpretation of LiDAR (Light Detection And Ranging) data for six Welsh islands. This work involved the use of software to process the laser point data to get it prepared for interrogation for archaeological features. Different visualisations were produced to show 3D representations of the islands’ topography and archaeology using a clever piece of software known as the Real Visualisation Toolbox (RVT) created by the Research Centre of the Slovenian Academy of Sciences and Arts. The different visualisations enabled us to see the islands as never before.

Searching for archaeology on the islands using this impressive dataset was an extremely fruitful exercise. Countless archaeological features (some previously

agus mar phobal rochtain a fháil ar sheandálaíocht agus í a iniúchadh, ná trínár scáileáin ríomhaire. Ach conas is féidir é sin a dhéanamh, conas is féidir linn an tseandálaíocht a ‘chur i gcrích’ ó chompord ár dtithe féin ag úsáid sonraí digiteacha agus cad a bhí CHERISH a dhéanamh go digiteach ó cuireadh tús leis an tionscadal? Agus atáimid gafa laistigh, ligeadh do chuid d’fhoireann CHERISH machnamh a dhéanamh ar roinnt de na rudaí digiteacha a bhí ar bun againn le cúpla bliain anuas.

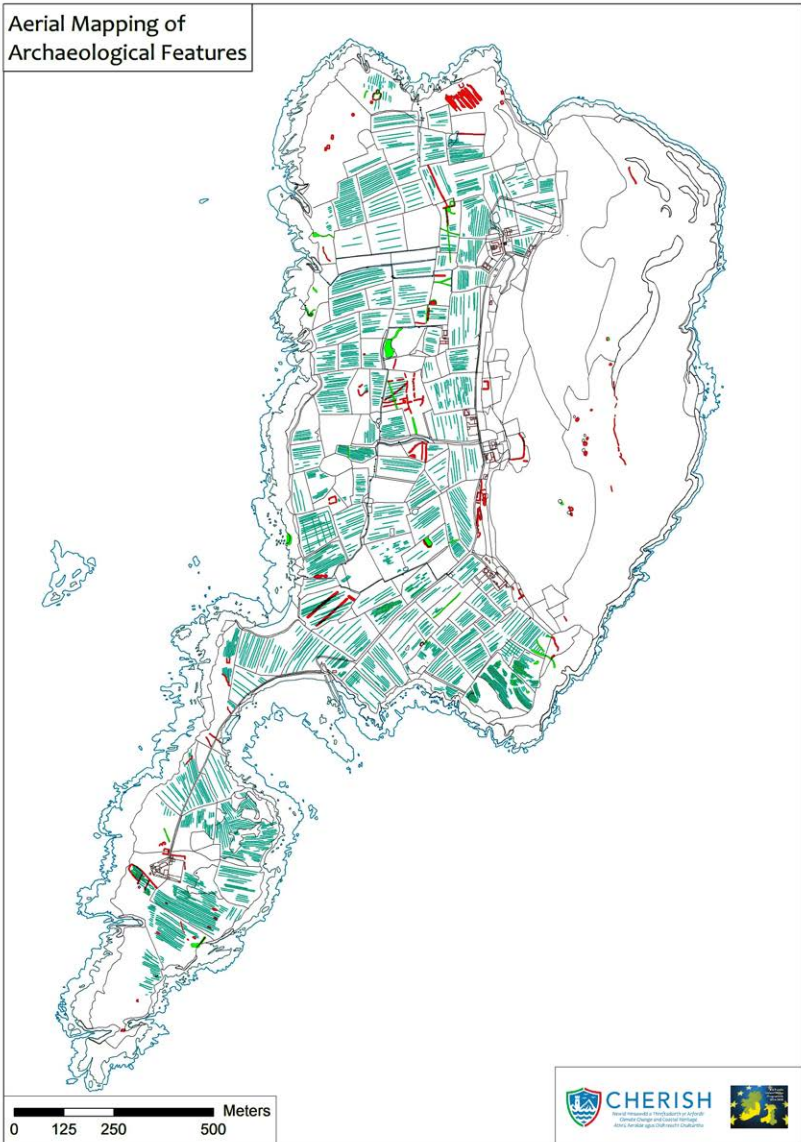
Ba é ceann den chéad saothair dhigiteach a rinne CHERISH ná éadail, próiseáil agus léirmhíniú sonraí LiDAR (Brath agus Réiteach Solais) do shé oileán sa Bhreatain Bheag. Is éard a bhí i gceist leis an obair seo ná bogearraí a úsáid chun sonraí pointe léasair a phróiseáil ionas go n-ullmhófaí iad le haghaidh fiosrúcháin ó thaobh gnéithe seandálaíochta de. Cuireadh léirshamhlacha éagsúla ar fáil chun léirithe 3D de thopagrafaíocht agus seandálaíocht na n-oileán a thaispeáint ag baint úsáide as píosa bogearraí cliste ar a dtugtar an Bosca Uirlisí Fíor-Léirshamhlaithe (RVT) a chruthaigh Ionad Taighde Acadamh Eolaíochtaí agus Ealaíon na Slóivéine. Leis na



Three different LiDAR visualisations of Ramsey Island, Pembrokeshire produced using the Real Visualisation Toolbox. The visualisations show the island ‘digitally illuminated’ through processing height data in a variety of ways.
Trí léirshamhail LiDAR éagsúla ar Oileán Ramsey, Pembrokeshire a táirgeadh ag baint úsáide as an mBosca Uirlisí Fíor-Léirshamhlaithe. Taispeánann na léirshamhlacha an t-oileán ‘soilsiú go digiteach’ trí shonraí airde a phróiseáil ar bhealaí éagsúla.

unknown) were mapped and recorded to produce new maps of all upstanding archaeology on each island, something that had not been done to such detail before. Bardsey Island (located off the tip of the Llŷn Peninsula) was by far the most impressive island mapped. An island coated in Medieval and Post-medieval field systems was revealed on the LiDAR, providing an insight into the farming past of the island. This work was taken further by looking at the historical estate maps created for the Newborough estate in the eighteenth and nineteenth centuries for clues as to how the island was divided and farmed in the past. When overlaying the digitised maps on top of the LiDAR it became clear that some of the ploughed ridge and furrow visible on the LiDAR was in fact related to field systems visible on the historic mapping. However, many of the boundaries still didn’t respect these field boundaries, pushing their dates further back into the Post-medieval period. The remarkable thing was that most of this work had been carried out from an office miles away from Bardsey – a true piece of digital archaeology.

Map showing all visible archaeological features mapped on Bardsey Island, Gwynedd including all of the ridge and furrow shown in green.



léirshamhlacha éagsúla ligtear na hoileáin a fheiceáil ar bhealach nach fhacthas riamh.

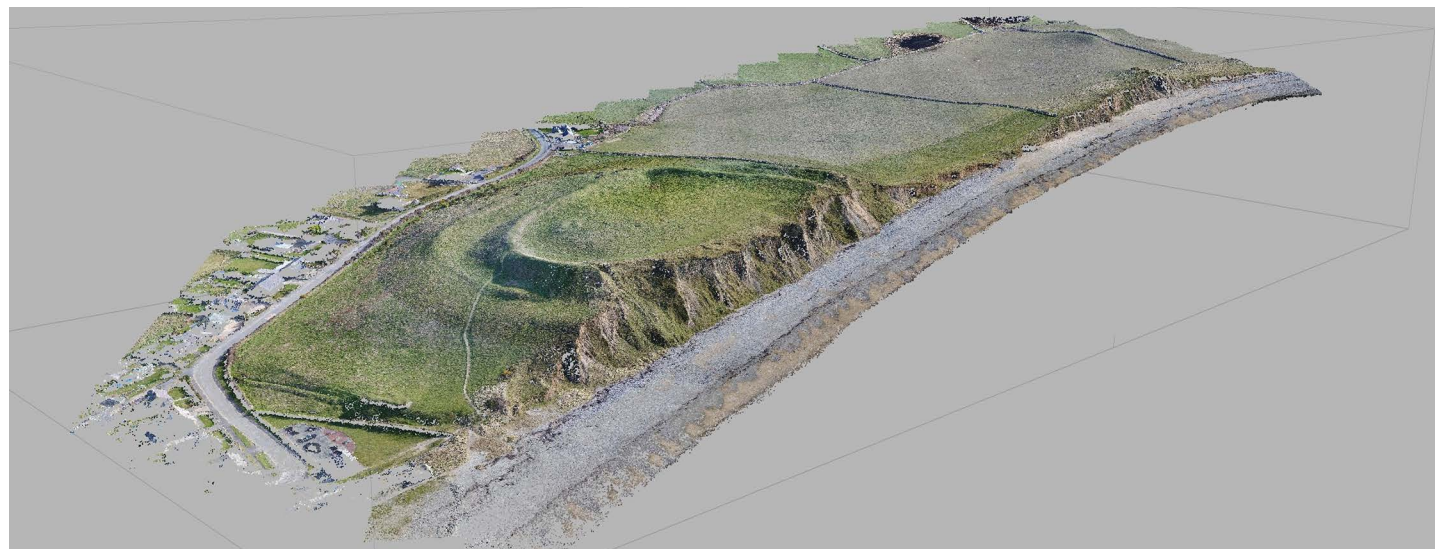
Cleachtadh thar a bheith torthúil ab ea cuardach a dhéanamh ar sheandálaíocht na n-oileán agus an tacar sonraí iontach seo á úsáid. Rinneadh gnéithe seandálaíochta iomadúla (cuid acu nach raibh ar eolas roimhe seo) a mhapáil agus a thaifeadadh chun léarscáileanna nua de gach seandálaíocht sheasmhach ar gach oileán a tháirgeadh, rud nach ndearnadh chomh mionsonraithe sin roimhe seo. Ba é Oileán Bardsey (suite amach ó bharr Leithinis Llŷn) an t-oileán is suntasaí a mapáladh. Nochtadh oileán atá brataithe i gcórais páirceanna Meánaoiseacha agus Iar-mheánaoiseacha ar an LiDAR, rud a thugann léargas ar stair fheirmeoireachta an oileáin. Rinneadh an obair seo a chur chun cinn trí bhreathnú ar na léarscáileanna eastáit stairiúla a cruthaíodh d’eastát Newborough san ochtú haois déag agus sa naoú haois déag le haghaidh leideanna maidir le conas a roinneadh agus a saothraíodh an t-oileán san am

atá thart. Nuair cuireadh na léarscáileanna digiteacha os cionn an LiDAR ba léir go raibh baint ag cuid den iomaire treafa agus an scean atá le feiceáil ar an LiDAR leis na córais pháirceanna atá le feiceáil ar an mapáil stairiúil. Mar sin féin, ní raibh go leor de na teorainneacha i gcomhréir leis na teorainneacha páirce seo fós, rud a bhrú a gcuid dátaí níos faide siar sa tréimhse Iar-mheánaoiseach. An rud iontach a bhí ann ná go ndearnadh an chuid is mó den obair seo ó oifig na mílte ó Bardsey - fíorphíosa seandálaíochta digití.

Léarscáil ina taispeántar na gnéithe seandálaíochta infheicthe go léir atá mapáilte ar Oileán Bardsey, Gwynedd lena n-áirítear an t-iomaire agus an scean go léir a thaispeántar i dtéal.

The use of drones also forms a huge part of CHERISH's digital survey work which is being carried out extensively in both Wales and Ireland. Drones (or UAVs) are steadily becoming a standardised tool used in the recording of archaeology and this is certainly the case on CHERISH where they have been deployed at almost all our sites. In our case, many of our sites are too dangerous to survey by any means other than using drones. High and crumbly cliffs are dangerous and best avoided by us archaeologists! However, these circumstances are where drones come into their own with their ability to record sites and eroding cliffs quickly and safely.

Physically visiting sites is clearly required to collect the initial data which is done by taking hundreds of overlapping aerial photographs; however, most of the work is actually done from the comfort of the office (or bedroom now!). The main aim at the post-processing stage is to take all the photographs of an individual site and 'stitch' them together to create 3D data that can then be turned into numerous different outputs. This is achieved using software such as *Agisoft Metashape* which uses a technique known as photogrammetry to build 3D point cloud data by matching common points between the overlapping 2D photographs. From this process we are left with thousands or sometimes millions of points that represent the true shape and size of the monument (think what the site would look like if millions of small bouncy balls were placed all over the monument).



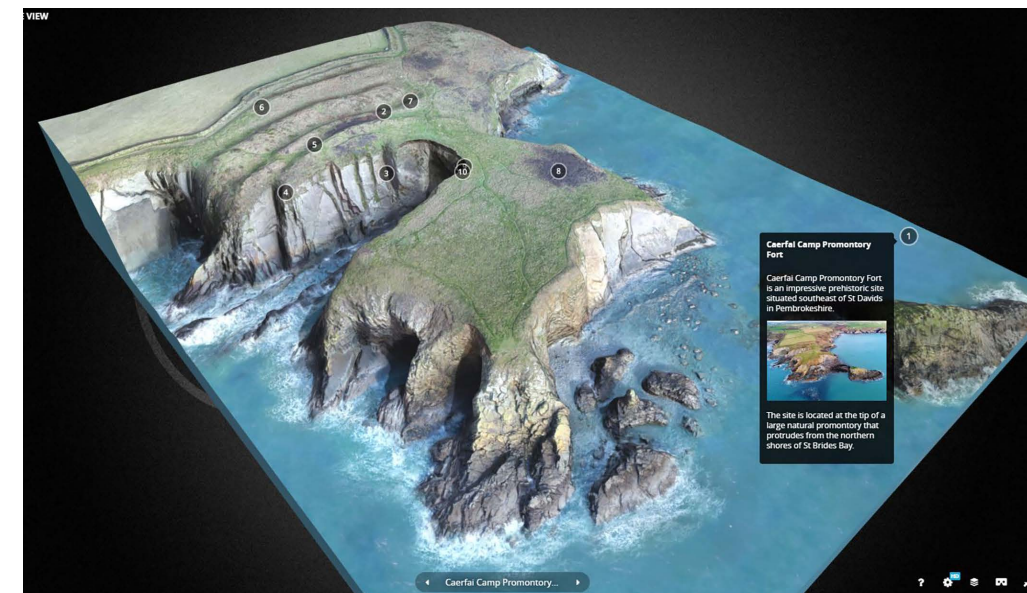
A 3D point cloud of Dinas Dinlle hillfort, Gwynedd.
Néalphointe 3D de dhún cnoic Dinas Dinlle, Gwynedd.

Is cuid ollmhór d'obair shuirbhé dhigiteach CHERISH é an úsáid de ladrainn freisin agus a úsáidtear go fairsing sa Bhreatain Bheag agus in Éirinn. Tá ladrainn (nó UAVanna) ina uirlis chaighdeánaithe beagnach anois, a úsáidtear chun an tseandálaíocht a thaifeadh agus is cinnte gurb amhlaidh an cás i CHERISH áit a ndearnadh iad a úsáid ag beagnach gach ceann dár suíomhanna. Inár gcás, tá go leor dár suíomhanna ró-chontúirteach suirbhé a dhéanamh orthu ar bhealach ar bith seachas trí ladrainn a úsáid. Tá aillte arda agus grabhrógacha contúirteach agus is fearr dúinn mar sheandálaithe iad a sheachaint! Mar sin féin, is sna cúinsí seo a thagann ladrainn i dtreis agus a gcumas suíomhanna agus aillte faoi chreimeadh a thaifeadh ar bhealach tapa agus sábháilte.

Is léir go gcaithfear cuairt fhisiciúil a thabhairt ar shuíomhanna chun na sonraí tosaigh a bhailiú, rud a dhéantar trí na céadta aerfótagraif forluiteacha a thógáil; áfach, déantar an chuid is mó den obair i ndáiríre ó chompord na hoifige (nó ón seomra leapa anois!). Is í an phríomhaidhm ag an gcéim iarphróiseála ná na grianghraif go léir de shuíomh aonair a thógáil agus iad a 'ghreamú' le chéile chun sonraí 3D a chruthú ar féidir iad a iompú ina n-aschur éagsúil iomadúil. Baintear é seo amach trí úsáid a bhaint as bogearraí ar nós Agisoft Metashape a úsáideann teicníc ar a dtugtar fótagraiméadracht chun sonraí néalphointe 3D a thógáil trí phointí coitianta a mheaitseáil idir na grianghraif 2D forluiteacha. Leis an bpróiseas seo, tá na mílte nó na milliúin pointí againn uaireanta a léiríonn fíorchruth agus méid an tséadchomhartha (smaoinigh ar an gcuma a bheadh ar an suíomh dá gcuirfí na milliúin liathróidí preabacha ar fud an tséadchomhartha).

We can use this point data to compare against previously collected data to carry out monitoring work. This is done in software such as *CloudCompare* which takes two point clouds, matches them up and then runs analysis to identify parts of a site that have metrically changed. Quantifying loss and identifying the weaker areas of sites is an important part of CHERISH's work which will help in the management of sites against the complex risks climate change poses. This work has been done to good effect in Ireland where sites such as Dunbeg, County Kerry have suffered huge amounts of loss due to coastal erosion caused by increasing storminess in the region (see page 13).

Another key aim of the project is to raise awareness of the archaeology of sites and the climate change risks they face. Drones also feature heavily in this aspect of our work where we use the drone data to produce digital 3D models to share online and use as outreach tools. We create these models by 'meshing' the points into a solid digital object which can then be shared online. Some of these we create inhouse but we also send off the data to expert 3D modellers (such as our friends at ThinkSee3D) to take our data and turn them into beautiful models that we can then upload to Sketchfab for the public to have a look at and explore. During this period, we have taken the opportunity to produce 'digital tours' using annotations on Sketchfab that highlight the visible (and sometimes hidden) archaeology as well as the types of climate change risks that they face. Have a look yourself!



A Sketchfab model and tour of Caerfai Camp, Pembrokeshire.

Is féidir linn na sonraí pointe seo a úsáid chun comparáid a dhéanamh i gcoinne sonraí a bailíodh roimhe seo chun obair monatóireachta a dhéanamh. Déantar é seo i mbogearraí ar nós CloudCompare a thógann dhá néalphointe, déantar iad a mheaitseáil agus ansin déantar iad a anailísiú chun codanna de shuíomh a bhfuil athrú méadrach tagtha air a shainaithint. Cuid thábhachtach d'obair CHERISH is ea cailteanas a chainníochtú agus na ceantair is laige de shuíomhanna a shainaithint a chabhróidh le bainistíocht suíomhanna i gcoinne na rioscaí casta a bhaineann le hathrú aeráide. Rinneadh an obair seo go héifeachtúil in Éirinn nuair a d'fhulaing suíomhanna mar An Dún Beag, Contae Chiarraí cailteanas ollmhóra mar gheall ar chreimeadh cósta a tharlaíonn de bharr níos mó stoirmeacha sa réigiún (féach leathanach 13).

Príomhspríoc eile atá ag an tionscadal ná feasacht a mhúscaill faoi sheandálaíocht suíomhanna agus na rioscaí a bhaineann le hathrú aeráide. Tá ladrainn le feiceáil go mór sa ghné seo dár gcuid oibre ina n-úsáideann muid na sonraí ladrainn chun samhlacha digiteacha 3D a tháirgeadh chun iad a roinnt ar líne agus úsáid a bhaint astu mar uirlisí for-rochtana. Cruthaímid na samhlacha seo trí na pointí a 'mheascadh' i réad digiteach soladach a fhéadtar a roinnt ar líne. Cruthaímid roinnt acu seo go himheánach ach seolaimid na sonraí chuig samhaltóirí 3D saineolacha (mar shampla ár gcairde ag ThinkSee3D) chun ár gcuid sonraí a thógáil agus iad a iompú ina samhlacha áille ar féidir linn iad a uaslódáil ansin chuig Sketchfab ionas go bhféadfadh an pobal breathnú orthu agus iniúchadh a dhéanamh

orthu. Le linn na tréimhse seo, thapaíomar an deis 'turais dhigiteacha' a tháirgeadh ag baint úsáide as anótaí ar Sketchfab a leagann béim ar an tseandálaíocht infheicthe (agus a fhéadfadh bheith i bhfolach uaireanta) chomh maith leis na cineálacha rioscaí athraithe aeráide atá rompu. Féach orthu tú féin!

Múnla Sketchfab agus turas timpeall Campa Caerfai, Pembrokeshire.

3D printing is also becoming a popular way of bringing digital data back into the real world to use as effective outreach tools. Before the lockdown we were keen to get a few of our sites printed to help us in our public engagement work. Thankfully, we were able to get a lovely print of Dinas Dinlle in Gwynedd which has been used instrumentally in describing the site and highlighting how it is being affected by coastal erosion. In the future we hope to take this work forward and to begin to develop site reconstructions and digital animations showing how sites previously appeared and how climate change is dramatically changing their appearance today, so watch this space.

Tá tóir ar phriontáil 3D freisin anois chun 'beocht' a thabhairt do shonraí digiteacha agus úsáid a bhaint astu mar uirlisí for-rochtana éifeachtacha. Roimh an dianghlasáil bhí fonn orainn roinnt dár suíomhanna a phriontáil chun cabhrú linn inár gcuid oibre rannpháirtíochta poiblí. Ar ámharaí, bhíomar in ann cló álainn a fháil de Dinas Dinlle in Gwynedd a úsáideadh go hionstraimeach chun cur síos a dhéanamh ar an suíomh agus chun aird a tharraingt ar an gcaoi a dtéann creimeadh cósta i bhfeidhm air. Amach anseo tá súil againn an obair seo a thabhairt ar aghaidh agus tús a chur le hathfhoirgníú láithreán agus le beochan dhigiteach, d'fhonn a thaispeáint conas a bhí suíomhanna le feiceáil roimhe seo agus an chaoi a bhfuil athrú mór ag teacht orthu inniu mar gheall ar athrú aeráide, mar sin féach ar an spás seo.



Engaging with schools using drones and 3D models.
Idirchaidreamh le scoileanna ag úsáid ladrann agus samhlacha 3D.

Whilst being in lockdown has hindered some aspects of our work, it is clear that the digital ways of 'doing' archaeology are steadily becoming mainstream practices, especially in the archaeological survey world. We can never substitute fieldwork purely with remote and digital methods but extended time in the office or at home has allowed many of the CHERISH team to reflect and take stock of the data and information gathered during the last three years. For example, we have been able to go back through digital data collected in the field in order to reprocess and reinterpret sites to make them more accessible to the public in the digital domain. The current lockdown situation has forced us to adapt our methods and drive a change in how we work, not only with the archaeology but with each other as a team. Using digital methods both for our archaeological work and to stay in touch with the team has proved vital to keep the project on course and we all hope to come out of this situation stronger as a team with plenty of interesting results to share.

Cé gur chuir bac ar roinnt gnéithe dár gcuid oibre de bharr an dianghlasála, is léir go bhfuil na bealaí digiteacha chun an tseandálaíocht a 'chur i gcrích' ag éirí níos coitianta mar chleachtais phríomhshrutha, go háirithe i réimse na suirbhéireachta seandálaíochta. Ní féidir linn obair allamuigh a chur in ionad modhanna cianda agus digiteacha amháin ach le ham breise san oifig nó sa bhaile, ligeadh do go leor d'fhoireann CHERISH na sonraí agus an fhaisnéis a bailíodh le trí bliana anuas a mhachnamh agus a mheas. Mar shampla, d'éirigh linn dul ar ais trí shonraí digiteacha a bailíodh ar an láthair d'fhonn suíomhanna a athphróiseáil agus a athmhíniú chun iad a dhéanamh níos inrochtana don phobal sa réimse digiteach. Leis an dianghlasáil atá ann faoi láthair, cuireadh iallach orainn ár modhanna a oiriúnú agus athrú a spreagadh maidir leis an gcaoi a n-oibrímid, ní amháin leis an tseandálaíocht ach lena chéile mar fhoireann. Bhí sé ríthábhachtach modhanna digiteacha a úsáid le haghaidh ár gcuid oibre seandálaíochta agus chun fanacht i dteagmháil leis an bhfoireann chun an tionscadal a choinneáil ar an gcúrsa agus tá súil againn go léir teacht amach as an staid seo níos láidre mar fhoireann le neart torthaí suimiúla le roinnt.



A lockdown CHERISH team meeting.
Cruinniú foirne dianghlasála CHERISH.

PUFFTY'S FACT FILE / COMHAD FÍRICÍ PUFFTY

Despite being house bound, CHERISH mascot and team member Puffty-Hump has managed to collate some interesting facts and figures relating to climate change, coastal heritage and our project. Did you know...

In ainneoin a bheith gafa sa teach, d'éirigh le sonóg CHERISH agus ball foirne Puffty-Hump roinnt fíricí agus figiúirí spéisiúla a bhaineann le hathrú aeráide, oidhreacht chósta agus lenár dtionscadal a chur le chéile. An raibh a fhios agat...



Despite not being able to meet up with friends, Puffty has enjoyed watching all their antics on the Skomer Island webcam. In ainneoin nach raibh sé in ann bualadh le cairde, bhain Puffty taitneamh as breathnú ar a gcuid pleidhíocht go léir ar cheamara gréasáin Oileán Skomer.



Puffty has been enjoying life in the luxury and comfort of the CHERISH Project Manager's house. Clare has been spoiling Puffty! Tá Puffty ag baint suilt as an saol i só agus i gcompord teach Bhainisteoir Tionscadail CHERISH. Tá milleadh ceart á dhéanamh ar Puffty ag Clare

Global emissions of CO₂ are estimated to fall by around 8% in 2020 due to the reduced human activity resulting from COVID-19; however average monthly atmospheric CO₂ for March and April are still higher than the same months in 2019.

Crickets can tell you the temperature! Count how many chirps this noisy little insect makes in 25 seconds. Divide this number by 3, then add 4 and this will give you the temperature in degrees Celsius.

The United Kingdom and Ireland are fringed by fragile, distinct and species-rich reef habitats such as cold-water coral reefs, biogenic reefs and rocky reefs. They are highly sensitive to changes in water temperature, pollution and human disturbance.

Saltmarshes are able to capture more CO₂ for the same sized area of any other natural habitat, including rainforests. Furthermore, because of their ability to trap sediment, they can also grow in response to sea-level rise.

February 2020 was confirmed to be the wettest February on record in Wales. According to the Met Office, Wales recorded 288.4 millimetres of rainfall during the month. This is 260% of its February average, and led to devastating flooding. This has been followed by the second driest May on record.

Meastar go dtitfidh astaíochtaí domhanda CO₂ thart ar 8% in 2020 mar gheall ar an laghdú ar ghníomhaíocht dhaonna de bharr COVID-19; tá CO₂ atmaisféarach míosúil ar an meán do mhí an Mhárta agus do mhí Aibreáin níos airde fós ná na míonna céanna in 2019.

Is féidir le criogair an teocht a insint duit! Comhaireamh cé mhéad bíogarnach a dhéanann an fheithid bheag ghlórach seo i 25 soicind. Roinn an uimhir seo faoi 3, ansin cuir 4 leis agus tabharfaidh sé seo an teocht duit i gcéimeanna Celsius.

Ar imeall na Ríochta Aontaithe agus na hÉireann, tá gnáthóga sceire leochaileacha, sainiúla agus saibhre ó thaobh speicis de mar sceireacha coiréil fuaruisce, sceireacha bithghéineacha agus sceireacha creagacha. Tá siad thar a bheith íogair ó thaobh athruithe i dteocht an uisce de, agus ó thaobh truaillithe agus suaithheadh daonna de.

Tá sé de chumas ag riasca goirt níos mó CO₂ a ghabháil don limistéar ar an méid céanna agus aon ghnáthóg nádúrtha eile, lena n-áirítear foraoisí báistí. Ina theannta sin, mar gheall ar a gcumas dríodar a ghabháil, is féidir leo fás freisin mar fhreagairt ar ardú i leibhéal na farraige.

Deimhníodh gurb é mí Feabhra 2020 an mí Feabhra is fliche a taifeadadh riamh sa Bhreatain Bheag. De réir na hOifige Meitéareolaíochta, thaifead an Bhreatain Bheag 288.4 milliméadar báistí i rith na míosa. Is é seo 260% dá mheán do mhí Feabhra, agus bhí tuilte tubaisteacha mar thoradh air. Ina dhiaidh sin bhí an dara mhí Bhealtaine is tirime a taifeadadh riamh.

MEET THE CHERISH TEAM / CAS LE FOIREANN CHERISH

Linda Shine, The Discovery Programme: Centre for Archaeology and Innovation Ireland

I am the Public Engagement and Outreach Officer at the Discovery Programme in Dublin where my role is to facilitate the communication of our research and activities to as wide an audience as possible. I've been working with the CHERISH project since we planned the official launch of the project in March 2017.

I graduated from National University of Ireland, Galway with a BA in Archaeology and History and I loved Galway so much I stayed for another two years to complete an MA in Archaeology. I have had a varied working life working in both commercial and public sector archaeology. I was lucky enough to get the opportunity to work as an Archaeologist in the National Monuments Service and later as an Assistant Keeper in the National Museum of Ireland. More recently I have worked on community heritage projects.

I had my first experience of working on a multi-agency project when I took up a position in the University of Ulster and began work on the Breifne Project, which aimed to use the natural and cultural heritage of an area of north-west Ireland to encourage tourism. The Geological Survey Ireland were project partners in the Breifne Project and CHERISH has given me the opportunity to renew some of those working collaborations.

My love of research led me back to university, this time

Linda Shine, An Clár Discovery: Ionad Seandálaíochta agus Nuálaíochta na hÉireann.

Is mise an tOifigeach Rannpháirtíochta Poiblí agus For-rochtana ar an gClár Discovery i mBaile Átha Cliath áit a bhfuil sé mar ról agam cumarsáid ár gcuid taighde agus gníomhaíochtaí a éascú do lucht féachana atá chomh héagsúil agus is féidir. Bhí mé ag obair le tionscadal CHERISH ó phleanálar seoladh oifigiúil an tionscadail i mí an Mhárta 2017.

Bhain mé céim amach in Ollscoil Náisiúnta na hÉireann, Gaillimh le BA sa tSeandálaíocht agus Stair agus bhí mé i ngrá leis an nGaillimh an oiread sin gur fhan mé ar feadh dhá bhliain eile chun MA sa tSeandálaíocht a bhaint amach. Bhí saol oibre éagsúil agam ag obair sa tseandálaíocht san earnáil thráchtála agus phoiblí araon. Bhí an t-ádh orm an deis a fháil oibriú mar Sheandálaí i Seirbhís na Séadchomharthaí Náisiúnta agus ina dhiaidh sin mar Choimeadaí Cúnta in Ard-Mhúsaem na hÉireann. D'oibrigh mé le déanaí ar thionscadail oidhreachta pobail.

Den chéad uair, fuair mé taithí ar obair ar thionscadal ilghníomhaireachta nuair a ghlac mé post in Ollscoil Uladh agus thosaigh mé ag obair ar an Tionscadal Breifne, a raibh sé mar aidhm aige oidhreacht nádúrtha agus chultúrtha limistéar in iarthuaisceart na hÉireann a úsáid chun turasóireacht a spreagadh. Bhí Suirbhéireacht Gheolaíochta na hÉireann ina gcomhpháirtithe tionscadail sa Tionscadal Breifne agus thug CHERISH an deis dom cuid de na comhoibrithe oibre sin a athnuachan.



to Trinity College Dublin to complete a PhD in Medieval Archaeology. My research focused on the evidence for cross-cultural interactions in the settlement record with case studies in my home county of Kilkenny and also in Cavan.

My involvement in the CHERISH project includes organising events, particularly during National Heritage Week, contributing to exhibitions, social media campaigns and generally promoting the project both to the professional communities and the local coastal communities where we are conducting our research.

Hywel Griffiths, Aberystwyth University

After studying for a degree in physical geography and mathematics and a Masters in River Basin Dynamics and Hydrology, my PhD focused on understanding the rates, processes and controls of historical river channel instability on rivers in Wales. I am now a senior lecturer in the Department of Geography and Earth Sciences, and my research has expanded to include human-environment interactions and social and cultural perceptions of the environment. In my role in the CHERISH project I apply my experience of studying erosion in rivers to coastal environments to reconstruct historical coastal dynamics and monitor contemporary erosion at key sites. This involves combining analysis of historical maps and aerial photography, surveys using GNSS and UAVs and more qualitative methods such as Rapid Coastal Zone Assessments. I am a field geomorphologist at heart and have enjoyed the opportunity to help CHERISH colleagues survey coastal environments, extract sediment cores and samples and interpret landscapes and landforms.

Having grown up in south west Wales, spending countless

Mar gheall ar mo ghrá don taighde d'fhill mé ar ais ar an ollscoil, an uair seo go Coláiste na Tríonóide, Baile Átha Cliath chun PhD sa tSeandálaíocht Mheánaoiseach a chur i gcrích. Dhírigh mo chuid taighde ar an bhfianaise maidir le hidirghníomhaíochtaí traschultúrtha sa taifead lonnaíochta le cás-staidéir i mo chontae dúchais, Cill Chainnigh agus sa Chabhán freisin.

Is é an pháirt atá agam i dtionscadal CHERISH ná imeachtaí a eagrú, go háirithe le linn na Seachtaine Náisiúnta Oidhreachta, rannchuidiú le taispeántais, feachtais sna meáin shóisialta agus an tionscadal a chur chun cinn go ginearálta do na pobail ghairmiúla agus do na pobail chósta áitiúla ina bhfuilimid ag déanamh ár gcuid taighde.

Hywel Griffiths, Ollscoil Aberystwyth

Tar éis dom staidéar a dhéanamh ar chéim sa tíreolaíocht fhisiciúil agus sa mhatamaitic agus Máistreacht i nDinimic agus Hidreolaíocht Abhantraí, dhírigh mo PhD ar thuiscint a fháil ar rátaí, próisis agus rialuithe d'éagobhsaíocht stairiúil cainéil abhann ar aibhneacha sa Bhreatain Bheag. Is léachtóir sinsearach mé anois sa Roinn Tíreolaíochta agus Domhaneolaíochta, agus chuir mé le mo chuid taighde chun idirghníomhaíochtaí idir an timpeallacht dhaonna agus braistintí sóisialta agus cultúrtha ar an

gcomhshaol a chur san áireamh. I mo ról i dtionscadal CHERISH úsáidim mo thaithí ar staidéar um chreimeadh in aibhneacha agus i dtimpeallachtaí cósta chun dinimic stairiúil cósta a athchruthú agus monatóireacht a dhéanamh ar chreimeadh comhaimseartha ag príomhláithreáin. Áirítear leis seo anailís ar léarscáileanna stairiúla agus aerfótagrafaíocht, suirbhéanna GNSS agus UAVanna agus modhanna níos cáilióchtúla mar Mhear-Mheasúnuithe Chrios Cósta, a chomhcheangal. Is geomoirfeolaí allamuigh mé i mo chroí istigh agus thapaigh mé an deis cabhrú le comhghleacaithe CHERISH suirbhéireacht a dhéanamh ar thimpeallachtaí cósta, croileacáin



day trips around the Pembrokeshire coast, and the last eighteen years in and around Aberystwyth, it has been fantastic to revisit and learn more about the evolution of familiar sites. Working with partners from Ireland has also been great, as I have a passionate interest in Irish history and culture. Outside work (and increasingly as part of work) I write poetry about landscape and language, among other things, and I am interested in how poetry and science can work together, for example for community engagement and outreach. Some of my poetry will feature on the forthcoming CHERISH exhibition.

agus samplaí dríodair a bhaint, chomh maith le tírdhreacha agus tírghnéithe a léirmhíniú.

D'fhás mé suas in iardheisceart na Breataine Bige, ag caitheamh turas lae iomadúil timpeall chósta Pembrokeshire, agus le hocht mbliana déag anuas in Aberystwyth agus thar timpeall, b'iontach an rud é filleadh ar éabhlóid de shuíomhanna a bhfuil aithne agam orthu agus níos mó a fhoghlaim fúthu. Bhí sé iontach ag obair le comhpháirtithe as Éirinn, mar tá suim mhór agam i stair agus i gcultúr na hÉireann. Lasmuigh den obair, scríobhaim filíocht faoi thírdhreach agus teanga, (agus de réir a chéile mar chuid den obair), i measc rudaí eile, agus tá suim agam sa chaoi ar féidir le filíocht agus eolaíocht oibriú le chéile, mar shampla le haghaidh rannpháirtíochta pobail agus for-rochtana. Beidh cuid de mo chuid filíochta le feiceáil ar an taispeántas CHERISH atá le teacht.

Caerfai Camp, Pembrokeshire
Campa Caerfai, Pembrokeshire



DATES FOR YOUR DIARY

In line with Government advice, face-to-face CHERISH activities including our travelling exhibition, talks, day schools and conferences are currently on hold or postponed. In the meantime, we're participating and engaging in as many virtual activities as possible. Keep in touch with our website and social media changes as new events and further updates will be posted here.

DÁTAÍ LE BREACADH SA DIALANN

De réir chomhairle an Rialtais, tá gníomhaíochtaí duine-le-duine CHERISH lena n-áirítear ár dtaispeántas camchuarite, cainteanna, scoileanna lae agus comhdhálacha ar fionraí nó curtha siar faoi láthair. Idir an dá linn, táimid ag glacadh páirte agus ag gabháil don oiread gníomhaíochtaí fíorúla agus is féidir. Coinnigh i dteagmháil lenár suíomh Gréasáin agus leis na meáin shóisialta de réir mar a chuirfear imeachtaí nua agus nuashonruithe breise suas anseo.

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