



CHERISH

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

Nuachtlitir

CHERISH

News

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Sheep Island, Copper Coast, Co. Waterford.

Oileán na gCaorach, Cósta an Chopair, Contae Phort Láirge.

Front Cover: The parched landscape of Bardsey Island, Gwynedd, taken in July 2018 during the summer's exceptional drought, on a CHERISH reconnaissance flight.

An Clúdach Tosaigh: Tírdhreach stiúgtha Oileán Bardsey, Gwynedd, a glacadh in Iúil 2018 i rith an triomaigh ar leith a rabhamar thíos leis i rith an tsamhraidh, ar eitilt taiscéalaíochta CHERISH.

WELCOME

to Issue 3 of CHERISH News

Welcome to the third issue of the CHERISH newsletter which marks the end of the second year of our five-year project. This issue brings you the highlights between June and December 2018, including the new archaeological discoveries made during this summer's unprecedented spell of hot, dry weather; CHERISH events on both sides of the water as part of National Heritage Week, Ireland; and further exploratory trips out to remote islands and headlands across Ireland and Wales.

For day-to-day news and features – and to see where the CHERISH team is working – don't forget to look at our website, Facebook and Twitter pages, details of which can be found below.

FÁILTE

chuig Eagrán 3 de nuacht CHERISH

Fáilte chuig an tríú heagrán de nuachtlitir CHERISH a dhéanann ceiliúradh ar dheireadh an dara bliana dár dtionscadal cúig bliana. Luaitear na buaicphointí idir Meitheamh agus Nollaig 2018 san eagrán seo, na hiarsmaí nua seandálaíochta ina measc a rinneadh i rith na tréimhse d'aimsir the thirim nár thit a leithéid amach roimhe seo; imeachtaí CHERISH ar an dá thaobh den uisce mar chuid de Sheachtain Oidhreacht Náisiúnta na hÉireann; agus turais bhreise thaiscéalaíochta a tugadh ar oileáin agus cinn tíre iargúlta ar fud na hÉireann agus na Breataine Bige.

Chun teacht ar nuacht agus gné-ailt laethúla – agus lena thabhairt faoi deara cá bhfuil foireann CHERISH ag oibriú – ná déan dearmad súil a chaitheamh ar ár láithreán gréasáin, leathanaigh Facebook agus Twitter, agus is féidir teacht ar shonraí fúthu siúd thíos.



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CHERISH Project



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ABOUT CHERISH / EOLAS FAOI CHERISH

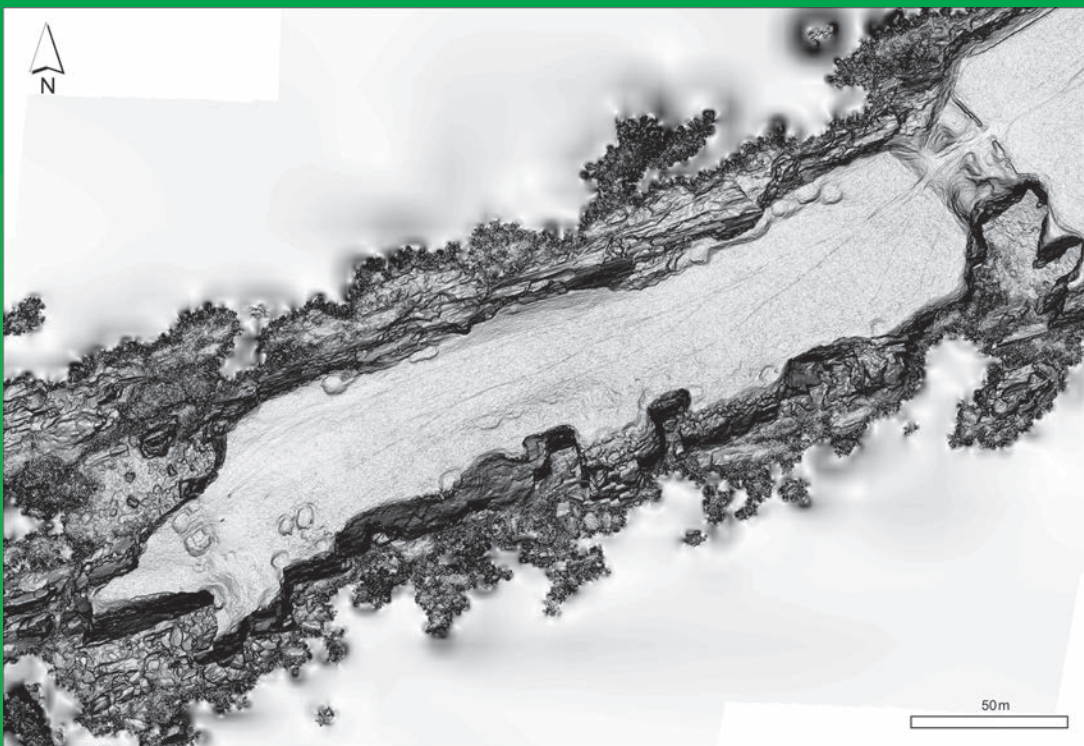
CHERISH is a five-year Ireland-Wales project, bringing together four partners across two nations: the Royal Commission on the Ancient and Historical Monuments of Wales; the Discovery Programme, Ireland; Aberystwyth University: Department of Geography and Earth Sciences; and Geological Survey Ireland. It began in January 2017 and will run until December 2021; it will receive €4.1 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 cúig bliana idir Éire agus an Bhreatain Bheag é CHERISH, a thugann le chéile ceithre chomhpháirtí ó dhá náisiún: an Coimisún Ríoga ar Shéadchomharthaí Ársa agus Stairiúil na Breataine Bige; an Clár Fionnachtana, Éire; Ollscoil Aberystwyth: Roinn na Tíreolaíochta agus Domhaneolaíochtaí; agus Suirbhéireacht Gheolaíochta na hÉireann. Thosaigh sé in Eanáir 2017 agus rithfidh sé go dtí mí na Nollag 2021; maoineofar é le €4.1 milliún ó chistí an AE tríd an gClár Comhoibríochta Éire – an Bhreatain Bheag 2014–2020.

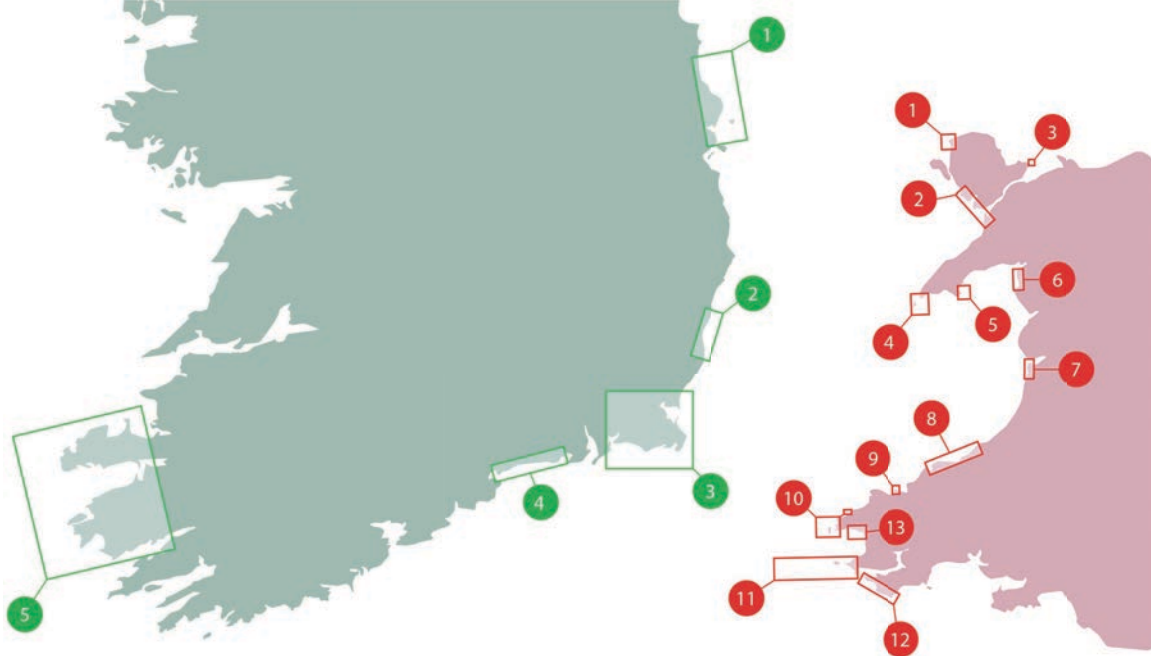
Is tionscadal trasdisciplíneach amach is amach é CHERISH a bhfuil mar aidhm aige cur le heolas an phobail agus leis an tuiscint atá againn ar an athrú aeráide, ar stoirmeacha agus ar theagmhais aimsire eisceachtúla san am atá caite, atá anois ann agus atá le teacht fós, agus an éifeacht atá acusan ar oidhreacht chultúrtha shaibhir ár gcósta agus ár bhfarraige. Nascaimid an talamh agus an fharraige, agus bainimid úsáid as teicnící agus modhanna éagsúla chun staidéar a dhéanamh ar chuid de na ceantair chósta is iocónaí in Éirinn agus sa Bhreatain Bheag. Cuimsíonn na teicnící seo scanadh léasair on aer agus trastíre, mapáil a dhéanamh de

ghrinneall na farraige agus suirbhéireacht geoifisiceach, sampláil pailéachomhshaoil, tochailt agus monatóireacht ar longa báite.



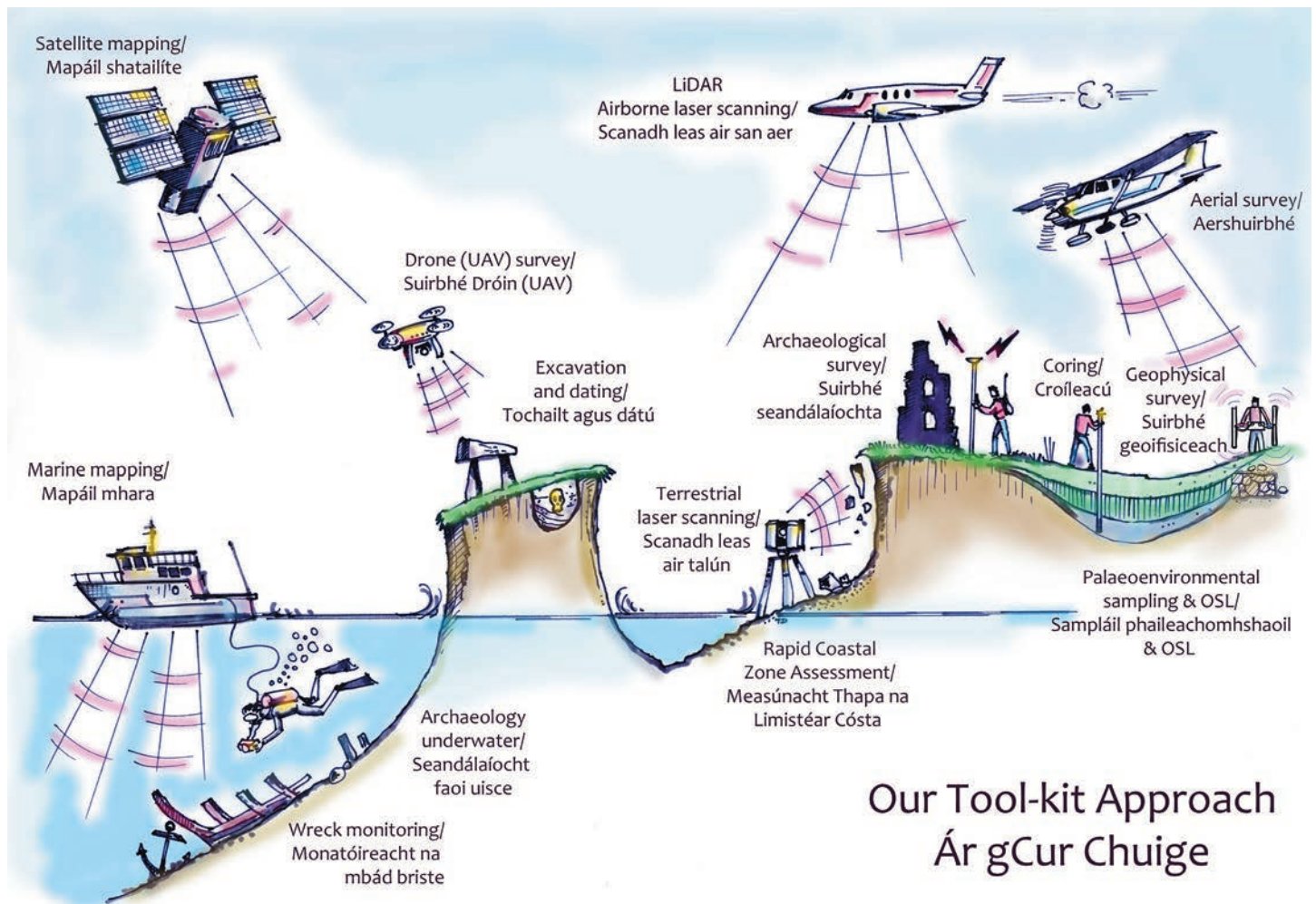
Digital Elevation Model generated from a UAV (Unmanned Aerial Vehicle) survey of Ferriter's Castle at the north-western fringes of the Dingle peninsula, Co. Kerry.

Samhail Dhigiteach den Airde a gineadh ó shuirbhé UAV (Aerfheithicil gan Fhoireann) ar Chaisleán an Fheirtéaraigh ar imill thuaidh thiar de leithinis an Daingin, Contae Chiarraí.



During our first year of the project we worked hard with agencies, stakeholders, landowners and local groups to finalise our joint-nation working areas. These have been selected on the basis of knowledge and data gaps (particularly islands and remote headlands), priority areas of erosion risk or where there is potential to collaborate on survey work. Visit the 'Activities' section of our project website for a clickable map where you can learn more about each study area.

I rith na chéad bhliana den tionscadal, rinneamar tréanobair le gníomhaireachtaí, le páirtithe leasmhara, le húinéirí talún agus le grúpaí áitiúla chun réimsí oibre an dá náisiún a shocrú. Roghnaíodh iad siúd ar bhonn eolais agus bearnaí sonraí (go háirithe na hoileáin agus ceann tíre iargúlta), ceantair atá i mbaol creimidh tromchúiseach, agus deiseanna comhoibrithe ar obair shuirbhéireachta. Tabhair cuairt ar an rannóg 'Gníomhaíochtaí' inár suíomh gréasáin. Feicfidh tú léirs cáil ar féidir a chliceáil agus tuilleadh a fhoghlaim faoi gach ceantar staidéir.



Our Tool-kit Approach Ár gCur Chuige

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.

Cur chuige comhtháite ar shuirbhéireacht ar thalamh agus faoin bhfarraige. Léiríonn an grafaic seo ar an modh is fearr, an cur chuige ildisciplíneach ar an taifeadadh muirí agus cósta atá a úsáid ag CHERISH sa Bhreatain Bheag agus in Éirinn.

HIGHLIGHTS JUNE–DECEMBER 2018

BUAICPHOINTÍ MEITHEAMH–NOLLAIG 2018



Hollie Wynne, Patrick Robson and Puffty percussion coring the relict sand dunes near Borth in Ceredigion.

Hollie Wynne, Patrick Robson agus Puffty percussíon coring agus na dùmha iarmharacha á gcnag-chroileacú acu i ngar do Borth in Ceredigion.

DATA GATHERING FROM THE AIR, ON SEA AND LAND / SONRAÍ A BHAILIÚ ÓN AIR, AR MUIR AGUS AR TALAMH

The CHERISH project is all about joint working, combining the skills and expertise of the four partners to work as a single CHERISH Survey Team. It's also about combining survey techniques in our study areas, using a 'toolkit' approach to tackle a site from every angle – the more difficult and remote the better!

We're making great progress and in the past six months have continued to gather highly accurate baseline data from which we can monitor future impacts of climate change. We have also retrieved more sediment cores and samples for optically stimulated luminescence (OSL) dating to establish records of past environments and storminess. We've made new discoveries, visited some remote places and met some wonderful people.

Is éard a bhaineann le tionscadal CHERISH ná chomhoibriú, scileanna ag oibriú saineolas an cheathair chomhpháirtithe a thabhairt le chéile chun oibriú mar Fhoireann Suirbhéireachta aonair CHERISH. Is éard a bhaineann leis, chomh maith, ná teicnící suirbhéireachta a thabhairt le chéile inár limistéir staidéir, trí úsáid a bhaint as cur chuige 'uirlisí' chun dul i ngleic le gach gné de láithreán – dá chasta agus dá iargúlta atá an láithreán, is é is fearr!

Tá dul chun cinn iontach á dhéanamh againn agus le sé mhí anuas leanamar le sonraí bonnlíne an-chruinne a bhailiú ónár féidir linn monatóireacht a dhéanamh ar an tionchar a imreoidh athrú aeráide amach anseo. Chomh maith leis sin, rinneamar níos mó croileacáin dríodair agus samplaí chun lonracht a spreagtar go hoptúil (OSL) a dhátú chun taifid ar thimpeallachtaí agus aimsir stoirme roimhe seo a dheimhniú. Tháingamar ar rudaí nua, thugamar cuairt ar roinnt áiteanna iargúlta agus chasamar le roinnt daoine iontacha.

Cardigan Island. Landing on islands isn't always easy and having lots of equipment makes life even more difficult!
Oileán Cardigan. Ní fusa teacht i dtír ar oileáin i gcónaí agus is deacrú a bhíonn sé nuair a bhíonn go leor trealaimh agat!

On the sea, marine surveying has continued unabated with 150 km² of bathymetric coverage completed in CHERISH areas. This largely completes the bathymetric surveys along the east and south coasts of Ireland and marks a start on the west coast with an 8 km² area in the west at Smerwick Harbour, Dingle surveyed, for which the results are eagerly anticipated.

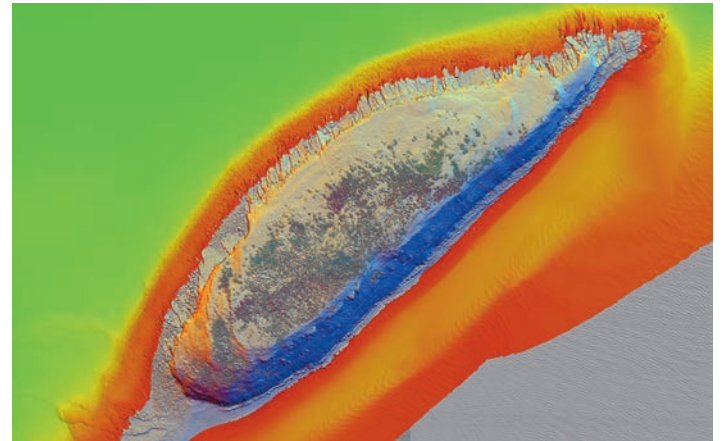
Puffin Island seamless onshore-offshore map derived from marine survey and LiDAR data.



The RV Keary and her crew, docked at Menai Bridge and flying the Welsh flag in August.

Marine surveys also became international, with the RV Keary travelling to Wales in August 2018 and surveying 12 km² of the seabed off the east coast of Anglesey. Results include an almost seamless onshore-offshore map of Puffin Island, which we hope to complete using UAVs. Little remained of the shipwreck targets surveyed, with only the SEAHOW identifiable as a vessel, the granite setts cargo of the WERN visible, and a debris field where the River Loyne had existed. The other shipwrecks were not discovered and pose questions as to whether they are now buried by sediment, completely destroyed by marine processes, or not at/have been transported from their recorded positions.

Lean suirbhéireacht mhuirí ar muir ar aghaidh gan deacracht agus tugadh 150 km² de chumhdach bataiméadrach i limistéir CHERISH chun críche. Déanann seo na suirbhéireachtaí bataiméadracha feadh chóstaí thoir agus theas na hÉireann a thabhairt chun críche den chuid is mó agus tosaíodh ar an gcósta thiar i ndiaidh gur ndearnadh suirbhé ar limistéar 8 km² san iarthar ag Cuan Ard na Caithne, an Daingean, a bhfuiltear ag súil go mór leis na torthaí.



Léarscáil gan uaim ar an gcladach-amach ón gcósta d'Oileán na gCánóg atá bunaithe ar shonraí LiDAR agus suirbhéireachta muirí.



An RV Keary agus a foireann, tagtha le balla ag Droichead Menai agus bratach na Breataine Bige ar foluain air i Lúnasa.

Rinneadh suirbhéireachtaí muirí go hidirnáisiúnta, chomh maith, agus thaistil an RV Keary go dtí an Bhreatain Bheag i Lúnasa 2018 agus rinne sé suirbhéireacht ar 12 km² de ghrinneall na farraige amach ó chósta thoir Anglesey. I measc na dtorthaí tá léarscáil ar an gcladach-amach ón gcósta gan uaim d'Oileán na gCánóg, a bhfuil súil againn é a chríochnú trí úsáid a bhaint as UAVanna. Ba bheag a bhí fágtha de na spriocanna longa báite ar a ndearnadh suirbhéireacht, agus ní raibh ach an SEAHOW inaitheanta mar ártach, ní raibh ach lastas seiteanna eibhir an WERN infheicthe, chomh maith le páirc smionagair, áit a mbíodh Abhainn an Loyne ag sreabhadh. Níor thángthas ar na longa báite eile agus tugann siad ceisteanna chun solais maidir le cé acu an bhfuil siad clúdaithe ag dríodar, ar mhill nó nár mhill próisis mhuirí go hiomlán iad, nó ar iompair próisis mhuirí iad óna suíomhanna taifeadta.



UAV image of the newly-discovered wreck on The Warren beach near Abersoch, Gwynedd.

Íomhá UAV den long bhriste nua-aimsithe ar thrá an Warren i ngar do Abersoch, Gwynedd.

The dynamic intertidal zone also provided us with some exciting fieldwork opportunities, new and surprise discoveries and some very wet feet! September saw some of the lowest tides of the year and there was a surprise at The Warren beach near Abersoch in Gwynedd when Dan and Toby visited to combine a low tide day and monitoring of the nineteenth-century wreck thought to be the FOSIL with filming for a new BBC Wales series of Weatherman Walking with Derek Brockway. The very low 0.2 m tide not only revealed the FOSIL but also a second wreck even closer to the low-water mark. According to locals walking their dogs on the beach, this second wreck hasn't been seen for some years and was unknown to archaeologists. The short tide window of around 45 minutes allowed Dan and Toby to obtain UAV photographs of the new wreck and a quick survey even as the tide turned and the waters lapped back around the old timbers. Both wrecks, as well as the intertidal peats on the beach, reported in Issue 2 of the newsletter, will form the basis for longer term research and survey within CHERISH.

Chruthaigh an crios idirthaoideach roinnt deiseanna spreagúla saothair allamuigh, fionnachtana nua agus iontais agus roinnt cosa an-fhliucha dúinn, chomh maith! Tugadh cuid de na taoidí ab ísle sa bhliain faoi deara i Meán Fómhair agus baineadh siar asainn ag trá an Warren i ngar do Abersoch in Gwynedd nuair a thug Dan agus Toby cuairt ar an trá freastal ar lá taoide tráite agus chun monatóireacht a dhéanamh ar an long bháite ón naoú haoise déag a gceaptar gurb é an FOSIL agus scannánú ar bun do shraith nua de chuid BBC na Breataine Bige de Weatherman Walking le Derek Brockway. Ní hamháin gur nocht an taoide an-íseal 0.2 méadar an FOSIL ach nocht sé an dara long bháite, chomh maith, ní ba ghiorra don mharc lag trá. De réir an phobail áitiúil a dhéanann a madraí a thabhairt ag siúl ar an trá, ní fhacthas an dara long bhriste seo le roinnt mhaith blianta anuas agus ní raibh cur amach ag seandálaithe air. Thug an tréimhse ghearr 45 nóiméad lag trá an deis do Dan agus Toby grianghraif UAV a ghlacadh den long bhriste nua agus chun suirbhéireacht thapa a dhéanamh, fiú nuair a tháinig casadh ar an taoide agus nuair a thosaigh an t-uisce ag lapadaíl timpeall ar an seanadhmaid. Beidh an dá bhád briste, anuas ar na móinte ar an trá, a ndearnadh tuairisciú orthu in Eagrán 2 den nuachtlitir, mar bhunús le taighde agus suirbhéireacht níos fadtéarmaí laistigh de CHERISH.



The wreck of the ALBION at Marloes in Pembrokeshire. The crankshaft of the wreck forms a distinctive feature of the foreshore, alongside other remains associated with the ship's side-lever steam engine.

Long bhriste an ALBION ag Marloes in Pembrokeshire. Cruthaíonn cromfhearsaid na loinge briste gné ar leith den urthrá, taobh le hiarsmaí eile a bhaineann le hinneall gaile taobhluamháin na loinge.

While Dan and Toby were in north Wales, Louise and Patrick made the most of the low-tide window in Pembrokeshire to visit and record the wreck of the ALBION, a paddle steamer built in Bristol in 1831. While returning from Ireland on 18 April 1837 the steamer struck a rock in Jack Sound, a treacherous body of water between Skomer Island and the Pembrokeshire mainland. Though the vessel managed to right itself, it subsequently ran ashore on what is now known as Albion Sands at Marloes. We were very fortunate and grateful to have the assistance and knowledge of local Marloes residents on our visit, and we will continue to assist the local residents as they carry on their studies and monitoring of the wreck.

Over in Kerry, Ireland, another surprise was in store for the CHERISH team, this time for our colleagues from the Discovery Programme, during their return monitoring visit to the SUNBEAM. The monitoring visits take place to see how seasonal and storm impacts are affecting this intertidal wreck. In early January 2014 severe storms had moved her over a hundred metres from her original position and she remained in this location in July 2017 when a CHERISH photographic and photogrammetric survey of the wreck took place resulting in a 3D model of the site and its immediate surroundings. At this date the majority of the wreck was buried with only its framing elements exposed. The wreck remained in this stable position during further monitoring work and in a monitoring visit a year later it was noted as re-buried/missing. So, when the team returned in October 2018, they were shocked to discover the wreck had moved over 2 km away from its partially buried position. It was re-discovered at the end of Rossbeigh spit, having

Cé go raibh Dan agus Toby beirt i dtuaisceart na Breataine Bige, bhain Louise agus Patrick lántairbhe as tréimhse an lag trá in Pembrokeshire chun cuairt a thabhairt ar agus taifeadadh a dhéanamh ar long bhriste an ALBION, galtán rotha a tógadh in Bristol in 1831. Fad a bhí sí ag filleadh ó Éirinn an 18 Aibreán 1837, bhuail an galtán carraig in Jack Sound, dobharlach an-chontúirteach uisce idir Oileán Skomer agus móirthír Pembrokeshire. Cé gur éirigh leis an ártach é féin a cheartú, rith sé chun cladaigh ina dhiaidh ag áit ar a dtugtar anois Albion Sands ag Marloes. Bhí an t-ádh dearg orainn agus bhíomar thar a bheith buíoch as an gcúnamh agus an t-eolas a thug pobal áitiúil Marloes ar chuairt dúinn, agus leanfaimid chun cabhrú leis na cónaitheoirí áitiúla fad a thugann siad faoina gcuid staidéir agus monatóireachta ar an long bhriste.

Thall i gCiarraí, Éire, bhainfí iontas eile as foireann CHERISH, an tráth seo i measc ár gcomhghleacaithe i gClár Discovery, fad a bhí cuairt eile á tabhairt acu chun monatóireacht a dhéanamh ar an SUNBEAM. Tugtar na cuairteanna monatóireachta lena thabhairt faoi deara conas a dhéanann tionchar séasúrach agus stoirme tionchar a imirt ar an long bhriste idirithaoideach seo. Thug stoirmeacha troma a thit amach go luath in Eanáir 2014 leo í breis agus céad méadar ón áit a raibh sí i dtosach agus d'fhan sí san áit seo in Iúil 2017 nuair a rinneadh suirbhéireacht ghrianghrafadóireachta agus fótagraiméadrachta ar an long bhriste ónar eascair samhail 3D den suíomh agus an limistéar díreach mórthimpeall air. Ag an dáta seo, bhí an chuid ba mhó den long bhriste faoin talamh agus ní raibh a gnéithe dá fráma nochta. D'fhan an long bhriste sa suíomh cobhsaí seo fad a rinneadh obair bhreise mhonatóireachta uirthi, agus nuair a tugadh cuairt monatóireachta bliain ní ba dhéanaí, tugadh faoi deara go raibh sé faoi thalamh in áit eile/ar iarraidh. Mar sin, nuair a d'fhill an fhoireann i nDeireadh Fómhair 2018, b'iontas dóibh a thabhairt faoi deara gur bogadh an long bhriste breis agus 2 km ón áit a mbíodh cuid di faoi thalamh roimhe sin. Thángthas

moved along the beach during the 2017–2018 winter storms.

air arís eile ag deireadh ghob Ros Beithe, i ndiaidh gur bhog sé feadh na trá i rith stoirmeacha gheimhreadh 2017–2018.

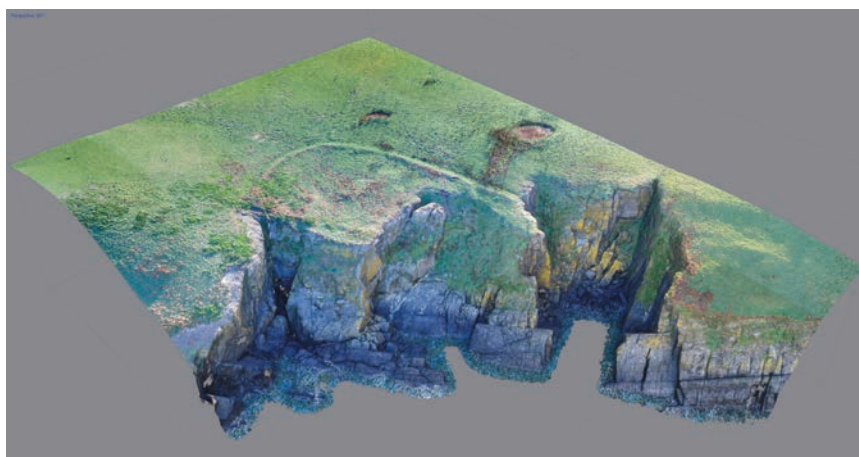


The wreck of the SUNBEAM in its new position on Rossbeigh spit, Co. Kerry. She is a wooden Schooner built in 1860 and driven ashore in a storm and wrecked in January 1904 on a voyage from Kinvara to Cork.

Long bhriste an SUNBEAM ina suíomh nua ar ghob Ros Beithe, Contae Chiarraí. Scúnar adhmaid í a tógadh in 1860 agus a rith chun cladaigh le linn stoirme agus a briseadh in Eanáir 1904 ar aistear di ó Chinn Mhará go Corcaigh.

The CHERISH team also took to the sea on a number of island visits. On a cold, minus 4-degree November morning, we made the crossing to Cardigan Island off the coast of Ceredigion, which is owned by the Wildlife Trust of South and West Wales. Access to the island is restricted and landing difficult, involving a rocky scramble from the boat. A lack of modern development has preserved the archaeology on Cardigan with most of the island covered by ridge and furrow, indicating that at one time cultivation took place. Two enclosed settlements, most likely later prehistoric in date, also indicate the island was once settled. For this visit the CHERISH team concentrated on what remains of the promontory enclosure. Here, the sea cliffs exhibit evidence of slumping and fracturing, so we undertook a UAV survey to gather baseline data for future erosion monitoring and an archaeological survey using GNSS (Global Navigation Satellite System) to improve our understanding of it.

3D model of the promontory enclosure on Cardigan Island, created from UAV imagery.



Thug foireann CHERISH faoin muir, chomh maith, ar roinnt cuairteanna ar oileán. Maidin fhuar Samhna lúide 4 chéim Celsius, thrasnaíomar an mhuir a fhad le hOileán Cardigan amach ó chósta Ceredigion, atá faoi úinéireacht lontaobhas Fiadhúlra Dheisceart agus Iarthar na Breataine Bige. Tá rochtain ar an oileán srianta agus is deacair teacht i dtír, agus tá go leor carraigí ann ar fhágáil an bháid duit. Mar gheall ar easpa forbairt nua-aimseartha, caomhnaíodh an tseandálaíocht ar Oileán Cardigan agus tá an chuid is mó den oileán cumhdaithe ag clais agus iomaire, a thugann le fios gur thit saothrú amach anseo ag tráth éigin. Tugann dhá lonnaíocht iata, ar dóchúil go ngabhann siad siar a fhad leis an tréimhse réamhstairiúil dhéanach, le fios go mbíodh daoine ina gcónaí ar an oileán tráth dá raibh. Don chuairt seo, dhírigh foireann CHERISH ar an méid a bhí fanta den imfhálú ceann tíre. Tá fianaise le tabhairt faoi deara anseo ar aillte na farraige go bhfuil sciorradh agus scoilteadh ag tarlú, mar sin, thugamar faoi shuirbhéireacht UAV chun sonraí

bonnlíne a bhailiú i dtaobh monatóireacht amach anseo ar chreimeadh agus suirbhéireacht seandálaíochta trí úsáid a bhaint as GNSS (Córas Domhanda Loingseoireacht Satailíte) chun feabhas a chur ar ár dtuiscint air.

Samhail 3D den imfhálú ceann tíre ar Oileán Cardigan, a chruthaigh íomhánna UAV.

Puffin Island or Preistholm lies barely a kilometre off the Anglesey coast in north Wales but is comparatively remote and inaccessible. It is privately owned and landings are not permitted without the permission of Sir Richard Williams-Bulkeley, to whom the CHERISH team are most grateful. During the summer months it is also out of bounds due to nesting birds, but the team were fortunate enough to travel under the supervision of Dr Jonathan Green from Liverpool University for their first visit in June 2018.

Cadw had asked the CHERISH team to carry out a detailed condition survey of the protected ruins of a medieval church and monastery which had been restored some years previously but had not been visited by archaeologists for nearly a decade. This is just the sort of challenging assignment that suits the CHERISH team. The team made their first visit in June to carry out detailed laser scanning of the ruined church, accompanied by the Cadw Field Monument Warden and watched by two nesting gulls from one of the ruined walls. The survey recorded at millimetre accuracy every stone of the building but was not able to scan the tops of the walls or the tower roof. Dan and Toby returned on a chilly winter's day in November to fly a UAV low over the building to photogrammetrically map the very top of the tower with remarkable detail, providing a view only seen by a handful of people over the centuries including the original medieval builders. The field survey information adds to the airborne LiDAR survey of Puffin Island commissioned by CHERISH in 2017, and new marine scanning of the waters around the island by the Geological Survey Ireland, as reported above.



A rare view! Photograph and 3D model of the twelfth-century church tower roof on Puffin Island. Created from UAV imagery.

Radharc aisteach! Samhail 3D de dhíon túr eaglaise ón dara haois déag ar Oileán na gCánóg. Cruthaithe ó íomhánna UAV.



Tá Oileán na gCánóg nó Preistholm suite níos lú ná ciliméadar amach ó chósta Anglesey i dtuaisceart na Breataine Bige ach tá sé sách iargúlta agus is deacair teacht air. Tá sé faoi úinéireacht phríobháideach agus ní cheadaítear teacht i dtír air gan chead a fháil ó Sir Richard Williams-Bulkeley, a bhfuil foireann CHERISH fíor-bhuíoch de. I rith mhíonna an tsamhraidh, ní féidir teacht i dtír ar an oileán, chomh maith, mar gheall ar éin neadaithe, ach bhí an t-ádh ar an bhfoireann taisteal faoi mhaoirseacht an Dr Jonathan Green le hOllscoil Learphoill sa chéad chuairt a thug siad i Meitheamh 2018.

D'iarr Cadw ar fhoireann CHERISH chun tabhairt faoi shuirbhéireacht mhionsonraithe ar fhothracha cosanta eaglaise agus mainistreach meánaoisí a milleadh roinnt blianta roimhe seo ach nár thug seandálaithe cuairt air le beagnach deich mbliana anuas. Seo díreach an saghas sprioc dhúshlánach faoina dtugann d'fhoireann CHERISH. Thug an fhoireann a gcéad chuairt i Meitheamh chun tabhairt faoi scanadh mionsonraithe léasair ar an eaglais a bhí ina fothrach, i dteannta Maor Shéadchomhartha Páirce Cadw agus dhá fhaoileán neadaithe ag féachaint anuas orthu ó cheann de na ballaí a bhí ina bhfothracha. Rinne an suirbhé taifeadadh ar chruinneas milliméadair ar gach cloch den fhoirgneamh ach níorbh fhéidir scanadh a dhéanamh ar bharra na mballaí nó ar dhíon an túir. D'fhill Dan agus Toby ar lá fuar geimhridh i Samhain chun UAV a eitilt íseal thar an bhfoirgneamh chun léarscáiliú fótagraiméadrachta a dhéanamh ar bharr an túir le sonraí iontacha, a thug radharc nach bhfaca ach dornán daoine i gcaitheamh na mblianta, na tógálaithe meánaoiseacha thiar ag an tráth sin ina measc. Cuireann an fhaisnéis suirbhé allamuigh leis an suirbhé ón aer LiDAR a rinneadh ar Oileán na gCánóg a choimisiúnaigh CHERISH in 2017, agus scanadh nua muirí a rinneadh ar na huiscí timpeall ar an oileán a rinne Suirbhéireacht Gheolaíochta na hÉireann, faoi mar a thugtar le fios thuas.

Laser scan survey data capturing the remains of the medieval church on Puffin Island.

Iarsmaí d'eaglais mheánaoiseach ar Oileán na gCánóg gafa ag sonraí ó shuirbhéireacht scanta léasair.



Aerial view of Llyn Maeolog behind the dunes of Traeth Llyndan at Rhosneigr and looking towards RAF Valley, Llyn Penrhyn and Llyn Traffwll on Anglesey.

Radharc ón aer ar Llyn Maeolog taobh thiar de dhumhcha Llyndan ag Rhosneigr agus ag féachaint i dtreo RAF Valle, Llyn Penrhyn agus Llyn Traffwll ar Anglesey.

To establish records of past environments and storminess, the CHERISH team from Aberystwyth University have been hard at work at a number of our mainland study sites including Cors Fochno, Borth and Ynyslas in mid Wales. One aspect of the work here is to investigate when the Borth–Ynyslas spit at the mouth of the Dyfi estuary became established in its current location and its rate of development. A transect of cores is being taken along the spit, with the age of sand deposits which lie on top of peats being determined using luminescence dating.

Chun taifid a bhunú ar thimpeallachtaí agus stoirmeacha roimhe seo, bhí obair dhian ar siúl ag foireann CHERISH ó Ollscoil Aberystwyth ag roinnt dár láithreáin staidéir móirthíre, Cors Fochno, Borth agus Ynyslas i lár na Breataine Bige ina measc. Gné amháin den obair anseo is ea imscrúdú a dhéanamh ar cathain a bunaíodh gob Borth-Ynyslas ag béal inbhear Dyfi ina láthair reatha agus a ráta forbartha. Tá traschrios de chroíleacáin á nglacadh feadh an ghoib, agus deimhnítear aois na spruadar gainimh a luíonn ar bharr móinte trí úsáid a bhaint as dátú lonracha.

At Rhuddgaer near Newborough on Anglesey we've been working with Gwynedd Archaeological Trust to investigate a field system and ploughed soil buried under 1.2 m (nearly 4 ft) of sand. Archival records suggest that the sand may have inundated a significant area of land in a single storm event around 1330, but it is also feasible that a succession of events built up the deposit over time. Excavations by Gwynedd Archaeological Trust show that the field



Professor Helen Roberts preparing to take luminescence samples from sand overlying a ridge and furrow plough soil at Rhuddgaer, Anglesey.

An tOllamh Helen Roberts agus ullmhúcháin á ndéanamh aici chun samplaí lonracha a ghlacadh ó ghaineamh a bhí ina luí anuas ar ithir threafa chlaise agus iomaire, Anglesey.

Ag Rhuddgaer i ngar do Newborough ar Anglesey, bhíomar ag oibriú le hlontaobhas Seandálaíochta Gwynedd chun imscrúdú a dhéanamh ar chóras páirceanna agus ar ithir threafa a bhí faoi 1.2 m (beagnach 4 troithe) de ghaineamh. Tugann taifid chartlainne le fios go bhféadfadh go ndearna an gaineamh limistéar mór talún a chumhdach le linn stoirm amháin a thit amach thart ar an mbliain 1330, ach d'fhéadfadh, chomh maith, gur chruthaigh roinnt

system is part of a farm that has been in existence since the early middle ages but may have been worked as far back as the Iron Age. The CHERISH team are applying luminescence dating to shed light on the timing of this event and how it links to evidence from other sites in the area.

In October 2018, we visited Llyn Coron near Aberffraw and Llyn Maelog at Rhosneigr on Anglesey to retrieve sediment records from the bottom of the two lakes. The weather conditions over the three days were perfect for using our new coring platform with sunshine and light winds. Once we assembled our platform we were able to take a 2.75 m core from Llyn Coron, which appears to have formed as a result of the formation of the Aberffraw sand dune system damming the Afon Gwna and the various small streams that flow into the valley. Samples are now being processed in our laboratory in Aberystwyth, which will date this more precisely and provide a detailed record of how the environment has changed through time.

Although only a few miles further north, Llyn Maelog appears to have formed under very different conditions. Here we managed to retrieve about 4.5 m of lake mud, sand and clay recording some significant environmental changes spanning thousands of years, including evidence of sea level change. We will be analysing these cores in the coming months and look forward to sharing our findings with you in future editions, publications and at public engagement events.



Hollie and Patrick assembling the CHERISH coring platform before its maiden voyage on Llyn Coron.

Ardán croileacaithe CHERISH á chur le chéile ag Hollie agus Patrick roimh a chéad aistear ar Llyn Coron.

imeachtaí i ndiaidh a chéile an spruadar le himeacht ama. Taispeánann tochairtí a rinne lontaobhas Seandálaíochta Gwynedd go bhfuil an córas páirceanna mar chuid d'fheirm a bhí ann ó thráth sa mheánaoise ach go bhféadfadh go ndearnadh iad a shaothrú a fhad siar leis an larannaois. Tá feidhm á baint ag foireann CHERISH as dátú lonrachta chun eolas a fháil ar cathain a thit an t-imeacht seo amach agus conas atá sé ceangailte le fianaise ó láithreáin eile sa cheantar.

I nDeireadh Fómhair 2018, thugamar cuairt ar Llyn Coron i ngar do Aberffraw agus Llyn Maelog ag Rhosneigr ar Anglesey chun taifid dríodair a fháil ó bhun an dá loch. Bhí an aimsir ghréine agus ísealghaoithe i gcaitheamh na dtrí lá foirfe chun úsáid a bhaint as ár n-ardán nua croileacaithe. A luaithe a rinneamar ár n-ardán a chur le chéile, bhíomar in ann croileacán 2.75 méadar a bhaint ó Llyn Coron, ar dealraitheach gur cruthaíodh é mar thoradh ar chóras dumhcha Aberffraw a dhéanann an Afon Gwna agus na sruthanna éagsúla beaga a shreabhann isteach sa ghleann a dhambáil. Tá samplaí á bpróiseáil anois inár saotharlann in Aberystwyth, a dhéanfaidh dátú níos cruinne air seo agus a chuirfidh taifead mionsonraithe ar fáil ar conas a d'athraigh an timpeallacht le himeacht ama.

Cé nach bhfuil sé suite ach cúpla míle eile ó thuaidh, is cosúil gur cruthaíodh Llyn Maelog faoi choinníollacha an-éagsúla. Déirigh linn thart ar 4.5 méadar de láib, gaineamh agus cré locha a fháil anseo, a chuir roinnt athruithe suntasacha timpeallachta i gcuntas thar thréimhse na mílte bliain, fianaise ina measc ar athrú leibhéil na farraige. Beidh anailís á déanamh againn ar na croileacáin seo sna míonna amach anseo agus táimid ag tnúth lenár dtorthaí a roinnt leat in eagráin, foilseacháin agus ag imeachtaí idirchaidrimh phoiblí amach anseo.



Retrieving a surface sediment core from Llyn Maelog. Croileacán dríodar dromchla á fháil ó Llyn Maelog.



UAV image of Clonmines Abbey, County Wexford.

Fieldwork at some of our mainland study sites has included the historic settlement of Clonmines, Co. Wexford. Here the team collected UAV mapping data and oblique images along with laser scan data of the castles and abbey that can be compared to past and future plans of the site to provide information on deterioration and rates of change. A walkover survey of the intertidal zone adjoining the historic settlement also revealed many interesting new features and insights into the Bannow bay estuary, movement, trade and the interconnected nature of Clonmines.

An exciting week of survey on the Copper Coast, Waterford, utilised many of the CHERISH survey approaches. The team visited, surveyed and recorded sites along the 25 km stretch of coastline, stretching from the town of Tramore in the east to Dungarvan in the west. This coastline provided an opportunity for us to focus on one particular monument form, the promontory fort, which has led to many new questions about this the

Íomhá UAV de Mhainistir Chluain Mín, Contae Loch Garman.

Áiríodh leis an obair allamuigh ag roinnt dár láithreáin staidéir mórtíre lonnaíocht stairiúil Chluain Mín, Contae Loch Garman. Bhailigh an fhoireann sonraí léarscáilithe UAV agus íomhánna fiara anseo, anuas ar shonraí scanta léasair ar na caisleáin agus an mhainistir ar féidir iad a chur i gcomparáid le pleananna den láithreán roimhe seo agus amach anseo chun faisnéis a sholáthar ar mheath agus rátaí athraithe. Chomh maith leis sin, nocht suirbhéireacht siúil ar an gcrios idirthaoideach taobh leis an lonnaíocht stairiúil go leor gnéithe agus léargas nua suimiúil ar inbhear Chuan Bhanú, gluaiseacht, trádáil agus cineál idirnasctha Chluain Mín.

Úsáideadh go leor cur chuige suirbhé de chuid CHERISH i rith seachtain spreagúil de shuirbhé ar Chósta an Chopair, Port Láirge. Thug an fhoireann cuairt ar agus rinne siad suirbhéireacht agus taifeadadh ar láithreáin feadh an stráice 25 ciliméadar den imeallbhord, a shín ó bhaile Thrá Mhór san oirthear agus Dún Garbhán san iarthar. Thug an t-imeallbhord seo an deis dúinn chun díriú ar fhoirm amháin de shéadchomhartha, an dún ceann tíre, ar cuireadh an



The eroding promontory forts of Islandhubbock and Ballynaris on the Copper Coast, Co. Waterford.

Na dúnta ceann tíre ar Oileán Hoboc agus Baile an Airid atá á gcreimeadh ar Chósta an Chopair, Contae Phort Láirge.

site type and its identification that will be addressed by ongoing fieldwork.

We've also been working on promontory and coastal forts in Wales, with a UAV survey of Castell Bach promontory fort in Ceredigion and Dinas Dinlle hillfort in Gwynedd. At Dinas Dinlle we also laser scanned the entire eroding cliff face so we can now accurately monitor and measure the future erosion.

iomaí ceist nua faoin saghas seo de shuíomh agus conas é a aithint a rachfar i ngleic leo trí obair allamuigh leanúnach.

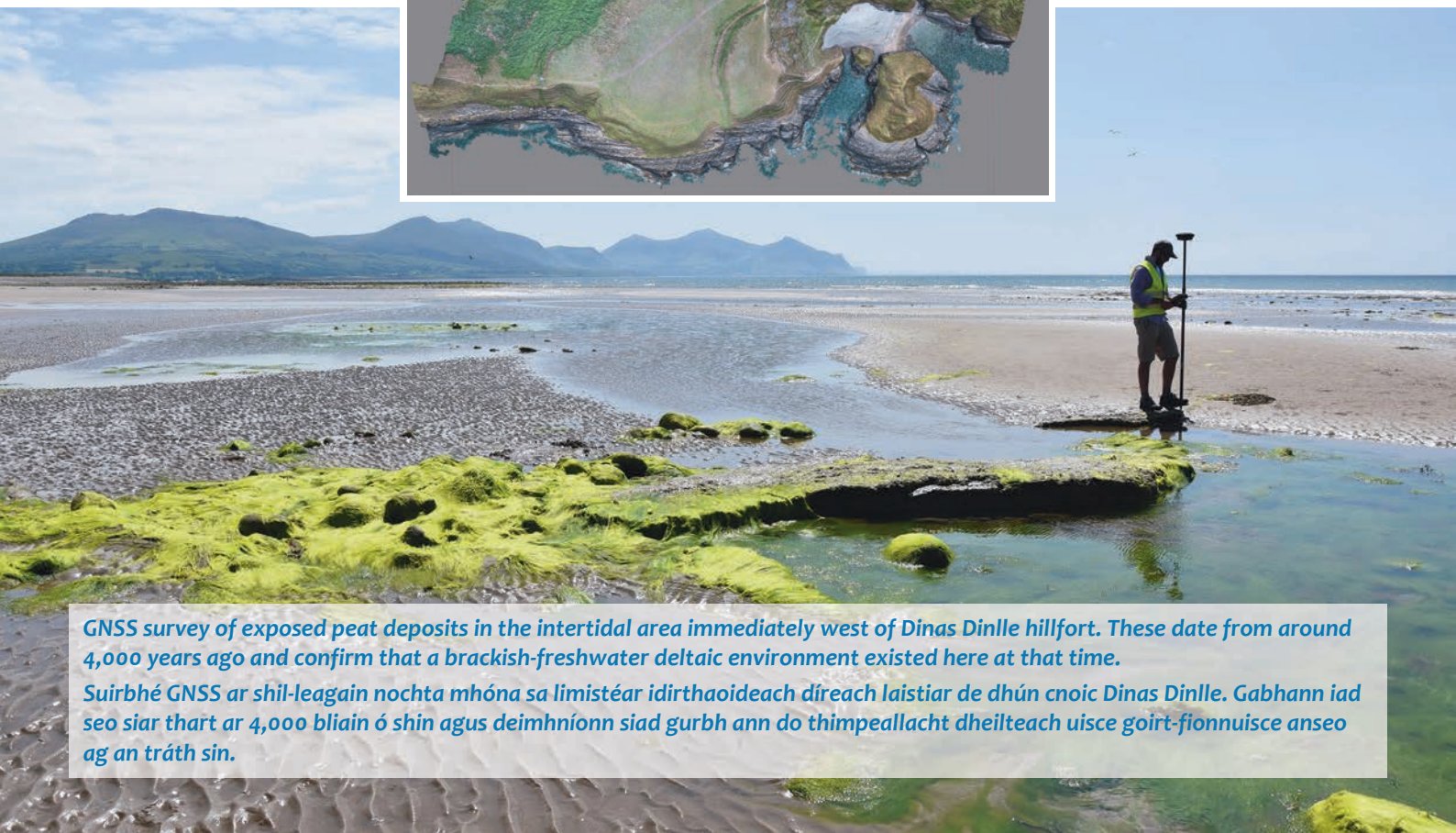
Bhíomar ag oibriú, chomh maith, ar dhúnta ceann tíre agus cósta sa Bhreatain Bheag, agus rinneadh suirbhéireacht UAV ar cheann tíre Castell Bach in Ceredigion agus dún cnoic Dinas Dinlle in Gwynedd. Ag Dinas Dinlle, rinneamar scanadh léasair, chomh maith, ar an aghaidh aille iomlán atá á gcreimeadh chun gur féidir linn monatóireacht agus tomhas cruinn a dhéanamh anois ar an gcreimeadh amach anseo.

3D model of Castell Bach promontory fort in Ceredigion, created from UAV imagery.



anseo.

Samhail 3D de dhún ceann tíre Castell Bach in Ceredigion, a cruthaíodh ó íomhánna UAV.



GNSS survey of exposed peat deposits in the intertidal area immediately west of Dinas Dinlle hillfort. These date from around 4,000 years ago and confirm that a brackish-freshwater deltaic environment existed here at that time.

Suirbhé GNSS ar shil-leagain nochta mhóna sa limistéar idirthaoideach díreach laistiar de dhún cnoic Dinas Dinlle. Gabhann iad seo siar thart ar 4,000 bliain ó shin agus deimhníonn siad gurbh ann do thimpeallacht dheilteach uisce goirt-fionnuisce anseo ag an tráth sin.

ENGAGEMENT / IDIRCHADREAMH

It was a busy summer and autumn 2018 for the CHERISH team, during which we engaged with over 4,000 people through a series of CHERISH events and conferences. The social media profile and reach of CHERISH also steadily grew with over 930 followers on Facebook and post reaches in excess of 370,000 people. Our star attraction, an aerial video of Dinas Dinlle hillfort in Gwynedd, has so far reached over 34,000 people.

In words and photographs, here are some of the highlights:

August saw the CHERISH team run five events as part of the Irish National Heritage Week celebrations. This included an open day on one of the GSI seabed survey vessel in Arklow, Co. Wicklow; fieldwalking and an archaeological walkover survey in Fingal, Co. Dublin; a talk in the Copper Coast Geopark visitor centre; and two guided walks at Dinas Dinlle hillfort in Wales.

In September the CHERISH team in Ireland took part in the Cultural Heritage and Digital Age Workshop in Cork while some of the CHERISH team from Wales spent the day filming with Derek Brockway for BBC Wales' Weatherman Walking in Abersoch, Gwynedd.

October began with our first free Public Day School, 'Facing the Storms', in Aberystwyth. The event was opened by Ben Lake MP and the audience

Ba shamhradh agus fómhar gnóthach é in 2018 i measc fhoireann CHERISH, agus rinneamar idirchaidreamh le breis agus 4,000 duine trí shraith d'imeachtaí agus comhdhálacha CHERISH. Chomh maith leis sin, tháinig borradh réidh ar phróifíl mheán sóisialta CHERISH agus bhí 930 de lucht leanúna ar Facebook agus bhain postálacha breis agus 370,000 duine. Ina theannta sin, rinne ár ndíol ba mhó spéise, físeán ón aer de dhún cnoic Dinas Dinlle in Gwynedd, 34,000 duine amach go dtí seo.

Seo roinnt de na buaicphointí i bhfriotal agus i ngrianghraif:

Reáchtáil foireann CHERISH cúig imeacht i Lúnasa mar chuid den cheiliúradh ar Sheachtain Oidhreacht Náisiúnta na hÉireann. Áiríodh leis seo, lá oscailte ar cheann d'árthaí suirbhéireachta ghrinneall na farraige de chuid OSI san Inbhear Mór, Contae Chill Mhantáin agus suirbhéireacht siúil seandálaíochta i bhFine Gall, Contae Bhaile Átha Cliath; caint in ionad cuairteoirí Geopháirce Chósta an Chopair; agus dhá shiúl threoraithe ag dún cnoic Dinas Dinlle sa Bhreatain Bheag.

Ghlac foireann CHERISH in Éirinn páirt i Meán Fómhair sa Cheardlann Oidhreacht Cultúrtha agus Aoise Digití i gCorcaigh agus chaith roinnt d'fhoireann CHERISH ón mBreatain Bheag an lá le scannánú a dhéanamh le Derek Brockway don chlár Weatherman Walking de chuid BBC Wales in Abersoch, Gwynedd.





heard presentations from all CHERISH partners alongside two guest speakers, Rebecca Evans from Pembrokeshire Coast National Park and Ken Murphy of the Dyfed Archaeological Trust. Later in the month we also ran a postgraduate seminar in Dublin on the theme of 'Witnessing and interpreting changes in Ireland's historic maritime environment'.

Autumn is conference season and CHERISH organised sessions and presented papers and posters at a number of conferences across Europe, including the European Association of Archaeologists conference in Barcelona, the Landscape Archaeology conference in Newcastle, the Aerial Archaeology Research Group Conference in Venice, and the British Society for Geomorphology annual meeting in Aberystwyth.

Cuireadh tús le Deireadh Fómhair lenár gcéad Lá Scoile Poiblí saor in aisce, 'Facing the Storms', in Aberystwyth. D'oscail Ben Lake, Feisire Parlaiminte, an t-imeacht agus chuir comhpháirtithe uile CHERISH cuir i láthair ar siúl don lucht féachana agus chuir beirt aoichainteoirí, Rebecca Evans ó Pháirc Náisiúnta Cósta Pembrokeshire agus Ken Murphy le hlontaobhas Seandálaíochta Dyfed, caint i láthair. Ní ba dhéanaí sa mhí, chuireamar seimineár iarchéime ar siúl, chomh maith, i mBaile Átha Cliath ar an téama 'Athruithe ar thimpeallacht mhuirí stairiúil na hÉireann a fhianú agus a léirmhíniú'.

Séasúr comhdhála is ea an fómhar agus d'eagraithe CHERISH seisiúin agus chuir sé páipéir agus póstaer i láthair ag roinnt comhdhálacha ar fud na hEorpa, comhdháil Chumann Seandálaithe na hEorpa agus in Barcelona, an chomhdháil Seandálaíochta Tírdhreacha in Newcastle, Comhdháil an Ghrúpa Taighde Seandálaíochta ón Aer sa Veinéis, agus cruinniú bliantúil Chumann Geomoirfeolaíochta na Breataine in Aberystwyth.



CHERISH IN FOCUS / DÍRIÚ AR CHERISH

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

Súil níos doimhne a chaitheamh ar ghnéithe áirithe de CHERISH, fionnachtana nua, teicnící suirbhéireachta, láithreáin staidéir ina measc.

Abermenai Point looking east to Caernarfon. Taken in July 2018 during the summer's exceptional drought, on a CHERISH reconnaissance flight.

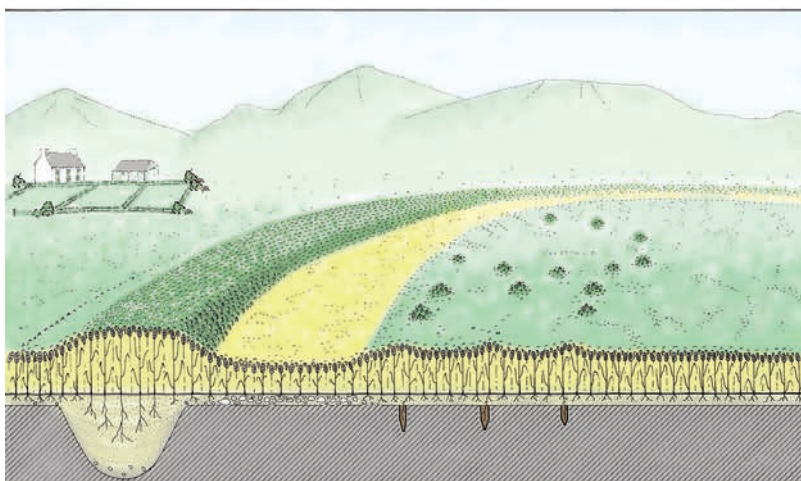
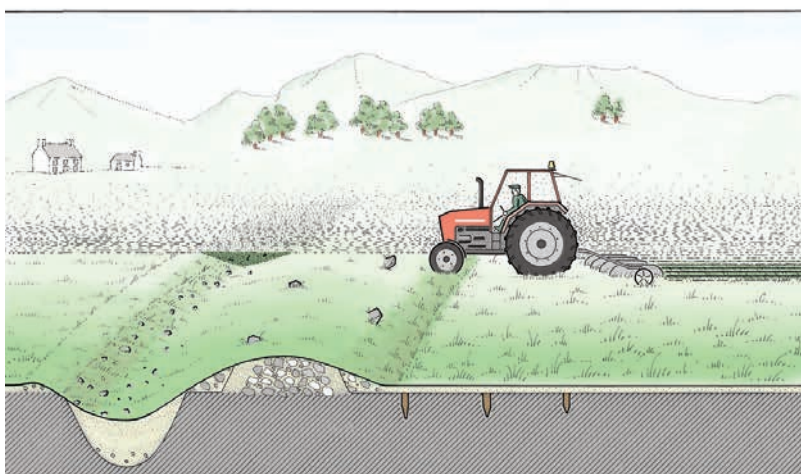
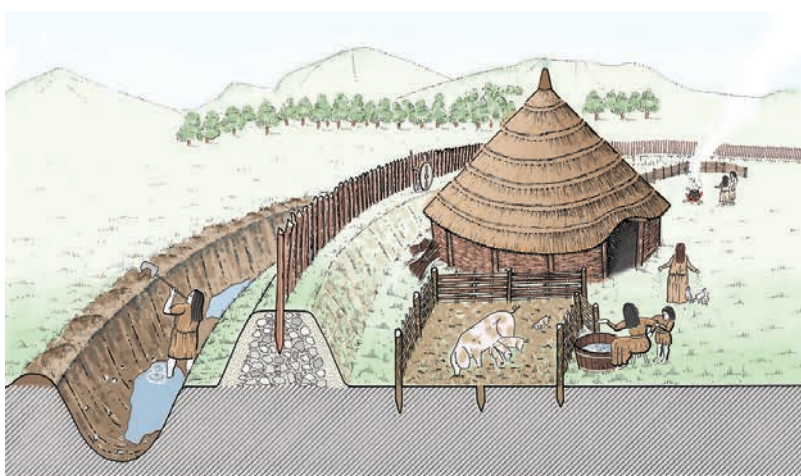
Pointe Abermenai ag féachaint soir chuig Caernarfon. Glactha in Iúil 2018 i rith thriomlach dochreidte an tsamhraidh ar eitilt taiscéalaíochta CHERISH.

TURNING UP THE HEAT: THE DROUGHT OF 2018 / AN TEAS A ARDÚ: TRIOMACH 2018

The summer of 2018 was one of the hottest and driest for many years, with Wales and Ireland experiencing weeks of intense heat and little or no rain. Porthmadog in north Wales recorded the hottest UK temperatures on successive days in late June. The latest UK Climate Projections (UKCP18) indicate hotter, drier summers to be a general trend of climate changes in the twenty-first century.

Such conditions are perfect for the formation of archaeological cropmarks, where differences in moisture in parched coastal grasslands or ripening crops can show the ghostly outlines of long buried archaeological sites. CHERISH Aerial Archaeologist Toby Driver explains some of the treasures that the heatwave revealed.

How cropmarks form. A prehistoric farm enclosed by a bank and ditch (top) has been reduced to an earthwork in recent decades (centre). Continued ploughing will eventually remove any trace of the site at ground level but during severe droughts (bottom) the buried archaeology will effect the way the crop grows, producing cropmarks. These are best seen from the air.



Bhí samhradh 2018 ar cheann de na samhraí ba theo agus ba thirime le go leor blianta anuas, agus bhí teas tréan agus ní raibh ach beagán báistí nó báisteach ar bith ann sa Bhreatain Bheag nó in Éirinn. Cuireadh na teochtaí ba theo i gcuntas sa RA roinnt laethanta i ndiaidh a chéile go déanach i Meitheamh in Porthmadog i dtuaisceart na Breataine Bige. Tugann Tuartha Aeráide an RA is

déanaí (UKCP18) le fios go mbeidh samhraí níos teo agus níos tirime mar threocht ghinearálta athrú aeráide san aonú haois is fiche. Tá na coinníollacha siúd foirfe chun barrachomharthaí seandálaíochta a chruthú, áit ar féidir leis na difríochtaí i dtaise i dtalamh féaraigh nó i mbarra atá ag aibiú, imlínte taibhsiúla láithreáin seandálaíochta a thaispeáint atá i bhfolach faoin talamh le fada an lá. Míníonn Seandálaí Air CHERISH, Toby Driver, cuid den taise a nocht an tonn teasa.

Conas a chruthaítear barrachomharthaí. Rinne créfort le roinnt blianta anuas (sa lár) d'fheirm réamhstairiúil imfhálaithe ag banc cré agus díog (ar barr). Bainfidh treabhadh leanúnach aon iarsma den láithreán ar leibhéal na talún ar deireadh thiar, ach i rith triomach dian (ag an mbun), imreoidh an bealach a fhásann an barr tionchar ar an tseandálaíocht atá faoin talamh, agus cruthóidh seo barrachomharthaí. Is fearr a fheictear iad seo ón aer.



The Cessna light aircraft parked up for lunch and fuel at a desert-like Caernarfon Airport, July 2018.

Aerárthacht éadrom Cessna páirceáilte i rith am lóin agus chun breosla a fháil ag Aerfort Caernarfon ar a bhfuil cuma fásaigh, Iúil 2018.

CHERISH archaeologists routinely use UAVs for low-level coastal surveys, aerial video and photogrammetry, but these have to be operated within strict guidelines and always within 'line of sight'. When a record drought strikes, aerial archaeologists have a few precious weeks to get airborne and record the remarkable sites revealed before they disappear with summer rain and the harvest. Because of this, a Cessna 172 light aircraft is used to survey hundreds of miles of countryside, flying at 110 mph around 500 metres above the ground.

CHERISH coastal study areas in Wales were intensively flown in late June and July, including coastal Gwynedd and the Llŷn Peninsula, the very dry Cardigan Bay region and coastal Pembrokeshire. Sorties also reached out to the parched offshore islands of Bardsey, the Tudwals, Skomer and Ramsey where water shortages for residents and visitors were most acute. Weekly drought readings from the Met Office helped to target flights to where they were most needed, indicating where archaeological cropmarks were most likely to be showing. Regional archaeologists and Cadw custodians alerted Toby to possible new marks showing around Wales and close to historic properties, while a couple of drone pilots followed up discoveries with low-level surveys while the fleeting marks were still showing.

Úsáideann seandálaithe CHERISH UAVanna chun suirbhéireachtaí íseal-leibhéil cósta, físeáin aeir agus fótagraiméadracht a dhéanamh, ach is gá iad seo a oibriú laistigh de threoirlínte diana agus laistigh de 'líne amhairc' i gcónaí. Nuair a bhuaileann an triomach is measa sinn, bíonn roinnt seachtainí an-luachmhara ag seandálaithe aeir chun an spéir a bhaint amach agus na láithreáin shuntasacha a chur i gcuntas a nochtadh sula n-imíonn siad ó radharc de bharr bháisteach an tsamhraidh agus an fhómhair. Mar gheall air seo, úsáidtear aerárthach éadrom Cessna 172 chun suirbhéireacht a dhéanamh ar na mílte den tuath, a eitlíonn ar luas 110 míle san uair thart ar 500 méadar os cionn na talún.

Eitlíodh go han-rialta timpeall ar limistéir staidéir cósta CHERISH sa Bhreatain Bheag go déanach i Meitheamh agus in Iúil, cósta Gwynedd agus Leithinis Llŷn, réigiún an-thirim Chuan Cardigan agus cósta Pembrokeshire ina measc. Ina theannta sin, d'fhreastail breabhaidí ar na hoileáin stiúgtha amach ón gcósta Bardsey, Tudwals, Skomer agus Ramsey, áit ba mheasa na ganntanais uisce i measc cónaitheoirí agus cuairteoirí. Chabhraigh léamha seachtainiúla triomaigh ón Oifig Mheitéareolaíochta le díriú ar eitiltí chuig na háiteanna ba mhó gátar, a thug le fios an áit ba dhóchála go raibh barrachomharthaí seandálaíochta le tabhairt faoi deara. Chuir seandálaithe réigiúnacha agus coimeádaithe Cadw Toby ar an eolas ar mharcanna féideartha nua a bhí á dtabhairt faoi deara timpeall na Breataine Bige agus i ngar do réadmhaoin

The low-lying Llŷn Peninsula revealed dramatic parched landscapes of wide-spreading cropmarks ranging from Bronze Age barrow cemeteries to pre-Roman defended farmsteads and medieval fields. The biggest surprise came at Abersoch where an interesting concentric hilltop enclosure, resembling an early Roman watchtower or fortlet, was discovered overlooking the nearby beach. This may be the first Roman military site on the Llŷn Peninsula, but a geophysical survey planned for 2019 should tell us more about its possible date.

stairiúil agus d'fhiosraigh roinnt pólótaí dróin na rudaí a aimsíodh trí shuirbhéireacht íseal-leibhéil a dhéanamh fad a bhí na marcanna sealadacha fós ar taispeáint.

Nochtadh tírdhreacha drámatúla stiúgtha de bharrachomharthaí forleathna ar Leithinis íseal Llŷn, reiligi tuláí ón gCré-Umhaois agus áitribh feirme cosanta ó tógadh roimh aimsir na Rómhánach agus páirceanna meánaoiseacha. B'ábhar mór iontais é ag Abersoch nuair a thángthas ar imfhálú comhlárnach suimiúil barr cnoic, a bhí cosúil le túr faire nó dún beag a tógadh go luath in aimsir na Rómhánach, ag féachaint amach ar an trá atá i ngar dó. D'fhéadfadh gurbh é seo an chéad suíomh míleata Rómhánach ar Leithinis Llŷn, ach ba cheart go gcuirfeadh suirbhéireacht gheoifisiceach atá pleanáilte don bhliain 2019 ní ba mhó eolais dúinn faoin dáta a tógadh é.



Concentric hilltop enclosure at Abersoch.

Imfhálú comhlárnach barr cnoic ag Abersoch.



A prehistoric defended farm appears as a bright green cropmark near Marloes in Pembrokeshire on 13 July 2018.

Tagann feirm chosanta réamhstairiúil aníos mar bharrachomhartha gléghlas i ngar do Marloes in Pembrokeshire an 13 Iúil 2018.

Several archaeological sites were discovered along the west coast, including a Romano-British farmstead at Llanon, Ceredigion, less than 300 m from the sea, and a large new prehistoric defended enclosure and other sites near Marloes, Pembrokeshire, in a landscape already rich in prehistoric coastal forts and island settlements. New prehistoric barrows and enclosures were discovered in north Pembrokeshire, although offshore surveys of Ramsey and Bardsey Islands failed to identify any new monuments.

The 'top 20' big discoveries stole the summer's limelight and caused intense excitement among archaeologists, academics and the world's press, but several months of intensive processing, cataloguing and analysis of the summer's 5,700 air photographs will reveal the full scale of the treasures recorded from the air.

Thángthas ar roinnt suíomhanna seandálaíochta feadh an chósta thiar, áitreabh feirme Rómhánach-Breataine ag Llanon, Ceredigion, ní ba lú ná 300 méadar ón bhfarraige, chomh maith le himfhálú mór nua réamhstairiúil cosanta agus suíomhanna eile i ngar do Marloes, Pembrokeshire, i dtírdhreach ina bhfuil fuilleach dúnta agus lonnaíochtaí oileáin réamhstairiúla cósta cheana féin. Thángthas ar thulacha agus imfhálú nua réamhstairiúla i dtuaisceart Pembrokeshire, cé gur theip ar shuirbhéireachtaí amach ón gcósta ar Ramsey agus Oileán Bardsey chun aon séadchomharthaí nua a shainaithint.

Bhain na '20' fionnachtain' mór aird an phobail amach sa samhradh agus bhí siad mar chúis le fuadar mór i measc seandálaithe, acadóirí agus nuachtáin an domhain, ach nochtfaidh roinnt míonna de phróiseáil, cataglógu agus anailís dhian ar na 5,700 grianghraf ón aer a glacadh i rith an tsamhraidh scála iomlán na dtaiscí a cuireadh i gcuntas ón aer.



A parched landscape at Morfa Nefyn, Llŷn Peninsula, Gwynedd, with the peaks of Yr Eifl beyond and clouds forming on a hot summer's afternoon on 10 July 2018.

Tírdhreach stiúgtha ag Morfa Nefyn, Leithinis Llŷn, Gwynedd, agus beanna Yr Eifl ag gobadh i gcéin agus néalta ag bailiú thart tráthnóna te samhraidh an 10 Iúil 2018.

OUR TOOL KIT APPROACH: SURVEY TECHNIQUES / ÁR GCUR CHUIGE SRAITH STRAITÉISÍ: TEICNÍC SUIRBHÉIREACHTA

Marine Survey Techniques

Within CHERISH, the Geological Survey Ireland (GSI) takes the lead on marine surveying. Many CHERISH sites are exposed to erosion by both terrestrial and marine processes, and we aim to combine marine bathymetric and terrestrial topographic surveys to provide seamless maps of the earth's surface immediately surrounding our study sites. These surface maps will then be used to place these sites of interest within a larger geomorphological (i.e., landscape) context, permitting increased understanding of the natural processes impacting them.

For the shallow water surveys around Ireland and Wales, CHERISH has been primarily using the GSI vessel the RV Keary which has a multibeam echosounder (MBES) and sub-bottom profiler (SBP). The MBES emits sound waves in a fan shape beneath the ship's hull, measuring a swath of seafloor providing us with information about the seabed surface, while the SBP is an acoustic source where the energy is directed beneath the vessel in a single beam, allowing us to gain information about the sediment make-up below the seabed. Due to the acoustic nature of these survey instruments, strict international guidelines are adhered to, to minimise impact on marine fauna, including marine mammals.

Multibeam Echosounder: Beneath the vessel's waterline, MBES transducers emit sound between 200-400 kHz that travels down through the water column. As it is a high frequency sound wave, when it reaches the seabed most is reflected back towards the surface where sensors record the returning sound wave. The amount of time it takes for the sound waves to bounce off the seabed and return to a receiver is used to determine water depth.



The RV Keary

An RV Keary

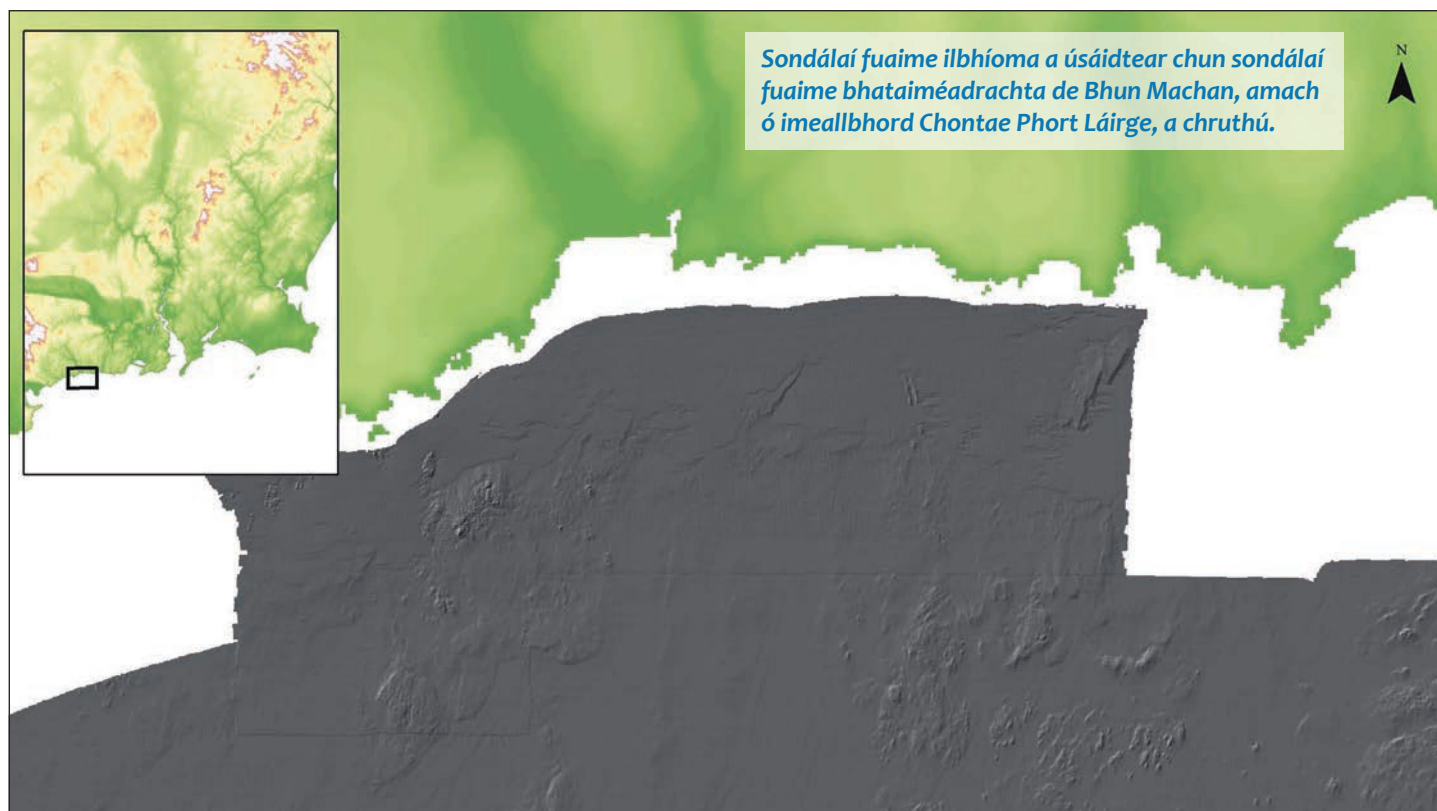
Teicnící Suirbhéireachta Muirí

Laistigh de CHERISH, glacann Suirbhéireacht Gheolaíochta na hÉireann (SGÉ) an ceannas maidir le suirbhéireacht mhuirí. Bíonn go leor suíomhanna CHERISH tugtha don chreimeadh ag próisis talún agus muirí araon, agus tá de chuspóir againn suirbhéireachtaí muirí bataiméadracha agus topagrafach talún araon a úsáid chun léarscáileanna gan uaim a sholáthar de dhromchla an domhain díreach timpeall ar ár

suíomhanna staidéir. Úsáidfear na léarscáileanna dromchla seo ansin chun na suíomhanna díol spéise seo a shuíomh laistigh de chomhthéacs geomoirfeolaíoch (i.e. tírdhreach), a cheadaíonn tuiscint mhéadaithe a fháil ar na próisis nádúrtha a imríonn tionchar orthu.

I gcás na suirbhéireachtaí uisce éadomhain timpeall na hÉireann agus na Breataine Bige, bhí úsáid phríomha á baint ag CHERISH as ártach SGÉ, an RV Keary, a bhfuil sondálaí fuaime ilbhíoma (MBES) agus próifíleoir fobhuin (SBP) aige. Scaoileann an MBES le fuaimthonnta i gcruth fean faoi chabhail na loinge, a dhéanann sraith de ghrinneall na farraige a thomhas a chuireann eolas ar fáil dúinn faoi dhromchla ghrinneall na farraige, agus foinse fhuaimiúil é an SBP ina ndírítear an fuinneamh faoin ártach i mbíoma aonair, a chabhraíonn linn eolas a fháil faoi chomhdhéanamh an dríodair faoi ghrinneall na farraige. Mar gheall ar chineál fuaimiúil na n-ionstraimí suirbhéireachta seo, cloítear le treoirilínte diana idirnáisiúnta chun an tionchar a imrítear ar fhána muirí a íoslaghdú, mamaigh mhuirí ina measc.

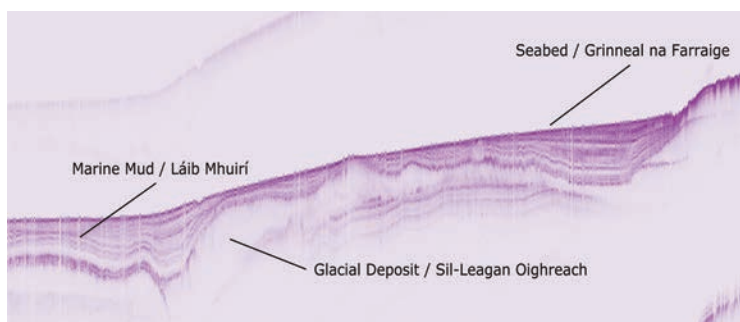
Sondálaí Fuaime Ilbhíoma: Faoi líne snámha an ártach, scaoileanna trasduchtóirí MBES le fuaim idir 200-400 kHz a thaistealaíonn síos trí an gcolún uisce. Mar gheall gur fuaimthonn ardmhinicíochta é, nuair a bhaineann sé grinneall na farraige amach, frithchaitear an chuid is mó



Multibeam Echosounder data used to create a bathymetry model of Bunmahon, off the Co. Waterford coastline.

In order to determine the transmit and receive angle of each beam, a multibeam echosounder requires accurate measurement of the motion of the sonar relative to a Cartesian coordinate system. The measured values are typically heave, pitch, roll, yaw, and heading and these are all collected on board and used for processing of the data.

Sub-Bottom Profiler: The chirp SBP system on board the RV Keary transmits a sweep of frequencies (e.g., 2–7 kHz) in a single pulse. The sound from this reflects from, and refracts through, the seafloor and underlying sediment due to density changes between the sediment layers. This results in a series of sound waves returning to the vessel at slightly different times depending on how deep they penetrated the sediment before returning. These are displayed in the output as a series of layers that can be interpreted to “see” through the seabed and reveal past sedimentation patterns.



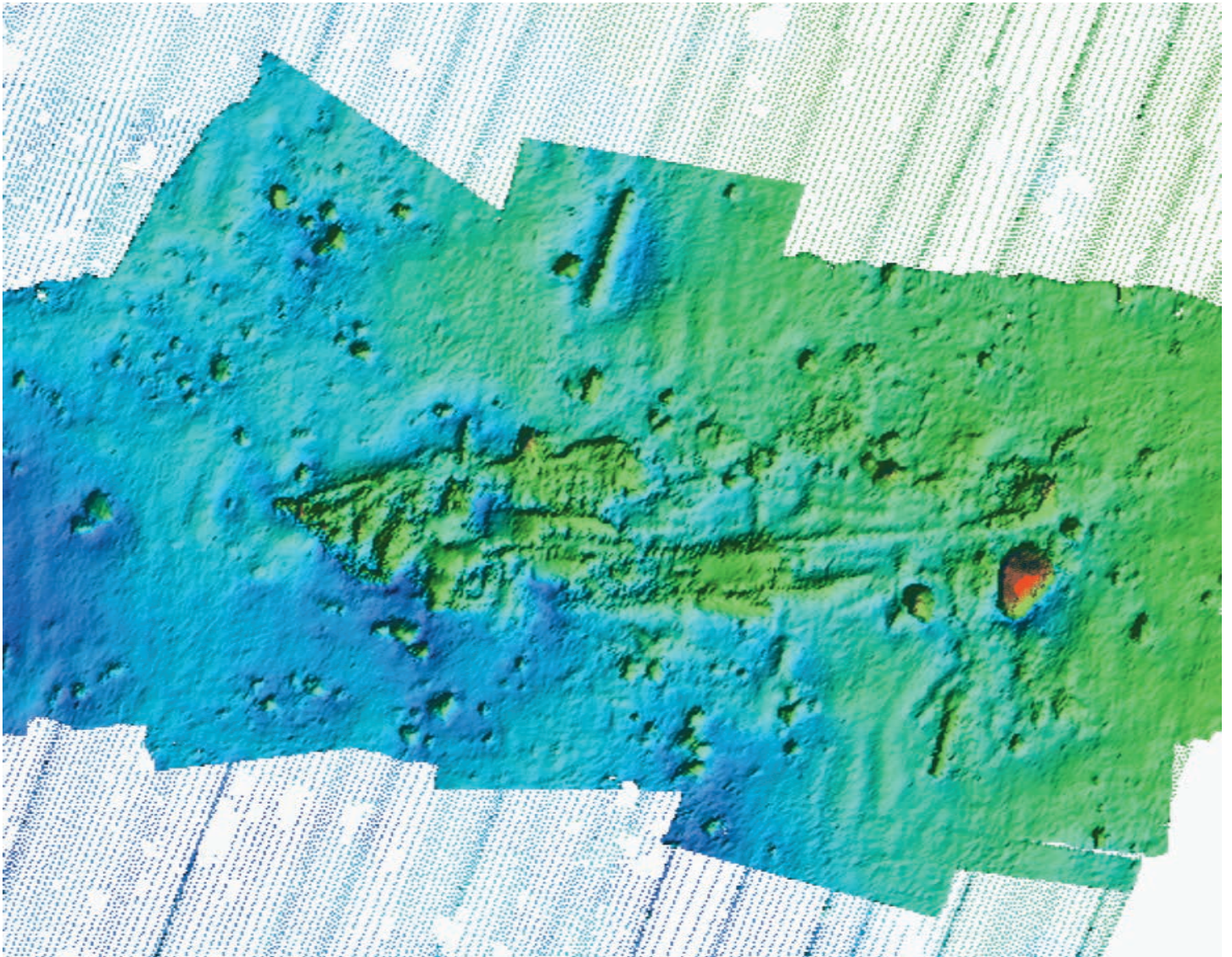
*Example of Sub-Bottom Profile data.
Sampla de shonraí Próifíleoir Fobhuin.*

de ar ais i dtreo an dromchla, áit a gcuireann braiteoirí an fhuaimthonn fhilleach i gcuntas. Úsáidtear an méid ama a ghlacann sé ar na fuaimthonnta chun preabadh ó ghrinneall na farraige agus filleadh ar ghlacadóir chun doimhneacht an uisce a thomhas. Le huilleann tarchuir agus uilleann faighte gach bíoma a dheimhniú, teastaíonn tomhas cruinn ar ghluaisne an tsonóra ón sondálaí fuaime ilbhíoma maidir le córas comhordanáidí Cairtéiseach. I measc na luachanna a thomhaistear, de ghnáth, tá aistriú cothrománach, airde, rolladh, luascáil agus treo-cheann agus bailítear iad seo go léir ar bord agus úsáidtear iad chun na sonraí a phróiseáil.

Próifíleoir Fobhuin: Tarchuireann an córas gíge SBP ar bord an RV Keary stráice minicíochtaí (e.g., 2–7 kHz) i mbíog aonair. Déanann an fhuaim uaidh seo frithchaitheamh ó, agus athraonadh chuig, grinneall na farraige agus an dríodar faoina bhun mar gheall ar athruithe ar dhlús idir na sraitheanna dríodair. Is éard a bhíonn mar thoradh air seo ná sraith fuaimthonnta a fhilleann chuig an ártach ag amanna atá beagán éagsúil, ag brath ar cé chomh domhain a d’imigh siad isteach sa dríodar sular fhill siad. Taispeántar iad seo san aschur mar shraith sraitheanna ar féidir iad a léirtheiscint le “féachaint” trí ghrinneall na farraige agus patrúin dríodraithe roimhe seo a nochtadh.

Outputs: Data from the MBES are used in the production of shaded relief, bathymetric contour, backscatter and seabed classification charts. These provide the context for understanding natural processes (particularly erosive ones) that impact selected sites. Alongside this, new shipwrecks are recorded, and detailed surveys of targeted shipwrecks are produced which let us know more about how these degrade over time, while any changes to navigation charts are recorded and passed onto the UK Hydrographic Office for updating. The SBP will potentially be used to identify buried shipwrecks and longer-term coastal processes.

Aschur: Úsáidtear sonraí ón MBES chun rilíf scáthaithe, comhrian bataiméadrach, cúlscaipeadh agus cairteacha rangaithe a chruthú. Cuireann iad seo an comhthéacs ar fáil chun próisis nádúrtha a thuiscint (go háirithe cinn chreimneacha) a imríonn tionchar ar shuíomhanna áirithe. Ina theannta sin, cuirtear longa báite nua i dtaifead, agus cuirtear suirbhéireachtaí mionsonraithe de longa báite ar leith le chéile a chuireann ar ár gcumas níos mó eolais a fháil faoi conas a thagann díghrádú orthu seo le himeacht ama, agus cuirtear aon athruithe ar chairteacha loingseoireachta i gcuntas agus cuirtear ar aghaidh iad chuig Oifig Hidreagrafach an RA lena nuashonrú. D'fhéadfadh go n-úsáidfear an SBP chun longa báite agus próisis chósta níos fadtéarmaí a shainaithint.



2D multibeam image of the SV Invercauld which was torpedoed and sunk by the German submarine U84 on 22nd February 1917 off the Saltee Islands, Co Wexford. The Germans boarded her in search of food, but with water ingress preventing this, the German commander contented himself by taking the chronometer, binoculars, clocks, bell, and ensign, for which he gave a receipt.

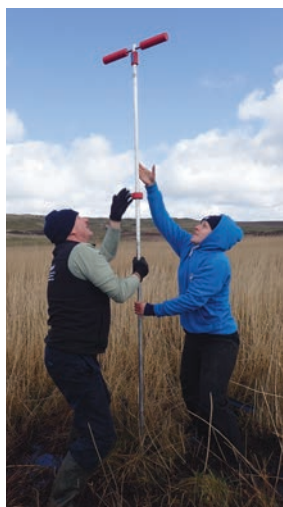
Íomhá ilbhíoma 2D den SV Invercauld a buaileadh le toirpéad agus a bháigh an fomhuireán Gearmánach U84 an 22 Feabhra 1917 amach ó na Sailtí, Contae Loch Garman. Tháinig na Gearmánaigh ar bord na loinge sa tóir ar bhia, ach níor éirigh leo sin a dhéanamh mar gheall ar an méid uisce a bhí ag iontráil na loinge, mar sin, thug an ceannasaí Gearmánach an cronaiméadar, na déshúiligh, na cloig, an clog agus an meirge ina ionad sin, agus thug sé admháil dóibh.

Sediment Coring

In order to reconstruct past environments (palaeoenvironments) or climatic change, we use physical, biological and chemical evidence trapped within layers of sediments that have been deposited over time in lakes, bogs and wetlands. For the CHERISH project, our palaeoenvironmental research, led by the team from the Department of Geography and Earth Sciences at Aberystwyth University, is focusing on investigating records of past storm activity and coastal change in our study areas. There is a variety of different equipment available to researchers to retrieve cores of sediment from the bottom of lakes or bogs, each suited to a particular situation or objective. Essentially, a hollow tube is inserted into the mud, filling the tube before being pulled out. This is rarely achieved without a lot of pushing, pulling, and getting thoroughly wet and muddy, but is quite a lot of fun into the bargain. The CHERISH team has been using three different types of corer dependent on the type of environment we have been working in.

Russian Corer: This is a half cylinder with the chamber covered by a metal flap. It is ideal for collecting sediments from bogs and mires where the surface can support the two or three people needed to operate it. Typically 0.5 or 1 metre in length, the corer is pushed into the sediment and, at the correct depth, it is rotated through 180° which opens the flap and fills the chamber with an undisturbed sample from that depth. A complete, overlapping sequence is taken alternately from two adjacent holes as the nose of the corer disturbs the sediments immediate

Russian coring at Castlemartin Corse, Pembrokeshire.



A sediment sample obtained with a Russian corer from Castlemartin Corse, Pembrokeshire. This sample is from c. 5 metres below the ground.

Sampla dríodair a fuarthas le croíghearrthóir Rúiseach ó Castlemartin Corse, Pembrokeshire. Tá an sampla seo ó thart ar 5 mhéadar faoin talamh.

Croíleacú Dríodair

Chun timpeallachtaí roimhe seo (pailéithimpeallachtaí) nó athrú aeráide a atógáil, úsáidimid fianaise fhisiciúil, bhitheolaíoch agus cheimiceach atá gafa laistigh de shraitheanna de dhríodair a rinneadh a shil-leagan le himeacht ama i lochanna, portaigh agus bogaigh. I gcás thionscadal CHERISH, tá ár dtaighde pailéachomhshaoil, atá faoi stiúir na foirne ón Roinn Tíreolaíochta agus Domhaneolaíochtaí ag Ollscoil Aberystwyth, ag díriú ar thaifid ar ghníomhaíocht stoirme roimhe seo agus athrú cósta inár limistéir staidéir. Tá éagsúlacht de threalamh éagsúil ann ar do thaighdeoirí chun croíleacáin de dhríodar a fháil ó bhun lochanna nó portach, a bhfuil gach ceann oiriúnach do chás nó cuspóir ar leith. Go bunúsach, ionsáitear feadán cuasach isteach sa láib, a líonann an feadán sula dtarraingítear amach é. Is annamh a bhaintear seo amach gan go leor brú, tarraingthe agus gan éirí go hiomlán fliuch agus loite le láib, ach bíonn go leor spraoi i gceist leis, chomh maith! Tá úsáid á baint

ag foireann CHERISH as trí shaghas éagsúla de chroíghearrthóir ag brath ar shaghas na timpeallachta ina rabhamar ag oibriú.

Croíghearrthóir Rúiseach: Leathshorcóir é seo ina bhfuil an seomra cumhdaithe ag flapa miotail. Bíonn sé an-oiriúnach chun dríodair a bhailiú ó phortaigh agus ó phuitigh, áit ar féidir leis an dromchla tacú leis an mbeirt nó

Croíleacú Rúiseach ar siúl ag Castlemartin Corse, Pembrokeshire.

an triúr daoine a theastaíonn chun é a oibriú. Bíonn siad 0.5 nó 1 mhéadar ar fad, de ghnáth, agus brúitear an croíghearrthóir isteach sa dríodar agus, ag an doimhneacht cheart, déantar é a chasadh thart 180° a osclaíonn an flapa agus a líonann an seomra le sampla den doimhneacht sin nár cuireadh isteach air. Glactar sraith iomlán fhorluíteach babhta ar bhabhta ó dhá pholl taobh lena chéile mar gheall go gcuireann srón an chroíghearrthóra isteach ar na dríodair díreach faoi gach sampla. Bailítear an tsraith

below each sample. The sequence is simply collected by rotating the flap and transferring it to a plastic tube for detailed analysis back in the laboratory.

Livingstone Corer: When it comes to coring lakes, loose sediments can be “washed” out of a Russian corer chamber as it is brought back up through the water. Therefore, we use a closed, 1-metre long cylinder fitted with a piston. As the tube is pressed into the mud, the piston is drawn up on a wire creating a suction to keep the sediments in the cylinder as it comes up through the water. This method means we gather more material than we get with a Russian corer, but recovering the core from the closed tube is a little more involved and a small winch comes in very handy for this. Cores are retrieved in metre-long sections. The key to a successful coring operation is a securely anchored platform. For the CHERISH project, we are using a modular pontoon and two inflatable ribs, one which stays attached to the raft as a safety boat and the other which is used to ferry between the platform and shore.



Pushing the Livingstone corer into the sediments at Stackpole Mere, Pembrokeshire.

Croígearrthóir Livingstone á bhrú isteach sna dríodair ag Stackpole Mere, Pembrokeshire.

go simply tríd an bhflapa a chasadh agus é a aistriú go feadán plaisteach go ndéanfar anailís mhionsonraithe air ar ais sa tsaotharlann.

Croígearrthóir Livingstone: Nuair a bhíonn lochanna á gcroileacú, tarlaíonn go ndéantar dríodair “a ghlanadh” amach ó sheomra croígearrthóra Rúisigh fad a thugtar ar ais aníos ón uisce é. Ar an ábhar sin, úsáidimid sorcóir dúnta, 1 mhéadar ar fad ina bhfuil loine. Fad a bhrúitear an feadán isteach sa láib, tarraingítear an loine aníos ar shreang a chruthaíonn sú chun na dríodair a choimeád sa sorcóir fad a thugtar aníos ón uisce é. Ciallaíonn an modh seo go mbailímid níos mó ábhar ná a fhaighimid le croígearrthóir Rúiseach, ach bíonn beagán níos mó le déanamh chun an croileacán a bhaint ón bhfeadán dúnta agus bíonn castainn bheag an-áisiúil dó seo. Faightear croileacáin ar ais i bhfaid mhéadair. Is é is tábhachtaí maidir le hoibriúchán rathúil croileacaithe ná ardán atá ar ancaire daingean. Do thionscadal CHERISH, tá úsáid á baint againn as pontún modúlach agus dhá easna inséidte, ceann amháin a fhanann ceangailte leis an rafta mar bhád sábháilteachta agus an ceann eile a úsáidtear chun farantóireacht a dhéanamh idir an t-ardán agus an cladach.



Sometimes a bit of extra help is needed to get the corer into the mud!

Teastaíonn beagán cabhair bhreise, amanna, chun an croígearrthóir a thabhairt isteach sa láib!

Dr Patrick Robson (standing) with postgraduate students, Joseph Taylor, Charlotte Hendley and Matej Roman at Stackpole Mere, at the end of a successful Livingstone coring trip.



An Dr Patrick Robson (ina sheasamh) le mic léinn iarchéime, Joseph Taylor, Charlotte Hendley agus Matej Roman ag Stackpole Mere, ag deireadh turas rathúil croileacaithe Livingstone.

Percussion Coring: Both Russian and Livingstone coring rely on our ability to push the corer into the sediment with brute strength, everyone's combined bodyweight or a very large hammer – but we also have to be able to pull it back out under our own steam as well! For highly compacted sediments, in drier conditions, coring can be very tough, and we need to use mechanical power in the form of a percussion corer. A petrol-driven percussive engine hammers the core tube into the sediments and is extracted with a hand-operated jacking system. We have been using this system successfully to obtain sediment cores from within sand dune systems, to help us reach the base, where we can take samples of sand to help us obtain the age of sand dune activity and initial development of coastal features.

Croileacú Tuargana: Braitheann croileacú Rúiseach agus Livingstone araon ar ár gcumas chun an croighearrthóir a bhrú isteach sa dríodar láidreachth thréan, meáchan coirp gach duine nó casúr an-mhór – ach caithfidh go bhfuil ar ár gcumas againn, chomh maith, é a tharraingt ar ais amach sinn féin! I gcás dríodair atá an-bhalctha, d'fhéadfadh croileacú a bheith an-deacair nuair a bhíonn an talamh níos tirime, agus is gá dúinn úsáid a bhaint as cumhacht mheicniúil i bhfoirm croighearrthóir tuargana. Buaileann inneall buailte faoi thiomáint peitрил feadán an chroileacáin isteach sna dríodair agus baintear é le córas seacála lámhoibrithe. Tá úsáid rathúil á baint againn as gcóras seo chun croileacáin dríodair a fháil ó thaobh istigh de chórais dhumhcha, chun cabhrú linn an bonn a bhaint amach, áit ar féidir linn samplaí de ghaineamh a ghlacadh chun cabhrú linn aois ghníomhaíocht na duimhche agus forbairt tosaigh gnéithe cósta a fháil.



Percussion coring at Aberleri, Borth, Ceredigion.

Croileacú tuargana ag Aberleri, Borth, Ceredigion.



Retrieving a percussion core sample near Borth, Ceredigion. Sampla croileacán tuargana á fháil i ngar do Borth, Ceredigion.

MEET THE CHERISH TEAM / CAS LE FOIREANN CHERISH

Daniel Hunt, Royal Commission on the Ancient and Historical Monuments of Wales

It is perhaps cliché to say that it was Time Team that first sparked my interest in archaeology, but it is true! The idea of discovering lost sites and being able to interpret how past humans lived on a day-to-day basis just by putting a hole in the ground really did capture my imagination. My archaeological journey began at The University of Wales, Trinity Saint David, where I studied for a BA in Archaeology. It soon became apparent to me that there was much more to archaeology than just digging around in the dirt looking around for clues. Since graduating I have worked for several commercial archaeological units and subsequently went on to spend a year with Historic England training in the dark arts of non-invasive archaeological survey. As well as working on CHERISH, I am also currently studying part-time for an MSc in Applied Landscape Archaeology at the University of Oxford.

My role as a project archaeologist on the CHERISH project involves the recording of archaeology around the Welsh coastline that is threatened by the effects of climate change. This work will enable us to improve our understanding of some of our most stunning sites before



Daniel Hunt, Coimisiún Ríoga Shéadchomharthaí Ársa agus Stairiúla na Breataine Bige

B'fhéidir gur cliché é le rá gurbh é Time Team an chéad rud a spreag suim ionaim sa tseandálaíocht, ach is fíor sin! Chuaigh teacht ar shuíomhanna ceilte agus bheith in ann a thuiscint conas a mhair daoine roimhe seo ar bhonn laethúil díreach trí pholl a chur sa talamh go mór i bhfeidhm ar mo shamhlaíocht. Cuireadh tús le m'aistear seandálaíochta ag Ollscoil na Breataine Bige, Trinity Saint David, áit a ndearna mé staidéar do BA sa tSeandálaíocht. Ba léir dom go luath go raibh i bhfad níos mó i gceist leis an tseandálaíocht ná díreach tochailt timpeall sa chré agus leideanna á gcuardach. Ó bhain mé céim amach, d'oibrigh mé le roinnt aonaid seandálaíochta tráchtála agus d'imigh mé ina dhiaidh sin chun bliain a chaitheamh go gcuirfí oiliúint Historic England orm in ealaíona ceilte na suirbhéireachta neamhionraí seandálaíochta. Anuas ar oibriú le CHERISH, tá staidéar páirtaimseartha á dhéanamh agam, chomh maith, ar MSc sa tSeandálaíocht Tírdhreacha Fheidhmeach ag Ollscoil Oxford.

Is éard a dhéanaim mar chuid de mo ról mar sheandálaí tionscadail ar tionscadal CHERISH ná seandálaíocht a chur i dtaifead timpeall ar imeallbhord na Breataine Bige a mbagraíonn éifeachtaí athrú aeráide uirthi. Cuirfidh an obair seo ar ár gcumas feabhas a chur ar ár dtuiscint ar roinnt dár suíomhanna is iontaí sula gcailltear iad. Ba ghá dúinn teicnící nua-aimseartha agus traidisiúnta taifeadta a ghlacadh agus a fhorbairt trí thabhairt faoin misean seo, ar nós scanadh léasair ón aer agus ar talamh, grianghraif ón aer a léirtheiscint, suirbhéireacht ar chréfort ar talamh agus úsáid a bhaint as UAVanna. Rud éigin atá i dteicneolaíochtaí nua-aimseartha a chur i bhfeidhm do thaifeadadh agus taighde seandálaíochta a bhfuil mé fíor-phaiseanta faoi agus rud éigin a bhfuil fonn mór orm cur leis laistigh de CHERISH agus ar aghaidh amach anseo. Ónár n-obair suirbhéireachta, beimid in ann táirgí a chruthú, ar nós samhla 3D, a úsáidfear leis an tionchar a thaispeáint go díreach a imríonn athrú aeráide ar na suíomhanna seo, anuas ar iad a oscailt do dhaoine a bhféadfadh nach mbeidís in ann iad a rochtain go pearsanta. Táim ag tnúth le leanúnach ag oibriú ar thionscadal atá chomh spreagthach sin agus tá súil agam go mbeidh ár n-obair éifeachtach lena

they are lost. Undertaking this mission has required us to adopt and develop modern and traditional recording techniques, such as aerial and terrestrial laser scanning, aerial photo interpretation, terrestrial earthwork survey and the use of UAVs. The application of modern technologies for archaeological recording and research is something that I am hugely passionate about and something that I am very keen to contribute towards within CHERISH and moving into the future. From our survey work we will be able to create products, such as 3D models, that will be used to demonstrate just how much these sites are being affected by climate change as well as opening them up to people who may not be able to personally access them. I look forward to continuing to work on such a stimulating project and hope that our work will be effective in showing that climate change is a huge problem that urgently needs to be addressed.

Kieran Craven, Geological Survey Ireland

I graduated with a BSc in Geoscience and Environmental Biology from the University of St Andrews in 2006. Following a stint working for an aggregates company in the UK, I completed my PhD in Geology from Trinity College Dublin in 2013 investigating the impacts of sea-level rise on coastal environments. I have since worked as a lecturer in both Trinity College Dublin and Maynooth University, where my research focussed on the impacts of the last glacial maximum to Quaternary sediments in marine environments. My most recent work was affiliated with the INFOMAR programme of the Geological Survey Ireland and involved using acoustic technologies to interpret seabed and subsurface environments.

In my current CHERISH role, which I started in July 2018, I'm responsible for the investigation, analysis and presentation of coastal mapping sites, and delivering public engagement and community geoscience activities. In particular, this relates to the bathymetric data the GSI survey vessels acquire and the topographic UAV data that we are collecting. I'm looking to make products from the data that will be of use to the communities where they're collected.

Given the international and interdisciplinary nature of the project, it's fantastic to be a part of CHERISH. Having grown up near the sea, I've always been interested in the coastal environment and am looking forward to encouraging the continued engagement of coastal communities with their surroundings.

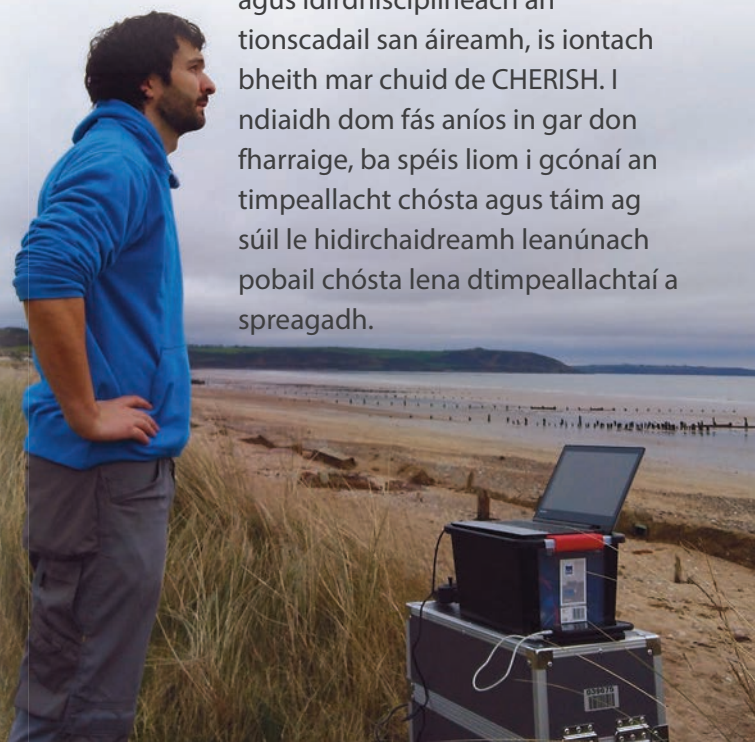
thaispeáint gur fadhb ollmhór é athrú aeráide ar gá dul i ngleic leis go práinneach.

Kieran Craven, Suirbhéireacht Gheolaíochta na hÉireann

Bhain mé céim amach le BSc sa Gheo-Eolaíocht agus Bitheolaíocht Chomhshaoil ó Ollscoil St Andrews in 2006. I ndiaidh seal a chaitheamh ag oibriú le cuideachta tathagaithe sa Ríocht Aontaithe, chríochnaigh mé mo PhD sa Gheolaíocht i gColáiste na Tríonóide, Baile Átha Cliath in 2013 agus tionchar ardú leibhéal na farraige ar thimpeallachtaí cósta á fhiosrú agam. D'oibrigh mé ó shin mar léachtóir i gColáiste na Tríonóide, Baile Átha Cliath agus Ollscoil Mhá Nuad, áit ar dhírigh mo thaighde ar thionchar an uasmhéid oighrithe dheireanaigh ar dhriodair an Cheathartha i dtimpeallachtaí muirí. Bhí an obair ba dhéanaí a rinne mé cleamnaithe le clár INFOMAR de chuid Shuirbhéireacht Gheolaíochta na hÉireann agus bhí baint aige i dteicneolaíochtaí fuaimiúla a úsáid chun timpeallachtaí ghrinneall na farraige agus fodhromchla a léirtheiscint.

Sa ról reatha CHERISH atá agam, a thosaigh mé in Iúil 2018, tá mé freagrach as suíomhanna léarscáilithe cósta a fhiosrú, a anailísiú agus a chur i láthair, agus gníomhaíochtaí rannpháirtíochta poiblí agus geoeolaíochta pobail a sholáthar. Baineann seo, ach go háirithe, leis na sonraí bataiméadracha a theastaíonn ó áirtheaí suirbhéireachta SGÉ agus na sonraí topagrafacha UAV atá á mbailiú againn. Táim ag súil le táirgí a dhéanamh ó na sonraí sin a bheidh áisiúil do na pobail nuair a bhailítear iad.

Nuair a chuirtear cineál idirnáisiúnta agus idirdhisciplíneach an tionscadail san áireamh, is iontach bheith mar chuid de CHERISH. I ndiaidh dom fás aníos in gar don fharraige, ba spéis liom i gcónaí an timpeallacht chósta agus táim ag súil le hidirchaidreamh leanúnach pobail chósta lena dtimpeallachtaí a spreagadh.



PUFFTY'S FACT FILE / COMHAID FÍRICÍ PUFFTY

CHERISH mascot and team member Puffty-Hump has been out in the field gathering some interesting facts and figures relating to Climate Change, Coastal Heritage and our project. Did you know ...

Bhí sonóg agus ball foirne CHERISH, Puffty-Hump, amach sa pháirc agus roinnt fíricí agus figiúirí suimiúla á mbailiú aige a bhaineann le hAthrú Aeráide, Oidhreacht Chósta agus ár dtionscadal. Arbh eol duit?

*Puffty surveying on Cardigan Island.
Suirbhéireacht á déanamh ag Puffty
ar Oileán Cardigan.*



Puffty in charge of the ROV (remotely operated vehicle) in Dun Laoghaire harbour.

Puffty i gceannas ar an ROV (feithicil chianoibrithe) i gcuan Dhún Laoghaire.

The new set of UK climate projections UKCP18, launched on 26 November 2018, shows climate change will increase the chance of warmer, wetter winters in the UK. Hotter, drier summers like 2018 could also become the norm by 2050. A warming climate will also lead to rising seas in the UK, with more rise in the south than in the north and more rise if greenhouse gas emissions aren't curbed.

North-west Wales was incredibly hot in the summer of 2018, accounting for all the cropmarks recorded from the air! For several days in late June, the coastal town of Porthmadog in Gwynedd recorded the hottest UK temperatures hitting 32.6C on Thursday 28 June.

At a UK level, the Met Office says 2018 was the hottest summer since records began in 1910, equalled by the summers of 1976, 2003 and 2006 – which were all excellent summers for recording buried cropmark archaeology in Wales.

A total of 10 named storms affected the UK during 2018 – of which four occurred in January (Source: Met Office National Climate Information Centre).

In the UK, the year 2018 saw both some high and low temperature records broken. However, the prevalence of warmer days in general – that were not restricted to the summer heatwave – continue a pattern of a warmer UK climate and contributed to a top 10 warmest year for the UK, which was warmer than any year of the twentieth century (Source: Met Office National Climate Information Centre).

Taispeántar sa tsraith nua de thuartha aeráide an RA, UKCP18, a seoladh an 26 Samhain 2018, go méadóidh athrú aeráide an dóchúlacht go mbeidh geimhrí níos teo agus níos fliche sa Ríocht Aontaithe. D'fhéadfadh go mbeadh samhraí níos teo agus níos tirime, ar nós shamhradh 2018, ina ngnáthaimsir shamhraidh faoin mbliain 2050, chomh maith. Beidh farraigí ardaithe sa Ríocht Aontaithe mar thoradh ar aeráid atá ag éirí níos teo, chomh maith leis sin, agus tiocfaidh ardú níos mó sa deisceart ná mar a thiocfaidh sa tuaisceart agus tiocfaidh ardú níos mó air mura dtéitear i ngleic le hastaíochtaí gás ceaptha teasa.

Bhí larthuaisceart na Breataine Bige fíor-the i rith shamhradh 2018, agus bá é ba chúis leis na barrachomharthaí go léir a cuireadh i gcuntas ón aer! Ar feadh roinnt laethanta go déanach i Meitheamh, cuireadh na teochtaí ba theo san RA i gcuntas in Gwynedd nuair a baineadh 32.6 céim Celsius amach Déardaoin, an 28 Meitheamh.

Ar leibhéal an RA, deir an Oifig Mheitéareolaíochta gurbh é 2018 an samhradh ba theo ó cuireadh tús le taifid i 1910, a bhí chomh te céanna le samhraí 1976, 2003 agus 2006 – ar shamhraí iontacha iad siúd go léir chun seandálaíocht bharrachomhartha faoin talamh a chur i gcuntas sa Bhreatain Bheag.

Bhuail 10 stoirm ainmnithe an RA i rith 2018, ar an iomlán – ar thit ceithre cinn díobh amach in Eanáir (Foinse: An Lárionad Eolais ar an Aeráid Náisiúnta de chuid na hOifige Meitéareolaíochta).

Sa Ríocht Aontaithe, sáraíodh roinnt íosleibhéil agus uasleibhéil teochta sa bhliain 2018. Mar gheall go dtagann laethanta níos teo aníos go ginearálta, áfach – nár tháinig aníos i rith thonn teasa an tsamhraidh amháin – leanann patrún d'aeráid níos teo san RA agus baineadh an bhliain ba theo le 10 mbliana anuas don RA, a bhí ní ba theo ná bliain ar bith san fhichiú haois (Foinse: An Lárionad Eolais ar an Aeráid Náisiúnta de chuid na hOifige Meitéareolaíochta).

THE #ClimateHeritage COMMUNITY / AN POBAL #ClimateHeritage

Heritage organisations in Scotland, Wales, England, Northern Ireland and the Republic of Ireland are all collaborating to develop a clearer understanding of the impacts of climate change on our cultural heritage. CHERISH is proud to be part of this collaboration through groups such as the Historic Environment Adaptation Working Group (HEAWG) and through partnership projects, forums, seminars and conferences where sharing knowledge, resources and data is the guiding principle.

In recent months, Climate Change Adaptation Plans have been launched for consultation in Wales, while in Ireland drafting of sectoral adaptation plans have commenced following publication of the National Adaptation framework in January 2018. We're pleased to say that CHERISH is involved with these, with our project showcased and several of our study sites used as case studies. More information is available here:

- **Wales's draft Historic Environment and Climate Change: Sector Adaptation Plan**
<https://cadw.gov.wales/about/partnershipsandprojects/partners/histenvgroup/climatechange/?lang=en>
- **Welsh Government's draft Climate Change Adaptation Plan for Wales**
<https://beta.gov.wales/climate-change-adaptation-plan-for-wales>
- **Ireland's National Adaptation Framework**
<https://www.dccae.gov.ie/en-ie/climate-action/topics/adapting-to-climate-change/national-adaptation-framework/Pages/default.aspx>
- **Ireland's Sectoral Adaptation Planning**
<https://www.dccae.gov.ie/en-ie/climate-action/topics/adapting-to-climate-change/national-adaptation-framework/Pages/default.aspx>

Join the growing community of researchers, academics, professionals and enthusiasts talking about cultural heritage and climate change. Search #ClimateHeritage.

Tá eagraíochtaí oidhreacht in Albain, an Bhreatain Bheag, Sasana, Tuaisceart Éireann agus i bPoblacht na hÉireann go léir ag oibriú as lámh a chéile chun tuiscint níos soiléire a fhorbairt ar thionchar an athraithe aeráide ar ár n-oidhreacht chultúrtha. Tá bród ar CHERISH bheith mar chuid den chomhoibriú seo trí ghrúpaí ar nós an Ghrúpa Oibre Oiriúnaithe Timpeallachta Stairiúla (HEAWG) agus trí thionscadail chomhpháirtíochta, fóraim, seimineáir agus comhdhálacha, áit arb é eolas, acmhainní agus sonraí a roinnt an prionsabal treorach.

Le míonna beaga anuas, seoladh Pleananna Oiriúnaithe Athraithe Aeráide do chomhairliúchán sa Bhreatain Bheag, agus cuireadh tús in Éirinn le pleananna oiriúnaithe earnála a dhréachtú i ndiaidh gur foilsíodh an creat Oiriúnaithe Náisiúnta in Eanáir 2018. Is deas linn a thabhairt le fios go bhfuil CHERISH leo seo, agus rinneadh ár dtionscadal a thaispeáint agus úsáideadh roinnt dár suíomhanna staidéir mar chás-staidéir. Tá faisnéis bhreise ar fáil anseo:

- **An dréacht Timpeallacht Stairiúil agus Athrú Aeráide de chuid na Breataine Bige: Plean Oiriúnaithe Earnála**
<https://cadw.gov.wales/about/partnershipsandprojects/partners/histenvgroup/climatechange/?lang=en>
- **Dréachtplean Oiriúnaithe Athraithe Aeráide don Bhreatain Bheag de chuid Rialtas na Breataine Bige**
<https://beta.gov.wales/climate-change-adaptation-plan-for-wales>
- **Creat Oiriúnaithe náisiúnta na hÉireann**
<https://www.dccae.gov.ie/en-ie/climate-action/topics/adapting-to-climate-change/national-adaptation-framework/Pages/default.aspx>
- **Pleanáil Oiriúnaithe Earnála na hÉireann**
<https://www.dccae.gov.ie/en-ie/climate-action/topics/adapting-to-climate-change/national-adaptation-framework/Pages/default.aspx>

Bí páirteach sa phobal taighdeoirí, acadóirí, gairmithe agus díograiseoirí atá ag dul ó neart go neart a labhraíonn faoi oidhreacht chultúrtha agus athrú aeráide. Cuardaigh #ClimateHeritage.



Cherish team members from the Discovery Programme outside the Martello tower during recent fieldwork on Ireland's Eye, a small uninhabited island off the coast of County Dublin.

Baill foirne Cherish ón gClár Fionnachtana taobh amuigh den Túr Martello fad a bhí obair allamuigh ar siúl le déanaí ar Inis Mhic Neasáin, oileán beag neamháitrithe amach ó chósta Chontae Bhaile Átha Cliath.



Coal Rock Pilot Beacons at Carmel Head, Anglesey.
Rabhcháin Phíolaí Carraig Ghuail ag Ceann Carmel, Anglesey.

DATES FOR YOUR DIARY

We've got a number of events already in the diary for 2019. You'll find us at:

- Gwynedd Archaeological Trust Winter Lecture Series: Menai Bridge, Anglesey, 13 February 2019.
- Europae Archaeologiae Consilium (EAC) Annual Meeting: Dublin Castle, 28 February – 2 March 2019.
- Institute of Archaeologists Ireland (IAI) Conference: River Lee Hotel, Co. Cork, 5–6 April 2019.
- Friends of Oriel y Parc: St Davids, Pembrokeshire, 10 April 2018.
- Ceredigion Historical Society, Annual General Meeting: Aberystwyth, 13 April 2018.
- Chartered Institute for Archaeologists (CIfA): Leeds, 24–26 April 2019.
- Cymdeithas Hanes y Tair Llan: Felinwnda (Llanwnda), 14 May 2019 (Talk in Welsh).
- 7th EUGEO Congress: Galway, Ireland, 15–18 May 2019.
- International Union for Quaternary Research (INQUA): Dublin, 25–31 July 2019.

More will be added in the coming months, so please keep an eye on our website and social media channels for the latest dates.

DÁTAÍ LE BREACADH SA DIALANN

Tá roinnt imeachtaí sa dialann againn cheana féin don bhliain 2019. Casfaidh tú linn ag na himeachtaí seo a leanas:

- Sraith Léachtaí Geimhridh Iontaobhas Seandálaíochta Gwynedd: Droichead Menai, Anglesey, an 13 Feabhra 2019.
- Cruinniú Bliantúil Europae Archaeologiae Consilium (EAC): Caisleán Bhaile Átha Cliath, an 28 Feabhra – an 2 Márta 2019.
- Comhdháil Institiúid Seandálaithe na hÉireann (IAI): Abhainn na Laoi, Contae Chorcaí, an 5–6 Aibreán 2019.
- Cairde Oriel y Parc: St Davids, Pembrokeshire, an 10 Aibreán 2018.
- Cumann Staire Ceredigion, Cruinniú Ginearálta Bliantúil: Aberystwyth, an 13 Aibreán 2018.
- Institiúid Chairte na Seandálaithe (CIfA): Leeds, an 24–26 Aibreán 2019.
- Cymdeithas Hanes y Tair Llan: Felinwnda (Llanwnda), an 14 Bealtaine 2019. (Caint sa Bhreatainis)
- 7ú Comhdháil EUGEO: Gaillimh, Éire, an 15–18 Bealtaine 2019.
- An tAontas Idirnáisiúnta um Thaighde ar an gCeathartha (INQUA): Baile Átha Cliath, an 25–31 Iúil 2019.

Cuirfear níos mó leis na himeachtaí thuas sna míonna amach anseo, mar sin, coimeád súil ar ár láithreán gréasáin agus ár gcainéil mheán sóisialta chun teacht ar na dátaí is déanaí.



CHERISH

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

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