

Newyddion

CHERISH

News



CHERISH

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



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Clawr Blaen: Rob Shaw, aelod o dîm CHERISH o'r Rhaglen Darganfod, yn cynnal arolwg monitro ar Safle Treftadaeth Byd Skellig Michael, Sir Kerry.

Front Cover: Rob Shaw, part of the CHERISH team from the Discovery Programme, undertaking a monitoring survey at the World Heritage site of Skellig Michael, Co. Kerry.



Gwaith maes wedi'i gwblhau! Patrick Robson, Sarah Davies a Louise Barker yn mynd am adref ar ôl prynhawn prysur yn cofnodi ac yn samplu ar draeth Warren ger Abersoch, Gwynedd ym mis Medi 2020.

Fieldwork complete! Patrick Robson, Sarah Davies and Louise Barker heading home after a busy afternoon recording and sampling on The Warren beach near Abersoch, Gwynedd in September 2020.

CROESO

i Rifyn 7 Newyddion CHERISH

Croeso i seithfed rhifyn cylchlythyr CHERISH. Oherwydd COVID-19, mae tîm CHERISH yn y ddwy wlad wedi bod yn gweithio o gartref yn bennaf, ond maent wedi gallu cynnal rhywfaint o waith maes blaenoriaeth ar y tir ac yn y môr yn ystod ail hanner 2020. Fel gweddill y byd, mae'r tîm wedi symud i ymgysylltu ar-lein yn hwylus, ar gyfer ein cyfarfodydd prosiect ein hunain ac ar gyfer darlithoedd cyhoeddus ac ysgolion dydd. Mae'r rhifyn hwn yn cyflwyno uchafbwyntiau'r prosiect rhwng mis Mehefin a mis Rhagfyr 2020, a rhywfaint o newyddion cyffrous am ddigwyddiadau yn y dyfodol i edrych ymlaen atynt yn 2021.

Ar gyfer newyddion a straeon o ddydd i ddydd, cofiwch edrych ar ein gwefan ni a'n tudalennau ar Facebook a Twitter, ac mae eu manylion ar gael isod.

Rydym yn cyflwyno'r rhifyn yma er cof am David Ingham, gwirfoddolwr gwerthfawr gyda CHERISH a fu farw yn drist iawn ym mis Tachwedd 2020.

WELCOME

to Issue 7 of CHERISH News

Welcome to the seventh issue of the CHERISH newsletter. Due to COVID-19 the CHERISH team in both nations have been largely working from home but have been able to undertake some priority fieldwork on land and sea during the second half of 2020. Like the rest of the world the team have embraced the move to online engagement, both for our own project meetings and for public lectures and dayschools. This issue brings you the project highlights between June and December 2020, and some exciting news about future events to look forward to in 2021.

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.

We dedicate this issue to David Ingham, a much valued CHERISH volunteer who sadly passed away in November 2020.



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YNGHYLCH CHERISH / ABOUT CHERISH

Mae CHERISH yn brosiect chwe blynedd rhwng Iwerddon a Chymru ac mae'n dod â phedwar partner ar draws y ddwy wlad at ei gilydd: Comisiwn Brenhinol Henebion Cymru; y Rhaglen Darganfod, Iwerddon; Prifysgol Aberystwyth; Adran Daearyddiaeth a Gwyddorau Daeareg ac Arolwg Daearegol Iwerddon. Dechreuodd y prosiect ym mis Ionawr 2017 a bydd yn weithredol tan fis Rhagfyr 2022. Bydd yn elwa o €4.9 miliwn o arian yr UE drwy Raglen Gydweithredol Iwerddon Cymru 2014-2020.

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

Mae CHERISH yn brosiect gwirioneddol drawsddisgyblaethol sydd â'r nod o godi ymwybyddiaeth a gwella dealltwriaeth o effeithiau newid yn yr hinsawdd, stormydd a thywydd eithafol yn y gorffennol, y presennol a'r dyfodol agos ar dreftadaeth ddiwylliannol gyfoethog ein môr a'n harfordir. Rydym yn cysylltu'r tir a'r môr ac yn defnyddio amrywiaeth o dechnegau a dulliau i astudio rhai o'r lleoliadau arfordirol mwyaf eiconig yn Iwerddon a Chymru. Mae'r rhain yn amrywio o sganio laser daearol ac awyr, arolygu geoffisegol a mapio gwely'r môr i samplu paleoamgylcheddol, cloddio a monitro llongddrylliadau.

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 paleoenvironmental sampling, excavation and shipwreck monitoring.



Map prosiect dwy wlad CHERISH yn dangos ein hardaloedd gweithio. Yn ystod blwyddyn gyntaf y prosiect, rydym wedi bod yn gweithio'n galed gydag asiantaethau, rhanddeiliaid, perchnogion tir a grwpiau lleol i lunio ardaloedd gweithio'r ddwy wlad yn derfynol ar sail bylchau gwybodaeth a data, meysydd blaenoriaeth risg erydu a'r potensial ar gyfer cydweithredu. Ewch i adran 'Gweithgareddau' gwefan ein prosiect i weld map y gellir clicio arno lle gallwch ddysgu mwy am bob ardal astudio.

Illustration © 2020 Carys Tait / Carys-ink.com

The CHERISH joint-nation project map, showing our working areas. 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.

**Mae graffeg 'pecyn adnoddau'
CHERISH yn dangos ein dull
integredig ac amlddisgyblaethol
o arolygu ar y tir ac o dan y môr.**

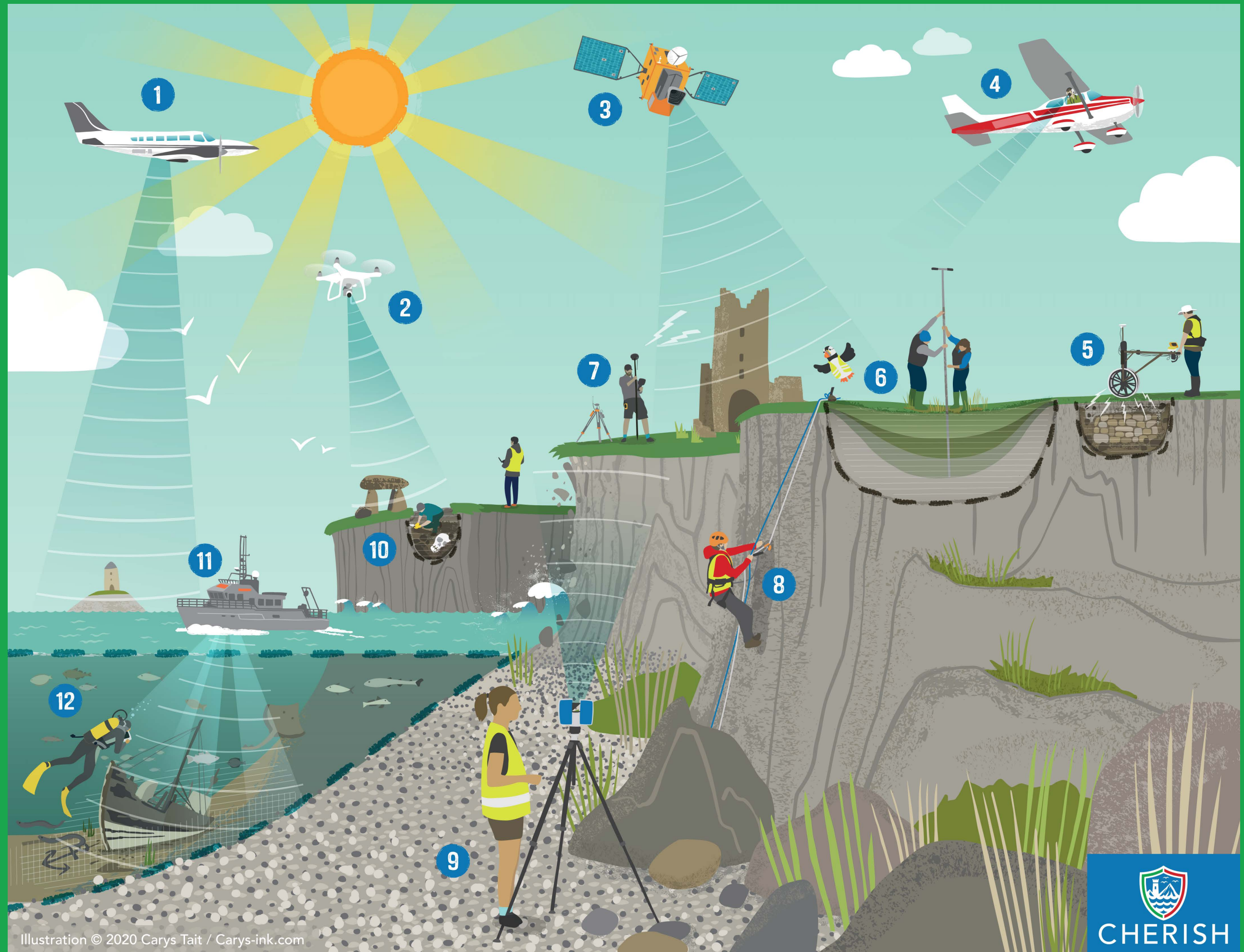
ALLWEDD:

- 1 LiDAR: Sganio laser o'r awyr
- 2 Arolwg Cerbydau Awyr Di-griw
(UAV neu Ddrôn)
- 3 Mapio lloeren
- 4 Arolwg o'r awyr
- 5 Arolwg geoffisegol
- 6 Creiddio
- 7 Arolwg manwl
- 8 Monitro erydiad
- 9 Sganio'r Ddaear â laser
- 10 Cloddio, samplu a dyddio
- 11 Mapio morol
- 12 Arolwg archaeolegol tanddwr

The CHERISH 'toolkit' graphic illustrates our integrated and multidisciplinary approach to survey on land and under the sea.

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



UCHAFBWYNTIAU MEHEFIN – RHAGFYR 2020 / HIGHLIGHTS JUNE – DECEMBER 2020

Peilot UAV Toby Driver yn paratoi ar gyfer codi i'r awyr ar Gaer Bentir Crocksydam, Sir Benfro, un o sawl safle a arolygwyd gan CHERISH ym mis Awst 2020.

UAV pilot Toby Driver preparing for take-off at Crocksydam Promontory Fort, Pembrokeshire, one of several sites surveyed by CHERISH in August 2020.

Yn unol â chanllawiau Llywodraeth Cymru ac Iwerddon, roedd posib i ni aildechrau cwblhau gweithgareddau gwaith maes cyfyngedig yn ystod chwe mis olaf 2020. Gydag asesiadau risg COVID manwl wedi'u cynnal, roedd posib i'r timau gwaith maes barhau i gasglu samplau gwerthfawr a data monitro sylfaen o bob rhan o'r arfordir ac allan ar y môr.

Am weddill yr amser rydym wedi bod yn gweithio o'n cartrefi, ein swyddfeydd a'n labordai yn prosesu ac yn dadansoddi data. Rydym yn edrych ymlaen at rannu rhai o ganlyniadau cyffrous y gwaith hwn gyda chi drwy gydol 2021.

Mae'r tîm hefyd wedi dechrau ysgrifennu canllaw arfer da sy'n nodi'r methodolegau a'r technegau sy'n cael eu defnyddio gan CHERISH i fonitro newid yn yr amgylchedd arfordirol. Gobeithio, pan gaiff ei ryddhau yn ddiweddarach yn 2021, y bydd o ddefnydd i unigolion a sefydliadau sy'n arolygu mewn amgylcheddau arfordirol a morol.

In accordance with Welsh and Irish Government guidance we were able to resume limited fieldwork activities during the last six months of 2020. Armed with detailed COVID risk assessments the fieldwork teams were able to continue gathering valuable samples and baseline monitoring data from along the coasts and out on the sea.

For the rest of the time we have been working from our homes, offices and laboratories processing and analysing data. We look forward to sharing some of the exciting results from this work with you throughout 2021.

The team have also begun to write good practice guidance which sets out the methodologies and techniques used by CHERISH to monitor change in the coastal environment. We hope that when it's released later in 2021 it will be of use to individuals and organisations surveying in coastal and maritime environments.



Wedi'i glymu'n ddiogel i wyneb y graig, mae Rob Shaw, aelod o dîm CHERISH o'r Rhaglen Darganfod, yn gosod yr offer yn ei le ar gyfer arolwg monitro ar Safle Treftadaeth Byd Skellig Michael, Sir Kerry.

Safely tied to the rockface, Rob Shaw, part of the CHERISH team from the Discovery Programme, sets equipment up for a monitoring survey at the World Heritage site of Skellig Michael, Co. Kerry.

GWEITHGAREDDAU GWAITH MAES. CASGLU DATA O'R AWYR, Y MÔR A'R TIR / FIELDWORK ACTIVITIES. DATA GATHERING FROM THE AIR, ON SEA AND LAND

Am y trydydd mis Medi yn olynol, dychwelodd RV Keary i ddyfroedd Cymru gydag Agust Magnusson (capten) a Jess Murray (prosesydd) o Arolwg Daearegol Iwerddon wrth y llyw.

For the third September running the RV Keary returned to Welsh waters with Agust Magnusson (skipper) and Jess Murray (processor) of Geological Survey Ireland at the helm.



Timau arolygu o Iwerddon a Chymru'n cadw pellter cymdeithasol, Harbwr Caernarfon, Medi 2020. Louise Barker (ar y dde) o'r Comisiwn Brenhinol yn cyfarch Agust Magnusson a Jess Murray ar ddech yr RV Keary ar eu diwrnod olaf o arolygu morol yn nyfroedd Cymru. Hefyd roedd timau'r Comisiwn Brenhinol a Phrifysgol Aberystwyth yng ngogledd Cymru ar gyfer arolygon yn Abersoch a Dinas Dinlle.

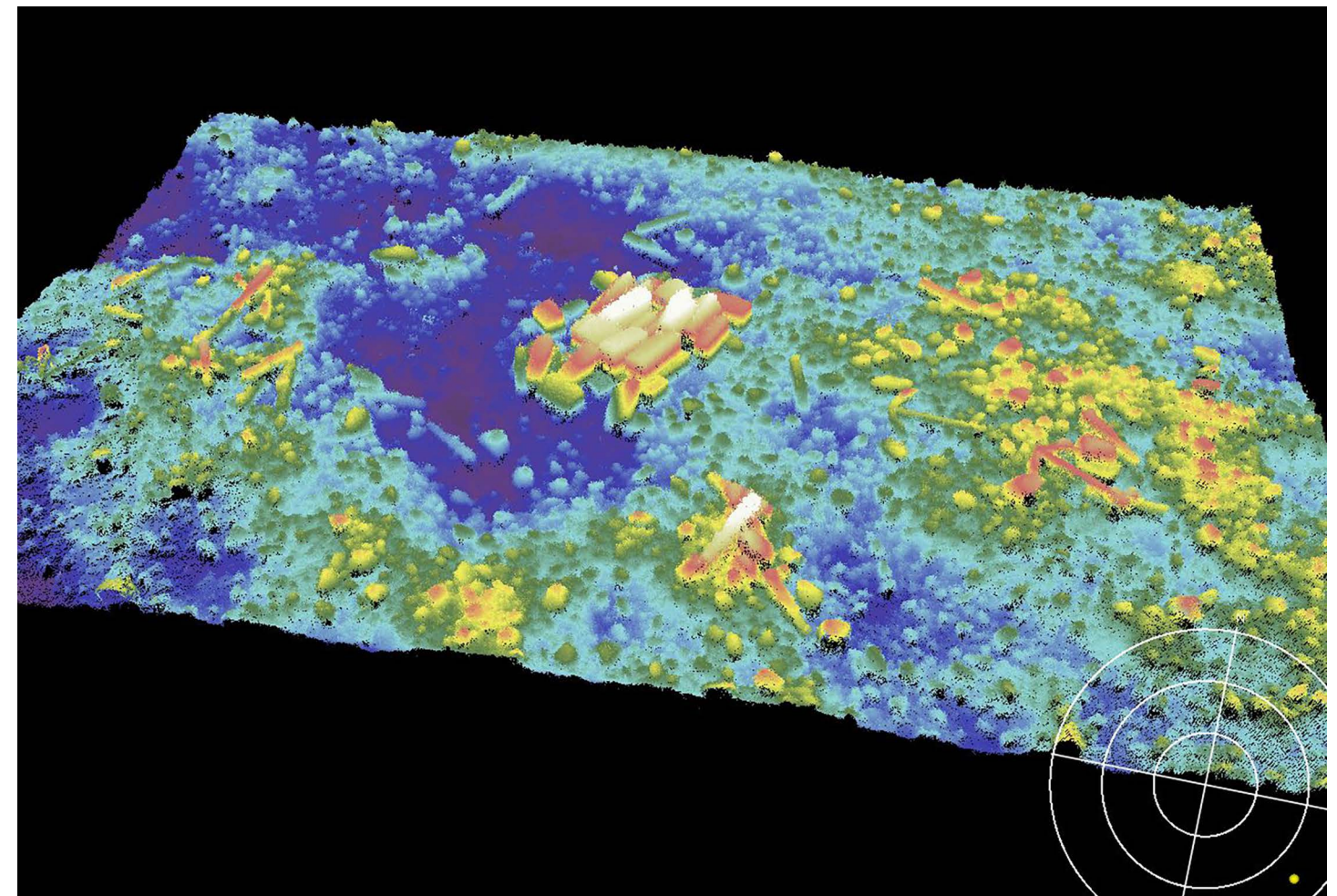
Socially-distanced survey teams from Ireland and Wales, Caernarfon Harbour, September 2020. Louise Barker (right) from the Royal Commission greets Agust Magnusson and Jess Murray on the deck of the RV Keary on its last day of maritime survey in Welsh waters. Royal Commission and Aberystwyth University teams were also in north Wales for surveys at Abersoch and Dinas Dinlle.

Roedd yr ymweliad yn canolbwyntio ar yr arolwg o rîff Sarn Padrig sy'n ymestyn i Fae Ceredigion o Fochras yng Ngwynedd. Mae nifer o longddrylliadau wedi'u lleoli arno. Amserwyd yr arolwg i gyd-fynd â'r wythnos yn arwain at lanw uchel y gwanwyn. Roedd yn ofynnol i'r criwiau asesu peryglon arolygu'r rîff bas tra oedd y cerrynt llanwol yn isel, cyn cwblhau'r gwaith arolygu yn

The visit was focused on the survey of Sarn Padrig reef which extends into Cardigan Bay from Shell Island in Gwynedd and upon which numerous wrecks are located. The survey was timed to coincide with the week leading to high spring tides. The crews were required to assess the dangers of surveying the shallow reef while tidal currents were low, before completing the coverage

ystod y llanw uchaf. Mae'r data a gasglwyd yn wahanol iawn i'r hyn a gofnodwyd yn flaenorol, gan gynnwys nodwedd sy'n ymddangos fel esgair (nodwedd dŵr tawdd rhewlifol) sy'n rhedeg ar hyd cefnen y rîff. Roedd data o'r arolwg o un o'r llongddrylliadau, llongddryliad y Bronze Bell yn yr ail ganrif ar bymtheg sy'n llongddryliad dynodedig a gwarchodedig, yn syfrdanol iawn gyda Jess yn aros ar ei thraed tan yr oriau mân yn mireinio'r delweddau o angorau, canon a blociau marmor Cararra ar wely'r môr.

during the highest tides. Data acquired is considerably different to that previously charted, including what appears to be an esker (glacial melt-water feature) running along the reef ridge. Data from the survey of one of the shipwrecks, the designated and protected seventeenth-century Bronze Bell wreck, was particularly stunning with Jess staying up to the early hours refining the images of anchors, cannon and Carrara marble blocks on the seabed.



Data arolwg yn dangos yr angorau, canon a marmor Carrara o'r llongddryliad o'r ail ganrif ar bymtheg o'r enw Bronze Bell, oddi ar arfordir Eryri ger Llanbedr. Mae tarddiad y gynau a mwyafrif y darnau arian yn awgrymu mai llong fasnach Ffrengig oedd hi a'i bod yn cludo marmor o chwareli Eidalaidd Carrara.

Survey data showing the anchors, cannon and Carrara marble from the seventeenth-century wreck known as the Bronze Bell, off the Snowdonia coast near Llanbedr. The origin of the guns and majority of coins suggests that the vessel was a French trader and was carrying marble from the Italian quarries of Carrara.

Llwyddodd yr RV Keary hefyd i wthio i'r gogledd i aber Afon Menai ac ymestyn yr ardal o bathymetreg ar y môr yr oeddent wedi'i gasglu'n flaenorol o amgylch caer arfordirol Dinas Dinlle. Bydd y data hyn yn cael eu cyfuno â'n data arolygu ar y tir i greu map ar y tir/môr cyffrous, di-dor ar gyfer bryngaer arfordirol Dinas Dinlle ac ardal y blaendraeth.

The RV Keary also managed to push north to the mouth of the Menai Strait and extend the area of offshore bathymetry they had previously gathered around the coastal fort of Dinas Dinlle. This data will now be combined with our onshore survey data to create an exciting seamless onshore/offshore map for the Dinas Dinlle coastal hillfort and foreshore area.

Ar ôl dychwelyd i ddyfroedd Iwerddon, aeth y llong a'r criw i Sir Kerry a gweithio ar ymestyn y bathymetreg presennol yn Ballinskelligs a Dunbeg. Fel gyda Dinas Dinlle, bydd mapiau tir/môr di-dor newydd yn cael eu creu yn awr ar gyfer yr ardaloedd hyn.

On their return to Irish waters, the vessel and crew made their way to Co. Kerry, and worked on extending the existing bathymetry at Ballinskelligs and Dunbeg. As with Dinas Dinlle, new seamless onshore/offshore maps will now be created for these areas.



*Caer Bentir Dunbeg sy'n erydu, fel y gwelwyd o'r RV Keary yn ystod arolwg morol ym mis Medi 2020.
The eroding Dunbeg Promontory Fort, as viewed from the RV Keary during maritime survey in September 2020.*

Ganol mis Awst, llwyddodd tîm CHERISH o'r Comisiwn Brenhinol i gynnal gwaith maes yn Sir Benfro ar Faes Tanio Castellmartin y Weinyddiaeth Amddiffyn. Cynlluniwyd y gwaith maes i gyd-fynd â seibiant tanio oedd wedi'i drefnu ar y safle milwrol prysur iawn. Nod y gwaith maes newydd hwn oedd cynnal yr arolygon ffotogrametrig cyntaf o'r awyr o'r pump o geyrydd pentir arfordirol ar y meysydd ar Drwyn Linney, Trefflemin, Crocksydam a Buckspool i ddarparu modelau 3D sylfaen i fonitro newid yn y dyfodol. Hefyd cynhaliwyd arolygon topograffig/gwrthgloddiau newydd o Wersyll Buckspool a Crocksydam i ategu'r rhai a gynhaliwyd yn Nhrefflemin a Linney gan y Comisiwn Brenhinol yn 2008. Roedd angen ymchwilio hefyd ar y tir i gaer bentir 'newydd' bosib a nodwyd yn ystod arolwg o'r awyr yn 2018 ar Dwyn Crickmail.

In mid-August the CHERISH team from the Royal Commission were able to undertake fieldwork in Pembrokeshire at the Ministry of Defence Castlemartin Firing Range. Fieldwork was planned to coincide with a scheduled non-firing break on what is a very busy military range. The aim of this new fieldwork was to carry out the first aerial photogrammetric surveys of the five coastal promontory forts on the ranges at Linney Head, Flimston, Crocksydam and Buckspool to provide baseline 3D models to monitor future change. We also undertook new topographic/earthwork surveys of Crocksydam and Buckspool Camp to complement those undertaken at Flimston and Linney by the Royal Commission in 2008. A possible 'new' promontory fort noted during aerial survey in 2018 on Crickmail Down also needed investigation on the ground.



Louise Barker a Dan Hunt yn trafod cymhlethdod y gwrthgloddiau sydd wedi goroesi yng Ngwersyll Buckspool yn ystod eu harolwg ar y gaer bentir ym mis Awst 2020.

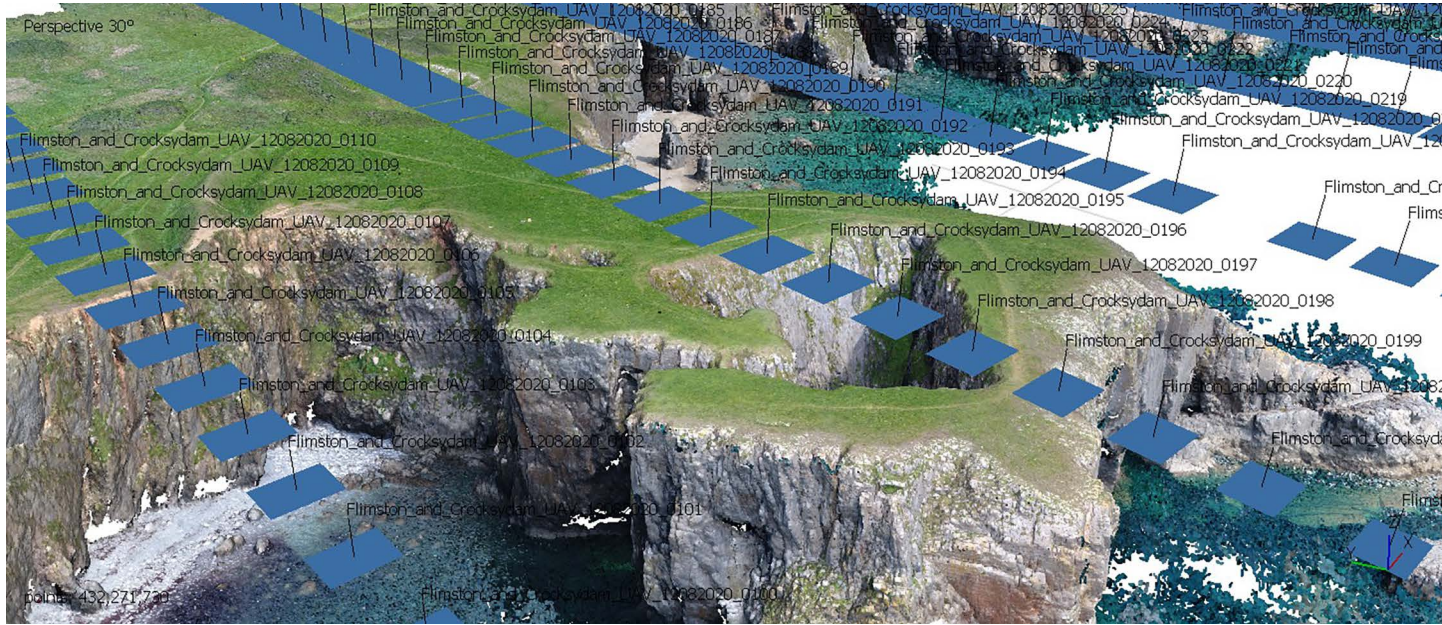
Louise Barker and Dan Hunt discussing the complexity of the earthworks surviving at Buckspool Camp during their survey of the promontory fort in August 2020.

Roeddem yn ffodus o gael wythnos o dywydd poeth, heulog a heb wynt i raddau helaeth i gynnal ein gwaith. Yn ystod yr wythnos, arolygwyd 2.8 cilometr o arfordir gennym i fanylder o 2 centimetr gyda'r UAV, gan hedfan 87.5 hectar o ffotogrametreg fertigol a chasglu tua 3,200 o luniau fertigol a llawer o luniau lletraws, yn ogystal â sawl munud o fideo o'r awyr. Mae heriau wrth brosesu'r holl ddata hyn gan weithio gartref, ac rydym newydd ddechrau cynhyrchu Modelau Gweddlyn Digidol gorffenedig o'r safleoedd arfordirol.

Hefyd cadarnhawyd y gaer bentir 'newydd' yn Nhwyn Crickmail gennym. Roedd y gweddillion yn fach ond gellid gweld sarn clir rhwng yr olion wedi'u herydu o ddwy ffo yn arwain at du mewn y gaer. Yn yr un ardal cawsom ein synnu hefyd o ddarganfod wal gerrig uchel yn y gyli arfordirol o dan y gaer, wedi'i lleoli rhwng clogwyni uchel y môr. Mae'n ymddangos bod hwn yn llwyfan llwytho ar gyfer y fasnach galchfaen hanesyddol oedd yn ffynnu yn ystod blynyddoedd cynnar yr ugeinfed ganrif. Er mawr syndod, nid yw hyn wedi'i gofnodi'n flaenorol yng nghofnod yr amgylchedd hanesyddol.

We were fortunate to have a week of hot, sunny and largely windless weather to conduct our work. During the week we surveyed 2.8 kilometres of coastline to 2 centimetre resolution with the UAV, flying 87.5 hectares of vertical photogrammetry and gathering around 3,200 vertical images plus many obliques, as well as several minutes of aerial video. Processing all this data whilst homeworking has its challenges, and we have just started to produce finished Digital Elevation Models of the coastal sites.

We also confirmed the 'new' promontory fort at Crickmail Down. Remains were slight but a clear causeway between the eroded remains of two ditches leading to the interior of the fort could be seen. In the same area we were also surprised to discover a tall stone wall in the coastal gully below the fort, set between high sea cliffs. This appears to be a loading platform for the historic limestone trade which flourished into the early years of the twentieth century. Surprisingly, this had not been previously recorded in the historic environment record.



Caer Bentir Bae Trefflemin. Llun prosesu yn dangos dosbarthiad lluniau UAV fertigol dros bwynt cwmwl 3D o'r gaer.
Flimston Bay Promontory Fort. Processing shot showing distribution of vertical UAV images over a 3D pointcloud of the fort.



Llun UAV fertigol o'r amddiffynfeydd o'r Oes Haearn sy'n erydu yng Nghaer Bentir Bae Trefflemin ar noson heulog ym mis Awst 2020.
UAV vertical image of the eroding Iron Age defences at Flimston Bay Promontory Fort on a sunny evening in August 2020.

Tra oedd yr RV Keary yn manteisio i'r eithaf ar lanw uchel y gwanwyn ar y môr yn ystod mis Medi 2020, manteisiodd tîm CHERISH o Brifysgol Aberystwyth a'r Comisiwn Brenhinol ar lanw gwanwyn isel iawn ar gyfer rhywfaint o waith maes rhynglanwol yng ngogledd

Whilst the RV Keary was making the most of the high spring tides at sea during September 2020, the CHERISH team from Aberystwyth University and the Royal Commission took advantage of the super-low spring tides for some intertidal fieldwork in north Wales. For



Twyn Crickmail. Llun UAV o gaer bentir arfordirol sydd wedi'i chanfod o'r newydd ar glogwyni deheuol Castellmartin, sy'n tarddu efallai o'r Oes Efydd Hwyr.
Crickmail Down. UAV image of a newly-identified coastal promontory fort on the southern Castlemartin cliffs, which may have Late Bronze Age origins.

Cymru. At ddibenion monitro eildro, ailymwelwyd â'r ddau longdrylliad sy'n cael eu hadnabod fel y Maria a'r Fosil, sydd wedi'u lleoli ar draeth Warren, Abersoch. Yn ystod yr ymweliad, roedd yn amlwg bod y ddau longdrylliad wedi'u gorchuddio gan dywod gyda dim ond rhan fechan o'r Fosil yn y golwg. Mae hyn yn gwrthgyferbynnu'n llwyr â'r blynyddoedd blaenorol ac yn tynnu sylw at natur ddeinamig y parth rhynglanwol.

Un o'r prif resymau dros ein gwaith llanw isel oedd samplu'r mawn rhynglanwol yn Abersoch, Dinas Dinlle a Rhosneigr ar Ynys Môn. Yn anffodus, er gwaethaf tymor haf stormus iawn, nid oedd y dyddodion mawn yn Rhosneigr a oedd i'w gweld yn gynharach yn y flwyddyn yn ystod y cyfyngiadau symud i'w gweld mwyach. Ein nod yw dyddio'r mawn rhynglanwol a gweddillion y goeden er mwyn helpu i wella ein dealltwriaeth o gynnydd yn lefel y môr yn y gorffennol yn y rhanbarth. Er bod gwynt cryf yn chwythu ar y tir, sicrhawyd dilyniant mawn diddorol yn Abersoch ynghyd â samplau o ddau o'r boncyffion coed. Yn Ninas Dinlle dim ond darn bach, ynysig o fawn rhynglanwol oedd yn y golwg, er gwaethaf y llanw isel. Er hynny, llwyddwyd i samplu rhywfaint o sylwedd organig a darnau o bren.

repeat monitoring purposes the two shipwrecks known as the Maria and the Fossil, situated at The Warren beach, Abersoch, were re- visited. During the visit both wrecks were visibly be-sanded with only a small part of the Fossil left exposed. This starkly contrasts with previous years and really highlights the dynamic nature of the inter-tidal zone.

One of the main reasons for our low-tide work was to sample the intertidal peats at Abersoch, Dinas Dinlle and Rhosneigr on Anglesey. Unfortunately, despite a very stormy summer season, the peat deposits at Rhosneigr which were visible earlier in the year during lockdown were no longer visible. We aim to date the intertidal peats and tree remains to help increase our understanding of past sea-level rise in the region. Despite a strong onshore wind blowing, we recovered an interesting peat sequence at Abersoch together with samples from two of the tree stumps. At Dinas Dinlle there was only a small, isolated fragment of intertidal peat exposed, despite the low tide. However, we still managed to sample some organic matter and fragments of wood.



*Sarah Davies yn tynnu sampl o'r darn bach o fawn rhynglanwol oedd yn y golwg yn Ninas Dinlle.
Sarah Davies extracting a sample from the small fragment of intertidal peat exposed at Dinas Dinlle.*



Patrick Robson yn cymryd sampl o weddillion coeden oedd yn y golwg yn Abersoch a chipolwg slei ar y sampl a gymerwyd drwy'r mawn.

Patrick Robson taking a sample from the remains of a tree exposed at Abersoch and a tantalising glimpse of the sample taken through the peat.

Yn Ninas Dinlle llwyddwyd hefyd i gynnal ail arolwg UAV ar y bryngaer arfordirol i gofnodi data 3D o'r parth rhynglanwol i gysylltu â'r arolwg morol mewndirol a gynhaliwyd gan dîm yr RV Keary o Arolwg Daearyddol Iwerddon. Roedd hon yn ardal arolygu fawr yn agos at ofod awyr gweithredol Maes Awyr Caernarfon sydd hefyd â hofrenyddion argyfwng yn glanio ac yn codi drwy gydol y dydd. Gyda help staff y maes awyr, lansiwyd 'Rhybudd i Weithwyr Awyr' (NOTAM) clir ar ddiwrnod arolwg ein drôn, yn hysbysu'r holl draffig awyr am waith CHERISH.

Whilst at Dinas Dinlle we also took the opportunity to undertake a repeat UAV survey of the costal hillfort to capture 3D data of the inter-tidal zone to link with the inshore marine survey undertaken by the RV Keary team of Geological Survey Ireland. This was a large survey area close to the active airspace of Caernarfon Airport which also has emergency helicopters landing and taking off throughout the day. With the help of airport staff, a clear 'Notice to Airmen' (NOTAM) was launched on the day of our drone survey, alerting all air traffic to the CHERISH work.



*Toby Driver yn gweithredu CHERISH UAV uwch ben Dinas Dinlle, Medi 2020, ar lanw isel y gwanwyn.
Toby Driver operating the CHERISH UAV over Dinas Dinlle, September 2020, at a low spring tide.*



Cofnodwyd 2,800 o luniau fertigol o'r awyr o fryngaer Dinas Dinlle a'r blaendraeth gan yr UAV am dros ddwy awr ar gyfer ffotogrametreg. Wrth i'r haul fachlud roeddem wedi cwblhau ein gwaith arolygu ar ôl deuddydd prysur ym mharthau rhynglanwol gogledd orllewin Cymru.

2,800 vertical aerial photos of Dinas Dinlle hillfort and foreshore were captured by the UAV over two hours for photogrammetry. As the sun set we completed our survey work after a busy two days in the intertidal zones of north-west Wales.

Roedd y cyfyngiadau symud cyntaf wedi ein gorfodi i ganslo astudiaeth Radar Treiddio Daear (GPR) yr oeddem wedi bwriadu ei chynnal ar y twyni tywod rhwng Llyn Maelog a Thraeth Llydan yn Rhosneigr ar Ynys Môn. Yn ffodus, pan laciwyd y cyfyngiadau, cafwyd ffenestr fer o dywydd da a wnaeth ganiatáu i ni aildrefnu'r gwaith ar gyfer diwedd mis Medi. Cynhaliwyd y gwaith GPR ar y safle gan yr Athro Charlie Bristow o Brifysgol Birkbeck a Lucy Buck fel rhan o gydweithrediad parhaus gyda Phrifysgol Aberystwyth a CHERISH. Mae'r maes twyni hwn yn agored i fygythiad deublyg - lefelau'r môr yn codi a gweithgarwch stormydd. Gall ymwybyddiaeth o'r hyn sydd o dan y twyni 20 metr o uchder helpu i ddatblygu strategaethau diogelu ar gyfer y cynefin twyni sensitif, y seilwaith a llyn dŵr croyw Llyn Maelog. Yr arwyddion cynnar yw bod cyfres o esgeiriau traeth wedi'u cuddio o dan yr wyneb, ond bydd rhaid i ni aros nes bod yr holl ddata wedi'u prosesu cyn y gallwn adrodd ar yr hyn rydym wedi'i ganfod. Mae ein hymchwil wedi datgelu bod Llyn Maelog wedi'i orlifo gan y môr am tua 500 mlynedd, tua 7,000 o flynyddoedd yn ôl, ac felly mae'n ychwanegiad pwysig at ein dealltwriaeth o newid yn lefel y môr yn yr ardal.

The first lockdown had forced us to cancel a Ground Penetrating Radar (GPR) study we had planned to carry out on the sand dune complex between Llyn Maelog and Traeth Llydan at Rhosneigr on Anglesey. Fortunately, the restriction relaxation coincided with a brief weather window allowing us to reschedule the work in late September. GPR work at the site was carried out by Professor Charlie Bristow of Birkbeck University and Lucy Buck as part of an ongoing collaboration with Aberystwyth University and CHERISH. This dune field is vulnerable to the twofold threat of rising sea-levels and storm activity. Awareness of what lies beneath the 20-metre-high dunes can help to develop protection strategies for the sensitive dune habitat, infrastructure and the freshwater lake of Llyn Maelog. Early indications are that a series of beach ridges are hidden beneath the surface, but we will have to wait until all the data has been processed before we can report what we've found. Our research has revealed that Llyn Maelog was inundated by the sea for about 500 years, approximately 7,000 years ago, and therefore represents an important addition to our understanding of sea level change in the area.

Hefyd casglwyd llinellau ychwanegol o ddata GPR o Forfa Dinlle a Dinas Dinlle i ychwanegu at y corff cynyddol o wybodaeth y mae CHERISH eisoes wedi'i gasglu. Diolch yn fawr iawn i Charlie a Lucy am eu help gyda'r gwaith hwn, ac wrth gwrs i'r perchnogion tir cysylltiedig am ganiatáu i ni fynd ar eu heiddo.

Extra lines of GPR data were also gathered from Morfa Dinlle and Dinas Dinlle to add to the growing body of information CHERISH has already accumulated. A big thank you is due to Charlie and Lucy for their help in this work, and of course to the landowners involved for allowing us on to their property.



Arolwg Radar Treiddio Daear ar droed uwch ben y system o dwyni tywod trawiadol yn Rhosneigr. Chwith: Gosod trawslun arolwg ar draws chwythfwlch yn y twyni. Dde: Y tîm yn symud drwy'r moresg uchel sy'n gorchuddio mwyafrif y system o dwyni.

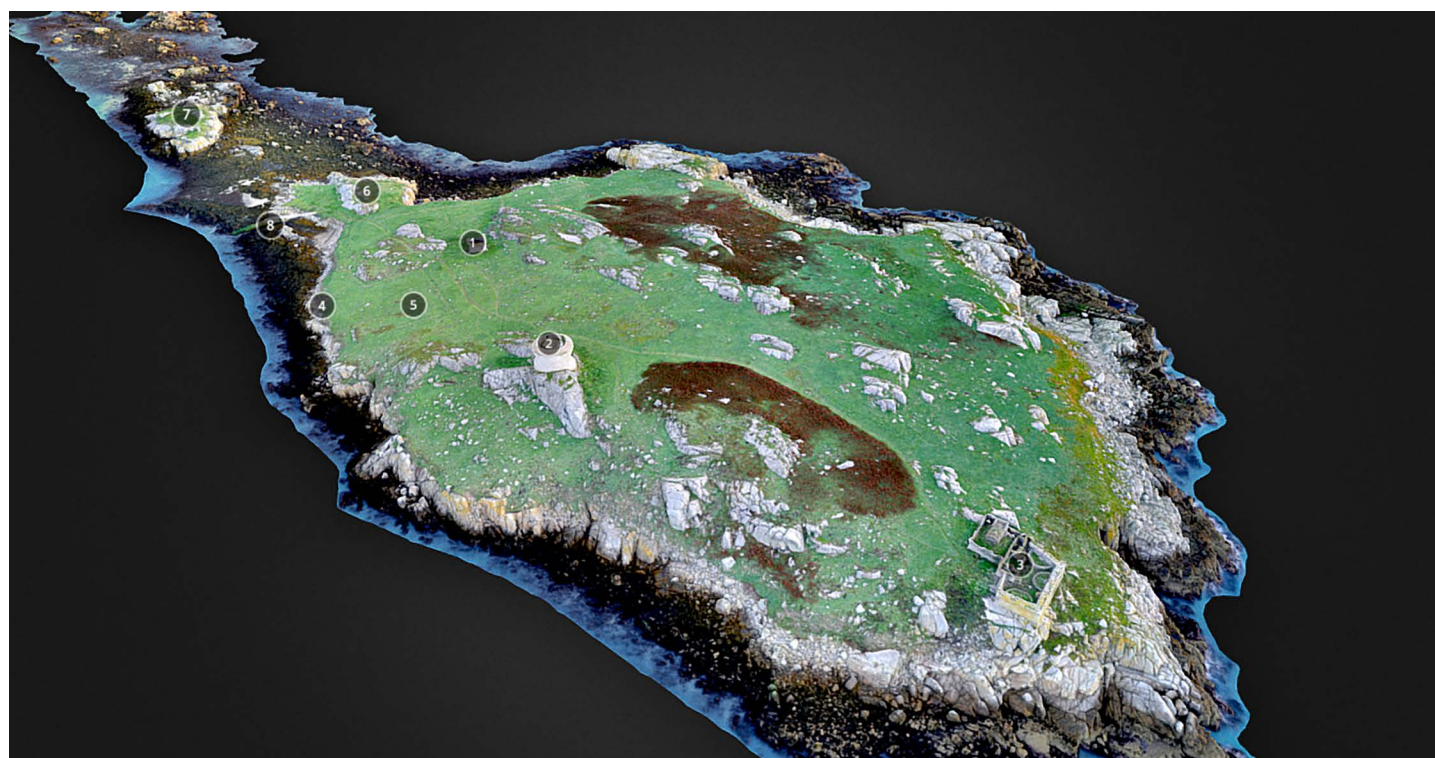
Ground Penetrating Radar survey in progress over the impressive sand dune system at Rhosneigr. Left: Laying out a survey transect across a large blow-out within the dunes. Right: The team navigating the high marram grass which covers the majority of the dune system.

Draw yn Iwerddon roedd timau CHERISH o'r Rhaglen Darganfod ac Arolwg Daearegol Iwerddon yr un mor brysur ar y tir ac yn yr awyr. Llwyddodd Kieran a James o'r Arolwg Daearegol i gwblhau nifer o arolygon UAV. Llenwyd bylchau data yn ymgyrch arolwg Bae Dulyn sydd bellach yn cynnwys cofnodion cyflawn ar hyd arfordir deheuol y bae. Hefyd cynhaliwyd arolwg newydd o Ynys Dalkey, gyda chaniatâd Cyngor Sir Dun Laoghaire Rathdown ar ôl i Fôr-wenoliaid y Gogledd sy'n nythu yno fudo. Cwblhawyd ail arolygon hefyd yn Bremore, Rosslare a Kilpatrick. Mae'r data'n dechrau adrodd stori'r newid sy'n digwydd ar y gwahanol adegau ar hyd yr arfordir.

Over in Ireland the CHERISH teams from the Discovery Programme and Geological Survey Ireland were equally busy on the ground and in the air. Kieran and James from the Geological Survey were able to complete a number of UAV surveys. Data gaps were filled in the Dublin Bay survey campaign which now boasts complete coverage along the southern coastline of the bay. A new survey was also conducted of Dalkey Island, with permissions from Dun Laoghaire Rathdown County Council once the nesting Arctic Terns migrated. Repeat surveys were also completed in Bremore, Rosslare and Kilpatrick. The data is starting to illuminate the story of change occurring at the different points along the coast.



*James Barry a Kieran Craven gyda'u UAV adenydd sefydlog, yn barod i gwblhau arolwg Bae Dulyn.
James Barry and Kieran Craven with their fixed wing UAV, ready to complete the Dublin Bay survey.*



*Ynys Dalkey, Sir Dulyn. Model 3D wedi'i greu gan yr arolwg UAV.
Dalkey Island, Co. Dublin. 3D model generated from the UAV survey.*

Ar arfordir gorllewinol Iwerddon, cafodd Rob Shaw a Sandra Henry o'r Rhaglen Darganfod dywydd perffaith ar gyfer taith i Skellig Michael (rydyn ni i gyd yn eiddigeddus iawn!). Mae'r safle treftadaeth byd hwn gan UNESCO, sydd 12 cilometr i'r gorllewin o benrhyn Iweragh yn Sir Kerry, yn gwbl agored i rym eithafol Môr yr Iwerydd. Mae gweithredoedd y tonnau, gweithgarwch

On the west coast of Ireland, Rob Shaw and Sandra Henry from the Discovery Programme had perfect weather for a trip to Skellig Michael (we're all very jealous!). This UNESCO world heritage site is completely exposed to the sheer force of the Atlantic Ocean, located 12 kilometre west of the Iweragh peninsula in Co. Kerry. Wave action, storm events, increased rainfall and heavy

stormydd, glawiad cynyddol a gwyntoedd cryfion yn effeithio ar integriti strwythurol y fynachlog a'r feudwyfa ar yr Ynys ac, o bosib, yn ei danseilio. Fel ymateb i'r bygythiadau hyn, datblygodd y Swyddfa Gwaith Cyhoeddus, ar y cyd â'r Rhaglen Darganfod, raglen fonitro i asesu sefydlogrwydd strwythurau cynnar y cyfnod Cristnogol ar yr ynys. Mae'r gwaith hwn wedi cael ei gynnal yn flynyddol gan y Rhaglen Darganfod ers 2015 gyda'r safle'n cael ei fonitro drwy system o farcwyr parhaol, sy'n cynnwys rhwydwaith o foltau pres morol wedi'u gosod mewn tri lleoliad ar safle'r fynachlog a phum lleoliad yn y feudwyfa ar y copa deheuol. Eleni, bu archaeolegwyr CHERISH yn cynorthwyo gyda'r rhaglen fonitro, gan asesu arfer yr arolwg sy'n bwydo'n uniongyrchol i ymchwil CHERISH o'r defnydd o farcwyr parhaol ar gyfer monitro safleoedd. Roedd hefyd yn cynnig cyfle i archwilio archaeoleg yr ynys, sy'n bwysig o ystyried ei hagosrwydd â'i pherthnasedd i safleoedd eraill CHERISH yn Kerry.

winds are acting upon and potentially undermining the structural integrity of the monastery and hermitage sites on the Island. It was in response to these threats that the Office of Public Work in conjunction with The Discovery Programme developed a monitoring programme to assess the stability of the early Christian period structures on the island. This work has been undertaken annually by The Discovery Programme since 2015 with the site monitored through a system of permanent markers, comprising a network of marine brass bolts installed in three locations at the monastery site and five locations at the hermitage on the south peak. This year CHERISH archaeologists aided in the monitoring programme, assessing the survey practice which feeds directly into CHERISH research into the use of permanent markers for site monitoring. It also offered the opportunity to examine the archaeology of the island, important given the close proximity and relevance to other CHERISH sites within Kerry.



*Y safle mynachaid Cristnogol cynnar sydd wedi'i warchod yn dda ar gopa gogleddol Skellig Michael. Mae'r safle magu pwysig i huganod ar Little Skellig i'w weld yn y cefndir.
The well-preserved early Christian monastic site on Skellig Michael's north peak. The important northern gannet breeding ground of Little Skellig is visible in the background.*

Parhaodd tîm CHERISH o'r Rhaglen Darganfod â'u gwaith hefyd ar hyd Arfordir Copr Sir Waterford, arfordir a enwyd ar ôl y dyddodion mwynau cyfoethog a fwyngloddwyd ar hyd y darn hwn o'r arfordir. Mae'r cofnodion mwyngloddio hanesyddol yn dechrau yn ystod yr oes Elizabethaidd, ond mae casgliad o hyd at 32 o geirydd pentir ac mae darganfod ingot copr yn awgrymu mwyngloddio ers y cyfnod cynhanesyddol. Gellir gweld y rhwydweithiau mwy diweddar o'r ddeunawfed ganrif a'r bedwaredd ganrif ar bymtheg o geuffydd mwynglawdd yn y clogwyni heddiw, a gweithwyd rhai mwyngloddiau hyd at 400 metr allan i'r môr. Mae hyn yn cynnwys Bae Ballydowane lle cafodd siafft awyru ei chloddio i stac môr i alluogi i aer fynd i mewn i'r mwynglawdd plwm ac arian o dan yr wyneb. Ym mis Awst, cofnododd CHERISH y nodwedd hon gyda'r UAV.

The CHERISH team from the Discovery Programme also continued their work along County Waterford's Copper Coast, named after the rich mineral deposits mined along this coastal stretch. Historical mining records begin in Elizabethan times, but the concentration of up to 32 promontory forts and a copper ingot find suggests mining since prehistoric times. The more recent eighteenth- and nineteenth-century networks of mine adits can be seen in the cliffs today, and some mines were worked up to 400 metres out to sea. This includes Ballydowane Bay where a ventilation shaft was dug into a sea stack to allow air into the lead and silver mine below the surface. In August, the CHERISH recorded this feature with the UAV.



Stac môr Bae Ballydowane, Sir Waterford. Yma defnyddiodd tîm CHERISH o'r Rhaglen Darganfod yr UAV i gofnodi siafft awyru mwynglawdd (dangosir â saeth).
Ballydowane Bay sea stack, Co. Waterford. Here the CHERISH team from the Discovery Programme used the UAV to record a mine ventilation shaft (arrowed).



Linda Shine yn tynnu llun cydweithwyr ar Ynys Brown, Sir Waterford. Heddiw mae wedi'i gwahanu oddi wrth Gaer Bentir Woodstown gan y môr, fodd bynnag efallai ei bod wedi bod yn rhan o'r gaer ar un adeg.
Linda Shine photographs colleagues on Brown's Island, Co. Waterford. Today it lies separated from Woodstown Promontory Fort by the sea, however it may have once been part of the fort.



Ymhellach ar hyd yr Arfordir Copr mae'r tîm wedi gweithio'n helaeth ar ochr orllewinol Traeth Annewstown yng nghaer bentir Woodstown, ond i'r dwyrain o'r traeth mae caer arall sy'n erydu'n ddifrifol, sef Caer Bentir Annewstown. Yma mae llwybr ar ben y clogwyn yn arwain i fyny o'r traeth, ond mae'r gaer ei hun yn anhygyrch gan nad yw'r sarn a grybwyllwyd gan Thomas Westropp yn gynnar yn yr ugeinfed ganrif yno mwyach. Arolygwyd y gaer gan dîm CHERISH ym mis Awst ac mae'r delweddau UAV o ganlyniad yn dangos yn glir sut mae erydiad wedi creu pentir bwa main gyda staciau môr a bonion tua'r môr ac ogof môr oddi tanodd. Gellir gweld clawdd y gaer ar y pentir, ond mae ardal y ffos bellach yn esgair gul, beryglus. Mae'n bosib bod wal gae sy'n erydu ar ochr y tir wedi bod yn ail glawdd ar gyfer y gaer neu/ ac wedi bod yn gysylltiedig â'r siafft fwyngloddio o'r bedwaredd ganrif ar bymtheg yn yr ardal hon.

Further along the Copper Coast the team have worked extensively on the western side of Annewstown Beach at Woodstown promontory fort, but to the east of the beach there is another severely eroding fort known as Annewstown Promontory Fort. Here a cliff top path leads up from the beach, but the fort itself is inaccessible as the causeway mentioned by Thomas Westropp early in the twentieth century is no longer there. The fort was surveyed by the CHERISH team in August and the resulting UAV imagery clearly shows how erosion has created a thin arcing promontory with sea stacks and stumps seaward and a sea cave below. The fort's bank can be seen on the promontory, but the area of the ditch is now a narrow perilous ridge. An eroding field wall on the landward side may have been a second bank for the fort or/and have been associated with the nineteenth-century mining shaft in this area.



Gweddillion Caer Bentir Annewstown ar yr Arfordir Copr, wedi'u cofnodi gan CHERISH yn ystod arolwg UAV ym mis Awst 2020.
The remains of Annewstown Promontory Fort on the Copper Coast, as captured by CHERISH during a UAV survey in August 2020.

YMGYSYLLTU / ENGAGEMENT

Mae ymgysylltu â'r cyhoedd yn rhan fawr o brosiect CHERISH, ac er nad ydym wedi gallu cwrdd â'r cyhoedd wyneb yn wyneb yn ystod y chwe mis diwethaf, rydym wedi addasu ac wedi cadw'n brysur yn rhannu cymaint o newyddion CHERISH â phosib gyda chi drwy sgysiau, ffilmiau a blogiau ar-lein. Rydym hefyd wedi parhau i fynychu seminarau a chynadleddau, lle gwyd i gwrdd â phobl a thrafod canlyniadau, er mai yn rhithwir mae hynny wedi digwydd! Rydym wedi siarad yng nghynhadledd Llwybrau a Rhwystrau i Weithredu dros yr Hinsawdd drwy Fframwaith Ymchwil Treftadaeth Coleg Prifysgol Llundain, cynhadledd flynyddol y Gymdeithas Archaeoleg Forwrol, Cyfarfod Cyffredinol Blynnyddol y Grŵp Ymchwil Archaeoleg o'r Awyr, Symposiwm y Cyngor Prydeinig-Gwyddelig ar Seilwaith Gwrthsefyll Hinsawdd, symposiwm a gynhaliwyd gan Gymunedau Arfordirol yn Addasu Gyda'n Gilydd (CCAT) a chyfarfod Cymdeithas Iwerddon o Astudiaethau Ewropeaidd Cyfoes ar 'Yr UE a Dyfodol Porthladdoedd, Cymunedau Arfordirol a Sector Morwrol Iwerddon'.

Un o fanteision cyflwyniadau ar-lein yw bod llawer o'r trafodaethau'n cael eu recordio ac felly maent ar gael i gynulleidfaoedd llawer ehangach eu gweld. Isod mae dolenni at rai o'n sgysiau diweddaraf sydd ar gael ar-lein.

- 'Staciau, Clogwyni a Chrochanau: Gwaith Maes diweddar ar Geyrydd Pentir Arfordirol Trawiadol Ardal Hyfforddi Castellmartin, Sir Benfro' gan Toby Driver ar gyfer Diwrnod Archaeoleg Arfordir Sir Benfro: https://www.youtube.com/watch?v=3_4Wud1Yzyo&t=1538s.
- 'Deall Gwerth a Chollodion ar Safleoedd Treftadaeth Arfordirol Cymru ac Iwerddon' gan Anthony Corns a Louise Barker ar gyfer y gynhadledd Tir, Môr ac Awyr: Archaeoleg Arfordiroedd ac Ynysoedd a drefnwyd gan Archaeology Ireland (y sgwrs yn dechrau ar 48 munud): <https://www.youtube.com/watch?v=WXZA5Hk3Ym0&feature=youtu.be>.
- Trefnwyd yn wreiddiol i gyd-fynd â lansio arddangosfa CHERISH yn Llyfrgell a Chanolfan Ddiwylliannol DLRLexlcon, Dún Laoghaire (a fydd yn gorfod aros tan y flwyddyn nesaf ar y cynharaf yn anffodus), cafwyd dwy sgwrs gan CHERISH:

Public engagement is a large part of the CHERISH project, and despite not being able to meet with the public face-to-face over the past six months, we've adapted and have been kept busy bringing you as much CHERISH news as possible via online talks, films and blogs. We've also continued attending seminars and conferences, a great place to meet people and discuss results, albeit virtually! We've spoken at the University College London Pathways and Barriers to Climate Action through Heritage Research Framework conference, the annual Nautical Archaeology Society Conference, the AGM of the Aerial Archaeology Research Group, the British-Irish Council Symposium on Climate Resilient Infrastructure, a symposium hosted by Coastal Communities Adapting Together (CCAT) and the Irish Association of Contemporary European Studies meeting on 'The EU and the Future of Ireland's Ports, Coastal Communities and Maritime Sector'.

One advantage of online presentations is that many of the talks are recorded and are therefore available for much wider audiences to view. Below are links to some of our most recent talks available online.

- 'Stacks, Cliffs and Cauldrons: Recent Fieldwork at the Remarkable Coastal Promontory Forts of the Castlemartin Training Area, Pembrokeshire' by Toby Driver for the Pembrokeshire Coast Archaeology Day: https://www.youtube.com/watch?v=3_4Wud1Yzyo&t=1538s.
- 'Understanding the Value and Loss at Irish and Welsh Coastal Heritage Sites' by Anthony Corns and Louise Barker for the Land, Sea & Sky: The Archaeology of Coasts and Islands conference organised by Archaeology Ireland (talk starts at 48 minutes): <https://www.youtube.com/watch?v=WXZA5Hk3Ym0&feature=youtu.be>.
- Originally planned to coincide with the launch of the CHERISH exhibition in DLRLexlcon Library and Cultural Centre, Dún Laoghaire (which will unfortunately have to wait until next year at the earliest), CHERISH gave two talks:
 - 'Lasers, Drones and Boats – Measuring the Impacts of Climate Change on Coastal Heritage'

- 'Laserau, Dronau a Chychod – Mesur Effeithiau Newid yn yr Hinsawdd ar y Dreftadaeth Arfordirol' gan Kieran Craven: <https://www.youtube.com/watch?v=CodSmMGQxrs>; a
- 'Effeithiau Newid yn yr Hinsawdd ar Dreftadaeth Arfordirol Sir Dilyn' gan Sandra Henry: <https://www.youtube.com/watch?v=SfKhcNSfRul>.
- 'Straeon am Golledion: Y Gaer Bentir a Newid yn yr Hinsawdd' gan Sandra Henry a Louise Barker fel rhan o gyfraniad CHERISH at Wythnos Treftadaeth Iwerddon 2020: <https://www.youtube.com/watch?v=YCO0kgexZYM>.

Rydym hefyd wedi creu ffilmiau newydd cyffrous, sydd ar gael i chi eu gwyllo ar ein sianel YouTube. Crëwyd dwy gan dîm CHERISH o'r Rhaglen Darganfod ac fe'u lanswyd yn ystod Wythnos Treftadaeth Iwerddon 2020.

- Mae 'Ymchwilio i'r Dreftadaeth Arfordirol Fregus: Prosiect CHERISH yn Anheddiad Canoloesol Glascarrig' yn amlinellu'r ystod o dechnegau sydd wedi cael eu defnyddio i gofnodi a monitro'r safle (mapio drôn neu UAV, arolwg daearegol ac asesiad parth arfordirol cyflym): <https://www.youtube.com/watch?v=Pswc6X9u1ic>.
- Mae 'Taith Forwrol o Archaeoleg yr Arfordir Copr, Sir Waterford' yn edrych ar hanes morwrol yr arfordir diddorol hwn, sy'n llawn ceyrydd pentir, llongddrylliadau, treftadaeth mwyngloddio a llwybrau môr, drwy lygaid archaeolegwyr morwrol. Mae hon yn ardal o arfordir sydd eisoes wedi profi lefelau uchel o erydu ac mae rhagolygon yr hinsawdd yn dangos y bydd hyn yn cynyddu, yn arbennig gydag amledd cynyddol stormydd: <https://www.youtube.com/watch?v=ExzjojXnJP8>.

Hefyd ymddangosodd tîm CHERISH o Arolwg Daearegol Iwerddon mewn fideo newydd gwyd fel rhan o Wythnos Arloesi Iwerddon a gellir ei weld yma: <https://www.youtube.com/watch?v=NYIfUHfdT7c>.

Mae gennym ni hefyd lawer o flogiau llawn gwybodaeth i chi eu darllen ar ein gwefan ni. Mae'r rhain yn cynnwys:

- Defnyddio Mapio UAV i Fesur Erydiad Arfordirol (Rob Shaw) <http://www.cherishproject.eu/en/news/259-how-cherish-uses-uav-mapping-to-measure-coastal-erosion>

by Kieran Craven: <https://www.youtube.com/watch?v=CodSmMGQxrs>; and

- 'Climate Change Impacts on the Coastal Heritage of County Dublin' by Sandra Henry: <https://www.youtube.com/watch?v=SfKhcNSfRul>.

- 'Stories of Loss: The Promontory Fort and Climate Change' by Sandra Henry and Louise Barker as part of CHERISH's contribution to Irelands Heritage Week 2020: <https://www.youtube.com/watch?v=YCO0kgexZYM>.

We've also produced some exciting new films, available for you to watch on our YouTube channel. Two were created by the CHERISH team of the Discovery Programme and were launched during Irelands Heritage Week 2020.

- 'Investigating Vulnerable Coastal Heritage: The CHERISH Project at Glascarrig Medieval Settlement' outlines the range of techniques that have been used to record and monitor the site (UAV or drone mapping, geophysical survey and rapid coastal zone assessment): <https://www.youtube.com/watch?v=Pswc6X9u1ic>.
- 'A Maritime Tour of the Archaeology of the Copper Coast, County Waterford' explores the maritime history of this fascinating coastline, filled with promontory forts, shipwrecks, mining heritage and sea routes, through the eyes of maritime archaeologists. This is an area of coastline that has already experienced high levels of erosion and climate projections indicate that this will increase particularly with an increased frequency in storm surge events: <https://www.youtube.com/watch?v=ExzjojXnJP8>.

The CHERISH team from Geological Survey Ireland also featured in a great new video as part of Ireland's Innovation Week which can be viewed here: <https://www.youtube.com/watch?v=NYIfUHfdT7c>.

We also have some great informative blogs for you to read on our website. These include:

- Using UAV Mapping to Measure Coastal Erosion (Rob Shaw) <http://www.cherishproject.eu/en/news/259-how-cherish-uses-uav-mapping-to-measure-coastal-erosion>

- Ymchwilio i'r Cofnod am Stormydd Hanesyddol (Sarah Davies) <http://www.cherishproject.eu/en/news/262-blog-weather-histories-sarah-davies-aberystwyth-university>
- Ceyrydd Pentir Cynhanesyddol Sir Benfro (Dan Hunt) <http://www.cherishproject.eu/en/news/260-blog-post-pembrokeshire-s-prehistoric-promontory-forts-shifting-coastlines-and-perceptions>
- Erydiad Caer Bentir Dunbeg (Ted Pollard) <http://www.cherishproject.eu/en/news/265-blog-dunbeg>
- Ar Drugaredd Duwiau'r Tywydd: Arolygu Morol yng Nghymru (Kieran Craven) <http://www.cherishproject.eu/en/news/268-blog-marine-survey-wales>
- Staciau, Clogwyni a Chrochanau: Arolygu Ceyrydd Pentir Maes Castellmartin (Toby Driver) <http://www.cherishproject.eu/en/news/269-stacks-cliffs-and-cauldrons-surveying-the-promontory-forts-of-the-castlemartin-range-south-pembrokeshire-august-2020-toby-driver-rcahmw>
- Researching the Record of Historical Storms (Sarah Davies) <http://www.cherishproject.eu/en/news/262-blog-weather-histories-sarah-davies-aberystwyth-university>
- Pembrokeshire's Prehistoric Promontory Forts (Dan Hunt) <http://www.cherishproject.eu/en/news/260-blog-post-pembrokeshire-s-prehistoric-promontory-forts-shifting-coastlines-and-perceptions>
- The Crumbling Promontory Fort of Dunbeg (Ted Pollard) <http://www.cherishproject.eu/en/news/265-blog-dunbeg>
- At the Mercy of the Weather Gods: Marine Surveying in Wales (Kieran Craven) <http://www.cherishproject.eu/en/news/268-blog-marine-survey-wales>
- Stacks, Cliffs and Cauldrons: Surveying the Promontory Forts of the Castlemartin Range (Toby Driver) <http://www.cherishproject.eu/en/news/269-stacks-cliffs-and-cauldrons-surveying-the-promontory-forts-of-the-castlemartin-range-south-pembrokeshire-august-2020-toby-driver-rcahmw>



Lluniau llonydd o ffilm yr Wythnos Arloesi, yn proffilio prosiect a thîm CHERISH o Arolwg Daearegol Iwerddon.
Stills from the Innovation Week film, profiling the CHERISH project and team from Geological Survey Ireland.

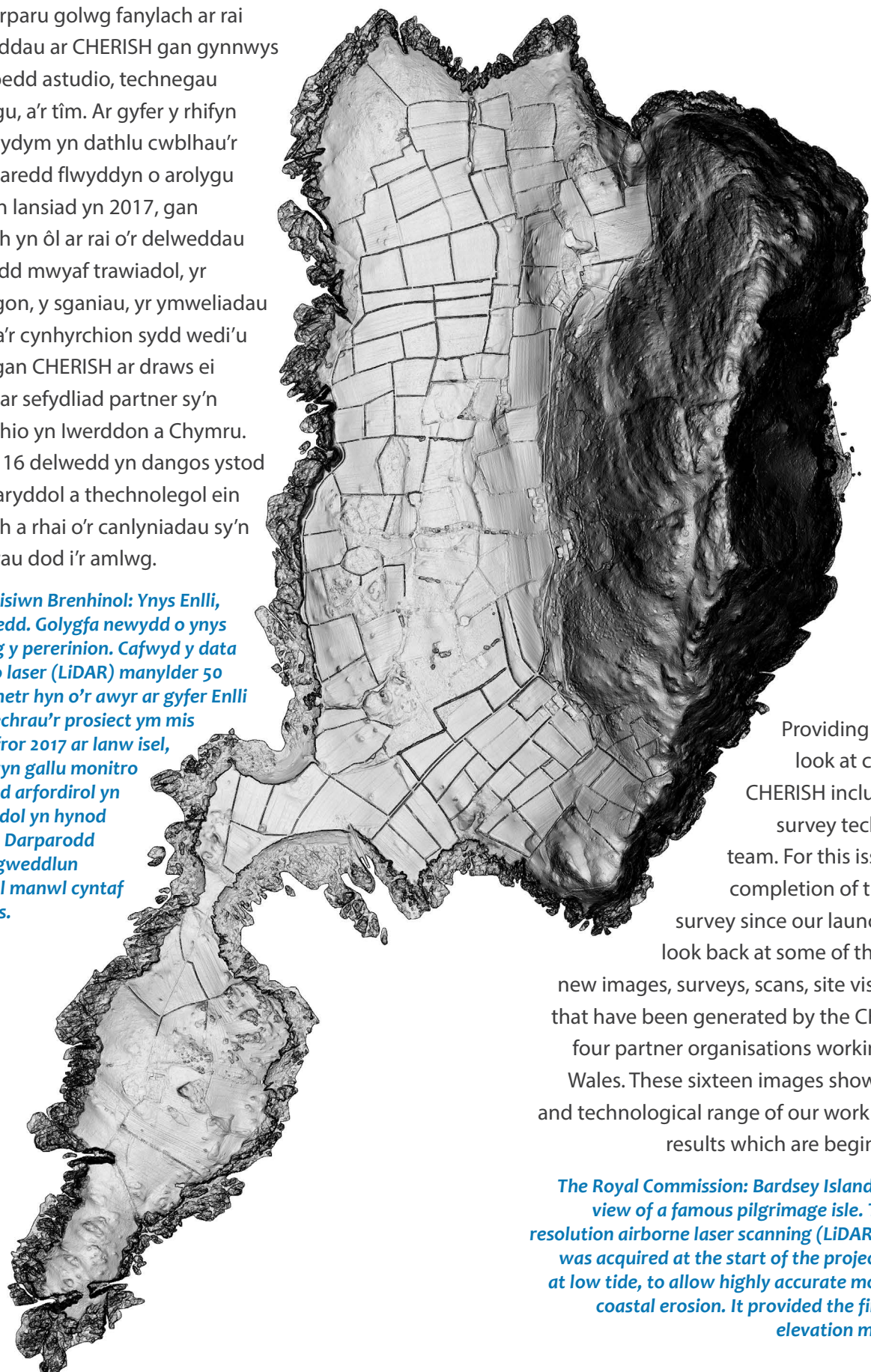


Dan Hunt yn cofnodi data arolygu yn ystod gwaith maes yn Llyn Maelog ar Ynys Môn ddiwedd mis Medi 2020.
Dan Hunt capturing survey data during fieldwork at Llyn Maelog on Anglesey in late September 2020.

CHERISH DAN Y CHWYDDWYDR / CHERISH IN FOCUS

Yn darparu golwg fanylach ar rai agweddau ar CHERISH gan gynnwys safleoedd astudio, technegau arolygu, a'r tîm. Ar gyfer y rhifyn hwn rydym yn dathlu cwblhau'r bedwaredd flwyddyn o arolygu ers ein lansiad yn 2017, gan edrych yn ôl ar rai o'r delweddau newydd mwyaf trawiadol, yr arolygon, y sganiau, yr ymweliadau safle a'r cynhyrchion sydd wedi'u creu gan CHERISH ar draws ei bedwar sefydliad partner sy'n gweithio yn Iwerddon a Chymru. Mae'r 16 delwedd yn dangos ystod ddaearyddol a thechnolegol ein gwaith a rhai o'r canlyniadau sy'n dechrau dod i'r amlwg.

Y Comisiwn Brenhinol: Ynys Enlli, Gwynedd. Golygfa newydd o ynys enwog y pererinion. Cafwyd y data sganio laser (LiDAR) manylder 50 centimetr hyn o'r awyr ar gyfer Enlli ar ddechrau'r prosiect ym mis Chwefror 2017 ar lanw isel, er mwyn gallu monitro erydiad arfordirol yn y dyfodol yn hynod fanwl. Darparodd fodel gweddol digidol manwl cyntaf yr ynys.



Providing a more in-depth look at certain aspects of CHERISH including study sites, survey techniques, and the team. For this issue we celebrate completion of the fourth year of survey since our launch in 2017 with a look back at some of the most stunning new images, surveys, scans, site visits and products that have been generated by the CHERISH across its four partner organisations working in Ireland and Wales. These sixteen images show the geographic and technological range of our work and some of the results which are beginning to emerge.

The Royal Commission: Bardsey Island, Gwynedd. A new view of a famous pilgrimage isle. This 50-centimetre resolution airborne laser scanning (LiDAR) data for Bardsey was acquired at the start of the project in February 2017 at low tide, to allow highly accurate monitoring of future coastal erosion. It provided the first detailed digital elevation model of the island.

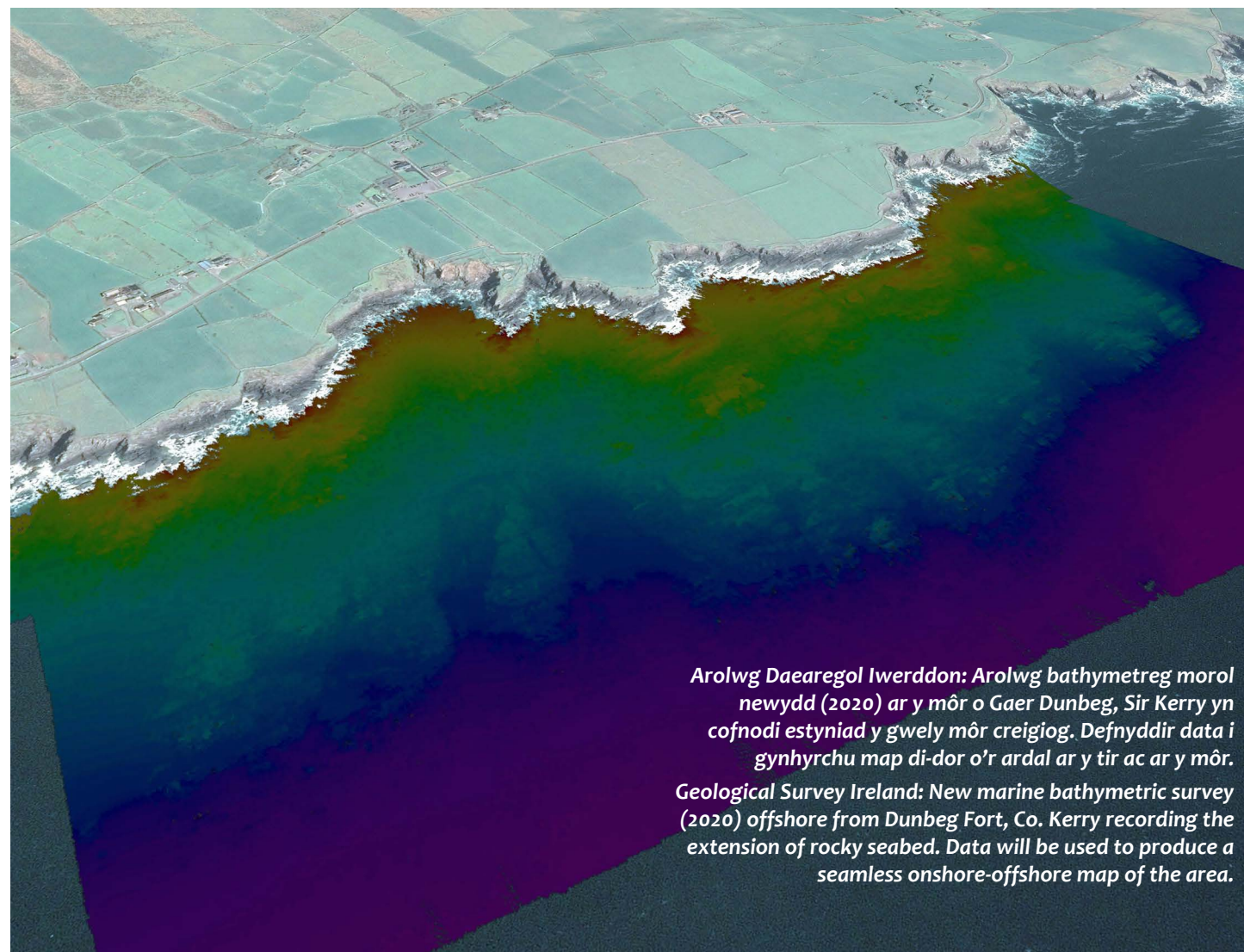


Prifysgol Aberystwyth, Adran Daearyddiaeth a Gwyddorau Daeor: Twyni tywod Borth ac Ynyslas, Ceredigion, 2018. Pan mae pethau'n mynd yn anodd, mae arnoch angen digreiddiwr taro i dreiddio i'r haenau tywod caled ar gyfer dadansoddi a dyddio. Aberystwyth University, Department of Geography and Earth Sciences: Borth and Ynyslas sand dunes, Ceredigion, 2018. When the going gets tough, you need a percussion corer to penetrate hard sand layers for analysis and dating.



Y Rhaglen Darganfod: Caer Bentir Woodstown, Sir Waterford. Cafodd y safle archaeolegol hwn sy'n erydu ei fonitro gyntaf ar gyfer CHERISH o awyren fechan ym mis Hydref 2017. Dangosir llun UAV manylach yma o 2020.

Discovery Programme: Woodstown Promontory Fort, Co. Waterford. This eroding archaeological site was first monitored for CHERISH from a light aircraft in October 2017. A more detailed UAV view is shown here from 2020.



Arolwg Daearegol Iwerddon: Arolwg bathymetreg morol newydd (2020) ar y môr o Gaer Dunbeg, Sir Kerry yn cofnodi estyniad y gwely môr creigiog. Defnyddir data i gynhyrchu map di-dor o'r ardal ar y tir ac ar y môr.

Geological Survey Ireland: New marine bathymetric survey (2020) offshore from Dunbeg Fort, Co. Kerry recording the extension of rocky seabed. Data will be used to produce a seamless onshore-offshore map of the area.



Y Comisiwn Brenhinol: Ynys Gwales yr RSPB, Sir Benfro, Hydref 2019. Roedd y cloddio modern cyntaf ar yr ynys fechan anghysbell hon yn canolbwyntio ar 'Dŷ 1', adeilad carreg petryal yng nghanol caeau yr oedd ei waliau cerrig wedi'u hadeiladu'n dda wedi'u claddu dan haenau dwfn o giwana huganod. Nid yw'r adeilad hynafol hwn wedi'i ddyddio ar hyn o bryd.

The Royal Commission: RSPB Grassholm Island, Pembrokeshire, October 2019. The first modern excavations on this remote islet focussed on 'House 1' a rectangular stone building among fields whose well built stone walls were buried in deep layers of gannet guano. This ancient building is currently undated.



Prifysgol Aberystwyth, Adran Daearyddiaeth a Gwyddorau Daeor: Llyn Maelog, Ynys Môn. Samplu o rafft i adfer gwaddodion o waelod y llyn. Mae'r dystiolaeth ffisegol, fiolegol a chemegol sydd wedi'i dal yn yr haenau o waddodion yn helpu i ailadeiladu amgylcheddau'r gorffennol.

Aberystwyth University, Department of Geography and Earth Sciences: Llyn Maelog, Anglesey. Sampling from a raft to recover sediments from the bottom of the lake. Physical, biological and chemical evidence trapped within layers of sediments help reconstruct past environments.



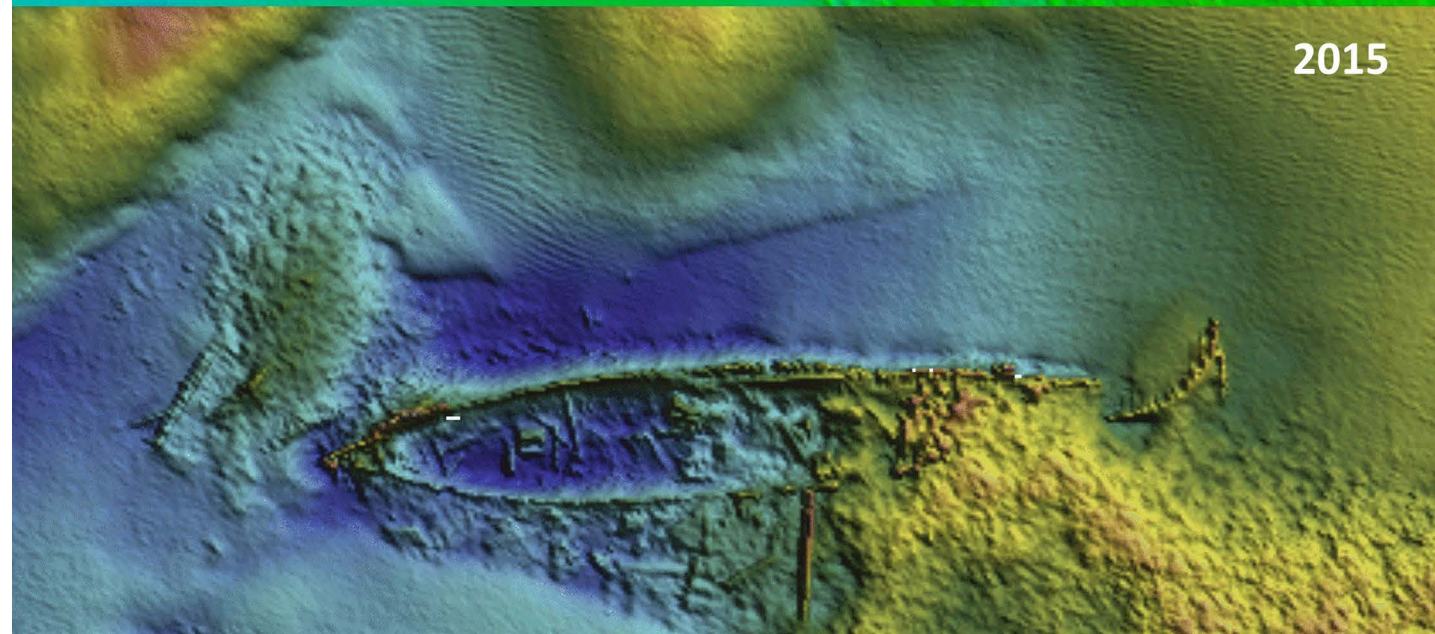
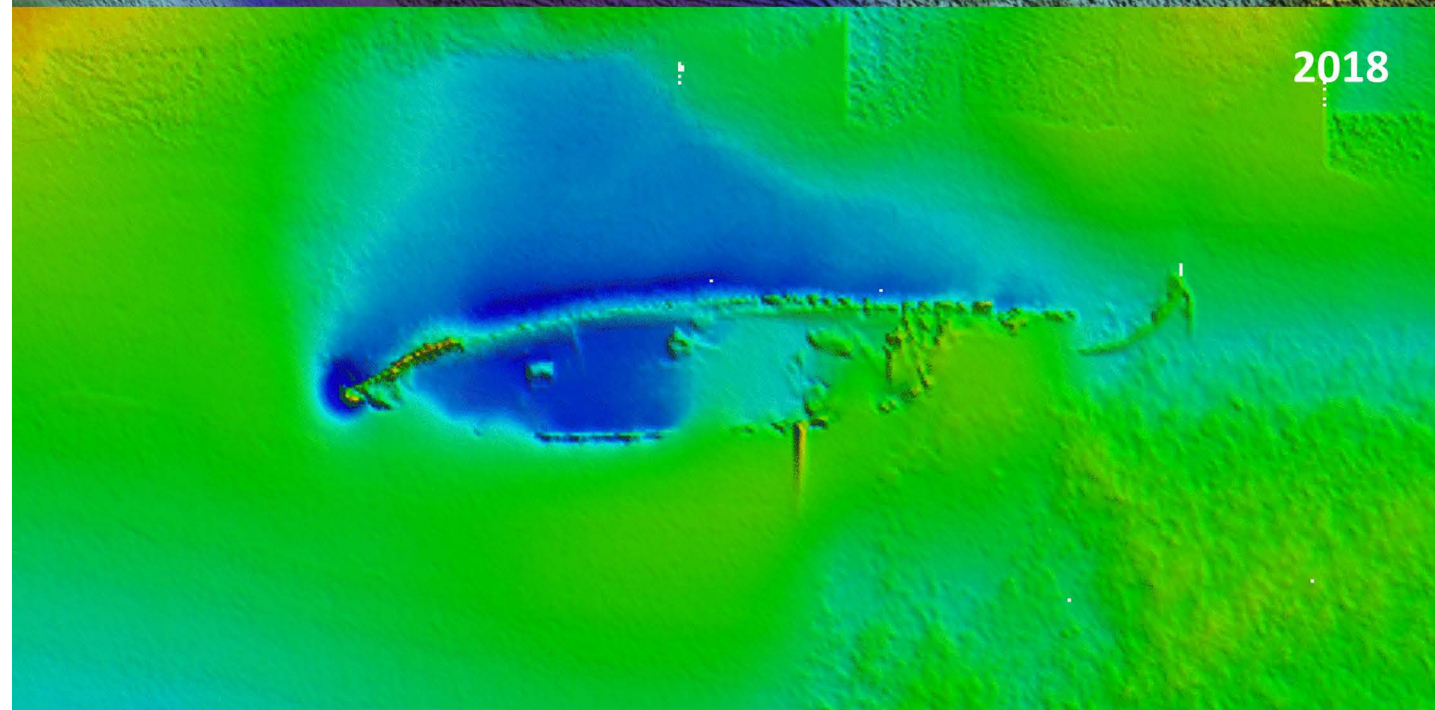
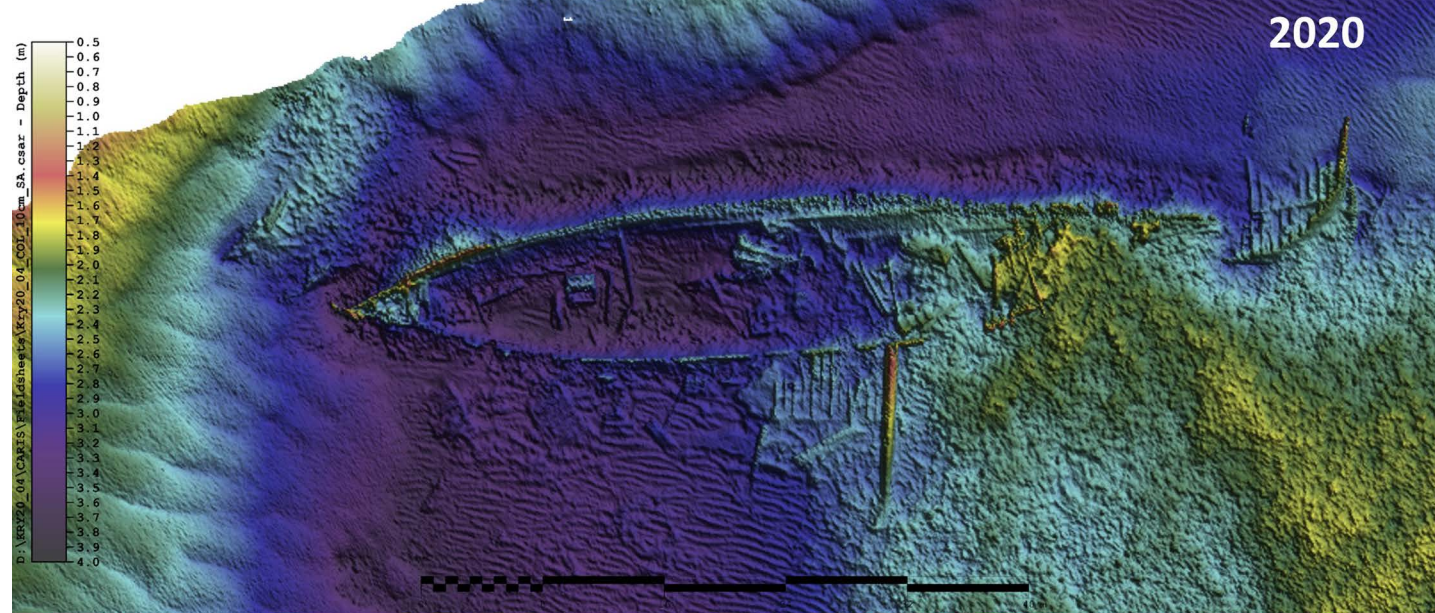
Y Rhaglen Darganfod: Tref wag Ganoloesol Clonmines, Sir Wexford. Mae cyfuniad o lefelau'r môr sy'n codi a gwaddodion cynyddol o Fae Bannow yn arwain at orlenwi cyson a gweithredoedd y tonnau'n cael effaith ar integriti strwythurol y fynachlog Awstinaidd sydd wedi'i lleoli ar lan y dŵr.

Discovery Programme: The abandoned Medieval town of Clonmines, Co. Wexford. A combination of rising sea levels and increased sedimentation of Bannow Bay are resulting in frequent inundation and wave action acting upon the structural integrity of the Augustinian friary located at the water's edge.



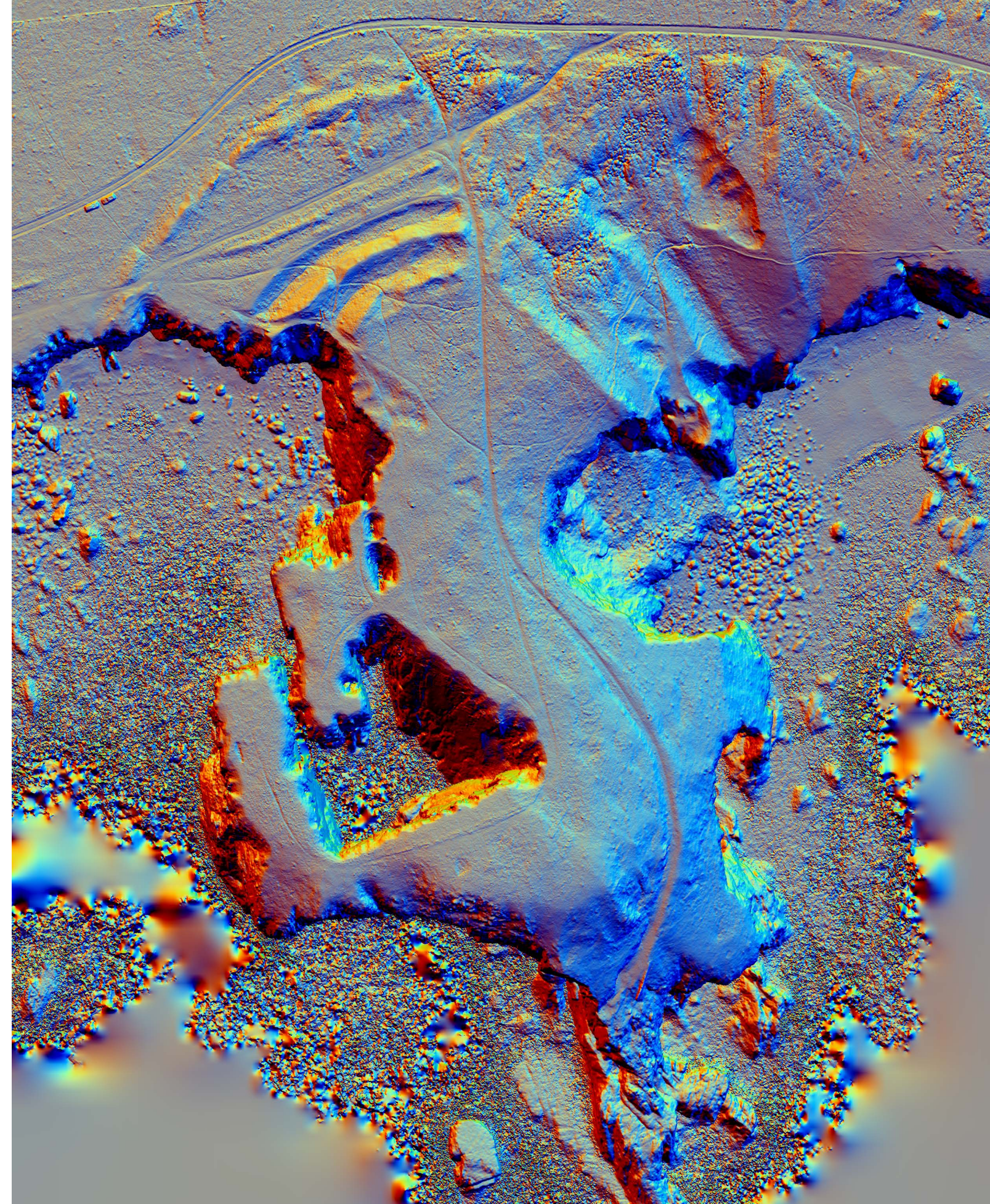
Arolwg Daearegol Iwerddon: Model gweddllun digidol o UAV o Ballinskelligs, Sir Kerry yn dangos erydu ar glogwyn gwaddodion bach uwch ben y creigwely. Sylwch ar estyniad amlwg y creigwely o dan y dyfroedd arfordirol clir, lle mae CHERISH yn bwriadu treialu bathymetreg sy'n deillio o UAV.

Geological Survey Ireland: UAV derived digital elevation model of Ballinskelligs, Co. Kerry showing eroding small sediment cliff above bedrock. Note the visible extension of bedrock beneath the clear coastal waters, where CHERISH plans to trial UAV derived bathymetry.



Arolwg Daearegol Iwerddon: Tri arolwg acwstig morol o Longddrylliad y City of London, Sir Wexford, a gynhaliwyd yn 2015 (INFOMAR), 2018 (CHERISH) a 2020 (CHERISH), sy'n dangos y gwaddodion symudol deinamig yn y rhanbarth sy'n cwmpasu ac yn datgelu ardal malurion y llongddrylliad.

Geological Survey Ireland: Three marine acoustic surveys of the City of London Wreck, Count Wexford, conducted in 2015 (INFOMAR), 2018 (CHERISH) and 2020 (CHERISH), showing the dynamically mobile sediment in the region covering and exposing the wreck debris field.



Y Comisiwn Brenhinol: Caer Bentir Bae Trefflemin, Sir Benfro. Mae model gweddllun digidol hynod fanwl a gynhyrchwyd o arolwg UAV ym mis Awst 2020 yn caniatáu monitro manwl yn y dyfodol ar yr erydiad arfordirol yn yr heneb adnabyddus hon. Gellir gweld tua 20 o lwyfannau tai cynhanesyddol y tu mewn.

Royal Commission: Flimston Bay Promontory Fort, Pembrokeshire. A highly detailed digital elevation model generated from a UAV survey in August 2020 allows close future monitoring of coastal erosion at this well known monument. Around 20 prehistoric house platforms can be seen in the interior.



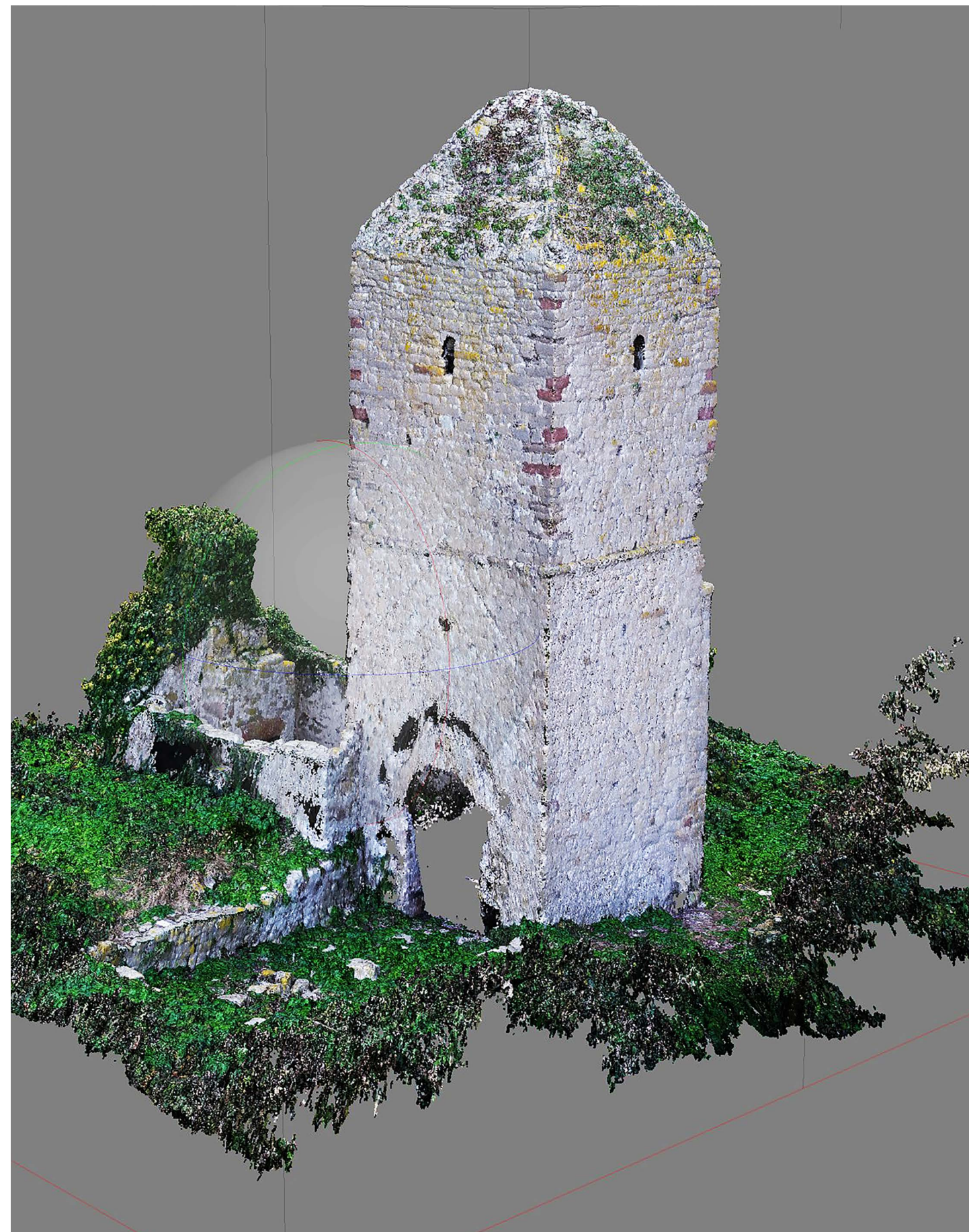
Prifysgol Aberystwyth, Adran Daearyddiaeth a Gwyddorau Daear: Craidd o Lough Gill, llyn bas wedi'i ffinio gan dwyni tywod ger Castlegregory, ar ochr ogleddol Penrhyn Dingle, Sir Kerry. Mae olion tywod wedi'i chwythu gan y gwynt yn y gwaddodion mawn yn rhoi cipolwg i ni ar newidiadau arfordirol a stormydd y gorffennol.

Aberystwyth University, Department of Geography and Earth Sciences: A core from Lough Gill, a shallow lake bordered by sand dunes near Castlegregory, on the north side of the Dingle Peninsula, Co. Kerry. Traces of windblown sand in the peat sediments provide an insight into past coastal changes and storm events.



Y Rhaglen Darganfod: Castell a Chaer Bentir Ferriter, Sir Kerry. Yn 2021 bydd CHERISH yn gwneud gwaith cloddio ar y safle hwn. Gan fod y gwaith cloddio hwn wedi'i gynllunio i gynnwys y gymuned, bydd tîm CHERISH yn gweithio i ddarparu profiad rhithwir drwy ddigwyddiadau ar-lein, modelau rhyngweithiol a theithiau safle.

Discovery Programme: Ferriter's Castle and Promontory Fort, Co. Kerry. In 2021 CHERISH will undertake excavation on this site. As this excavation was planned to provide a strong community involvement, the CHERISH team will work to provide a virtual experience through online events, interactive models and site tours.



Y Comisiwn Brenhinol: Eglwys Ganoloesol Ynys Seiriol, Ynys Môn. Model 3D newydd o dŵr yr eglwys Romanesg anghysbell ac anhygyrch hon sydd prin byth yn cael ymwelwyr heddiw. Cynhyrchwyd y model yn dilyn arolwg UAV ym mis Rhagfyr 2019.

Royal Commission: Ynys Seiriol Medieval church, Puffin Island, Anglesey. A new 3D model of this remote and inaccessible Romanesque church tower which is rarely visited today. The model was generated following a UAV survey in December 2019.



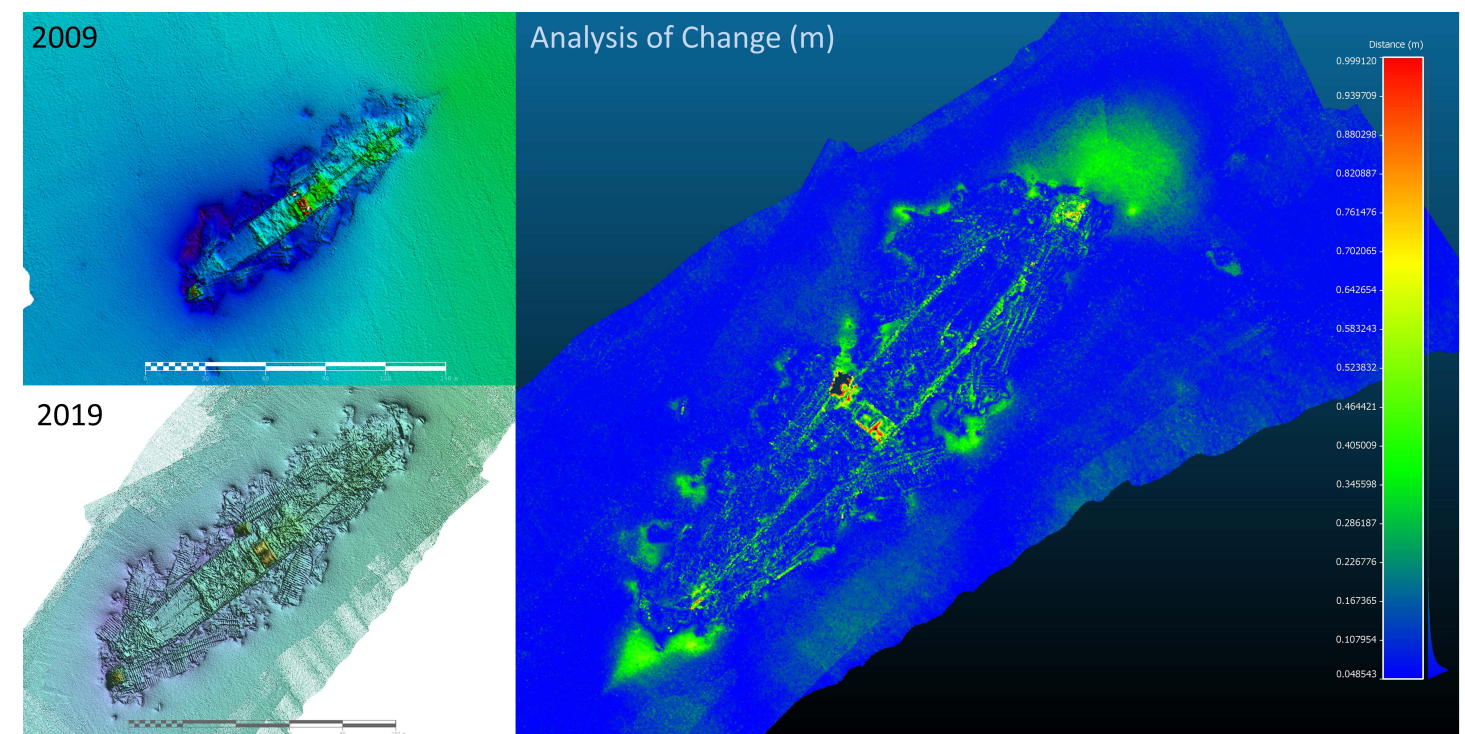
Prifysgol Aberystwyth, Adran Daearyddiaeth a Gwyddorau Daear: Caer arfordirol Dinas Dinlle, Gwynedd. Helen Roberts yn cymryd samplau ar gyfer dyddio Goleuedd a Ysgogir yn Optegol yn ystod ein gwaith cloddio drwy fynediad ar raff ar wyneb y clogwyn sy'n erydu ym mis Mehefin 2019.

Aberystwyth University, Department of Geography and Earth Sciences: Dinas Dinlle coastal fort, Gwynedd. Helen Roberts taking samples for Optically Stimulated Luminescence dating during our rope-access excavation of the eroding cliff face in June 2019.



Y Rhaglen Darganfod: Llun dramatig o Gaer Bentir Dun an Oir ar benrhyn Dingle yn Sir Kerry, o UAV ym mis Ebrill 2019.

Discovery Programme: A dramatic shot of Dun an Oir Promontory Fort on the Dingle peninsula in Co. Kerry, flown by UAV in April 2019.



Arolwg Daearegol Iwerddon: Llongddrylliad y Manchester Merchant, Sir Kerry. Monitro newid i longddrylliadau tanfor sy'n dangos gwahaniaeth gweddlyn rhwng arolygon yn 2009 a 2019. Mae'r newid wedi'i ganoli o amgylch blaen a starn y llong, ynghyd â'r boeleri canol llong sy'n dymchwel.

Geological Survey Ireland: The wreck of the Manchester Merchant, Co. Kerry. Monitoring change to undersea wrecks showing elevation difference between surveys in 2009 and 2019. Change is concentrated around the bow and stern of the vessel, along with the collapsing mid-ship boilers.

FFEIL FFEITHIAU PUFFTY

PUFFTY'S FACT FILE

Mae'r masgot ac aelod o dîm CHERISH, Puffty-Hump, yn hapus iawn o fod wedi cael ailddechrau'r gweithgareddau maes yn ystod y chwe mis diwethaf. Ar ei theithiau mae'n casglu ffeithiau a ffigurau diddorol yn ymwneud â newid yn yr hinsawdd, y dreftadaeth arfordirol a'n prosiect ni. Yn ei ffeil ffeithiau ddiweddaraf, mae Puffty wedi canolbwyntio ar fawndiroedd. Oeddech chi'n gwybod ...

CHERISH mascot and team member Puffty-Hump is very happy to have resumed field activities in the last six months. On her travels she gathers interesting facts and figures relating to climate change, coastal heritage and our project. In her latest fact file Puffty has focussed on peatlands. Did you know...

Puffty yn gosod offer arolygu Radar Treiddio Daeaf yn ei le yn ystod gwaith maes diweddar. Puffty setting-up the Ground Penetrating Radar survey equipment during recent fieldwork.



Mae rhamant yn y gwynt gyda phâl arall yn ystod ymweliad monitro â llongddrylliad Fosil ger Abersoch. Romance is in the air with a fellow puffin during a monitoring visit of the wreck known as the Fosil near Abersoch.

Mae mawndiroedd yn chwarae rhan bwysig mewn cadw CO₂ allan o'r atmosffer – dim ond 3 y cant o arwyneb tir y byd maent yn ei orchuddio, ond maent yn cynnwys mwy na dwywaith y carbon sy'n cael ei storio yn fforestydd y byd gyda'i gilydd.

Gall mawndiroedd gweithredol, iach storio llawer iawn o ddŵr glaw – gall sffagnwm ddal 20 gwaith ei bwysau ei hun mewn dŵr. Mae mawndiroedd yn arafu rhyddhau dŵr glaw i nentydd ac afonydd gan helpu i leihau effeithiau llifogydd.

Daw bron i 70 y cant o ddŵr yfed y DU o ddalgylchoedd sy'n cael eu rheoli gan fawndiroedd; mewn cyflwr da ac iach gallant gynhyrchu dŵr glân naturiol, sydd â lefel isel o lygredd a maethynnau, heb angen fawr ddim triniaeth ymlaen llaw.

Mae bron i 2 filiwn m³ o fawn yn cael ei werthu i arddwyr y DU bob blwyddyn (digon i lenwi 800 o byllau nofio maint Olympaidd). Dangoswyd bod compost di-fawn amgen sy'n deillio o gynhyrchion wedi'u hailgylchu neu gynhyrchion gwastraff yr un mor effeithiol â mawn neu hyd yn oed yn well.

Mae mawndiroedd y DU mewn cyflwr gwael ac nid yw llawer ohonynt yn storio carbon mwyach. Mae'r mawndiroedd sydd wedi'u difrodi'n rhyddhau'r hyn sy'n cyfateb i fwy nag 20 miliwn tonnell o garbon deuocsid bob blwyddyn – tua 4 y cant o gyfanswm allyriadau nwyon tŷ gwydr blyneddol y DU.

I gael gwybod mwy a dysgu am y prosiectau adfer mawn yn y DU, ewch i <https://www.iucn-uk-peatlandprogramme.org/>.

Peatlands play an important role in keeping CO₂ out of the atmosphere – they cover just 3 per cent of the world's land surface, but contain more than twice the amount of carbon that is stored in the world's forests combined.

Active, healthy peatlands are able to store vast amounts of rainwater – sphagnum can hold 20 times its own weight in water. Peatlands slow the release of rainwater into streams and rivers helping to reduce the impacts of flooding.

Nearly 70 per cent of the UK's drinking water comes from catchments dominated by peatlands; in a good healthy state they can produce naturally clean water, low in pollutants and nutrients requiring minimal pre-treatment.

Nearly 2 million m³ of peat are sold to UK gardeners every year (enough to fill 800 Olympic sized swimming pools). Alternative peat-free composts derived from recycled or waste products have been shown to be as effective as or even better than peat.

The UK's peatlands are in a poor state with many no longer storing carbon. Damaged peatlands are releasing the equivalent of over 20 million tonnes of carbon dioxide each year – around 4 per cent of the UK's total annual greenhouse gas emissions.

To find out more and learn about peatland restoration projects in the UK, go to <https://www.iucn-uk-peatlandprogramme.org/>.

CYFARFOD Â THÎM CHERISH / MEET THE CHERISH TEAM

Louise Barker, Comisiwn Brenhinol Henebion Cymru

Rwy'n archaeolegydd sy'n gweithio'n rhan amser ar CHERISH drwy fy rôl fel Uwch Ymchwilydd gyda Chomisiwn Brenhinol Henebion Cymru. Rydw i wedi gweithio ym maes archaeoleg ers graddio gyda BA mewn Archaeoleg o Brifysgol Newcastle yn 1996, gan ddechrau fy ngyrfa yn y ffos fel 'cloddiwr' i Archaeological Practice Cyf. yng ngogledd Lloegr, cyn symud i Gaergrawnt yn 1999 i weithio i English Heritage fel ymchwilydd archaeolegol. Yn hiraethu am y mynyddoedd a'r môr, roedd y cyfle i symud i Gymru ac Aberystwyth yn 2004 yn ormod o demtasiwn ac ymunais â thîm arolygu ac ymchwilio'r Comisiwn Brenhinol.

Mae fy rôl fel ymchwilydd archaeolegol yn ymwneud yn bennaf ag arolygu a dehongli. Rydw i ar fy hapusaf – yn archaeolegol! – yn yr awyr agored, gydag offer arolygu, yn cynnal arolwg manwl o safle neu dirwedd archaeolegol i gynorthwyo gydag ymchwil a dealltwriaeth. Rydw i'n lwcus iawn yn cael gyrfa sy'n fy ngalluogi i deithio ledled Cymru a gweithio ar amrywiaeth o henebion a thirweddau sy'n rhychwantu'r cyfnod cynhanes hyd heddiw. Mae hyn wedi arwain at fy niddordebau ymchwil fy hun mewn tirweddau ynysoedd a cheyrydd pentir arfordirol, dau faes sy'n cyd-fynd yn berffaith â gwaith CHERISH.

Yn ogystal ag arolygu archaeolegol, mae fy rôl gyda'r Comisiwn Brenhinol yn cynnwys gweithio ar brosiectau mawr ar gyfer sector yr amgylchedd hanesyddol yng Nghymru ac ar hyn o bryd mae hyn yn cynnwys enwebu Tirwedd Llechi Gogledd Orllewin Cymru ar gyfer statws Treftadaeth Byd ac, yn fwy perthnasol i CHERISH, fel rhan o dîm rhyngasiantaeth bach sydd wedi ysgrifennu

Louise Barker, Royal Commission on the Ancient and Historic Monuments of Wales

I'm an archaeologist working part-time on CHERISH through my role as Senior Investigator with the Royal Commission on the Ancient and Historical Monuments of Wales. I've worked in archaeology since graduating with a BA in Archaeology from Newcastle University in 1996, beginning my career in the trench as a 'digger' for the Archaeological Practice Ltd in north England, before moving to Cambridge in 1999 to work for English Heritage as an archaeological investigator. Yearning for the mountains and sea, I couldn't resist the opportunity of moving to Wales and Aberystwyth in 2004 to join the Royal Commission's survey and investigation team.

My role as an archaeological investigator principally involves survey and interpretation. I am at my happiest – in an archaeological sense! – in the great outdoors, armed with survey equipment, undertaking the detailed survey of an archaeological site or landscape to aid research and understanding. I'm very lucky to have a career that enables me to travel across Wales and work on a range of monuments and landscapes spanning prehistory to the present day. This has led to my own research interests on island landscapes and coastal promontory forts, both of which align perfectly to CHERISH.

In addition to archaeological survey, my role at the Royal Commission involves working on major projects for the historic environment sector in Wales and this currently includes the nomination of the Slate Landscape of Northwest Wales for World Heritage status and, more pertinent to CHERISH, as part of a small inter-agency



ac sydd bellach yn cydlynw'r gwaith o gyflawni Cynllun Addasu'r Sector Cymru ar gyfer yr Amgylchedd Hanesyddol a Newid yn yr Hinsawdd.

Yn fy amser hamdden byddwch fel arfer yn fy ngweld yn rhedeg i fyny mynydd neu'n beicio ffyrdd tawel a llwybrau canolbarth Cymru.

Sean Cullen, Arolwg Daearegol Iwerddon

Wedi bod yn hwyliwr brwd erioed, yn gweithio'n wreiddiol fel hwyliwr proffesiynol a physgotwr tiwna masnachol, rydw i'n hydrograffydd wrth fy nghreffft. Cefais BSc yn y wyddoniaeth o Brifysgol Plymouth ac yn fuan ar ôl hynny ymunais â'r cwmni arolygu Fugro, sy'n gweithredu o'r Dwyrain Canol. Yn dod yn wreiddiol o Dde Affrica, treuliais flynyddoedd lawer yn Iwerddon yn tyfu i fyny a dychwelais i'r glannau hyn bron i 20 mlynedd yn ôl i ymgymryd â rôl fel hydrograffydd gydag Arolwg Gwely'r Môr Cenedlaethol Iwerddon (rhagflaenydd i'r rhaglen INFOMAR). Yn 2006, tra oedd rhaglen INFOMAR yn cael ei chreu, cefais ddychwilio i fod yn Uwch Ddaearegydd, ac roedd fy mhrofiad morol o gymorth i'r Arolwg Daearegol sy'n berchen ar fflyd bwrpasol o gychod arolygu. Dair blynedd yn ôl, cefais fy mhenodi yn rheolwr prosiect ar gyfer y rhaglen INFOMAR, yn gyfrifol am gydlynw a chyflwyno elfen mapio glannau'r rhaglen a rheoli grŵp amrywiol o wyddonwyr.

Rydw i wedi bod yn ymwneud â phrosiect CHERISH ers ei sefydlu. Ymhlith fy nyletswyddau eraill, rydw i'n gyfrifol am sicrhau bod adnoddau INFOMAR ar gael ar gyfer CHERISH a bod yr elfennau y gellir eu cyflawni'n cael eu cwblhau a'u rheoli am ansawdd. Mae natur ddeinamig yr arfordiroedd, a'r gallw i CHERISH wthio caffael data yn y "rhuban gwyn" arfordirol a chynnal arolygon dro ar ôl tro gydag offer cwbl fodern, yn ei wneud yn brosiect hynod ddiddorol i fod yn rhan ohono.



team that has written and is now coordinating the delivery of Wales's Historic Environment and Climate Change Sector Adaptation Plan.

In my spare time you'll usually find me running up a mountain or cycling the quiet roads and trails of mid Wales.

Sean Cullen, Geological Survey Ireland

Having always been a keen sailor, working originally as a professional yachtsman and commercial tuna fisherman, I am a hydrographer by trade. I got my BSc in the science from the University of Plymouth and shortly after joined the surveying company Fugro, operating out of the Middle East. Originally from South Africa, I'd spent many years in Ireland growing up and returned to these shores nearly 20 years ago to take up a role as hydrographer with the Irish National Seabed Survey (a fore-runner of the INFOMAR programme). In 2006, as the INFOMAR programme was being created, I was promoted to Senior Geologist, and my maritime experience assisted in the Geological Survey owning a dedicated fleet of survey vessels.

Three years ago I became the co-project manager for the INFOMAR programme, responsible for co-ordinating and delivering the inshore mapping component of the programme and managing a diverse group of scientists.

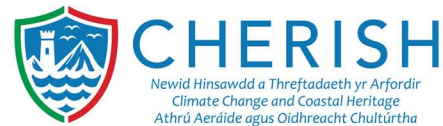
I've been involved with the CHERISH project since its inception. Among my other duties, I'm responsible for ensuring the INFOMAR resources are available for CHERISH and the deliverables are achieved and quality controlled. The dynamic nature of the coasts, and the ability for CHERISH to push data acquisition in the coastal "white ribbon" and conduct repeat surveys with state-of-the-art equipment, makes it an extremely interesting project to be involved with.

DYDDIADAU AR GYFER EICH DYDDIADUR

Yn ystod 2021 bydd CHERISH yn cyflwyno rhai digwyddiadau ar-lein cyffrous i chi, a hefyd – croesi bysedd – cyfle i ymweld ag arddangosfa CHERISH a chymryd rhan mewn sawl digwyddiad cloddio cymunedol.

O fis Ionawr 2021 ymlaen rydym yn dechrau cynnal 'Sgyrsiau CHERISH' misol, cyfres o gyflwyniadau byr gan y tîm yn ymwneud â gwahanol agweddau ar ein gwaith. Bydd y rhain ar gael i'w gweld ar ein sianel YouTube, Twitter, Facebook a'r Wefan, felly cadwch lygad ar ein cyfryngau cymdeithasol i gael yr wybodaeth ddiweddaraf.

Rydym hefyd yn brysur yn cynllunio cynhadledd ar-lein CHERISH sydd i'w chynnal ddydd Mercher 12 Mai 2021. Mae gennym nifer o siaradwyr rhyngwladol gwych wedi'u trefnu eisoes, i drafod y thema *Treftadaeth Ddiwylliannol Arfordirol a Newid yn yr Hinsawdd*. Edrychwch ar y daflen gyferbyn am fwy o fanylion.



Cadwch y dyddiad:
Dydd Mercher
12fed Mai 2021

Cynhadledd AR-LEIN Prosiect CHERISH: Treftadaeth Ddiwylliannol Arfordirol a Newid Hinsawdd

Bydd y gynhadledd ryngwladol hon yn dangos pa mor agored i niweddau amgylcheddau arfordirol i newid yn yr hinsawdd a sut gallai newidiadau yn y dyfodol effeithio ar y rhain. Bydd y papurau'n ymdrin ag ystod o bynciau sy'n ymwneud â'r thema o ddeall a rheoli treftadaeth arfordirol sydd o dan fygythiad. Cadwch lygad ar ein gwefan ni a'r cyfryngau cymdeithasol am raglen y gynhadledd pan gaiff ei rhyddhau, a'r manylion archebu:

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PRIF SIARADWR:

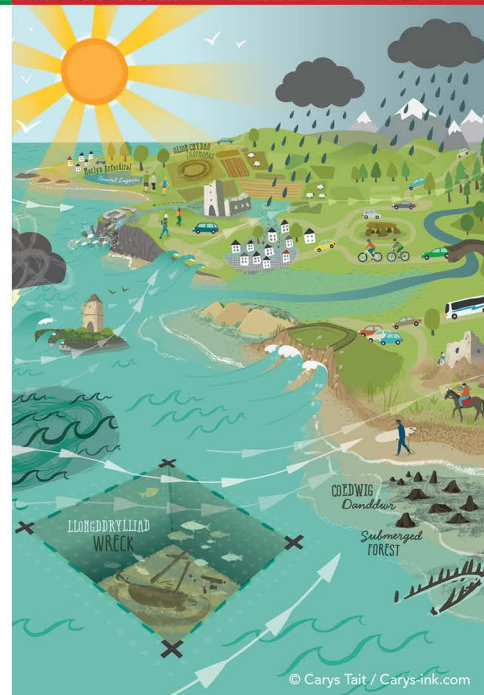


JOHN SWEENEY,
Prifysgol Maynooth, Iwerddon
www.maynoothuniversity.ie



SIARADWYR ERAILL WEDI'U CADARNHAU:

- **Jill Bullen**, Cyfoeth Naturiol Cymru, y DU
- **Rónadh Cox**, Coleg Williams, UDA
- **Cathy Daly**, Prifysgol Lincoln, y DU
- **David Dodd**, Swyddfa Ranbarthol Gweithredu ynghylch yr Hinsawdd, Iwerddon
- **Hannah Fluck**, Historic England, y DU
- **Ewan Hyslop**, Historic Environment Scotland, y DU
- **Elgidius Ichumbaki**, Prifysgol Dar Es Salaam, Tanzania
- **Michael MacDonagh**, Adran Dai, Llywodraeth Leol a Threftadaeth, Iwerddon
- **Sarah Miller**, Rhwydwaith Archaeoleg Gyhoeddus Fflorida, UDA
- **Elias Lopez-Romero and Marie-Yvane Daire**, Prifysgol Complutense Madrid, Sbaen a Phrifysgol Rennes, Ffrainc
- **Riikka Tevali**, Prifysgol Helsinki, Y Ffindir
- **Andrew Viduka**, Treftadaeth Forol a Chymanwlad, Awstralia
- **Kieran Westley**, Prifysgol Ulster, y DU

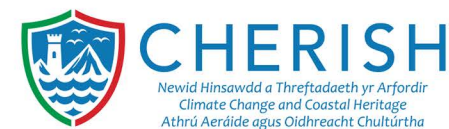


DATES FOR YOUR DIARY

During 2021 CHERISH will be bringing you some exciting online events, and – fingers crossed – a chance to visit our CHERISH exhibition and take part in several community excavations.

From January 2021 we are starting our monthly 'CHERISH Chats', a series of short presentations by the team relating to different aspects of their work. These will be available to view from our Twitter, Facebook, Website and YouTube channels, so please keep an eye on our social media feeds for the latest information.

We're also busy planning the CHERISH online conference to be held on Wednesday 12 May 2021. We have a number of great international speakers lined up already, discussing the theme of *Coastal Cultural Heritage and Climate Change*. See the flyer below for more details.



Save the date:
Wednesday
12th May 2021

CHERISH Project's ONLINE conference: Coastal Cultural Heritage and Climate Change

This international conference will showcase the vulnerability of coastal environments to climate change and how these may be impacted by future changes. Papers will cover a range of topics around the theme of understanding and managing coastal heritage under threat.

Keep an eye on our website and social media for release of our conference programme and booking details:

www.cherishproject.eu

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KEYNOTE SPEAKER:

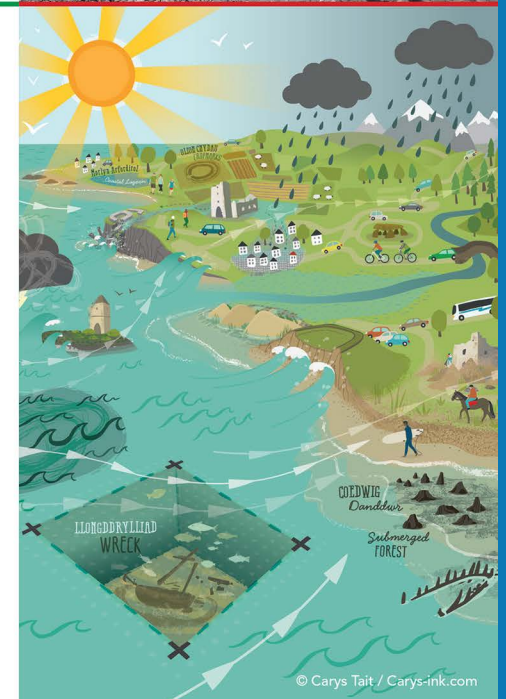


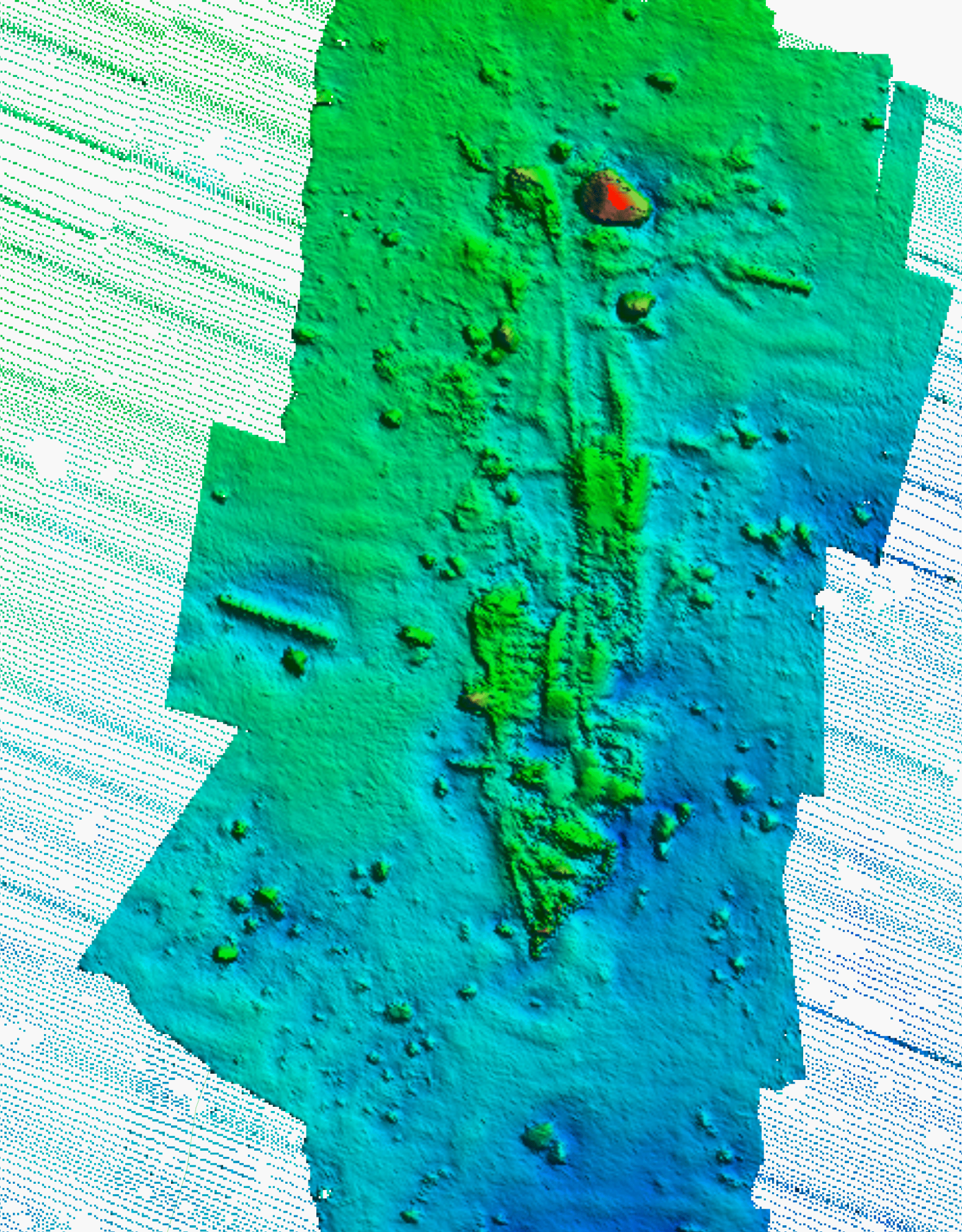
JOHN SWEENEY,
Maynooth University, Irl
www.maynoothuniversity.ie



OTHER CONFIRMED SPEAKERS INCLUDE:

- **Jill Bullen**, Natural Resources Wales, UK
- **Rónadh Cox**, Williams College, USA
- **Cathy Daly**, University of Lincoln, UK
- **David Dodd**, Climate Action Regional Office, Irl
- **Hannah Fluck**, Historic England, UK
- **Ewan Hyslop**, Historic Environment Scotland, UK
- **Elgidius Ichumbaki**, University of Dar Es Salaam, Tanzania
- **Michael MacDonagh**, Dept of Housing, Local Government & Heritage, Irl
- **Sarah Miller**, Florida Public Archaeology Network, USA
- **Elias Lopez-Romero and Marie-Yvane Daire**, Complutense University of Madrid, Spain and University of Rennes, France
- **Riikka Tevali**, University of Helsinki, Finland
- **Andrew Viduka**, Maritime and Commonwealth Heritage, Australia
- **Kieran Westley**, Ulster University, UK





Mae'r SS Invercauld i'w gweld ar wely'r môr ar ddyfnder o 35m 11 cilometr i'r de o Gei Kilmore, Sir Wexford. Fe suddodd ar 22 Chwefror 1917.

The SS Invercauld lies on the seabed at a depth of 35m 11 kilometre south of Kilmore Quay, Co. Wexford. It sank on the 22 February 1917.



Er Cof am David Ingham

Gyda thristwch mawr y cawsom wybod yn ddiweddar am farwolaeth David Ingham, gwirfoddolwr brwd gyda CHERISH. Bu David o help mawr i ni gyda'n gwaith yn Ninas Dinlle ac aeth ymhell y tu hwnt i'r hyn a ddisgwylir gan wirfoddolwr gyda'r prosiect – nid yn unig y cadwodd lygad barud ar wyneb bryngaer Dinas Dinlle sy'n erydu a chasglu delweddau ffotograffig yn rheolaidd i ni, ond hefyd bu'n trefnu mynediad er mwyn i ni allu cerdded ar dir ei gymydog a chymryd samplau, a chyfrannodd ei amser a'i wybodaeth leol yn gwbl barod a digwestiwn.

Roedd David yn unigolyn caredig a brwdfrydig ac roedd yn bleser cyfarfod a gweithio gydag ef. Mae ei gysylltiad â CHERISH yn batrwm o werth prosiectau yn y gymuned sy'n dal dychymyg pobl ac yn ysgogi ymateb yn y gymuned leol i rannu syniadau a hyrwyddo trafod ac ymgysylltu. Bydd prosiect CHERISH yn colli David yn fawr ac mae ein meddyliau gyda'i deulu a'i ffrindiau.

In Memory of David Ingham

It is with great sadness that we recently learned of the passing of David Ingham, an active CHERISH volunteer. David assisted us greatly in our work at Dinas Dinlle and went far beyond what is expected of a project volunteer – not only did he keep a close eye on the eroding face of Dinas Dinlle hillfort and collect photographic imagery on a regular basis for us, he also negotiated access for us to walk over and sample his neighbour's land and gave us his time and local knowledge freely and without question.

David was a kind and enthusiastic individual, who was a pleasure to meet and work with. His involvement with CHERISH epitomises the value of community-based projects that capture people's imagination and prompt a response within the local community to share ideas and promote discussion and engagement. David will be greatly missed by the CHERISH project and our thoughts are with his family and friends.



CHERISH

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

CADWCH MEWN CYSYLLTIAD / KEEP IN TOUCH:

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