



CMAC : WCMC

Canolfan Monitro Arfordirol Cymru
Wales Coastal Monitoring Centre

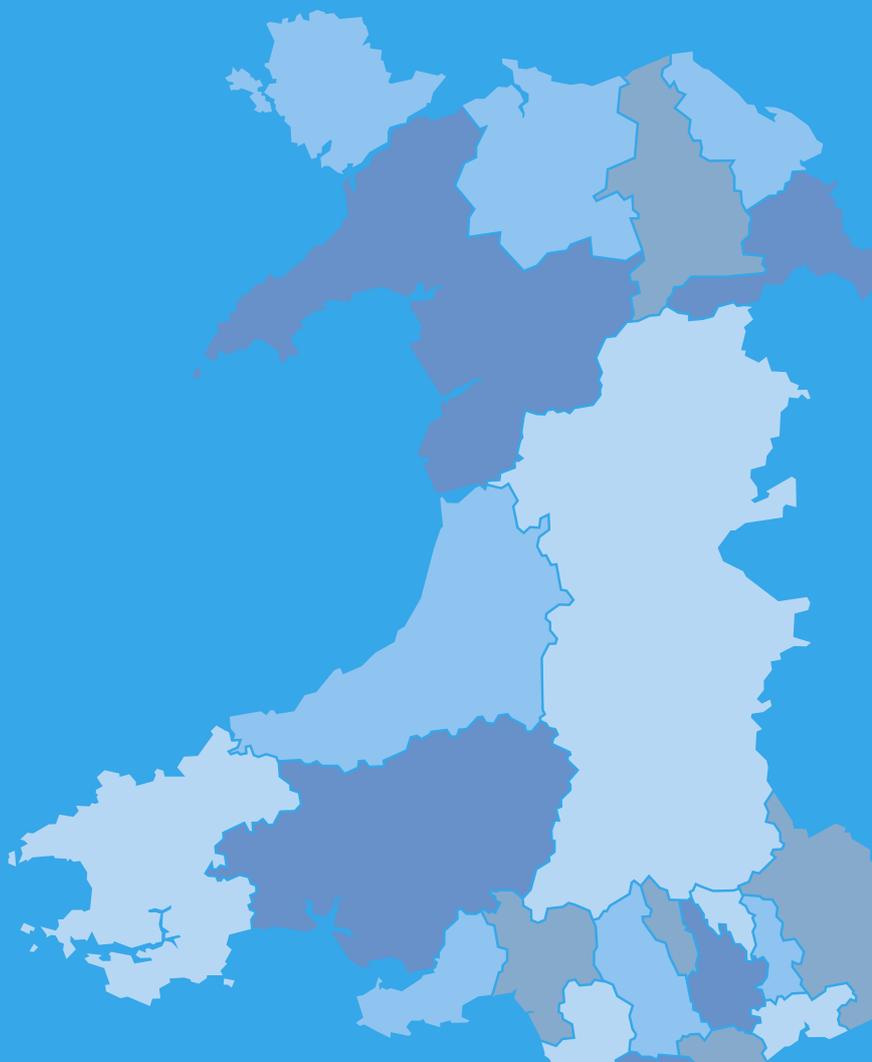
Annual Report

2020/21



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Foreword

2020-21 has been a challenging year for the Centre. Like many other organisations, we have had to navigate through COVID restrictions to ensure the safety of our teams and contractors, and to deliver our planned monitoring programme.

This was also our final year of funding, and a lot of time has been spent developing a new business case with support from our Advisory Panel, 3 years' worth of data and our newly developed tools. We are pleased to announce that we were successful in securing additional funding from the Welsh Government to deliver our ambitious work programme and support the National FCERM Strategy objectives and end users.

Whilst this is evidently good news and further highlighting the success of the WCMC and support from the Welsh Government FCERM Branch, the grant award for 2021-22 is insufficient to deliver our preferred option and many high-risk frontages will not be monitored.

Conwy and Gwynedd councils survey teams and our contractors have gone the extra mile to ensure full programme delivery. We have also continued with our improvement programme which has led to an increase in data quality and almost 50% of our programme being delivered in-house.

The Centre is still growing in reputation and recognition through the hard work of our team. Our Risk Based Methodology has attracted a lot of interest internationally and we are now involved in a range of UK wide technical working groups providing support and expert advice to a range of stakeholders.

Strengthened links with academia have led to numerous projects and initiatives pushing the boundaries of what is possible in coastal monitoring through cutting edge technologies. We are very proud of our work in this area as well as the opportunities we offer through our Undergraduate Programme.



2020/21

AT A GLANCE



Continuation of our undergraduate placement scheme, 1 undergraduate recruited

Additional funding secured to support 3 additional graduate placements (kickstart and Kess2)



Launch of our new website with interactive tools for data users, education, and contractor management ([Welsh Coastal Monitoring Centre | WCMC](#)).

Data holding system freely accessible via online portal, in partnership with Channel Coastal Observatory (www.channelcoast.org).



113 No. Terrestrial survey units completed across Wales.
47% of nationwide surveys delivered in-house; an increase of 15% from last year.



5 capital schemes benefitting from our data.

17 CRMP schemes aligning with programme locations thus offering long-term opportunities for post construction monitoring and to inform future maintenance



Development of Robotics Survey Rover with Aberystwyth University

Development of free flood forecast model for South Wales with Plymouth University

Development of survey equipment weather risk tool with Aberystwyth University

2020/21

IN MORE DETAIL

Delivering Against WCMC Objectives

With climate change predictions highlighting increasing risks to coastal areas, the implementation of SMP2s epoch 2 policies, and the difficult decisions of adapting our approach to coastal risk management and funding allocation, it is paramount for the WCMC to adapt to deliver value for money but most importantly to provide the high quality data necessary to inform FCERM decisions throughout Wales.

The WCMC is also well rehearsed in the need to have a skilled public sector workforce to be able to face these challenges. With this in mind, our programme is driven by 3 key objectives and whilst these have remained the same, the way we deliver against them evolves yearly to maximise opportunities and benefits.

Cost-effective monitoring programme

For the last 4 years we have developed a range of tools and processes which allow us and contractors to provide more accurate estimates.

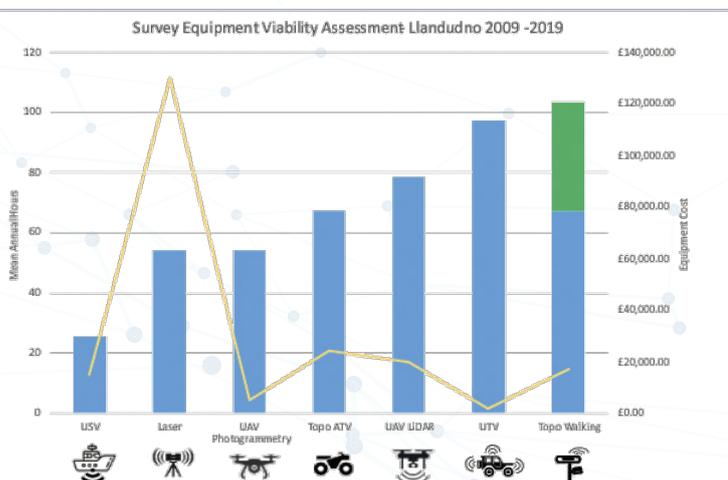
The centralised approach to procurement via the WCMC allows for surveys units to be 'packaged' in geographic lots which are then advertised on the Framework. This approach provides further efficiencies by reducing traveling time and expenses as well as the number of days necessary to survey different lots.

We have also worked closely with the Geographical Data and Earth Observation for Monitoring (GEOM) at Aberystwyth University to develop a weather risk tool. Once finalised, this tool will enable comparison of different surveying methods and will be available from our website to use.

GEOM - Geographical Data and Earth Observation for Monitoring

- Copernicus reanalysis Meteorological data
- 40 year archive
- Any locations on earth

Collaboration - GEOM – Weather Risk Tool



Helping to Prioritise Investment

Is another core objective which aligns with the national objective set-out in the National FCERM Strategy for Wales. To meet this objective, we have developed our monitoring programme to ensure it focusses on the most at-risk coastal areas in Wales. This has been done through our risk-based methodology which ensures that we monitor where the risk is the highest.

This methodology is core to our programme, it provides transparency for sites selection ensuring our funding is used where the risk is the highest but also provides invaluable comparative data to RMAs to inform decisions and investment where appropriate.

Improving Skills & Expertise

The lack of capacity, particularly amongst local authorities as well as the shortage of skilled workforce out there have been identified as key issues in the field of flood & coastal erosion risk management. This continues to lead to a difficulty in recruitment and a loss of more specific skills as officers are asked to become more generalists.

We are tackling the issue through our ongoing Undergraduate Programme which offers the opportunity to learn new skills in the field of surveying and data analysis. We are also working in partnership with several universities to provide subjects for undergraduate and postgraduate dissertations.

This year we have also signed up to the Government Kickstart Scheme. Whilst it helps employers by providing funding for them to create job placements for 16 to 24 year olds, it also provides fantastic opportunities to these young people, leading hopefully to a keen interest in coastal management and further professional opportunities in this field.

Our survey teams also benefit from constant improvement through our Coordination Group aimed at improving survey efficiencies and ensuring specifications are met.



Meet Our Team

With the added benefit of our Undergraduate Programme and the Government Kickstart Scheme, we have been able to deliver a range of activities. This would never have been possible without the fantastic skills and enthusiasm of our very talented team. Apart from our annual monitoring programme, our work has covered joint research with Bath University, a new programme with schools, point cloud data, data analysis, and developing a risk based methodology for bathymetric areas.



Gwyn Nelson
Programme Manager

Arriving in 2019 with 15 years experience in commercial coastal surveys, Gwyn and the team have developed the WCMC from the business case, to what we see today.



Will Russell
Coastal Process Scientist

Arriving in 2019 with a Masters in Ocean Science, Will has been key in developing the processes and systems for strategic surveying of the Welsh Coastline.



Myah Horsford
Assistant Coastal Process Scientist

Myah is our first full time undergraduate placement. Starting in September 2020, Myah has organised our control network and historic data records. Myah enjoys developing our schools programme.



Sivert Hellvik Havso
Robotics Researcher

Sivert began his KESS2 MPhil in November 2020 at Aberystwyth University Robotics Department, to develop a low cost autonomous survey rover.



Ben Davies
Assistant Coastal Scientist

Ben joined in 2021 as a graduate kickstarter. He has a BSc in Physical Geography and Oceanography, and is excited to launch a career focused on the marine environment.



Hannah Richards
Assistant Coastal Scientist

Joining in 2021 as a graduate kickstarter. Hannah has degrees in Geological and Ecological science, and enjoys working with people. She looks forward to contributing her knowledge to WCMC.

	Method	Frontage	Locations
	Bathymetric Surveys	93 km	West Wales Fishguard to Cardigan Bay Conwy Council bridges
	Topographic Surveys	214 km	53 km coastal frontage baselines Total 1269 profiles completed
	Mobile Laser Scanning	2 km	Trials at Penarth, Tenby North Beach and Newton
	Laser	1 km	Monmouth, Swanbridge, River Rhymney, Penarth Cliff, Porthcawl
	Unmanned Aerial	6.3 km	Penrhyn Bay and the eastern extent of Colwyn Bay

Conwy and Gwynedd Councils' survey teams remain instrumental in helping us deliver our annual programme. Considering the added complexity of working under COVID restrictions, the teams have managed to complete a breath-taking 270 beach profiles across North Wales (43 survey units). Overall, the WCMC has delivered **47%** of nationwide surveys in-house which is a staggering increase of **15%** from last year.

This increase is the result of the dedicated work of both teams, councils' investment in this area of work, and an increase in the quality of the data collected due to our ongoing improvement programme delivered through our Coastal Scientist. This approach has also proven to be extremely successful with external contractors.

This year our teams have also undertaken some baseline surveys highlighting an increase in skills and confidence. This is the first time that baseline surveys have been delivered in-house.

Whilst we recognise the different priorities driving monitoring across Wales, there is a lack of coordination and collaboration in this sector. This leads to not maximising value for money, no common specifications in place to allow multi-use of data and inefficiencies in procurement, tendering and savings. We are committed to work closely with relevant stakeholders to improve how coastal monitoring is managed across Wales.

We have been able to share a range of data with several organisations. This further highlights the value of the consistent and repeatable monitoring programme which we deliver thanks to funding from the Welsh Government. To date we have provided data for a range of use to academia, councils, and consultants.

Collaboration

Collaboration is at the core of our activities and our Programme Manager has championed engagement with a range of national and international stakeholders. As well as opening new doors and sharing expertise, this also enables the Centre to meet our statutory obligations under the Well-Being of Future Generations Act.

Our work in this area has proved extremely successful and facilitated the development of a range of materials readily available from our website, 15 x '360 tour' climate change case studies, The Climate Change and Coasts Programme for year 6 pupils and peer reviews.

As the WCMC grows in reputation through quality and innovation, interest in what we do has also risen. We showcased our work at a range of conferences including the annual Maritime and Coastguard Agency Conference, and Natural Resources Wales Our Coast and Sea event.

The experienced English regional monitoring observatories have kindly integrated Wales into their wider teams. Wales are now represented through the WCMC at both Strategic and Co-ordination groups as well as specialised UAV and Earth Observation working groups where progress and knowledge is shared.

Our Risk Based methodology which informs our monitoring programme has also generated a lot of interest.

Technology & Trials

Our work in this area is vital to ensure that we stay at the cutting edge of technology. This approach ensures we maximises on opportunities, value for money and our data fulfils the needs of stakeholders. This area of work could not be possible without close collaboration with academia and the fantastic projects they develop.

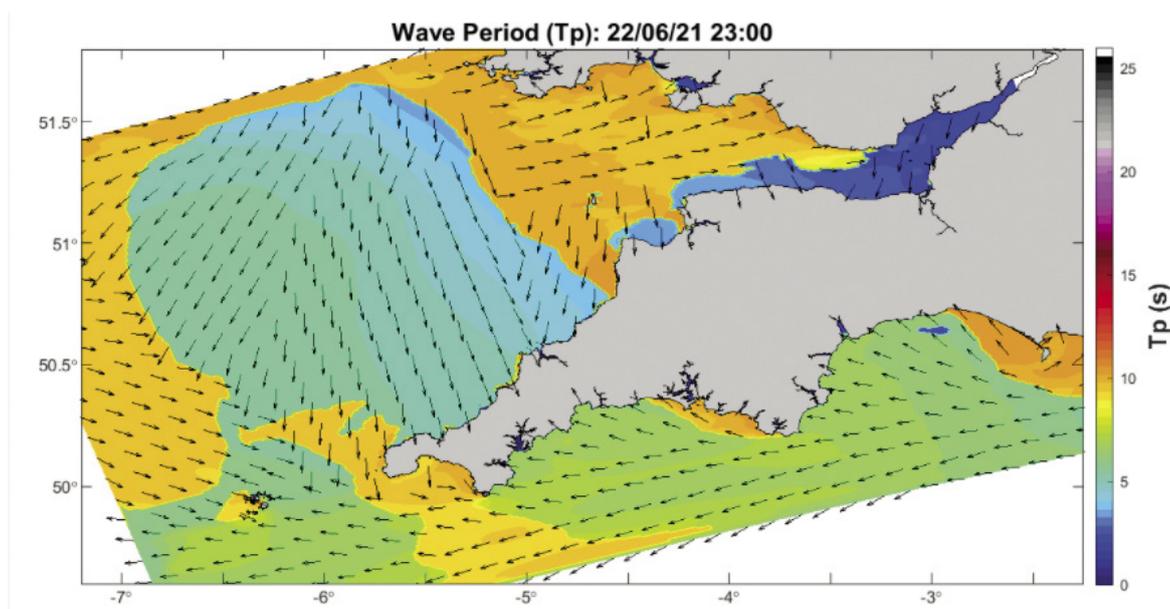


Plymouth-Operational Wave & Water Level Model

The model has been developed at the University of Plymouth Coastal Processes Research Group as part of The South West Partnership for Environmental and Economic Prosperity project.

It is a forecasting system designed to predict waves, water levels, and wave overtopping hazard around the southwest coast of the UK. The model is updated once a day and provides a three-day forecast. The system uses a 1-km resolution hydrodynamic (wave, currents, and water levels) Delft3D model, which is forced by a larger Met Office model, providing 2D spectral wave data, water levels, and currents along the four model boundaries, and the entire domain is forced with gridded wind and pressure data at 7-km resolution.

The model is regularly updated with our beach survey profiles which enabled the model to be extended to cover several locations on the South coast of Wales. It is accessible through our website and freely available to the public.



Robotics Project

Through a collaboration with Aberystwyth University, we are developing a low-cost autonomous rover for topographic surveys. By being able to carry out coastal surveys autonomously with minimal interaction from the surveyors, it will enable us to survey areas otherwise not accessible. Coastal groups and other stakeholders have provided guidance and feedback underway, helping to ensure the viability of the system. To show the team from Aberystwyth how surveys are done today, WCMC arranged for a mock-survey together. In addition, the KESS 2 funded postgraduate student working on the project joined the Gwynedd Council team for a profile survey in Barmouth. Extensive field trials of the rover are planned for the summer.



Forward Look

2021-22 is promising to be a very exciting year for the WCMC with a range of activities planned with our team and stakeholders. With Welsh Government funding agreed in principle for the next 4 years now is the time to ensure that our programme is fit for purpose and meets practitioners needs. We will be engaging with all Maritime Local Authorities, NRW and consultants to ensure that we continue to survey in the most at risk locations but also where further evidence is required to implement Shoreline Management Plans preferred policies.

We are also working with our stakeholders to determine the most valuable methods of reporting data, including the potential for an online beach data analysis portal.

Whilst we recognise the different priorities driving monitoring across Wales, there is a lack of coordination and collaboration in this sector. This leads to an inability to maximise value for money, no common specifications in place to allow multi-use of data, and inefficiencies in procurement, tendering and savings. We are committed to work closely with relevant stakeholders to improve how coastal monitoring is managed and delivered across Wales.

Finally, our year 6 Climate Change and Coasts Programme has been extremely successful in generating interest from the 4 corners of the globe. We are finalising online learning modules which will then be accessible to use as part of the Welsh curriculum. We are also working on another school programme which will offer a transition for secondary school curriculum.



Contact the WCMC

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