



Wales Coastal Monitoring Centre

Annual Report 2018-19



Canolfan Monitro Arfordirol Cymru
Wales Coastal Monitoring Centre



The need to improve the co-ordination and consistency of coastal monitoring and data collection to inform coastal risk management decisions in Wales has always been seen as a priority by risk management authorities. The National Network of Regional Coastal Monitoring Programmes of England with already 10 years of consistent data has already proven its worth. An aim the Wales Coastal Monitoring Centre (WCMC) will be working towards.

With a view of developing this essential and affordable collaborative model for Wales, an initial consultation amongst Risk Management Authorities (RMAs) took place to gauge expressions of interest to be part of the consortium in January 2015 and again in July 2016. This initial process generated interest from Conwy, Gwynedd and Vale of Glamorgan Councils and the Welsh Local Government Association. These 4 organisations as *the Consortium* now oversee the WCMC.

A successful business case seeking initially 3 years funding was submitted to the Welsh Government in January 2018 and funding was agreed by the Minister for a period of 2 years with a third in principle starting on April 1st 2018.

The new delivery model sees the Vale of Glamorgan Council as the grant

recipient body and employer of 2 full-time employees. The proposed monitoring programme will provide improved and consistent data to underpin robust evidence-based strategic and local level decisions. It will also help make predictions of shoreline evolution such as those required in SMPs.

OUR OBJECTIVES

The Wales Coastal Monitoring Centre is developing a strategic approach to coastal monitoring in Wales, supporting the National Strategy for Flood and Coastal Erosion Risk Management and the work of other Maritime Local Authorities (MLAs) by providing the evidence base required for coastal risk management and decision making. To achieve this, we have focussed on 3 key objectives

Cost-effective monitoring programme which focusses in areas most at risk across Wales.

Skills & expertise by improving knowledge-based skills and partnership opportunities amongst RMAs with a view of building up better resilience and sound understanding of coastal risk issues.

Help to prioritise investment by identifying and providing consistent and seamless data to end users for the most at-risk areas in Wales.

WHY DO WE MONITOR

Our strategic coastal monitoring programme is being developed to gather data on specific Shoreline Management Plans (SMPs) units. The aim of the WCMC programme is for the data to feed into a long-term dataset showing changes to the beaches and coastline of Wales allowing us to better understand the processes affecting our coast.

This will assist coastal managers by providing them with relevant information on which to make sustainable future shoreline management decisions based on high quality scientific evidence. With the right data, beach managers can plan for the future and ensure that any beach or coastal defence schemes are designed based on reliable information.

Our freely available data will also be suitable for research projects at a range

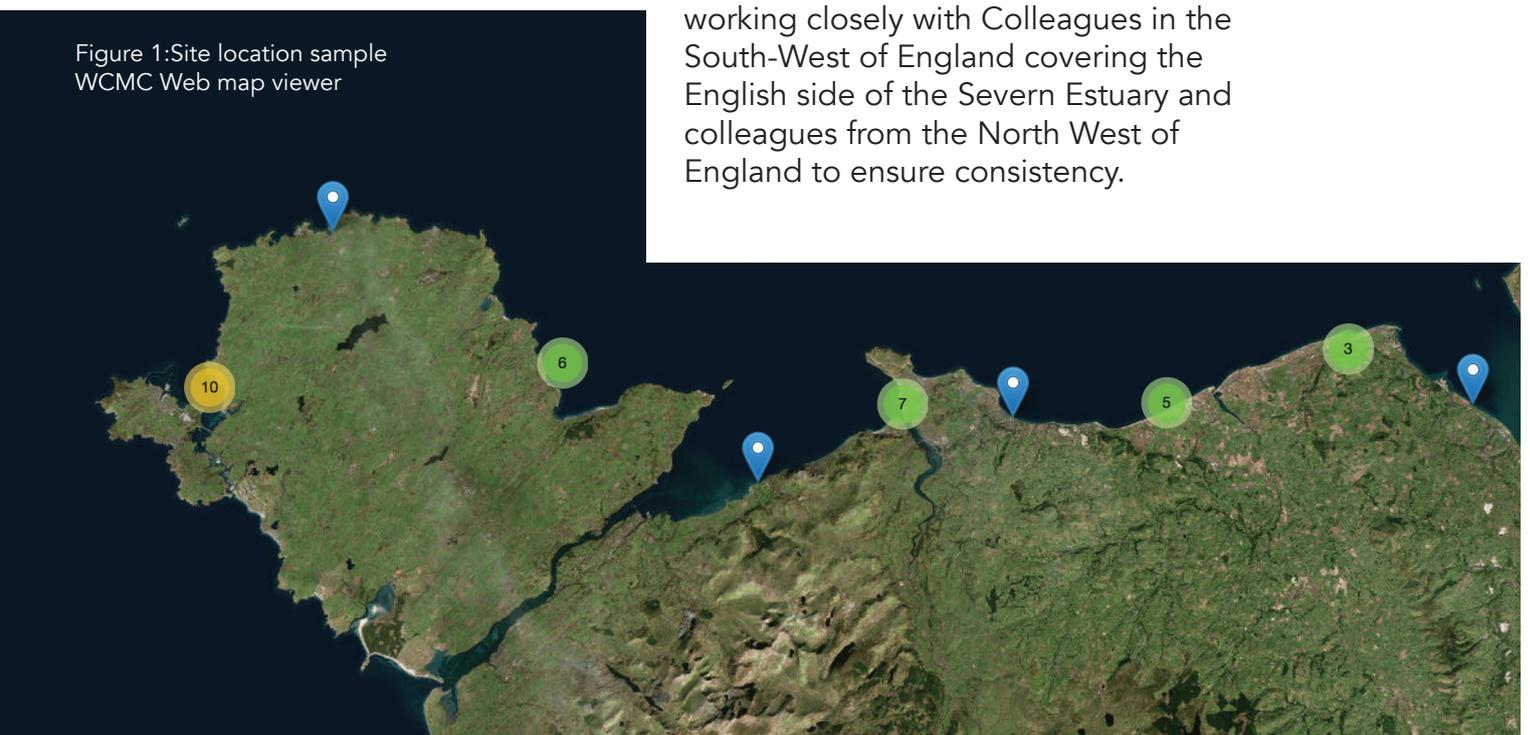
of levels as well as activities to improve understanding of coastal change which can be used to inform strategic planning such as The National Strategy for FCERM, Marine Spatial Planning, Local Development Plans, and SMP2 implementations.

WHERE DO WE MONITOR

Our monitoring programme covers the whole of the Welsh coast but focusses on specific SMP units traditionally chosen by coastal groups or individual authorities to examine local problems. Historically around 330 profile locations have been irregularly monitored. We have temporarily increased this number to 400 sites with the aim of focussing on defended frontages which account for approximately 415km of man-made sea defence structures.

Whilst we only monitor in Wales, we are conscious that consistent and aligned monitoring where sediment cells meet is important. We are therefore working closely with Colleagues in the South-West of England covering the English side of the Severn Estuary and colleagues from the North West of England to ensure consistency.

Figure 1: Site location sample WCMC Web map viewer



2018-19 at a glance



2 full-time jobs

created for an initial period of 2 years with a third in principle



10 staff

from North Wales and 1 from the WCMC attended 2 days training with Plymouth Coastal Observatory to develop monitoring skills in line the national specifications set-out by the WCMC. These will undertake the monitoring in North Wales as part of in-house monitoring delivering the WCMC objectives.



Live WCMC

website with map viewer providing location details of sites monitored across Wales. This will be linked to CCO website.

www.welshcoastalmonitoringcentre.cymru



Collaboration with the Channel Coastal Observatory (CCO) who will be hosting our data and offer a downloading platform for users. Collaboration with Plymouth Coastal Observatory for training



156 terrestrial

156 terrestrial SMP policy units surveyed across Wales including 13 new sites

23 % of nationwide km frontage monitoring delivered in-house



3 capital schemes

benefitting from our data

2 CRMP schemes

benefitting from our trial scanning and drone surveying exercise (Newton and Aberavon)



Multi-beam bathymetric survey

delivered from Point Lynas to Hilbre Point in North Wales. This is a partnership project with the Maritime Coastguard Agency and the Civil Hydrography Programme who coordinated the project.

OUR STRUCTURE

The WCMC is an inclusive service with an objective to increase skills and expertise within the public sector through active involvement in the delivery of the national monitoring programme, thus reducing reliance on external contractors and building resilience of the public sector.

We are committed to improve delivery and quality of the data captured in a

cost-effective manner. To do so, we have turned to the Wales Coastal Groups Forum to fulfil the role of Advisory Panel and continue to develop links with Academia to ensure we stay up to date with latest research and monitoring techniques.

The WCMC will also be represented on the Flood & Coastal Erosion Committee further integrating the Centre at the heart of FCERM decision-making in Wales.

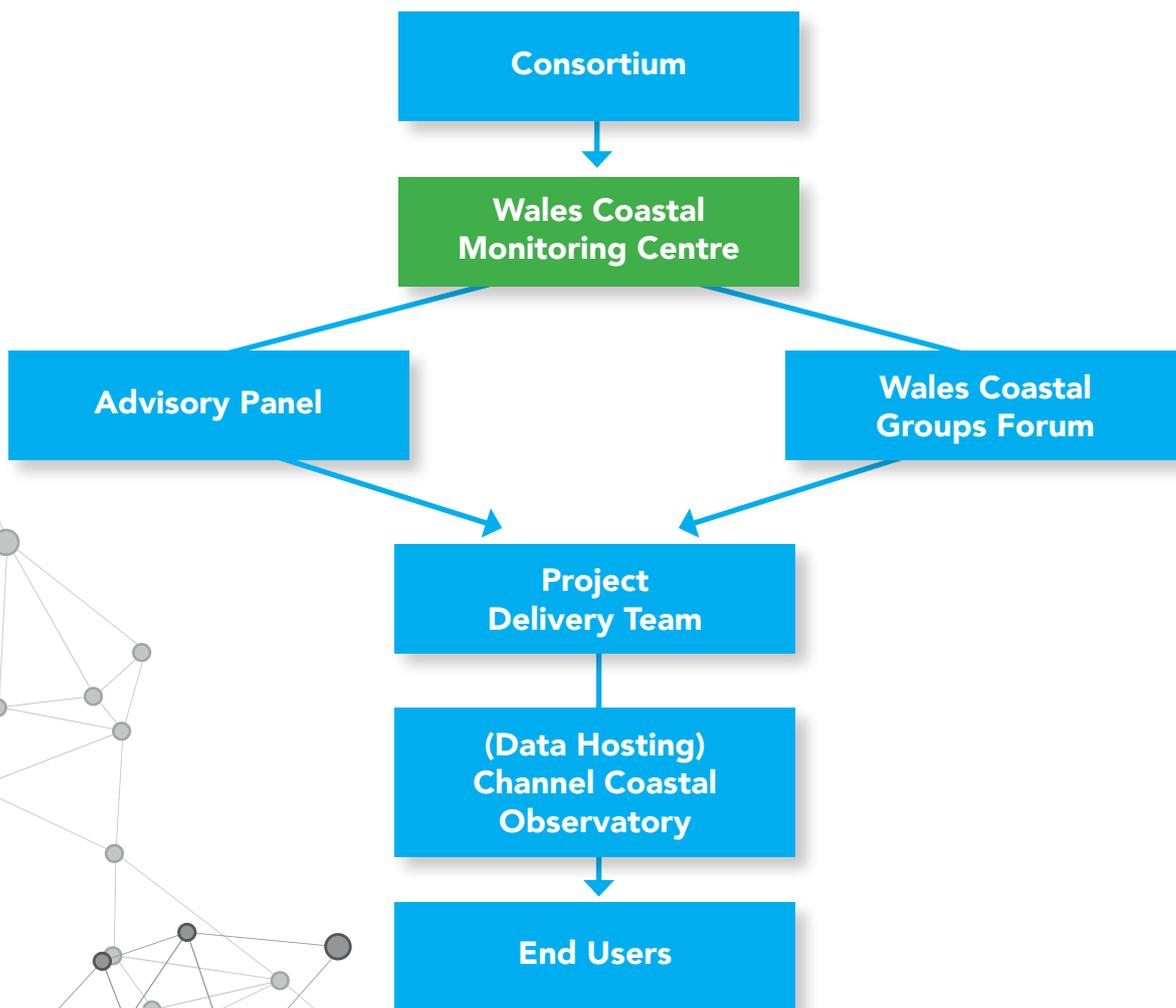


Figure 2: WCMC Governance Structure

Meet the team

MEET OUR EXPERIENCED AND DYNAMIC TEAM

The Consortium consists of lead officers representing each public sector partner. They are a mix of engineers and environmental scientists with a wealth of experience in flood and coastal erosion risk management and coastal engineering. Members provide the strategic direction for the WCMC ensuring alignment with the key strategic objectives.

Owen Conry - Flood Risk & Infrastructure Manager - Conwy County Borough Council

Jean-francois Dulong- Resilience & Safety Officer - Welsh Local Government Association

Emlyn Jones - Senior Manager Ymgynghoriaeth Gwynedd Consultancy

Clive Moon - Engineering Manager - Vale of Glamorgan Council

Gwyn Nelson Programme Manager

Gwyn obtained a degree in Marine Geography from Cardiff University in 2003. After travelling and working abroad for 1 year Gwyn joined Titan Environmental Surveys as an Assistant Hydrographer. Gwyn gained 5 years survey experience on over 50 projects culminating in running international surveys as Party Chief. Surveys conducted include topographic, hydrographic, oceanographic, marine mammal and water quality.

Gwyn developed into a project manager and business support role within Titan for the next 8 years. By 2019 Gwyn had managed 51 projects with a value greater than £4.3 million. Gwyn developed the business integrated management system complying with OHSAS/ISO standards for QHSE. Other responsibilities included tender management, human resource management, business strategy and marketing support.

Gwyn joined The Wales Coastal Monitoring Centre in March 2019 and is responsible for managing and developing a strategic approach to coastal monitoring in Wales which will help support the work of Risk

Management Authorities and support the delivery of objectives linked with the National strategy for flood, coastal erosion and risk management (FCERM).



William Russel

Coastal Process Scientist

Will is an advocate of all things coastal and oceanographic, an avid surfer and outdoors enthusiast. Captivated by the intricate and dynamic processes occurring at the land sea interface Will attended Swansea University to study (BSc) Physical Geography 2012-2015.

Following undergraduate study, Will travelled extensively for two years working as a Beach Lifeguard and Surf Instructor in New Zealand and Indonesia.

Upon returning Will completed a Master's degree at Plymouth University in Applied Marine Science and was awarded the Plymouth Marine Laboratory Award for Outstanding Achievement and Best Research Project.

Will's degrees have provided him with the ability to characterise coastal processes through technical surveys, mapping and both physical and numerical modelling. Will has developed a robust scientific approach with regard to ensuring a strong evidence base supports the implementation of forward-thinking solutions.

Will joined the WCMC in December 2018 and is responsible for assisting the WCMC Programme Manager in the provision of a comprehensive strategic coastal monitoring programme for Wales, including the collection and quality assurance of beach topographic survey.



Meet the team

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DELIVERING VALUE FOR MONEY THROUGH PRIORITISATION AND CONSISTENCY

Our coastline is an ever changing and dynamic environment comprising of coastal towns and communities, private frontages, protected natural areas with great ecological values, national parks and major infrastructures. While all of it would benefit from regular monitoring, our budget cannot accommodate this ideal.

In line with our objectives and the need of risk management authorities and national FCERM policies and strategies, the WCMC is committed to apply a risk-based approach to its monitoring programme focussing where the risk to people is highest, and in areas identified in SMPs as changing from Hold the Line to Managed Realignment or No Active Intervention. We want to ensure that our data provides the evidence necessary to inform local decisions as well as local and national policies and strategies.

We are developing this risk based methodology using readily available information and dataset from SMPs, National Receptor Database, NCERM erosion rates and Future Coast. In doing so, we also want to ensure that coastal managers are part of the decision making process and that local knowledge is fed back to us to further develop our methodology.

We have also started reviewing the monitoring specifications previously developed with a view of standardising

their use in our programme but also for contractors and RMAs undertaking monitoring as part of scheme development. Without this consistency we are unable to undertake comparative data analysis. The revised specifications will be available for download from our website.

10 officers from Gwynedd and Conwy councils undertook 2 days training with Plymouth Coastal Observatory (PCO) to further improve their understanding of the standard specifications and apply them in practice with some real time surveying, using a range of techniques and equipment. This will ensure that all our surveying teams across Wales use the same approach, to standard and quality.

Will, our Coastal Process Scientist also spent 4 days with PCO before his move to Wales. This further improved his knowledge of quality assurance, checking of survey data and use of specific software.



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IMPROVING SKILLS & EXPERTISE

Our new delivery model is based on making the most out of local authorities' skills, expertise and capacity. From the offset this brings added benefits in terms of improving the WCMC and local authorities' expertise and resilience as well as ensuring national coverage. Most importantly, it reduces reliance on the private sector and can reduce costs of delivering the monitoring programme.

Surveying teams from Conwy and Gwynedd Councils are already trained and undertaking topographic and baseline surveys across North Wales while our team with support from the Vale of Glamorgan council can cover a small part of South and West Wales.

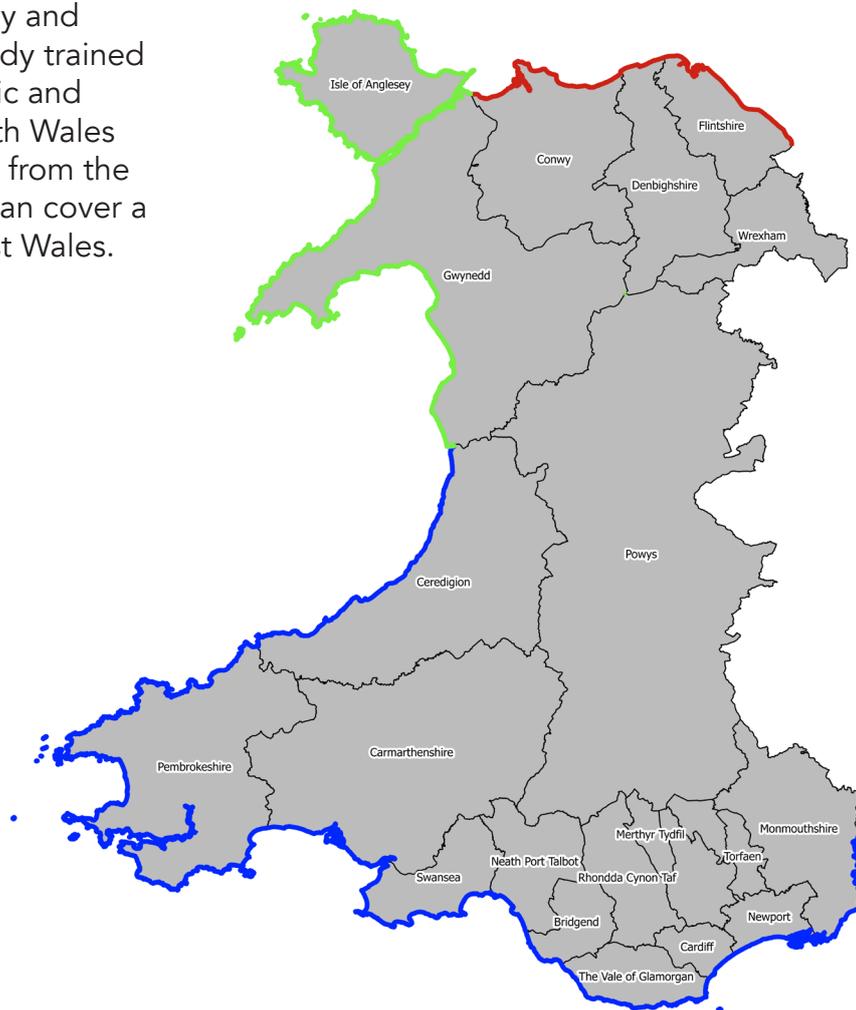


Figure3: Spatial Monitoring coverage of the Consortium

DELIVERING OUR MONITORING PROGRAMME

For the first time in many years Wales has seen an almost seamless round of coastal monitoring along our coast with unfortunately only Ceredigion frontage not being monitored this year due to a change of monitoring technique.

This has been achieved through close collaboration with the Swansea & Carmarthen Bay Coastal Group, Conwy, Gwynedd and Vale councils and our in-house Coastal Process Scientist.

	Method	Frontage	Locations
	Bathymetric Survey	113 Km	N.Wales HI 1572 Little Ormes Head to Hilbre Point Frontage. HI 1573 Point Lynas to Little Ormes Head
	Topographic	302 Km	S. Wales Penarth to Newgale NW. Wales Aberdovey to Pontllyfni y Garth N. Wales Llanfairfechan to Holywell
	Unmanned Aerial Vehicle	1 km	S. Wales Newton Beach
	Laser	4 km	S. Wales Aberavon

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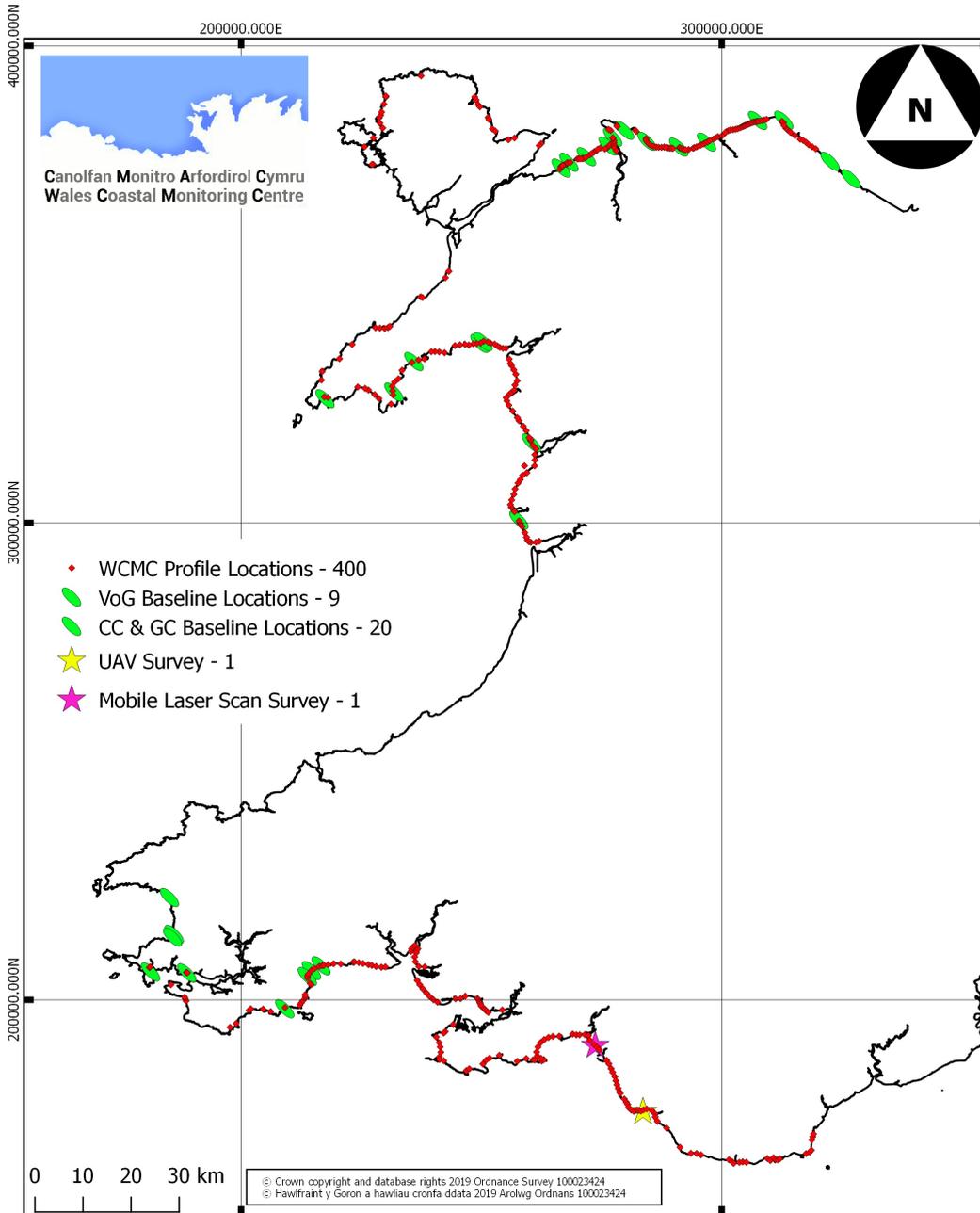


Figure 4. WCMC 2018-19 surveys

SEEKING MONITORING OPPORTUNITIES

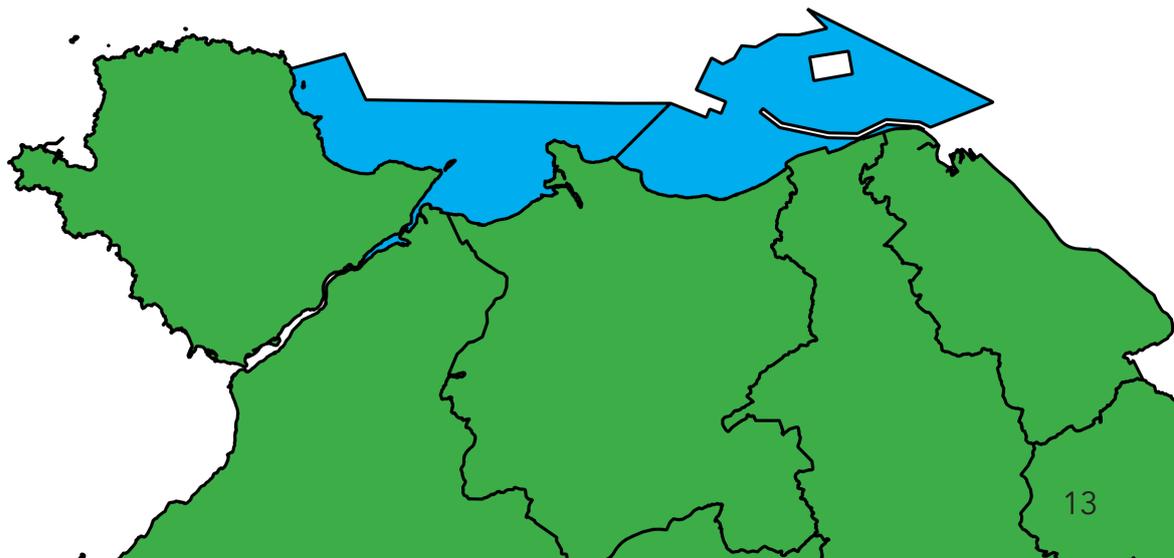
We were successful in applying for additional match funding from the Welsh Government's FCERM Branch which enabled us working in partnership with the Maritime Coastguard Agency and the Civil Hydrography Programme to deliver a multi-beam bathymetric survey from Point Lynas to Hilbre Point in North Wales.

The WCMC and WG funding was used to extend the coverage of the survey which will now provide a valuable baseline data-set (either in combination with WCMC topographic surveys) against which to assess the impact and long-term performance of schemes. This data can also be used for wave modelling or over-topping assessments used during scheme development and detailed design phase.

The most benefit will come in areas where beach management,

sandscaping, or other softer-engineering approaches are being proposed or where a better understanding of sediment transport and morphology is required to inform a Shoreline Management Plan policy change.

This dataset also complements an existing set for the Swansea Bay area which was part funded by the Swansea & Carmarthen Bay Coastal group in 2017 and the WG.



STAYING AT THE CUTTING EDGE OF TECHNOLOGY

A significant goal of coastal monitoring is to provide high resolution, accurate data with the most appropriate and efficient survey technique.

New technology is allowing surveys to :

- Be safer
- Have a lower impact on the environment
- Provide greater coverage
- Provide higher density data
- Be more time and cost efficient

In order to accomplish our assessment the WCMC is building a comparative database, to assess which methods are best suited to individual survey units and to best achieve key data requirements. Locations subject to SMP policy change and coastal works have been used as ‘test sites’ to compare multiple survey techniques – see table below.

Survey Technique	Aberavon	Newton
Multi-beam Bathymetric	P	P
Mobile Laser Scanner	P	
Terrestrial Laser Scanner	P	
RTK - GPS	P	P
UAV (Unmanned Aerial Vehicle)		P

These location’s along with other sites provides a platform upon which we can base robust scientific evidence to underpin survey technique decisions across the whole of Wales.

In order to maximise the value of the outputs provided by the WCMC, it is critical that we explore the most cost-effective techniques that output both high quality and multiple data sets to satisfy local requirements. Staying at the cutting edge of technology

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is therefore crucial as each survey technique can be superior to others depending on the data requirements and geomorphological setting of the survey location. Furthermore, specialist survey equipment and data processing toolkits are quickly becoming a standard tool for coastal surveyors which in turn makes them more economically viable options for the WCMC.

Traditional methods of beach profiling, ATV (All-Terrain Vehicle) topographic and airborne LiDAR have served as reliable survey techniques. The WCMC aims to use them when and where appropriate in conjunction with new UAV, ASV, Bathymetric, Satellite, Laser and Mobile Laser Scanning techniques. As coastal data requirements are varied and continuously evolving the WCMC aims to keep pace with the advancements in technology putting the centre at the forefront of scientific and technological monitoring.

DEVELOPING PARTNERSHIPS & COLLABORATION



Throughout 2018-19 we have carried on building strong links with Welsh and English partners. The Channel Coastal Observatory and Plymouth Coastal Observatory have been instrumental in helping us develop the WCMC by providing training to our team and offering a digital platform to store, access and download our data.

Our partnership work with the Maritime Coastguard Agency has enabled 2 additional multi-beam bathymetric surveys on top of our programme. We will have the opportunity to carry on working with them next year and potentially part-fund another survey on the West of Wales.

We have also engaged with Bangor University (Seacams) and Swansea University to explore potential opportunities. While it is still early, we would like to explore how undergraduates and post graduates can get involved in surveying, the development of research projects or have access to the latest surveying techniques and equipment.

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LOOKING AHEAD

2019-20 is going to be an exciting year for the Centre with our team eager to make a difference and improve efficiencies!

We have set ourselves some challenging targets, and these cannot be achieved without close collaboration

with RMAs, Coastal Groups and the support of our Advisory Panel.

Finalising the Consortium strategic role through the validation of our Service Level Agreement.

Finalising & applying the risk-based methodology to our monitoring programme

Delivering a comprehensive round of surveys across Wales

Promoting close collaboration with MLAs to help deliver our monitoring programme. In 2019-20 we will seek interest from MLAs in South and West Wales to take part in delivering our national monitoring programme.

We are currently delivering 23% of topographic surveys in-house. In 2019-20 we will aim to reach a minimum of 30%

We want you to help us shape a better monitoring programme for Wales and want our team to share their findings with you to help decision making. To do so, we will run a national Stakeholders' event and engage with universities.

We will work closely with the Wales Coastal Groups Forum to increase the profile of the WCMC and risks associated with climate change and coastal flood risk. As part of their corporate initiative, our members will further increase awareness locally amongst schools.

FIND OUT MORE

www.welshcoastalmonitoringcentre.cymru

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