

**Project Number: B3 Beneath the Waves (BTW)**



**Project Overview:** (Please refer to LCAP or website)

Using immersive activity, this project will reveal the hidden heritage beneath the waves training local divers to create 3D shipwreck models to provide virtual wreck dive experiences, support local divers to carry out marine recording, improving knowledge and understanding of our marine habitats.

**Project lead organisation and other organisations involved:** Newcastle University

**Project Location:** Tyne to Tees

**Project dates:** 01/12/2020 – 01/10/2024

**Project Outputs**

Measure	Target	Delivered	Notes
<b>NLHF Targets from LCAP</b>			
Number of dive clubs trained	8	12	This was embraced by divers from a wider range of training agencies than anticipated allowing us to grow the number of clubs.
Number of divers attending 3D PG course directly	16	41	As above – recruiting two project officers, we were able to deliver far more of this training in-house and reach more people.
Club divers trained by colleagues	36	109	Having kit for divers to borrow enhanced club abilities for training and developing approved training courses (e.g. PADI) enabled wider dissemination of learning and is an established legacy for the project.
Divers attending heritage presentations and secondary training at clubs	450	491	Activities were embraced by the local dive community and their friends/families.
Natural heritage virtual dives created for hubs	3	3	12 videos captured with Insta360 camera across NE rocky reefs and wrecks. Three edited for use at hubs as needed.
Virtual wreck dives created for hubs	3	5	As above, five edited. Clips included in the wreck and coastal explorer apps.

Wrecks adopted	6	9	Ben Ardna, Cider, Ethel Taylor, Firelight, Kalua, Longclara, Oslofjord and Eugene Chandris, Seaton Carew Protected Wreck, UC32.
3D wreck models created	3	10	Ben Ardna, Cider, Ethel Taylor, Firelight, Kalua, Longclara, Oslofjord and Eugenia Chandris, Seaton Carew Protected Wreck, UC32, and the Sea plane ramp at South Shields.
<b>Additional or unexpected outputs</b>			
Training for 'Ghost Fishing' survey dives	NA	8	New application for 3DPG identified by local diver working for the charity 'Ghost Fishing' that removes old fishing nets from wrecks – the models allow them to plan this more safely.
3d Wreck artefact models created	NA	16	Smaller artefacts acquired from local divers and museum were modelled using 3DPG, including artefacts from the UC32 (anchor, gear box, door handle, lamp holder, valves and bolts), the Oslofjord/ Eugenia Chandris (tea pot, plates, cream jug, cutlery and diner plate marked with Norwegian American Line, and a bullet magazine), and a Tees Archaeology collection of historic washed-up wooden wreckage.
Two apps created with Jam Creative, that host wreck models produced.	NA	2 Apps 6 Models incorporated (number growing)	The Coastal Explorer and Wreckhunter Apps are available to download for android and iPhone users. We are exceptionally proud of the 3D wreck content and historical narratives that these host, collected by divers. These really amplify the impact of BTW and will continue to do so, forming an important part of our legacy.
Community events attended and delivered to showcase Apps	NA	2235	Wider impact across region for communities via family and friends attending public events.
Protected Wreck Training developed and delivered across Teesside	NA	13	Rolled out training and showcased our findings based on the Seaton Carew protected wreck, to deliver impact within archaeology communities.
Funding obtained from Historic England's 50th-anniversary celebration of protected wrecks	NA	1	Building on this success, through collaboration with local organizations, we successfully secured grant funding to deliver photogrammetric surveys of the region's only protected shipwreck, and later created a 3D-printed model that was exhibited at the Hartlepool Museum for public viewing.
Involvement with the North-East Maritime Archaeology Forum (NEMAF)	NA	12	As above. Honoured to be invited to be part of the local Maritime Archaeology Forum.

## Looking back, what is the one thing that you are most proud of that has come from your project being part of the SeaScapes LP Scheme?

Beneath the Waves genuinely managed to forge a connection between coastal and underwater heritage. By working with divers who experience underwater worlds, teaching them to capture these to share with friends, families, their local communities and beyond, we really enhanced local understanding of cultural and natural heritage along the Tyne to Tees coast.

This resulted from the success of bringing together the local dive community, which formed a group of more committed experts and enthusiasts than we could ever have envisaged. We worked closely with local divers and dive clubs, unifying individuals and groups from different (traditionally very independent and sometimes adversarial) diving agencies such as BSAC (British Sub-Aqua Club), IANTD (International Association of Nitrox and Technical Diving) and PADI (Professional Association of Diving Instructors). This project created a collaborative environment where divers from different backgrounds could gain new skills, share knowledge, and work together towards a common goal. By offering workshops in underwater photogrammetry and heritage documentation, we empowered these divers to contribute actively to the preservation of their local marine heritage, fostering a sense of shared purpose and community among themselves. This carried far beyond as they were then conduits for this knowledge into their groups of friends, families and communities.

One of our personal highlights has been the opportunity to unearth and preserve the historically significant stories surrounding these shipwrecks. Many of the wrecks we worked on are not just remnants of the past but carry with them powerful narratives about maritime history, wartime efforts, and coastal trade. Through detailed 3D modelling and engagement with local historians and archives, we were able to uncover and bring to light previously forgotten or little-known stories tied to these wrecks. This work has not only enriched the understanding of the historical importance of these sites but has also allowed the local community to connect with their marine heritage in a more tangible way. Particularly memorable were the individual stories, such as the privilege we had of speaking with the group of divers who discovered a German U-boat off Sunderland in the 1980s. Their firsthand accounts and deep knowledge of the wreck added a rich, personal layer to the project. They contributed contemporary news items from the discovery and early artefacts from the wreck. These were invaluable in helping us understand the significance of the U-boat and the broader wartime history it represented. Their involvement reinvigorated interest in the wreck and demonstrated the important role local people play in preserving marine heritage. Engaging these community members in the project was incredibly rewarding and reinforced the project's mission of making marine heritage accessible to all. The wreck of the UC-32 is one of the flagship locations from BTW and the story reached thousands of people across the region at major outreach events.

A major accomplishment, and significant contribution to BTW's legacy was the development and publication of a PADI specialty course focused on underwater photogrammetry. PADI are the largest diver training agency in the world. This course was written and launched as part of the project to equip divers with the skills to accurately capture and model underwater environments while diving safely. By formalizing this training through a recognized global diving organization, we have gone beyond elevating the technical capabilities of local divers, also creating a lasting educational resource for dive professionals around the world. The course ensures that divers trained through PADI can now apply advanced techniques to document marine heritage, contributing to protection and

preservation of assets. This bridges the gap between recreational diving and professional heritage conservation, leaving a sustainable legacy that extends beyond the scope of the project.

### **If you were to start the project again tomorrow, what might you look to do differently??**

Our biggest change to the original project plan was early-on to substitute a 2-year data manager position with two 4-year postgraduate researcher posts. This was also one of the strongest improvements in delivery we could have envisaged. Though salary costs to the project were increased from (£66k to £104k), BTW benefitted from significant extra effort and experience that allowed the in-house team to deliver the world class training evidenced here. Newcastle University are now contributing a further £53k to retain these staff until May and Nov 2025 respectively. This ensures a solid project legacy, as strong volunteer divers' groups can be maintained, data can be processed from summer 2024 dives (which continued up to 21 September 2024) with technical support for volunteers provided, and popular publications produced to add value to the project. The researchers will also produce PhD thesis and scientific papers from their work with the divers, creating an ensuring impact for the technical achievements of the project alongside the community engagement.

One of our most significant outputs over the long term are the Apps that host our 3D models and wreck research. The Coastal Explorer App helps those walking between the Tyne to Tees visualise and explore the heritage around them, including wrecks as they look out to sea, while the Wreckhunter App let people explore the methods divers used searching for wrecks, and use historic clues to simulate the process of identification for the user (also, it is really fun!). The Apps are excellent, have reached many people in the area and beyond, and the designers were amazing, but we nearly lost these in translation with an intermediary interpretation company.

So, one of the key changes we would make is probably to collaborate more closely with a local interpretation company from the very beginning. We worked well with a company based in another part of England, and the results were ultimately positive, but a local firm may have allowed us to convey a deeper understanding of the region's unique maritime heritage. A local company could bring a more nuanced perspective, reflecting the specific cultural and historical significance of the North East's shipwrecks. This approach would not only have enhanced the authenticity of the project's interpretation but also strengthened our ties with the local community, supporting regional businesses and ensuring that the heritage stories resonated more deeply with the local audience.

Additionally, we would look to engage with app and game developers earlier in the process. One of the highlights of the project was the creation of digital tools, such as an app and an interactive game, that allowed the public to explore the shipwrecks and the rich history beneath the waves. However, we realised later in the project that starting these collaborations sooner would have provided more time to refine these digital products. Earlier involvement of developers would have allowed us to integrate feedback more effectively and ensure that the apps were as immersive and user-friendly as possible by the time they were launched. This would have further enhanced the project's ability to engage a wider audience, especially younger generations, through technology.

That said, these exceeded our expectations of what was possible in this field, and we believe they will be some of the strongest and most enduring parts of the project legacy.

## What difference has this project made to the cultural and natural heritage of the SeaScapes programme area?

The Beneath the Waves project has had a profound impact on the cultural and natural heritage of the SeaScapes programme area by engaging thousands of members of the local community and fostering a deeper connection with the region's maritime history. Through workshops, public exhibitions, and outreach events, we were able to share the significance of the underwater heritage that lies just off the North-East coast. By involving local divers, clubs, and various stakeholders, we created a sense of shared responsibility for the preservation of these marine assets. The project brought heritage to life for many who may not have had previous exposure to marine history, effectively connecting the community with its coastal roots. The coastal explorer app alone has had over 3.5 thousand downloads.

The project also succeeded in raising awareness among both divers and non-divers about the importance of protecting and conserving marine cultural and natural heritage. For divers, the project offered hands-on training and a new understanding of how their skills could be applied to the preservation of historical sites. For non-divers, it provided access to this hidden world through interactive tools like 3D models, apps, and exhibitions, allowing them to explore and appreciate shipwrecks and other marine cultural assets. This heightened awareness has helped to cultivate a broader appreciation of the value of marine heritage and its role in the region's identity, fostering a lasting legacy of stewardship among local residents.

## What difference has this project made to people?

The project fostered new relationships among divers and dive clubs across the region. By bringing together individuals from different clubs and agencies, the project encouraged collaboration and knowledge-sharing, creating a stronger sense of community among local divers. Divers who may have previously been disconnected from one another now share a common goal in preserving the region's marine heritage, leading to the formation of lasting partnerships that extend beyond the project.

The training offered through the project has also equipped divers with new, valuable skills, particularly in underwater photogrammetry and heritage documentation. These new skills have not only enriched the individual divers' experiences but have also allowed dive clubs to offer additional courses to their students, expanding their educational offerings. By formalizing these skills through recognized courses, such as the PADI specialty in underwater photogrammetry, the project has empowered dive clubs to train future generations in heritage conservation, ensuring that the impact of the project will continue long into the future.

Additionally, the project has provided some dive clubs with a new sense of purpose and mission. Many divers who participated in Beneath the Waves found themselves exploring their underwater environments with a renewed focus—no longer diving just for recreation, but as part of a larger initiative to protect and document historically significant shipwrecks. This has given diving a deeper meaning for many clubs, with heritage preservation becoming a central part of their activities.

Thinking more broadly, communities' and individuals' awareness of the rich diversity of the marine life and historic shipwrecks hiding under North-East seas has definitely been enhanced. The Apps and associated outreach activities have benefitted thousands of people, raising awareness that there are

beautiful, fascinating and exciting things to experience, even under the often-grey surface of North Sea. We hope we have inspired some future explorers to wreck-hunt for themselves.

## Future Plans and Legacy

Looking ahead, the legacy of the Beneath the Waves project will be firmly rooted in the foundations we've built with the local dive community, and the public. Considerable research impact is also anticipated from the postgraduate researchers that delivered so comprehensively as project officers. Our future plans include continuing to work with dive clubs to expand their capabilities in underwater heritage conservation, ensuring that the training provided through the project becomes a permanent part of their educational programs. The PADI specialty course in underwater photogrammetry will remain a key tool in teaching divers to document and protect marine cultural assets, fostering ongoing engagement with heritage preservation efforts. Four scientific publications are initially planned, to document the rigour of the work undertaken, and highlight the importance of engaging communities with local heritage.

We also aim to build on the relationships established with organisations such as Historic England to use documented footage of these historically significant wrecks that have been collected as part of the project as evidence to get legislative protections applied to some of these wrecks. Currently, only one wreck within the project area is afforded any special protections, and the expanding of this to other important sites along the coast would be a significant and lasting aspect of the project's legacy.

A crucial part of the project's legacy is public engagement. Through the development of apps and interactive tools, we have opened the door for people to explore and appreciate underwater heritage in ways that were previously impossible. Moving forward, we plan to further enhance these digital tools, incorporating new features and content that will keep the public connected to the maritime history of the region. Ultimately, the Beneath the Waves project has laid the groundwork for sustained efforts in marine heritage conservation, education, and public awareness, ensuring its impact will endure for years to come.

## Photographic Evidence



Volunteer divers receiving historical archive training - workshop with partners Tees Archaeology



Divers receiving training in three-dimensional photogrammetry with expert help.





Divers receiving training in 3-D photogrammetry during a land-based workshop.



Examples of 3D printed shipwreck artefacts, achieved using underwater photogrammetry.



Divers on site at a diving quarry during one of the early project workshops, putting learned underwater photogrammetry skills into practice (above).

A BTW project diver ready to go. Photogrammetry training weekend from MV Spellbinder from South Shields (right).



## Funding Partners

