RH24 Student Reports

Adam Malik | Postgraduate Student at Glasgow University

Being invited by THS:UKI to attend the Remote Hydro conference in Dublin was an incredible opportunity for me. The icebreaker event on the day of my arrival was an interesting initial insight into the world of hydrography as I was able to speak to experts from a diverse range of expertise and learn what life in hydrography is really like. I picked up some great advice and felt excited for what was to come next. Day 1 was spectacular. In the morning I found it exciting to delve into the work that hydrography firms undertake as well as learn about how they utilise unmanned surface vessels to achieve their objectives. In the afternoon I particularly enjoyed exploring the regulations and policies which can cause major issues for the use of USVs. The development of technology and overcoming legal hurdles that arise with it was particularly intriguing as it portrayed a unique angle on the industry that I hadn't considered before.

The following morning was perhaps my favourite session of the trip. It was great to hear about the exciting projects that some of the younger hydrographers were undertaking, from mapping locks in England, to underwater volcanoes in Tonga, to starting an alternative fuel company aged 18, the future of this industry looks positively bright. The Seabed 2030 project was also discussed, and the sheer ambition of such an extensive project truly captured my attention. I certainly look forward to seeing how this project develops and how Remote Survey Vessels (RSVs) can help achieve such an ambitious goal.

It was also very interesting to learn about the developments in the remote sector in different countries. From New Hampshire to Jamaica to Nigeria, RSVs are a game changing and developing technology that are becoming an increasingly more common solution to many everyday hurdles that are encountered in an offshore survey. Exploring the widespread use of RSVs also enlightened me to the versatility of the technology. I learned that not only can they be used for traditional hydrographic seabed mapping, they can also be utilised to survey smaller bodies of water with lower depths such as canal locks and lakes.

I particularly enjoyed exploring the different stalls during the breaks, simply asking companies about their work and how they are implementing new technology into their surveys. I was astounded to see an entire RTK system in a cube half the size of my fist! I am very grateful for the opportunity to network and meet new people, and I even made some great friends along the way. I'll certainly cherish the memory of walking through Dublin's city centre hotly discussing the future of remote work, AI, and robotics, all whilst munching on a shawarma and enjoying the city's enticing warmth.

András Ambrus | Student at the University of Aberdeen

The Icebreaker

For someone who has just started to explore the industry one of the concerns may be being lost at a conference of this scale, not knowing how, or whom to speak with. Thankfully, THS:UKI who were kind enough to invite us to the event also offered the opportunity to attend the icebreaker event, the night before the conference. The event took place at the Old Storehouse Bar in the historic Temple Bar district of Dublin. The initial concerns melted away very quickly, as the attendees were keen to welcome us at the event, happily chatting about their own experiences starting in the industry and introducing us to their friends and colleagues. With excellent live music, fantastic food, and drink, as well as great company the hours flew by quickly, leaving us with nothing but excitement for the first day of the conference.

Day 1| The first day of the conference started with exploring the exhibition, showcasing exciting

vehicles and offshore survey equipment. It was a great opportunity to have a chat with the people we met the night before, as well as to have a chance to meet company representatives and experts before the talks began.
The first set of talks focused on various forms of USV development, from developing shallow water survey capacity to exploring the mindset the industry may need to adapt to fulfil the platform's potential. These talks provided a great insight into where the technology of USV's are today, and what challenges they face. This also provided an excellent frame for our studies, contextualising the information we learn with infield struggles and experiences.
Following a delicious lunch break, the second set of talks put a spotlight on various technological innovations and challenges. Seeing how companies utilised the potential in remote surveying, both in data gathering and processing was an eye-opening experience.
The final session of the day focused on a fairly interesting topic, and it proved to be an excellent addition to the day. Regulations and policies are topics that seemed a bit out of place in the broader context of the day, however, the final two hours revealed a fascinating side of technological innovation and the relationship it has with government organisations such as the MCA.
The Taste of Ireland event was a great way to finish the day, and to have a chat with the speakers about their presentation topics.
Day 2| Following day 1, the second set of talks had an interesting shift toward academia and more practical applications. As a student myself it was great hearing the experiences of other members of the academic community, both in terms of master's level research and undergrad startup projects.
Following this, the two sets of operational experience sections were a great way to connect the vast amount of theoretical knowledge we've accumulated throughout the conference to operations conducted around the world.
Seeing how hydrography is utilised from port management and satellite bathymetry to shallow water analysis and ocean mapping was an inspiring experience that revealed how open and innovative this industry truly is.
Finally, the conference was crowned by a set of talks considering the future drawing on every aspect of hydrography discussed up until that point such as policies, automation as well as remote opportunities. The last panel discussion with the comments and questions from the audience underlined a point displayed towards us throughout the conference, how passionate every attendee is towards creating a welcoming and technologically developed industry that can flourish in the years to come.

Aryan Shah & Andrew Boyd | Students at Imperial College London

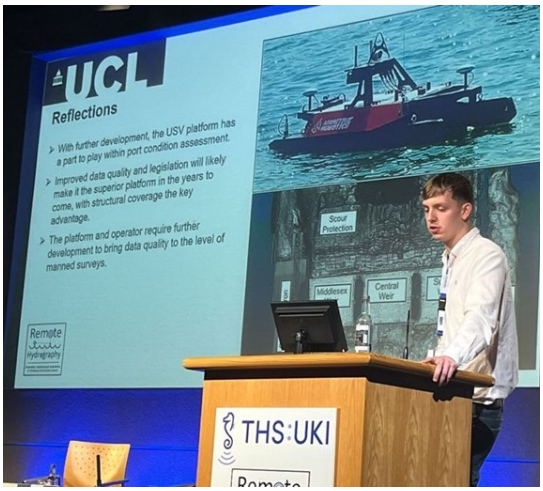
Touching down in Dublin was exhilarating, as it made it all real for us about the next few days that were to come and the potential opportunities ahead of us!
As Geophysics undergraduates, we are introduced to many aspects of marine geophysical surveying, but we don't necessarily get to see the inner workings of the industry.
Participating in RH24 gave us a chance to learn more about the hydrographic community, as well as gain invaluable insight into the latest technological innovations in the field.
As well as being undergraduates, we're working on building a long-endurance AUV platform for geophysical and hydrographic surveys that is powered by Hydrogen and can smartly manage its energy consumption to maximise time at sea. We knew about some of the larger companies in the geophysical industry, but we really wanted to take a dive into the world of Hydrography and where long-range platforms might fit into the sector. Everybody always mentions to us, the opportunities present in this space and how dynamic it is, and we wanted to see for ourselves and hear from the foremost experts

through legal, technological, regulatory points of view about how they are making a difference and what's in store for this space. Attending RH24 allowed us to witness all this firsthand and we were in awe at Michael King's (Sulmara) remarks about taking baby steps in this space. This is something we are seeing everyday as we develop our system from scratch. This was followed by Cathal Leigh-Doyle's (Stephenson & Harwood) talk on the legalities behind MASS operation and steps taken in new standards being adopted to get as many USV's on the water as possible!

We were absolutely honoured to have spoken on stage and pitched what we are working on to nearly two hundred industry professionals and sat in on two panel sessions covering early-careers, the challenges we are faced with and our visions for the future. The coffee breaks after our panel session were the best, everybody was keen to find out more about what we are working on, and we even got some offers for sponsorship and collaboration which was really exciting for us!

Everybody was so friendly at this conference and the session topics were so thought provoking, we couldn't help but discuss them with colleagues and new connections made. We even reconnected with old colleagues from other conferences!

We want to say a massive thank you to THS:UKI for sponsoring us to come to this wonderful conference, experiencing what it is like being an ocean professional and forming connections that will last a lifetime! Do reach out to us at aryanshah@inxtech.org, andrewboyd@inxtech.org if you're interested by what we are working on and want to find out more!



Oliver Foulds | 3D at Depth/University College London

As a recent graduate of the UCL Master's program in Hydrographic Surveying, I had the privilege of participating in the conference to present my research findings. The work focused on assessing the ability of unmanned surface platforms in conducting port structural condition surveys.

The conference allowed me to share my work with a wider audience and engage in meaningful discussions with industry experts. It was an impressive showcase of diverse knowledge, featuring presentations from industry leaders discussing innovative remote data collection techniques and the challenges currently faced across unmanned operations.

I would also like to highlight my fellow presenters in the student/graduate slot, each of whom conducted impressive research within their respective areas. I believe these slots play an important role in highlighting ongoing academic research in the sector, as well as fuelling the growth of young professionals. The presentation was very kindly supported by 3D at Depth and allowed further opportunity to showcase the capabilities of Subsea LiDAR technology to the wider hydrographic community.

Following on from the presentations, the speakers were invited to sit on a panel to discuss current perspectives on the industry and future change. Questions regarding student uptake and education were at the forefront of discussion, with the panel focusing on the need to improve exposure pre-university to increase programme uptake. I would also like to extend my gratitude to the organising committee for their outstanding work in arranging the event at such an impressive venue. This was my first visit to Dublin, and I am looking forward to the possibility of returning for future conferences. I highly recommend that any current students consider attending events like these, with the networking and experience invaluable when building a career in hydrography.

William Stark | Student at the University of Aberdeen

As an environmental engineering undergraduate student, my experience at the Remote Hydrography Conference in Dublin was enlightening, exposing me to many new technologies, applications, and research within the industry. The conference covered a broad spectrum of topics, with a predominant focus on Uncrewed Surface Vehicles (USVs). A recurring theme in the

presentations and discussions was the imminent and significant changes underway in the hydrography sector.

Technological advancements such as Starlink satellite communication, Autonomous Surface Vehicles, and AI/Machine Learning are revolutionising remote surveying, enabling control from anywhere in the world while reducing the reliance on human intervention and management. The advent of autonomous surveys allows for monitoring and control from Remote Operating Centers (ROCs) situated virtually anywhere globally. This method, made feasible only recently due to advancements in bandwidth and data capabilities, is facilitating the mainstream adoption of over-the-horizon surveying.

Discussions at the conference regarding recent developments in USVs primarily revolved around two key issues perceived within the industry: regulatory challenges and the shortage of a skilled workforce. Many companies expressed concerns regarding the varying levels of acceptance towards autonomous surveying in different maritime jurisdictions. Attendees had strong opinions when discussing the MCA and its perceived lag in permitting over-the-horizon and autonomous surveying compared to other European counterparts. The prevailing consensus was that the use of USVs and ASVs would continue to proliferate in the hydrographic survey industry, necessitating global regulatory frameworks facilitated by organisations such as the IHO.

Furthermore, there were expressions of concern regarding whether there is a diminishing workforce within the industry. While this may enhance job security for myself, a skilled workforce is required for the sustained health and innovation of hydrography surveying. Some also voiced apprehension regarding the potential loss of the identity of hydrographic surveying as fewer hydrographers go to see for their work. However, this concern may be overstated, as demonstrated by presentations from NOAA surveyor Michael Stevens, UNH engineer Avery Muñoz, and other researchers, who showcased how ASVs complement rather than replace traditional surveying methods. For instance, Stevens' case study surveying in Bristol Bay Alaska showed the use of two USVs programmed to follow the flanks of a traditional survey ship. This method accelerated data collection, and allowed measurement previously infeasible, in shallow water.

As a student with a keen interest in hydrography and remote sensing, I am genuinely excited about the prospects within the industry. The discussed technological advancements are poised to enhance both commercial and academic endeavors. I am particularly enthusiastic about the shift towards offshore wind energy and navigation, as well as the diversification of USV applications beyond bathymetry, such as chemical spill monitoring and remediation.

This trip to Dublin was a great chance for me to meet a lot of new people, and listen to many interesting presentations. I am truly appreciative for all that I learned at the Remote Hydrography conference this year.

Yvette Pyke | Postgraduate Student, Glasgow University

The conference opened with a talk from Ed Parsons which looked at AI/ML applications in geospatial information. This was an especially interesting way to start the event considering how quickly AI is developing, and set the tone for the conference as forward looking and critical, while still being optimistic about the future of remote hydrography. Following in a similar vein were talks detailing developments with USV technology. Of particular note was the presentation from Michael King focusing on the challenges of implementing USVs, including reluctance from clients to trust the new technology and the difficulties

of going fully remote. This session was very exciting as it showed the reality of remote hydrography, when before I had only engaged with it in a classroom setting.

The following sessions were about data technology and regulations in remote hydrography. The talks on regulations were very interesting, as was the panel that followed. Hearing from both a representative of the MCA and people in industry gave me an intricate picture of the struggles between the pace of technological progress and the pace of legislation in the offshore sector. I am hopeful that the MCA will catch up in the coming years, with pressure and assistance from the FAST Cluster.

Day two opened with the session which was most immediately relevant to myself as a current student: Academia & Early Experience. The academic work was especially exciting, and it was refreshing to have the scientific applications of this technology emphasised after the previous day being entirely industry focused. Aileen Bohan's talk on the Hunga-Tonga Hunga-Ha'apai volcanic eruption was of special interest to me, coming from an environmental science background myself. The student founders from Imperial were also very inspiring, and I am interested to see how their start-up, InX Tech, develops over the coming years.

Following this were two sessions on operational experience, which were all interesting and provided more perspective on the work actually being done in the industry with remote hydrography. I found Kyle Goodrich's talk on satellite bathymetry especially forward looking among these, and I think that moving towards more diverse ways of performing hydrography and including more people in the industry is a great step forward.

This led perfectly into the final section about the future of the hydrographic industry, and I am excited to hear so much optimism about the transformation that is occurring currently, with remote hydrography allowing companies to expand capacity, include more people, and decarbonise, all while recognising that traditional hydrography still has a place in the industry too.

Between all the sessions, there was a fantastic social experience. This was my first time doing proper "networking," and I couldn't have done it with a more friendly and enthusiastic group of people. Everyone who had a stall took their time to explain to me what it was they did, and to give me a close look at the tech they had on offer. I've made many close connections already, and I am excited to see people again at future events.

▲ RH24 Organising Committee | *(from left to right)* Fergal McGrath, David Parker, John Dillon-Leetch, Trish Buxton, Iain Slade, Gordon Johnston, Becky Conway, Gillian Mills, Mark Poole, Sean Cullen. *(not photographed)* Tom Broomfield and Nicki Nicholson.