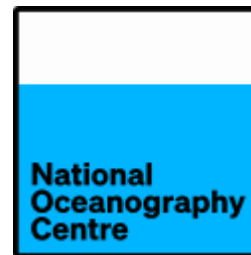


Highlights from INMARTECH 2025

National Oceanography
Centre, Southampton, UK



 **INMARTECH**
7 - 9 October 2025
Southampton



About INMARTECH

The INMARTECH symposia were initiated and coordinated by the International Research Ship Operators (IRSO) meetings to provide a forum for marine technicians to exchange knowledge and improve operations during scientific cruises.



About INMARTECH 2025

- Hosted at the National Oceanography Centre (NOC) in Southampton, UK.
- Set on the historic Southampton waterfront, NOC offers state-of-the-art facilities, direct access to marine infrastructure, and a vibrant hub of scientific collaboration.





RRS James Cook

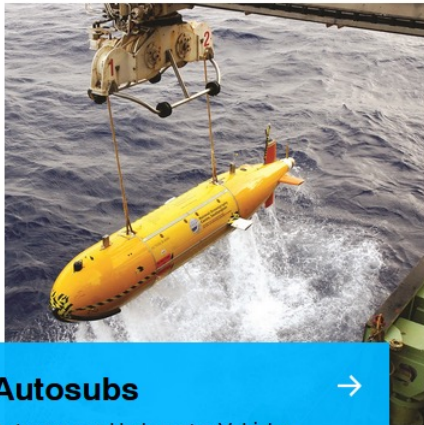
RRS Discovery

Natural Environment Research Council (NERC) has a fleet of two RRS vessels including the RRS James Cook and RRS Discovery. The vessels are operated by the National Oceanography Centre, Southampton, UK, on behalf of NERC.

National Marine Equipment Pool

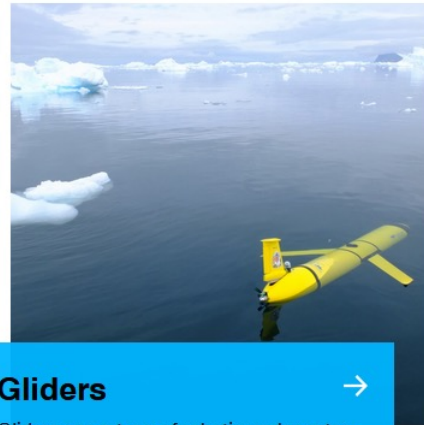


Marine Autonomous and Robotic Systems



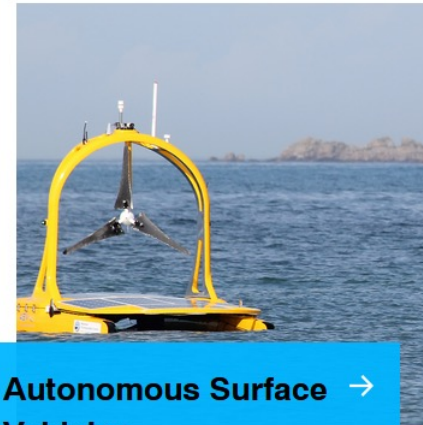
Autosubs →

Autonomous Underwater Vehicles (AUVs) are robot submarines, which are used to explore the world's oceans and gather data without a pilot or any tether.



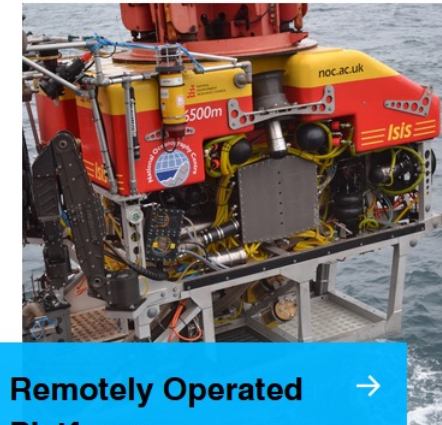
Gliders →

Gliders are a type of robotic underwater vehicle used for measuring oceanographic parameters such as chlorophyll levels, temperature and salinity, which are then transmitted back to the shore.



Autonomous Surface Vehicles →

Autonomous Surface Vehicles (ASVs) are robotic vehicles that operate on the sea surface recording a range of oceanographic data.



Remotely Operated Platforms →

Going down to ocean depths needs specialised platforms for instruments. Some platforms are tethered, and are towed or lowered from the ship, collecting real-time data; others are stand-alone, to be deployed and then recovered several months later.

Day 1 – Tuesday 7th October

Time	Duration (Mins)	Venue	Session	Theme	Topic	Owner	Org
8:30	40	234	Welcome Tea, Coffee and Muffins Registration & Workshop Sign-on			Ian Folger	NOC
9:10	10	One Ocean Suite	Opening Session		Host introduction and housekeeping	Helen Oldridge	NOC
10					Welcome to INMARTECH at NOC	Dr. Maaten Furlong	NOC
30					Keynote	Dr. Maaten Furlong	NOC
20					Satcoms Upgrade on RRS James Cook and RRS Discovery	Marwan Chartouny & Juan Ward	Omniaaccess & NOC
10:20	30	234	Morning Break				
10:50	20	One Ocean Suite	1st Presentations	In-house solutions	New Developments and Projects at NIOZ-NME	Yvo Witte	NIOZ
20				Digital Ocean	NOC's Open Source Ecosystem for Marine Autonomous Systems	Ashley Morris	NOC
20				Seismics	Development of the NOC's Marine Seismic Topside Capability	Joshua Pedder	NOC
12:00	60	234	Lunch				
13:00	20	One Ocean Suite	2nd Presentations	Sensors	One Instrument, Many Roles: Integrating Navigation and Ocean Measurement with Acoustic Doppler Technology	Nils Coe	Nortek UK
20				Vessel & Platform	RRS Sir David Attenborough Moonpool Trials	Carson McAfee	BAS
20				Autonomous Vehicles	Expanding unmanned surface vessels survey capabilities; the ROTV Swiss-army knife approach	Lageshan Steffen Pannerselvam	EIVA
20				Continuous Underway Monitoring	Underway Measurement of Seawater pCO ₂ on RRS James Cook and Discovery: Operational Insights and Challenges	Dr. Daniel Phillips	NOC
14:30	30	234	Afternoon Break				
15:00	60	Red Library Room	1st Workshops	In-house solutions	Modular Systems	Helen Oldridge	NOC
15:00	60	074/02		Vessel & Platform	High Speed Internet Onboard: Management, Remote Access and	Juan Ward, Basem Drawil & Marwan	Omniaaccess & NOC

Time	Duration (Mins)	Venue	Session	Theme	Topic	Owner	Org
					Other Applications	Chartouny	
15:00	60	One Ocean Suite	Family Photo and Close Out	Digital Ocean	Management of Metadata of Ship/Vehicle Data Acquisition	Dr. Daniel Phillips, Dr. Justin Buck	NOC
16:00	30	One Ocean Suite				Helen Oldridge	NOC
16:30		NOC Cafeteria		Icebreaker Drinks		Helen Oldridge	

Day 2 – Wednesday 8th October

Time	Duration (Mins)	Venue	Session	Theme	Topic	Owner	Org
9:00	30	234	Welcome Tea, Coffee and Muffins				
9:30	20	One Ocean Suite	3rd Presentations	Vessel & Platform	Onboard IT Systems modernisation and cybersecurity compliance	Juan Ward	NOC
20				In-house solutions	SwathCam - a 9m long Towed Camera System	Ethan Carson	NIWA
20				Vessel & Platform	Uncontaminated Sea Water Flow Control System	Nikita Petrov	BAS
10:30	30	234	Morning Break				
11:00	20	One Ocean Suite	4th Presentations	Autonomous Vehicles	How FUSION's novel design is transforming the way we inspect and monitor underwater infrastructures	Angus Elkins	RS Aqua
20				Seismics	NOC seismic suite restoration	Helen Oldridge	NOC
20				Vessel & Platform	NOC's New Tethered Underwater Vehicle MPUS	Alex Downer	NOC
20				In-house solutions	A mechanical design solution for a rotatable CTD water-sampler rosette to improve collection of suspended sediments	Charles von der Meden	NIOZ
12:30	60	234	Lunch				
13:30	25	ROV Hangar	1st Facilities Tour		Remote Operated Vehicles	Alex Downer & Emre Mutlu	
13:30	25	OEG Workshop	2nd Facilities Tour		Autosub Long Range	Dr. Alex Phillips	
13:30	25						

Time	Duration (Mins)	Venue	Session	Theme	Topic	Owner	Org
			Workshop				
14:00	25		1st Facilities Tour		Gliders	Mike Smart	
14:00	25	ROV Hangar	2nd Facilities Tour		Remote Operated Vehicles	Alex Downer & Emre Mutlu	
14:00	25	OEG Workshop	3rd Facilities Tour		Autosub Long Range	Dr. Alex Phillips	
14:30	25	OEG Workshop	1st Facilities Tour		Autosub Long Range	Dr. Alex Phillips	
14:30	25	Glider Workshop	2nd Facilities Tour		Gliders	Mike Smart	
14:30	25	ROV Hangar	3rd Facilities Tour		Remote Operated Vehicles	Alex Downer & Emre Mutlu	
15:00	10	One Ocean Suite	Close out of 2nd Day			Helen Oldridge	NOC
15:10	10	234	Afternoon Break				
15:20	70	234	Refreshments and Poster Session				
19:00		Coriander Lounge	Conference Dinner				

Day 3 – Thursday 9th October

Time	Duration (Mins)	Venue	Session	Theme	Topic	Owner	Org
9:30	30	234	Welcome Tea, Coffee and Muffins				
10:00	20	One Ocean Suite	5th Presentations	Vessel & Platform	Update on RV Anne Weber van Rosse	Yvo Witte	NIOZ
20				Digital Ocean	Co-designing AI path planner for ocean gliders with operators, engineers and users for explainability and transparency in AI assisted glider piloting operations.	Justin Buck	NOC
20				Digital Ocean	Co-ordination of multiple autonomy deployments in the mission	James Burris	NOC
11:00	30	234	Morning Break				
11:30	20	One Ocean Suite	6th Presentations	Digital Ocean	Designing Data Pathways for the Digital Ocean: From Sensor to Shore	Oliver Potter	Ground Control Technologies Ltd

Time	Duration (Mins)	Venue	Session	Theme	Topic	Owner	Org
	20			Seismics	Best Practices in Ocean-Bottom Seismometer (OBS) Data Acquisition: From Shipboard Operations to High-Quality Seismic Records	Gaye Bayraktı	NOC
	20			Autonomous Vehicles	Operational Highlights from the Autosub Long Range Autonomous Underwater Vehicle	Stewart Fairbairn	NOC
12:30	60	234	Lunch				
13:30	20	One Ocean Suite	7th Presentations	Vessel & Platform	Quadcopters for science	Carson McAfee	BAS
20				In-house solutions	Mechanical solutions for movement issues	Edwin Keijzer	NIOZ
20				In-house solutions	King Henry II and a Short History of Administration	Juan Ward	NOC
14:30	10	One Ocean Suite	Close out of Conference			Helen Oldridge	NOC

Posters

Abadseat driver system for Socom gliders operated under ice

Yaomei Wang, Benjamin Allsup, Alexander B. Phillips (NOC)

ASED-II

Aris van der Vis (NIOZ)

Autonomous eDNA sampling in the deep-sea

S.Evans, R.Brown, J.Wyatt, J.Walk, K.Saw, R.Samuel, J.Robidart (NOC)

Biological Influence on Future Ocean Carbon Storage: Insights from the BO-CAPEDON Project

Samuel Smith (NOC)

Deep Digging Dredge

Dave Huijsman, Rob Witbaard, Edwin Keijzer (NIOZ)

Enhancing clean water sampling facilities on a research icebreaker to meet the needs of the scientific community

Lahaye, Quentin¹; Morisset, Simon¹; Guillot, Pascal²; Forest, Alexandre¹; Dhifallah, Fatma¹; Rochefort, Véronique¹; Cullen, Jay²; Anderlini, Tia² (¹Amundsen Science, Université Laval, Canada, ²University of Victoria, Canada)

Meeting Format:

- Three days of presentations, workshops, facility tours, hands-on demos, Posters and networking opportunities – Tuesday, 7 October – Thursday, 9 October 2025
- Ice Breaker Reception – Tuesday, 7 October 2025
- Conference Dinner – Wednesday, 8 October 2025

Key Themes for 2025

- Vessels and platforms
- Autonomous Vehicles
- In Situ Observation Systems
- Water column and Benthic Sampling
- Sensors
- Seismics
- Continuous Underway Monitoring
- Digital Ocean
- “In House” Technical Solutions



Highlighted Talks from the INMARTECH Meeting

Innovation in Marine Technology

- *Development of the NOC's Marine Seismic Topside Capability – National Oceanography Centre (NOC)*
 - How to turn a multipurpose Oceanographic ship into a Seismic Ship- An array of air guns (sound source), a towed streamer (listening device) ending in a tail buoy.

AUVs and Gliders

- *Co-designing AI Path Planner for Ocean Gliders — integrating operators, engineers & users for transparency in AI-assisted piloting - (NOC)*
- *Coordination of Multiple Autonomy Deployments in a Mission - (NOC) - AutoSubs, Gliders, Wave Gliders, etc.*

Unmanned , Towed Systems and Moon Pools

- *RRS Sir David Attenborough Moonpool Trials – British Antarctic Survey (BAS)*
- *SwathCam – A 9m Towed Camera System – NIWA now Earth Sciences New Zealand (EIS)*
- *Quadcopters for Science – British Antarctic Survey (BAS)*



Quadcopters for Science – British Antarctic Survey (BAS)

Enhancing Polar Research with Unmanned Aircraft Systems (UAS)

- **Enhance Safety:** Reach hazardous or remote sites without putting personnel at risk
- **Expand Reach:** Access areas beyond ship or ground team limits
- **High-Resolution Data:** Capture detailed imagery, mapping, and environmental measurements
- **Increase Efficiency:** Faster, lower-cost missions with reduced logistics burden
- **Minimize Impact:** Quiet, low-disturbance operations ideal for sensitive ecosystems
- **Enhance Outreach & Visibility:** Provide striking visuals and media to promote research programs and engage the public



**British
Antarctic Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

UAS provide safer, faster, and more detailed insights into Antarctica's most challenging environments.

Building Trust and Coordination for UAS Operations

Section 1 – Captains & Marine Ops

- Present clear **safety and flight protocols**
- Ensure **no interference** with navigation or ship routines

Section 2 – Scientists / PIs

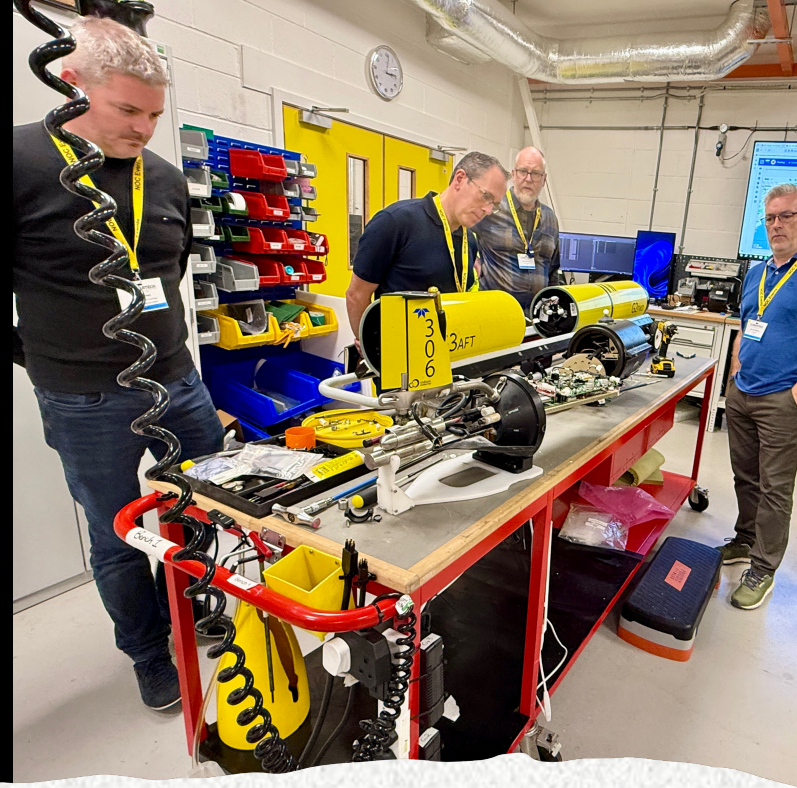
- Demonstrate **research value** and enhanced data outcomes
- Share **success stories** from prior UAS-supported missions

Section 3 – Operators & Technicians

- Involve early in **planning and payload integration**
- Provide **training, maintenance plans,** and workflow coordination

Early coordination, transparency, and shared goals ensure smooth, safe, and impactful UAS missions.





Facility Tours

Marine Autonomous Robotic Systems (MARS) Facility

The NOC operates seven AUVs: Autosub 5, and six Autosub Long Range vehicles including "Boaty McBoatFace". Rated to 1500m or 600m with a 2000Km range.

GLIDER Lab

Comprised of 32 gliders combination of the Slocum gliders and the University of Washington Seagliders. Dive to 1000 m and can last up to 6 months in the field depending on sensor suite.

HANGAR Workshop

Remotely Operated Vehicle (ROV) - ISIS Tethered underwater robot that is unmanned, highly maneuverable, attached to the ship by umbilical cable able to operate in depths up to 6,500 m.



Questions?