Unlocking the potential of consumer-grade drones for marine research
(26-28th June, 2024, Bremen, Germany)

26th June - What do coastal and marine scientists use/need drones and machine learning for?	
09:00-09:15	Welcome by ZMT director Professor Raimund Bleischwitz
09:15-09:30	The goals and strategy of this workshop (Sonia Bejarano, Alessio Rovere) Proposed scope of joint manuscript
09:30-09:45	Drones used to study past and modern coastal processes Elisa Casella and Alessio Rovere (University Ca'Foscari, Italy)
09:45-10:00 (online)	Photogrammetry as a tool for studying coral reef ecosystems Isabel Urbina-Barreto (IRD, La Reunion)
10:00-10:15	Experiences in the use of remotely-piloted aircraft systems in the characterisation of mangrove ecosystems for restoration and monitoring changes in coastal ecosystems Diana Romero (INVEMAR, Colombia)
10:15-10:30	Multi-risk intelligence for transformative climate change adaptation in coastal ecosystems Jacopo Furlanetto (CMCC, Italy)
10:30-10:45	Coffee Break
10:45-11:00	Monitoring coastal dynamics using drones Philip-Neri Jayson-Quashingah (University of Ghana)
11:00-11:15	Drones as a cost-efficient tool to monitor tropical coastal ecosystems Gustavo Castellanos (IGB, Berlin)
11:15-11:30	An integrated approach for benthic habitat mapping based on innovative sensing technologies and measurements of ecosystem functioning Danielle Piazzolla (CMCC, Italy)
11:30-11:45	Using Unoccupied Aerial Vehicles (UAVs) for hydro-morphological mapping Anette Eltner (Dresden University of Technology)
11:45-12:00	How do modern digital methods transform science in coastal zones and climate change adaptation? Gabriel David (Technical University of Braunschweig, Germany)
12:00-13:30	Lunch

13:30-13:45	Mapping cover and counting trees from Unoccupied Aerial Systems (UAS) images of a mangrove forest using artificial intelligence Daniel Schürholz (ZMT, Germany)
13:45-17:00	<u>Interactive work session and synthesis</u>: • Brainstorm to define structure and scope of joint manuscript. • Assign manuscript sections and form small manuscript writing teams. • Draft contents of manuscript sections and share them with the group.
Group dinner	

27th June	
What is the state of the art in drone technology/capabilities and machine learning and how do these fit support/limit scientists needs/aims?	
09:00-09:45	KEYNOTE Drone mapping the Great Barrier Reef (Karen Joyce, Geonadir / James Cook University / She Maps)
09:45-10:00	Plan Blue Representative
10:00-10:15	A world of underwater drones (Oda Ryggen, Blueye, Norway)
10:15-10:30	Coffee Break
What is the current status of legislation regulating drone use in EU projects and in the tropics?	
10:30-11:00	A brief overview of European drone legislation (Jan Evers, Copteruni, Germany)
11:00-11:30 (online)	Globhe: The world's premier on-demand drone data marketplace (Andreas Nordansjö, Sweden)
11:30-11:45 (Pre-recorded)	Legal aspects of drone operations in the EU (Michael Schmid, Hanseatic Solutions)
11:45-12:15	Future drone- and true multi-sensor-based remote sensing of near-coastal ocean regions for improved oceanographic parameter extraction Frank Lehmann and Martin Nägele (OptoPrecision) Markus Peichl and Thomas Jagdhuber (Microwaves and Radar Institute, German Aerospace Centre).
12:00-13:30	Lunch
13:30-13:45	Long-term drone monitoring of multisource impacts on Maldivian coral reefs: the MaRHE Centre Experience (Luca Fallati, MARHE Maldives)
13:45-14:00	Legal aspects of flying drones over Colombian coasts Colombia (Speaker TBD)

14:00-16:00	Interactive work session and synthesis: ● Manuscript writing ● Discussion on progress
	Group dinner

28th June Finalise workshop outputs	
09:00-11:00	Interactive work session: ● Next steps, timeline, and responsibilities to complete the manuscript. ● Identify possible target journals. ● Identify possibilities for collaboration and calls we can respond to. ● Identify the pathway towards drone operations at ZMT.
11:00-12:00	Wrap up and future outlook
12:00-13:30	Closing lunch
	Departures