ID25- POLYBIUS2020, A COST-EFFECTIVE UNDERWATER AUTONOMOUS VIDEO SYSTEM TO RECORD FISHING GEAR SELECTIVITY PERFORMANCE CATCHING FISH AND MARINE LITTER

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Abstract
Underwater video cameras are a highly versatile survey solution for marine fisheries research. The POLYBIUS2020 is a system specially designed to be used as a tool for video recording inside towed fishing gears. Its design allows for rapid installation onboard commercial fishing vessels as well as for quick reconfiguration and battery replacement. The system is based on simple commercial components to ensure low costs and the opportunity of future studies using house technology. The field experiments carried out have shown the flexibility and ability of the system to obtain key information about fishing selectivity, flora and fauna characterization and marine litter presence.

Keywords
Towed fishing gear, selectivity performance, video transect, discards, marine litter

INTRODUCTION
Despite their high performance in a variety of underwater tasks, Autonomous Underwater Vehicles (AUV) or Remote Operated Vehicle (ROVs) cannot operate inside nets due to their sensibility to hard impacts. The research on selectivity of fishing trawls includes large, heavy and mobile nets, producing hard strikes and impacts during trawling. Image recording makes necessary to securely place the underwater cameras at different points within the net (headline, top panel, codend). To overcome the mentioned issues, a cost-effective video system was built using a low-cost set of devices to record videos inside fishing nets in a very harsh submarine environment where it can be severely shocked and impacted by the net, fish and water flows.

DESING AND APLICATIONS
The system consists of an underwater camera placed in an underwater housing with a range of 250 m depth and a LED light source which are assembled in a protection housing made of Nylon. This material offers good properties in terms of resistance, strength, coefficient of friction and degree of bearing and wear. Besides, its mid-range price compared to other engineering plastics must be taken into account if dimensional stability of parts is required. Additionally, a sheet stabilizes the system and also functions as a sail. Plastic compounds are assembled with stainless steel bolts and nuts which allow to easily replacing damaged spare parts.

The high resolution of digital video/photo allows to get a better knowledge of net performance and to improve the understanding of fishing process. It provides information about the complexity of fish behaviour and ability of marine fauna to escape out the net. This knowledge is key to the design of more sustainable fishing gears with better selectivity characteristic to avoid discards and accidental catch of unwanted species as shown in several projects [1] and has successfully used to obtain information about seabed marine litter [2].

Their low operational cost and the lack of need for skilled personnel make these filming systems highly appealing for many marine scientific researches.

ACKNOWLEDGEMENTS
POLYBIUS2020 system takes part of IEO and CETMAR strategy to support new technological developments. It has been used during the trials of the Projects DESCARSEL-IEO[1] and CLEANATLANTIC[2] with excellent performance to marine litter monitoring.

Fig 1. POLYBIUS2020 design

2. Attachment and position in the net

Fig 3. Video recording during fishing

REFERENCES
[1] Project DESCARSEL-IEO Study of strategies to reduce discards and unwanted species, fishing selectivity and fish survival. http://datos.ieo.es/geonetwork/srv/api/records/urn:SDN:CSR:LOCAL:29MO202008290
[2] Project INTERREG-CLEANATLANTIC Tackling Marine Litter in the Atlantic Area. http://www.cleanatlantic.eu/