# Application of underwater photography to monitor fouling growth on experimental fishnet panels

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## Introduction

Biofouling in aquaculture is a well-known problem; costing 5-10% of production (Fitridge *et al.*, 2012) and posing threats to fish health. Fouling on fish nets can restrict water flow-through rates (Madin and Chong, 2010) and subsequently lead to undesirable accumulation of waste products, damaged infrastructure (Gansel *et al.*, 2015) and increase disease risk in fish (Braithwaite *et al.*, 2007). Moreover, biofouling itself can act as a pathogen vector with serious consequences to fish health.

The experimental site was situated off the coast of Malta, in the central Mediterranean Sea.

## Experimental Design

Experimental panels of fish net (15x15cm) of uncoated nylon fibre net and commercially antifouled fish nets were secured in PCV/metal frames. The frames were positioned at two different depths (6 and 14 m). Throughout a year, monthly inspections by means of SCUBA diving were performed in order to monitor the growth of fouling organisms using **underwater photography** (Fig. 1, Fig. 1A, Fig. 1B). A GoPro, with pre-set settings, was mounted onto a U-shaped PVC support in order to ensure consistent distance and focal points in each photograph sample.
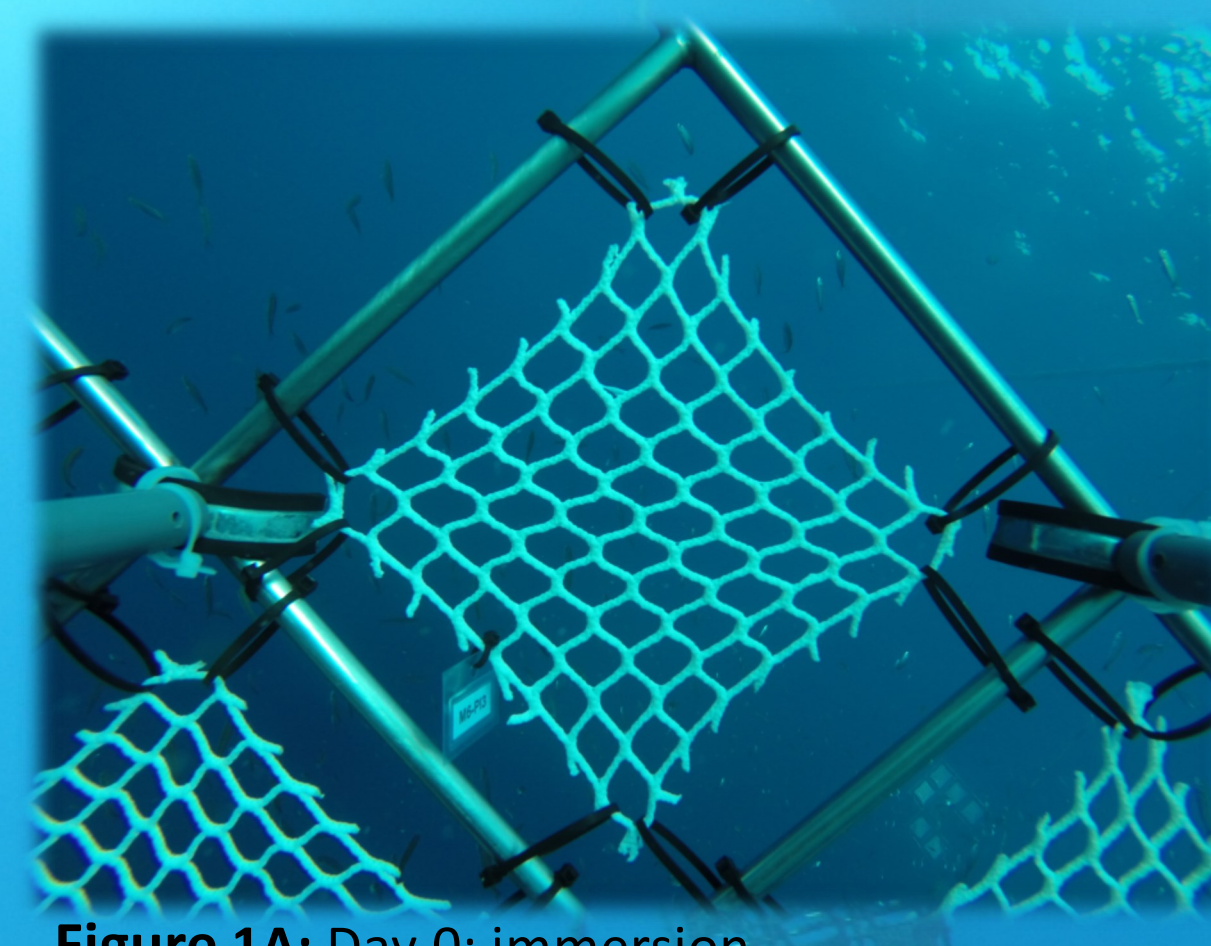


**Figure 1A:** Day 0; immersion.
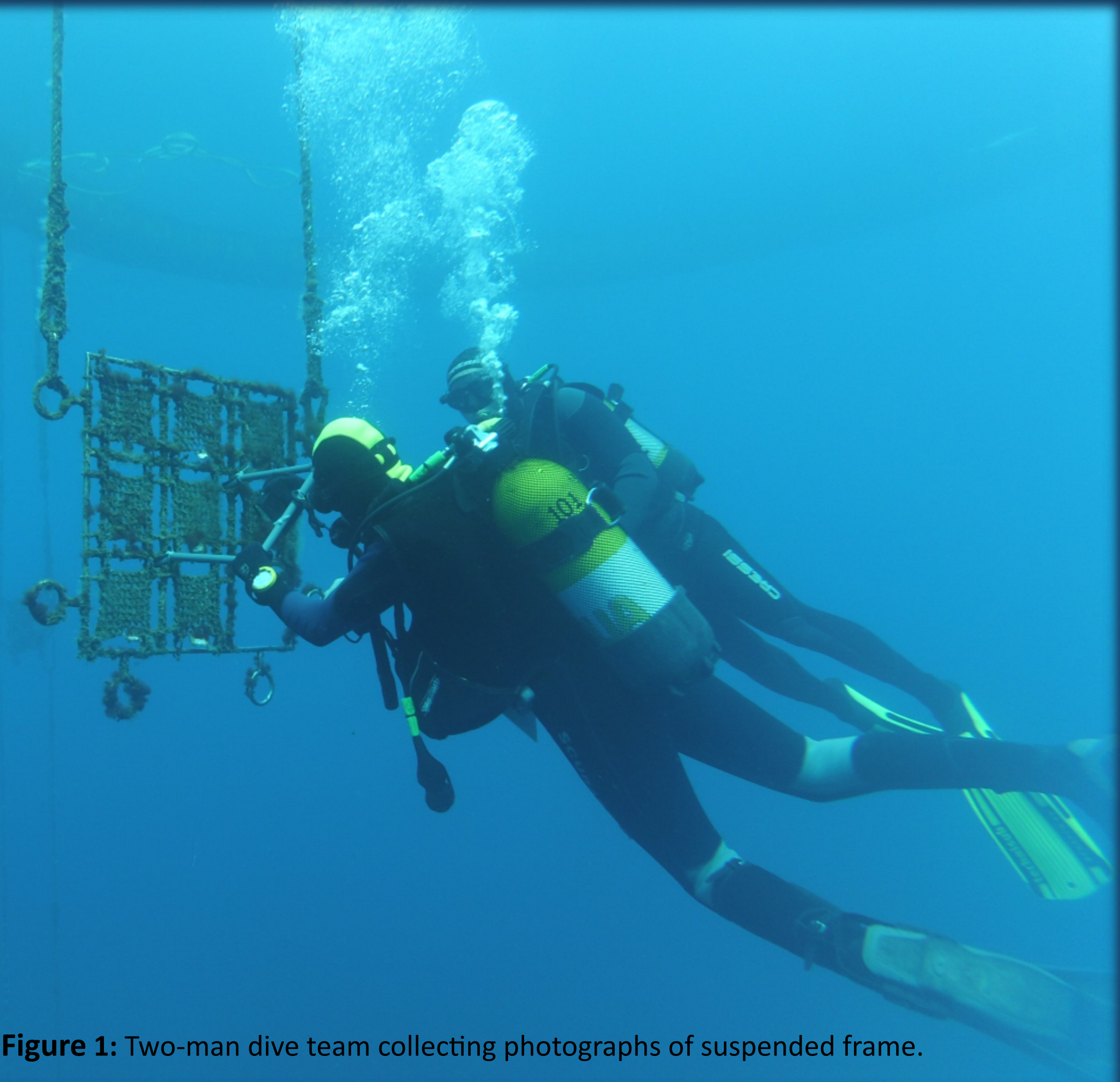
**Figure 1B:** 119 days post-immersion.

**Figure 1:** Two-man dive team collecting photographs of suspended frame.

## Dive Plan

The dive plan was created to optimize the time (40 to 50 minutes) (Fig. 2) and the tasks to be performed (photos and maintenance of the frames) and to minimize the chances of accidents; ensuring the safety of the divers. The dive always started by descending to 14 metres, to the first frame. Here, an inspection was performed on the carabiners, connection ropes and nets' cable ties. Before photos are taken, the divers waited 1-2 minutes to let any silt disperse. The divers then moved to the next frame and to perform the same tasks. Once the bottom frames were complete, a slow ascension was made to 6 meters, where maintenance and photographers were made on the remaining frames; repeating the same order of tasks as the deeper frames. The order of tasks and dive path was kept constant throughout the all sampling events, making the dive action more routine, allowing for easy execution.
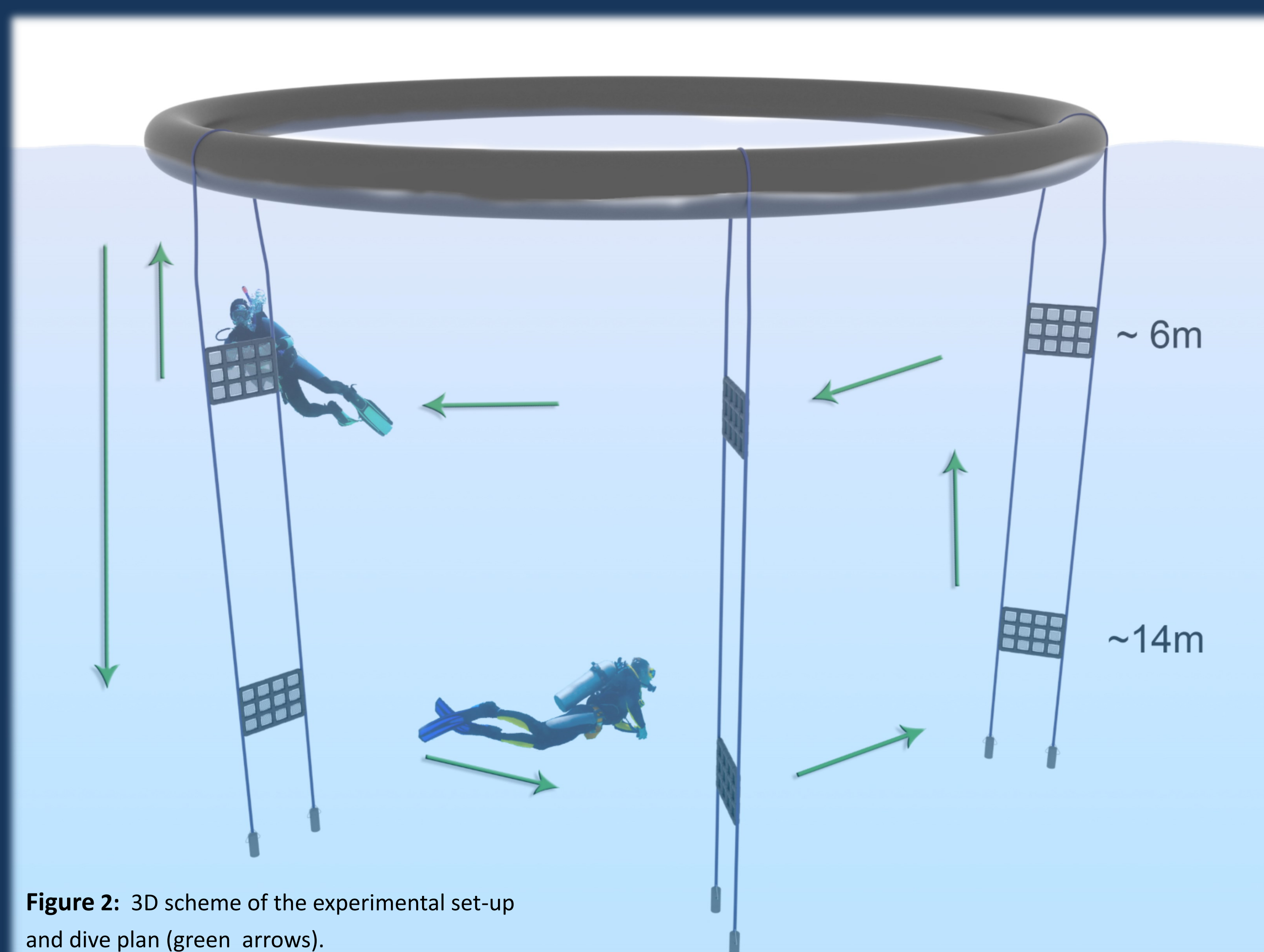


**Figure 2:** 3D scheme of the experimental set-up and dive plan (green arrows).

~ 6m

~14m

## References

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