Jelly-FAD workshop

08/09/2022 – 09/09/2022

Abidjan

Agenda

September, 8th

10:00 – 12:00 → Theoretical presentation

14:00 – 17:00 → Visit to the construction zone

September, 9th

8:30 – 12:00 → Construction

14:00 – 16:00 → Construction

Workshops participants

SALVADOR CASTIELLA Joaquin, ICM-CSIC (workshop leader)

WAIN Gwenaëlle, ORTHONGEL

LE COULS Sarah, CFTO

BONNIEUX Antoine, CFTO

SINQUIN Paul, CFTO – STERENN

Bargain Jérôme, VIA OCEAN

BAIDAI Yannick, AMEXPERT

AMOUSSOU Steeve, CMB-Abidjan

ASSIKLI Alex, CMB-Abidjan

CODJO Fulgence, CMB-Abidjan

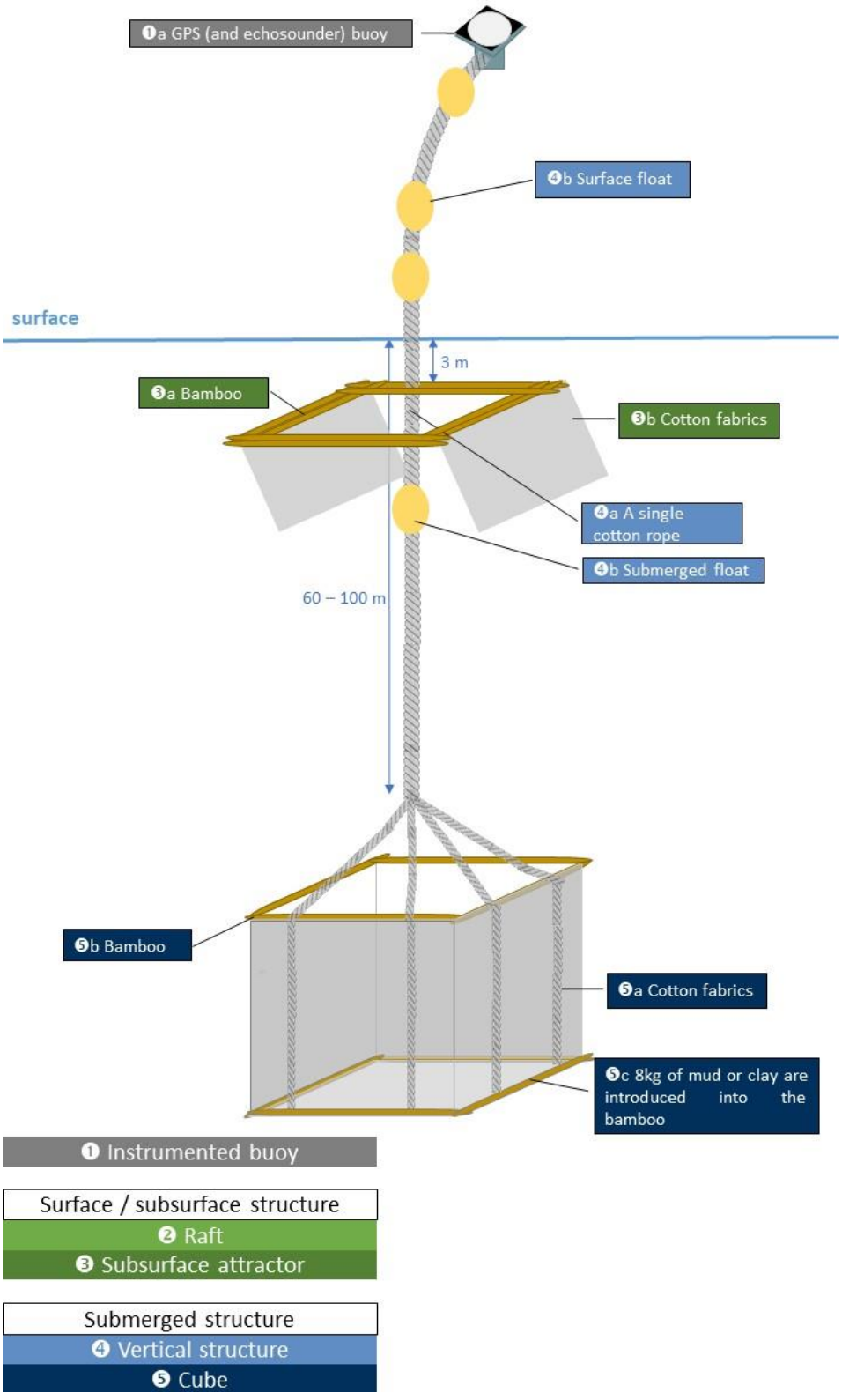
AMOUSSOU Gatien, CMB-Abidjan

KLAHON Oscar, CMB-Abidjan

ADOGONY Sylvain, CMB-Abidjan

OGOGNON Justin, CMB-Abidjan

Jelly-FAD presentation



Main characteristics of Jelly-FAD:

- The form of the Jelly-FAD

The physical concept of drag is a force acting opposite to the relative motion of any object moving with respect to a surrounding fluid. In the case of dFADs, the drag is created by the submerged structure, which we will call "drogue", the drogue is the component of the dFAD structure that causes them to slowly drift.

The drag coefficient indicates how well an object resists movement through a fluid such as water and is determined by the shape of the sea anchor. These drag coefficients are independent of the area or size of the drogue. The resistance to movement of an object, is calculated as the coefficient of drag (determined by its shape), multiplied by its area (determined by the size of the structure). Thus, in the case of dFADs, the choice of a shape with a high drag coefficient would allow good performance (resistance to movement) which in turn would allow a reduction in the total surface area of the structure. The shape of the dFAD should have as much drag coefficient as possible to reduce movement. Thus, an effective drogue for dFAD should be three-dimensional. In addition, the sea anchor must be symmetrical so that the drag created is independent of the orientation of the sea anchor.

The drogue chosen to slowly derive the dFAD is a $1m^3$ symmetrical three-dimensional cubic structure which is suspended from the surface structure with a rope to a depth below the mixing layer (this depth varies depending on the area. oceanic, could be 60m to 100m).

It is important that there are no knots. They increase the shearing forces and therefore the risk of breakage.

- Materials used in Jelly-FAD construction

Biodegradable materials used in the jelly-FAD construction (and other bio-FADs) should be made of 100% organic materials, for which the product of their degradation is non-toxic for the marine environment, and sustainably harvested and preferably provisioned from local or regional sources.

The cubic structure is made of bamboo canes, cotton canvas and a unique cotton rope (20mm diameter). The attractor is made with the same materials. For floats, avoid plastic floats: friction may damage the cotton rope quickly.

- Weight and flotation required for the Jelly-FAD

In approximatively 30 days, the bamboo is saturated in seawater and its density is very similar of that of seawater. Thus, the cubic structure made of bamboo will neutrally drift in the water column and won´t need any extra weight added. In 30 days, the cotton rope will saturate in seawater and its weight after 25 days will be 100 gr / 1m of rope.

The Jelly FAD won´t need any extra weight to be added and the flotation needed would be that to neutralize the weight of the cotton rope, which would be proportional to the number of meters used.

During the deployment of the Jelly FAD extra weight would need to be attached for the cubic structure made of bamboo to sink. Block of mud or clay (4x2 kg) will be added to the cotton fabrics. These blocks will dissolve in about 30 days.

- Time needed to build Jelly-FAD

Currently, 2 hours are needed to assemble the Jelly-FAD if the materials have been prepared in advance (drilled bamboo, sewn fabrics …).

Summary of the two-day workshop

The first morning, Joaquin SALVADOR CASTIELLA made a theoretical presentation of Jelly-FAD. He presented the forces acting on FADs (wind, swell, etc.). He then presented the structure of Jelly-FADs and the materials used for their construction.

In the afternoon, we went to the FAD construction area. We looked at the Jelly-FADs already assembled by the team in charge of building the FADs (CMB-Abidjan). Joaquin was able to give them advice and suggest improvements. We then prepared the material to be able to build a Jelly-FAD the next day.

On the second day, we spent the day on the construction site to see the different steps required to build a Jelly-FAD. At each stage, Joaquin was able to helps and give advice to the CMB-Abidjan employees.


BOSCH
HAMMER DRILL
G. Wain


CMB
ABIDJAN
G. Wain


VAN BONITA
G. Wain