For: **Poster session**

A new biomimetic surface to restore oysters and protect salt marsh edges.

S. De Lauretis[1], D. De Battisti[1], F. Gobbin[2], F. Grasselli[1], R. Gauff[1], G. Riva[1], J. Riedel[1], Antonino Italiano[3], P. Colombo[2], L. Airoldi[1,4]

[1] Chioggia Hydrobiological Station "Umberto D'Ancona", Department of Biology, University of Padua, Riva Canal Vena 1281 – Calle Grassi Naccari, 30015 Chioggia (VE), Italy

[2] Department of Industrial Engineering, University of Padua, Via Gardenigo, 6/a – 35131, Padova, Italy

[3] Desamanera S.r.l., Via Martiri di Belfiore 118, 45100 Rovigo, Italy

[4] NBFC, National Biodiversity Future Center, Piazza Marina, 90133, Palermo, Italy

Presenting author: Serena De Lauretis (PhD student), **serena.delauretis@studenti.unipd.it**

Abstract

Human activities and climate change have strongly altered natural systems and reduced biodiversity. To actively reverse these degradation and losses, there is public and political demand for restoring ecosystems and their valuable services. However, restoration interventions themselves can have high carbon footprint (e.g., big dredged material displacements and use of polluting materials e.g., plastic). Thus, there is a growing interest to employ nature-based approaches, which employ bio-inspired materials and surfaces to exploit the facilitation mechanisms among species in the restoration and to reduce the carbon footprint of the interventions. Here, we test a new biomimetic surface design to support fringing oyster reef restoration while reducing saltmarsh edge erosion. We used 3D printing techniques to design experimental tiles made of 75% of oyster shells which reproduce the jagged profile of a natural oyster reef. The performance of the new tiles on oyster recruitment and community species diversity is being compared to that of two conventional materials (intact oyster shells and rock boulders) used for marsh edge erosion control and oyster restoration. We are also testing how the performance of the materials can be affected by important local parameters, such as local hydrodynamics. So far, we are detecting no differences between the three different treatments in term of oyster abundance and positive effects on marsh's edges will be assessed in the future. Although results are still prelimiray, these novel biometic surfaces may offer a more sustainable solution to both restore fringing oyster reef and counteract salt marsh loss.