

# **Ongoing and Upcoming Cold-Water Coral Multi Stressor Experiments**

Barnhill, KA<sup>1</sup>†, Gutiérrez-Zárate, C<sup>2,3</sup>†, Carreiro-Silva, M<sup>4,5</sup>†, Orejas, C<sup>2</sup>, Veiga, A<sup>6</sup>, Martins, I<sup>4,5</sup>, Rakka, M<sup>4,5</sup>, Movilla, J<sup>2</sup>, Wolfram, U<sup>7</sup>, Álvarez, M<sup>2</sup>, Varela, M<sup>2</sup>, Gori, A<sup>3</sup>, Hennige, S<sup>1</sup>, Roberts, JM<sup>1</sup>

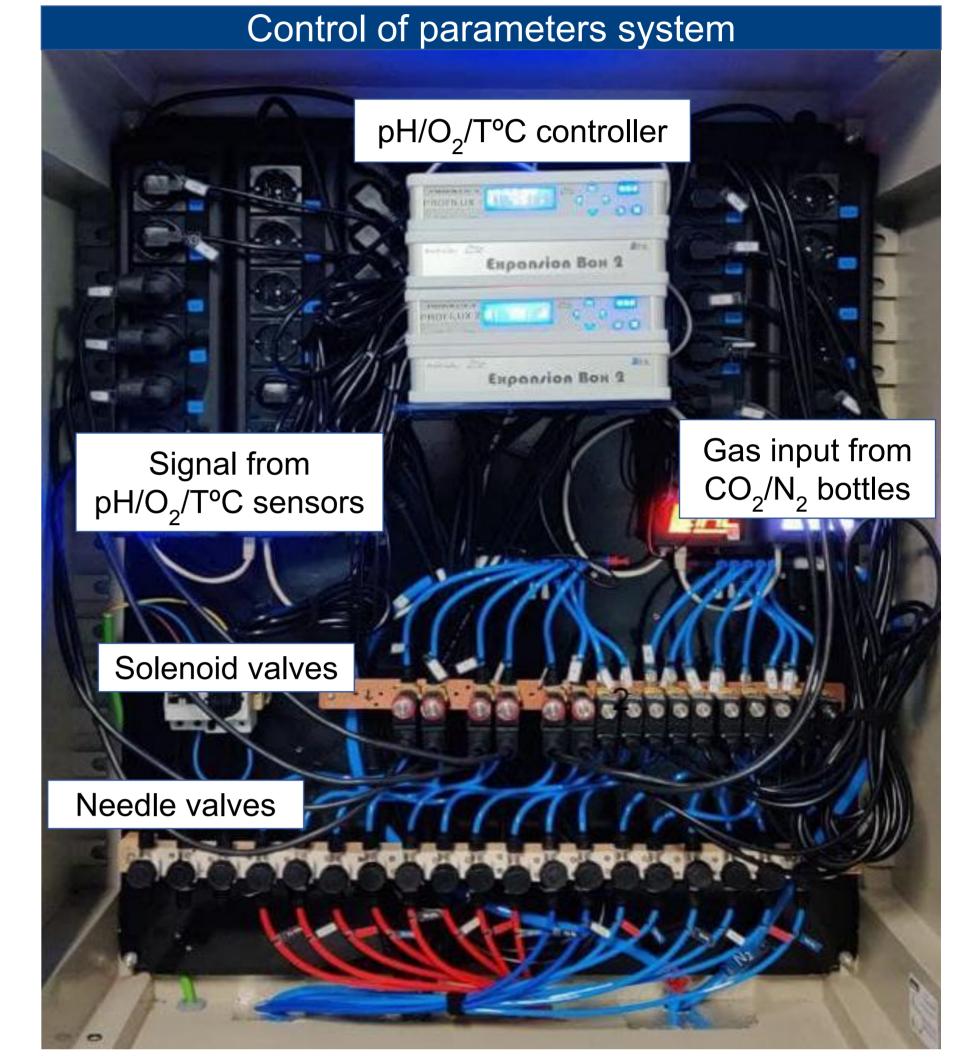
> <sup>1</sup>University of Edinburgh, <sup>2</sup>IEO, CSIC, <sup>3</sup>Universitat de Barcelona, <sup>4</sup>OKEANOS Research Center, University of the Azores, <sup>5</sup>Instituto do Mar, <sup>6</sup>Aquarium Finisterrae, <sup>7</sup>Heriot-Watt University **†**These authors share first authorship

**Background &** Dverview

### Methods

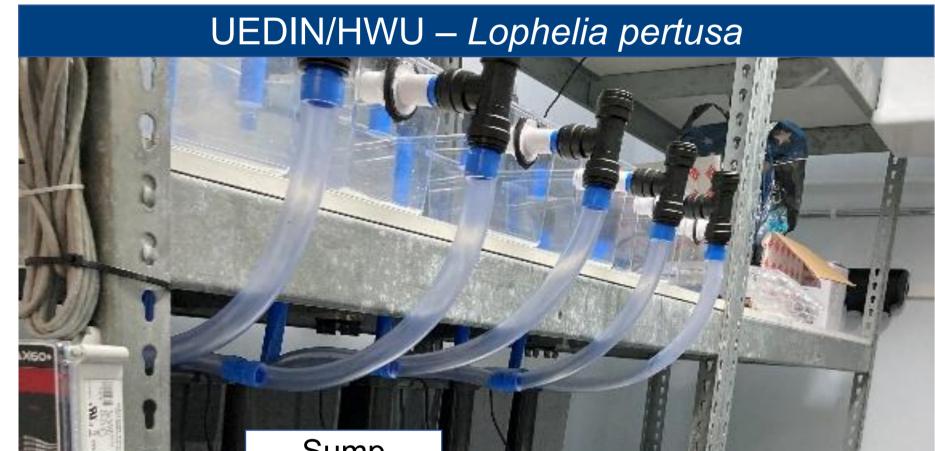
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• Three different experimental design with different combination



• Cold-water corals (CWC) form complex 3-D structures that are biodiversity hotspots. However, knowledge about their ecophysiological the response to global change stressors (i.e. warming, acidification, decrease of dissolved oxygen concentration) is still very limited, as well as their possible interactions with local stressors such as the impacts from mining and fishing activities.

• Three long-term, multi stressor experiments will combined explore the impact of several environmental and local stressors based on the IPCC projections on different CWC species across the North Atlantic.



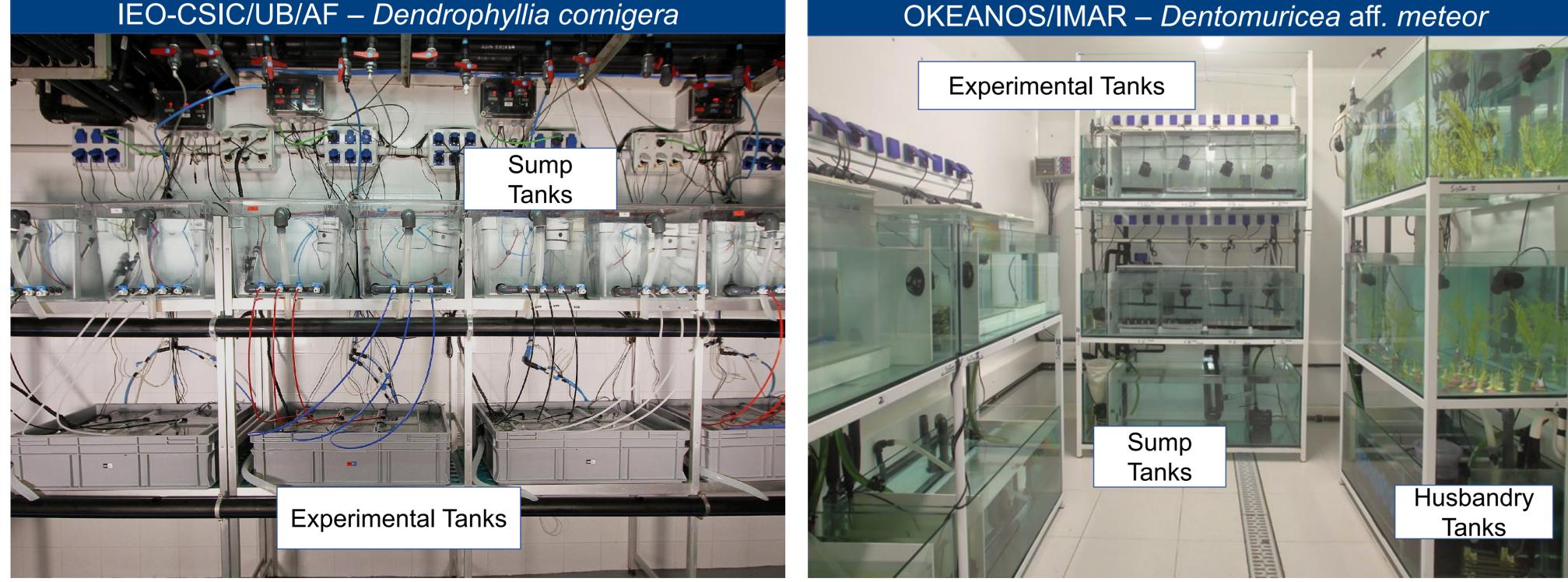
of stressors and response variables (Table 1), considering the previous knowledge on the ecophysiology of the three studied species: the scleractinians Lophelia pertusa and Dendrophyllia cornigera, and the octocoral Dentomuricea aff. meteor.

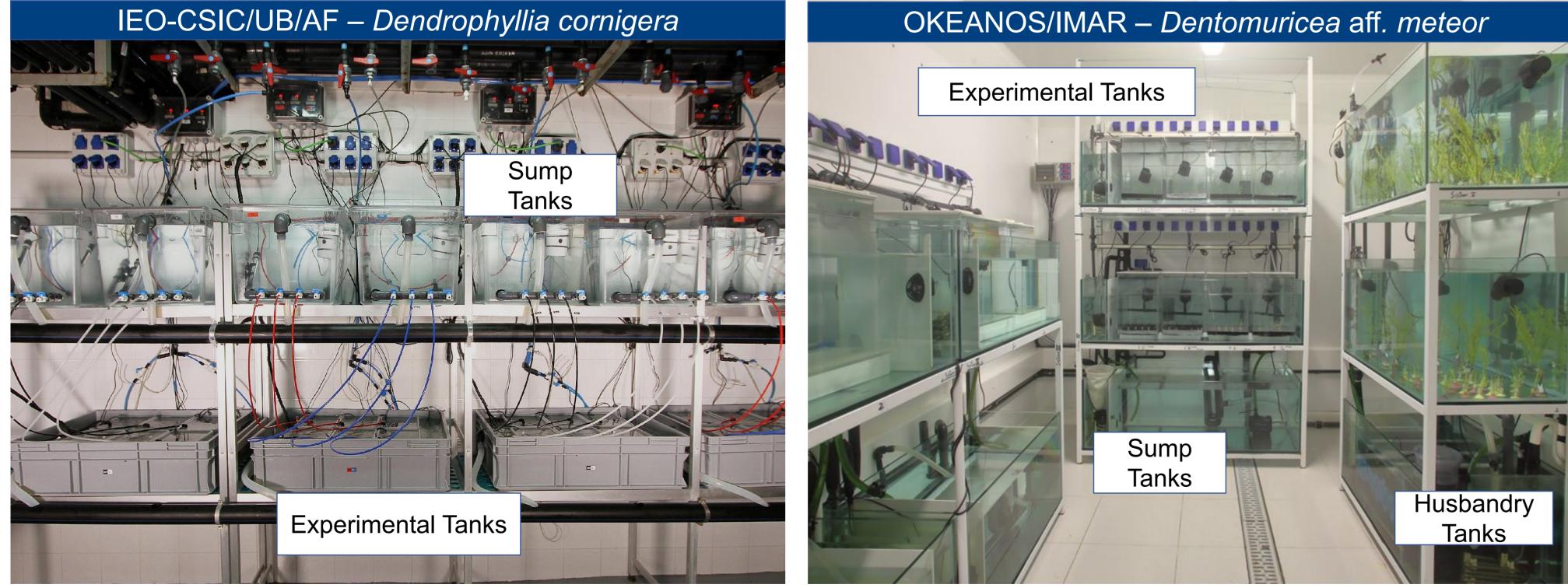
- Response variables:
  - -Skeletal growth, microporosity and density -Polyp behaviour -Respiration and excretion rates
  - -Tissue retraction
  - -Repeated 3-D imaging of the coral skeleton (*L. pertusa*)
  - -Tissue regeneration rate (*D. cornigera*)
- Control of parameters:
  - $-\downarrow pH: CO_2$  bubbling
  - $-\downarrow O_2$ : N<sub>2</sub> bubbling
  - -↑T°C: Heaters
  - POC: Decrease of food concentration

Table 1: Cold-water coral experimental treatments with the different stressors and their year of IPCC projection (2050 and 2100).

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			Treatments							
	CWC species	Region	1	2	3	4	5	6	7	8
Sump Tanks     Description     Experimental Tanks	Lophelia   pertusa	Norway	Control	2100 ↓pH ↓O <sub>2</sub> ↑T°C	2100 ↓pH	2100 ↓O <sub>2</sub>	2050 ↓pH	2100 ↓pH high range		
	Image: Constraint of the second se	NW Spain	Control	2100 ↓pH ↓O <sub>2</sub> ↑T°C	2100 ↓pH	2100 ↓O <sub>2</sub>	2100 ↑T°C	↓рН	2100 ↓O <sub>2</sub> ↑T°C	2100 ↓pH ↓O <sub>2</sub>
Commental lanks	Dentomuricea aff. meteor	Azores	Control	2100 ↓pH ↓POC	2100 ↓pH	2100 ↓POC				





# Looking Forward

- Further experiments will include the addition of particles from mining or sediment from trawling activities to all treatments after long-term experiments finish to study the potential physical damage and ecotoxicological effects.
- The results from these studies will increase our knowledge on the potential consequences of global change and local stressors and their possible

interactions on CWC species and ecosystems that they form.

• The results will contribute to support science-based marine spatial planning for the North Atlantic.

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