Could seahorse population distributions be used to model oceanic currents?
Report by Finn Endres for the Pier Giorgio Frassati fund

Searching for seahorses

Upon receiving the Pier Giorgio Frassati travel grant, I set off to explore the underwater world along the southern coast of Portugal. My research was focused on using seahorse distributions to model oceanic currents, and I had the opportunity to sample various areas primarily within a lagoon in southern Portugal; the Ria Formosa.

Exploring different underwater terrain

The Ria Formosa, with its four extremum tides per day and multiple inlets of different sizes, offered a unique environment for my study. These non-uniform currents forming in the lagoon allowed me to examine the effect of current magnitude on seahorse positions. Notably, I observed that seahorses tended to adhere to a more stringent disturbed flow shape where water velocity was greater. However, this pattern couldn't be verified in the region with the fastest flowing water, approximately 6-7 knots at mid-spring tides, due to its depth of up to 20 metres.

It would have been fascinating to observe the distributions of seahorses in these deeper areas. It would however likely have been futile as the artificial breakwater terrain offers few anchoring opportunities for this Sygnathidae. Instead I made use of different tidal states to observe different currents.

Caves in the west Algarve

As part of my research, I also designated select basins shielded from tidal currents as control variables. However, interpreting the results from these areas proved to be challenging, as it was not possible to hold environmental factors constant. Some basins experienced high levels of marine traffic, which disturbed seahorse populations, while others were protected breeding grounds, limiting study opportunities.

Additionally I looked into different salinities of water, as the Guadiana river which divides Spain and Portugal is brackish. I was also able to play around with different temperatures of water, this was easiest to measure at different states of tide. Typically lagoons are warmer as the tide falls, as they have had sufficient time to warm up. The effect of depth was readily observable in different areas. I was also intrigued whether water clarity had an impact, I was able to find patches of murky water, due to silting. However as one would expect, this made it very difficult to observe seahorses as visibility could be limited to less than a metre.

Some other wildlife

During my stay in Portugal, whilst I travelled between locations of interest I was able to experience the rich culture. Portuguese cuisine, known for its diverse flavors, was a delightful aspect of my journey. Traditions such as Fado music were highlights too. Engaging with the locals allowed me to gain insights into how the environment had changed over the past decades and the measures being taken to protect the precious ecosystem.

Reflecting on my time in Portugal, I did not reach a decisive conclusion regarding the absolute validity of my hypothesis. I think in order to test this fully one would need to curate an environment where one has total control of all variables, this would likely need be an artificial tank or similar setup. Nevertheless, this journey expanded my awareness of the intricate web of factors at play in this dynamic environment and underscored the challenges of conducting controlled studies in such a setting. I am profoundly grateful for the opportunity to meld my investigative work with travel, thanks to the support of the Pier Giorgio Frassati Fund. My heartfelt appreciation goes out to everyone involved in organizing the travel grants, enabling me to explore my ideas and contribute to our understanding of this fascinating ecosystem.

Inland riverside village in Spain along the Guadiana