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Citizen Science and Capturing our Coast

Capturing our Coast (CoCoast) is a national citizen science project which trains volunteers to collect data on the abundance and diversity of the coastal flora and fauna of their local shores. Volunteers receive training in general survey techniques and species identification, and are also invited to take part in the setting up and monitoring of question-driven experiments and targeted surveys. Eight institutions are project partners (see map), seven of which are training hubs (orange dots on map). Portsmouth University is leading on a CoCoast study that looks at breeding of the lugworm *Arenicola marina* across the UK. This is the first time citizen scientists have been used in a polychaete phenology study, however the protocol could be applicable to other similar species.



Lugworm breeding patterns

Arenicola marina are an important food source for birds and represent a valuable intertidal fishery as they are commonly used for fishing bait. However, their reproduction cycle is not well documented. In the UK, *A. marina* have an 'epidemic spawning crisis' over a few days in autumn (Watson *et al* 2000). The timing of spawning may vary depending on location - populations which are close together geographically may spawn at very different times and for different durations. Using trained citizen scientists to collect scientific data can be ideal for investigating *A. marina* reproduction, as this allows the collection of data from multiple locations for extended time periods.



Spermwatch surveys

Study aims:

- 1) to investigate if lugworm populations across the UK breed at the same time
- 2) to correlate breeding patterns to environmental factors

Study sites and timing: Surveys will be undertaken in the autumn months of 2016, 2017 and 2018 at multiple locations across the UK. Surveys can be carried out on all spring tides at any soft-sedimentary shore a volunteer wishes to survey.

Volunteer engagement and training: Any member of the public will be able to participate in the surveys. No formal training is required to participate as training material will be available for self-learning online. However, CoCoast scientists will be offered support during various field support events.

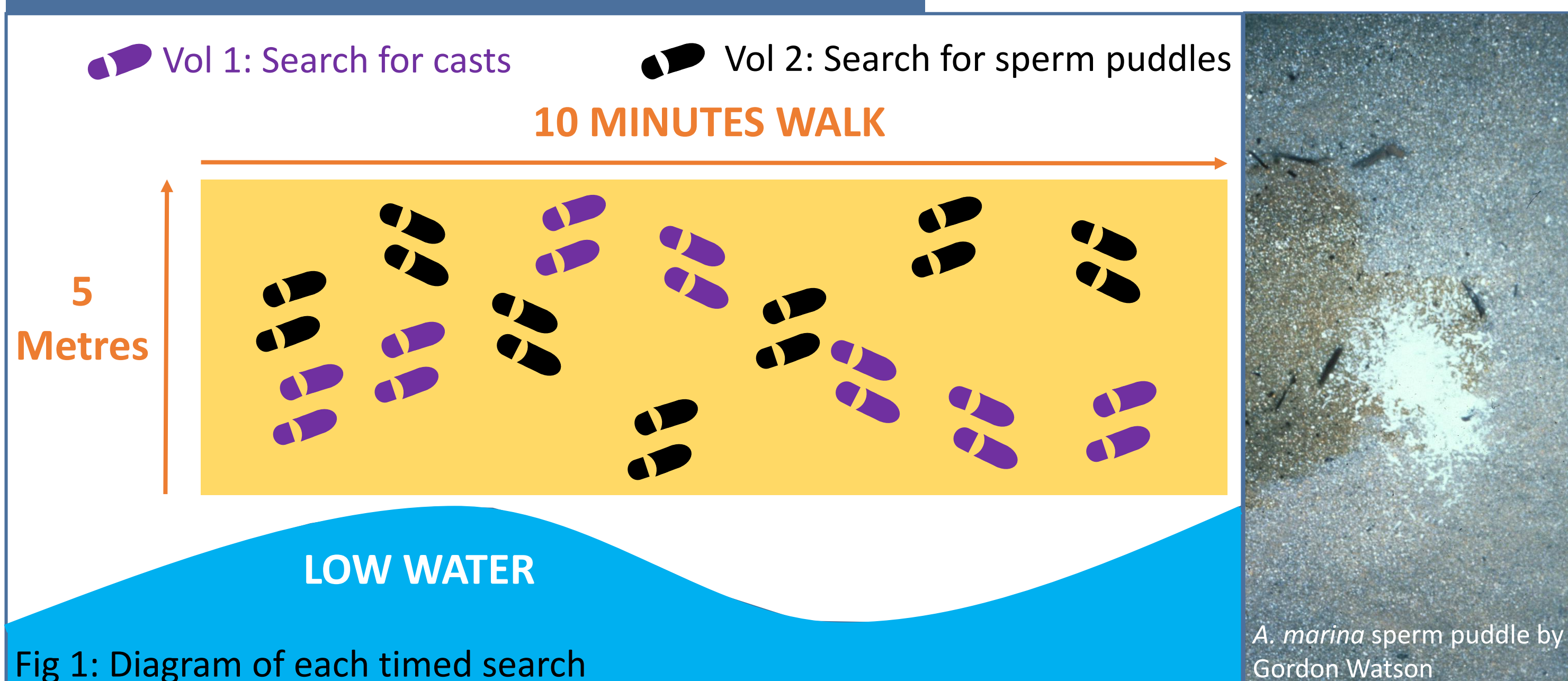
The protocol: Volunteers will work in pairs and each undertake three 10 minute timed searches. One person searches for and counts the number of lugworm casts, and the other one searches for and counts the number of lugworm sperm puddles (see fig 1). Those semi-quantitative data can be used to understand and compare breeding cycles between the various locations surveyed across the UK.

The CoCoast Team



Results

Each CoCoast training hub will lead surveys at a minimum of two beaches. Volunteers are invited to also survey their local beach. This will provide data from a minimum of 14 beaches across the UK coastline, but it is anticipated that sporadic data are also returned from many other locations. Geographic coverage at such a scale has not been seen in this kind of study before and will allow links with environmental variables to be investigated.



References

Watson, G.J., Williams, M.E. and Bentley, M.G., 2000. Can synchronous spawning be predicted from environmental parameters? A case study of the lugworm *Arenicola marina*. *Marine Biology*, 136(6), pp.1003-1017.

Significance

This study will provide a unique dataset on the spawning behaviour of *A. marina* at a large spatial scale. It will give insight into the environmental variables that trigger spawning in *A. marina*. This has proven difficult so far as *A. marina* spawning occurs during very short time periods and most likely during the same time of year and tides. Engaging citizen scientists may help to overcome such difficulties. These data will be used to understand the drivers of reproduction and how *A. marina* may be able to adapt to future climate change. 'Spermwatch' protocols could be applied to other species worldwide and will give an important baseline from which to measure the impacts of climate change.