

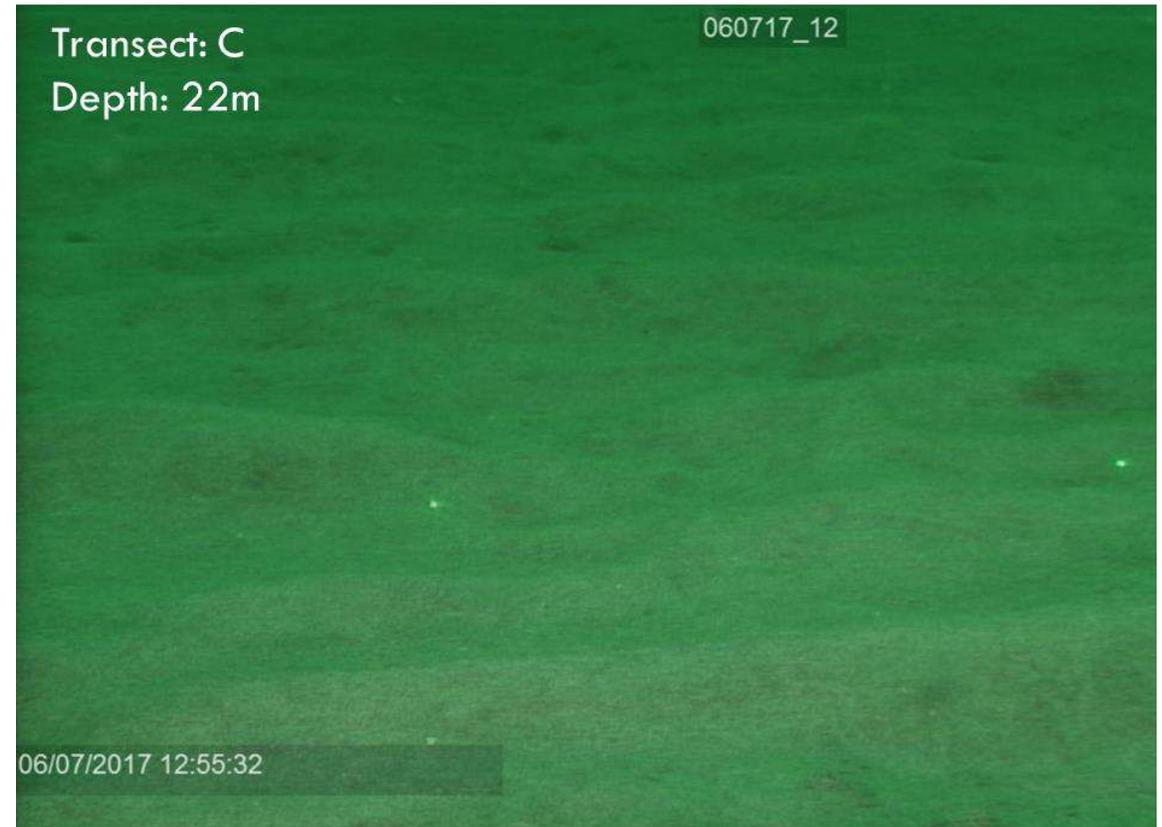


IS STICKY ECOLOGY PROTECTING OUR SANDY BEACHES?

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METHODS

- **EPIBENTHOS** – Video array (Sheehan et al., 2010)
- **INFAUNA** – Sediment grabs
- **EPS** (extracellular polymeric substance) – 1 cm sediment surface cores



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Polychaete sp. found at -3m.



Talitrus saltator found at +1m.



Eurydice pulchra found at -2m

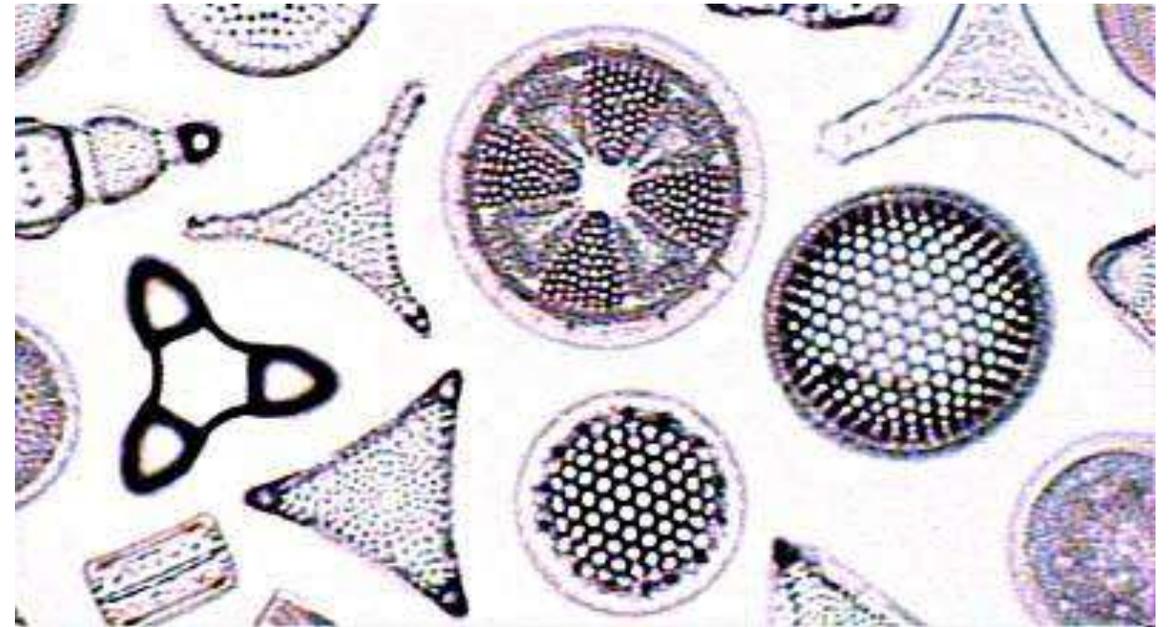


Gammaridae sp. found at -4m

Examples of intertidal infauna

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Diatom image from UCMP Museum Scientist Dr. Karen Wetmore

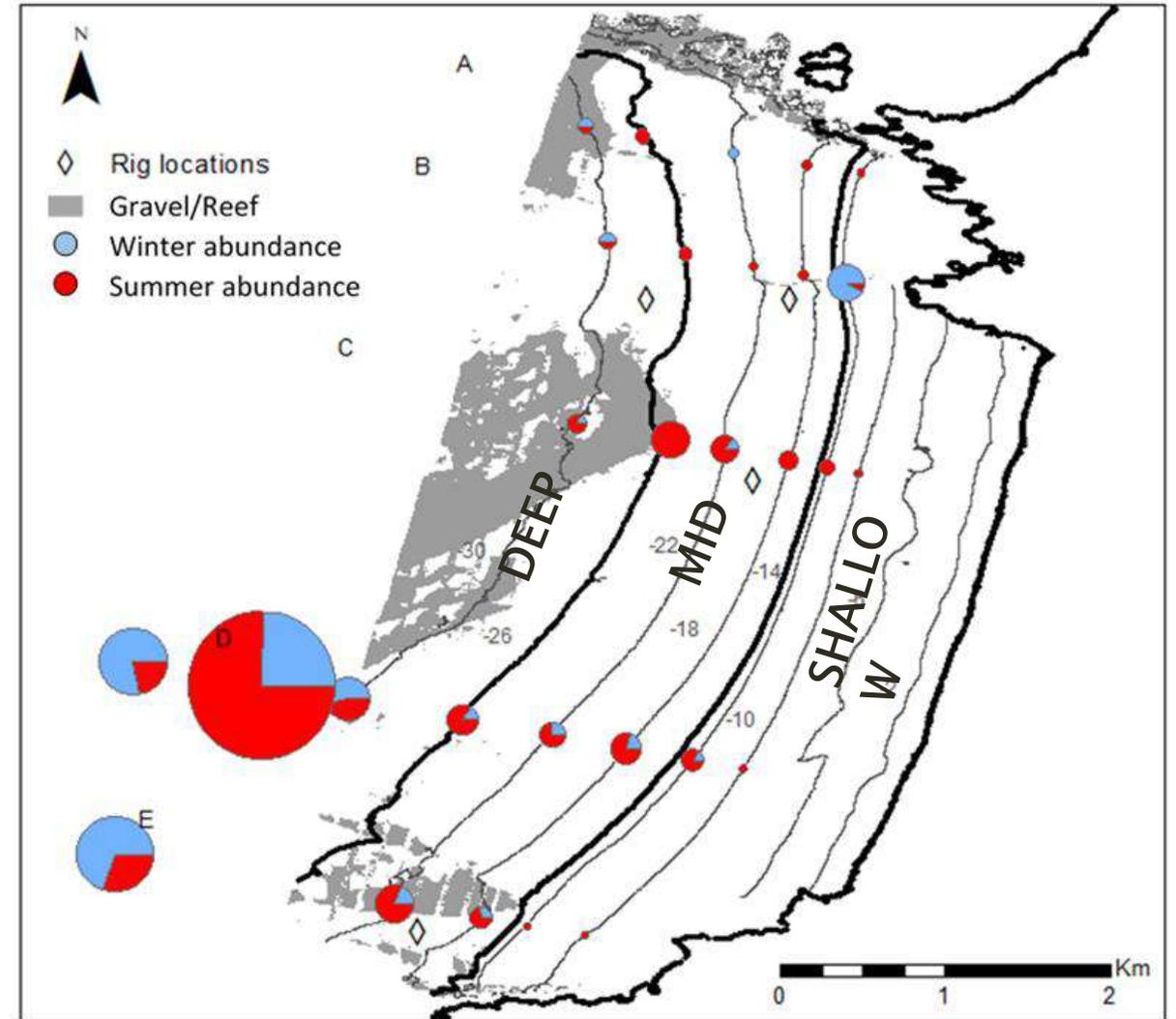
EPIBENTHOS

Deep – Deeper than the outer depth of closure (>25m) minimal wave induced sediment transport

Mid – Between the inner depth of closure and outer depth of closure (15 – 25m) wave induced sediment transport in extreme storm events

Shallow – Shallower than the inner depth of closure (<15m) highly mobile sediment (Valiente et al., 2017)

- Greater abundance during the summer survey
- Greater abundance with distance offshore



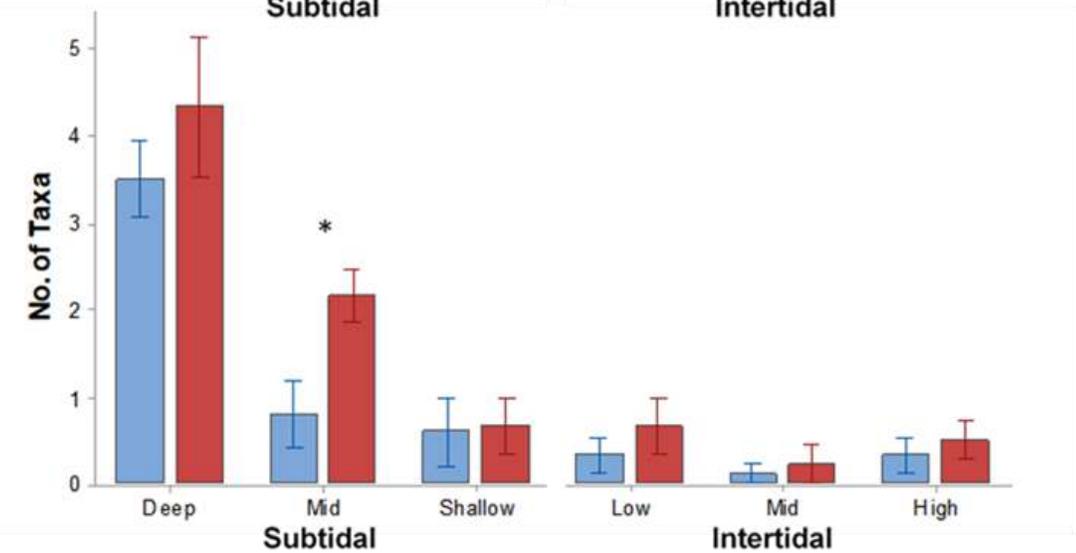
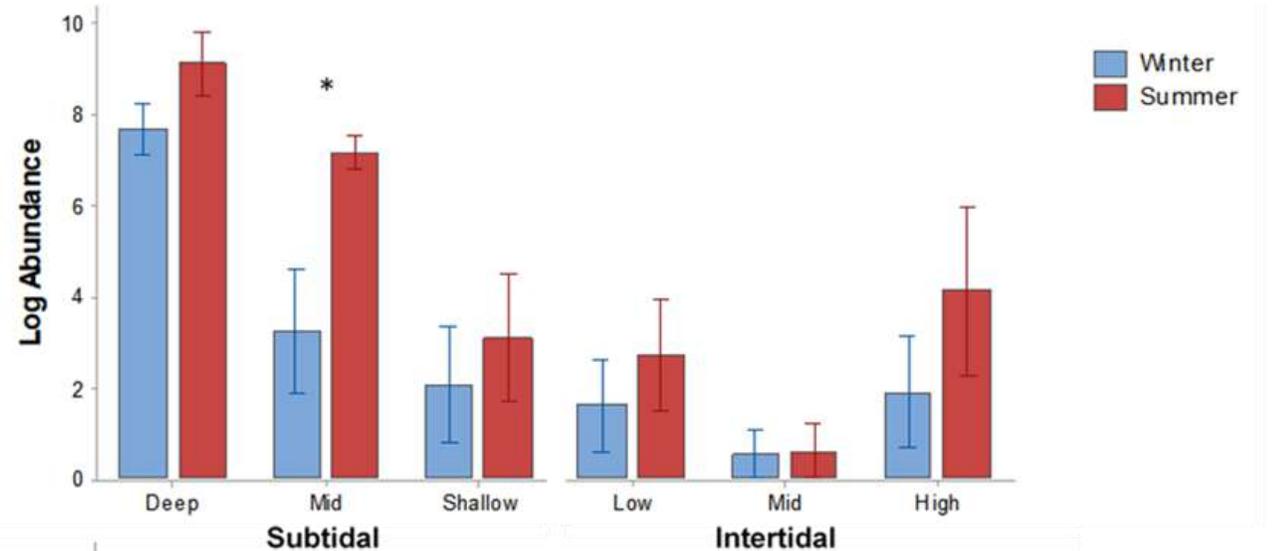
Map of Perranporth bay with pie chart to indicate abundance of epifauna surveyed in winter and summer, where size of the pie chart is proportional to the total epifauna observed in winter and summer. Grey patched indicate regions of gravel and reef substrate

INFAUNA

Overall trend for increase in abundance and number of taxa in the summer.

This increase was only significant in the Mid region.

In the subtidal there is a trend for increased abundance with depth.



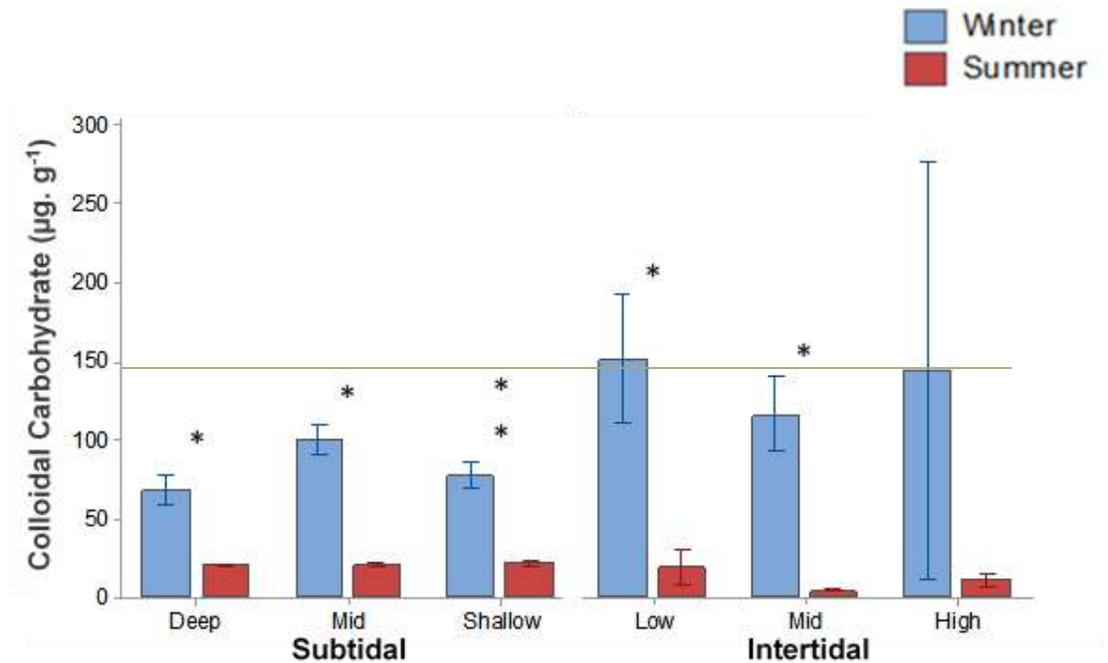
Mean abundance (ind. m³) and number of taxa present in intertidal and subtidal infauna with SE

EPS

Colloidal carbohydrate as proxy for EPS (Underwood et al., 1995)

Clear seasonal change in EPS

Concentrations as low as $150\mu\text{g}\cdot\text{g}^{-1}$ have been found to reduce sediment mobility (Huzarska, 2013; Malarkey et al., 2015)



Mean colloidal carbohydrate concentration in intertidal and subtidal sediment with SE

SO IS STICKY ECOLOGY PROTECTING OUR SANDY BEACHES?

The answer is we still don't know!

It's clear that EPS and macrofauna are unlikely to be affecting sediment transport in the shallow region, where waves are the prevailing force.

But..

EPS may play a role in aeolian transport within the intertidal

And both macrofauna and EPS may play a role in sediment stability in the 'mid' region

THANK YOU

For listening!

And to my supervisors

Dr Emma Sheehan

Prof Gerd Masselink

and

The BLUEcoast team, Team Sheehan, The Atlantic Diver, Plymouth University divers and Plymouth University lab technicians for all your help throughout the project



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