

Geophysical Benthic Habitat Map off Rosemullion Head, Cornwall, UK.

H. Bailev. I. Barnes. M. Cockcroft. H. Cooper. W. Hardman. H. Hind. E. McCracken. S. Miles. M. Stacev.

Background:

The Falmouth Bay and estuary are within a designated Special Area of Conservation owing to its largely diverse and delicate ecosystem. Many areas of the estuary are susceptible to effects from industrial pollution and much of the area remains unsurveyed for many years. The aim of this investigation is to produce a benthic map of the area approximately 1 kilometre east of Rosemullion Head located in Falmouth Bay.

Methodology:

Four, 2 kilometre long transects were taken, each spaced 100m apart running parallel to Rosemullion head. A dual frequency side scan sonar was towed at shallow depth with a swath range of 75 metres in order to provide insight into the nature of the substrate. After identifying areas of interest, a submersible video system was used in order to truth the sonar return and identify benthos. A Van Veen grab system was also utilised in order to bring samples to the surface where sediments types and organisms were then identified.

Metadata:

Sidescan Survey: Started 1259. Finished 1337. 24/06/2016. Weather: CU/CB 4/8. Light Rain. Wind: F3/4 NW. Seastate: Slight. Tides for Falmouth: H0834 4.7m L1500 0.9m H2047 4.9m. Vessel: MTS Valonia. Personnel: 9 Scientists, 1 Supervisor, 2 Crew.



Figure 1. The common algae covered rocky substrata type seen in the first video recording station.



Figure 2. The *Desmarestia dresnayi* dominated rocky substrata type seen in the second video recording station.

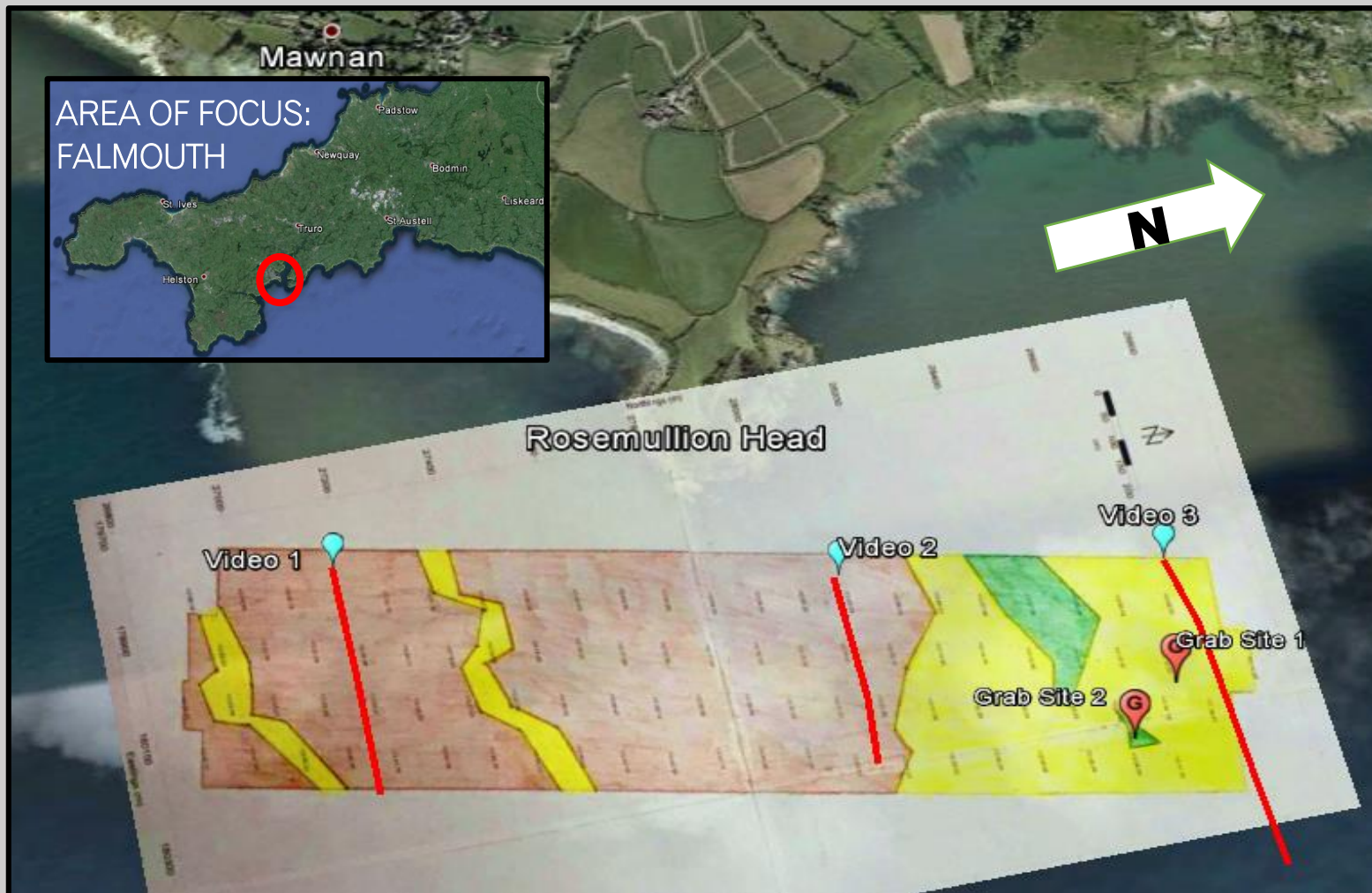


Figure 3. The sandy and dead mollusc shell substrata type seen in the third video recording station.



Video recordings: Three drop down video recordings were performed periodically across the sidescan transects, indicating the differing substrata and species present. The first two video stations displayed a rocky and algal covered substratum (Fig. 1 & 2.). The dominant algae species present were *Plocamium cartilagineum* and *Desmarestia dresnayi*, a Rhodophyta and chlorophyta respectively. Amongst this habitat a high abundance of *Marthasterias glacialis* the spiny starfish (fig. A) and *Tethya aurantium* the orange puffball sponge (fig. B).

The last video recording depicted a sandy substrate with prominent bedforms and rocky outcrops. Invertebrates such as *Cancer pagurus* (Fig C.) the common edible crab, *Asterius rubens* and *Marthasterias glacialis* were present. This was less biodiverse in comparison to the other two recordings. Although there was a higher diversity of fish including a shoal of *Atherina presbyter*.



Sonar Discussion:

In the sonar plot of the seabed, rocky substrate is observed in front of the headland, further north this turns into an area of sand and silt sitting in deeper water. On the southerly end of the sandy zone, the bed forms take on a uniform sinuous alignment with a wavelength of approximately 0.6 metres. This uniformity indicates a unidirectional flow and is likely due to strong tidal influence wrapping around the headland. To the north of the survey area towards Maenporth, the bedforms take on a less uniform sinuous structure, this possibly suggests less influence from tidal currents and more influence from variable surfaces processes such as wind driven waves. In the rocky outcrop, two strips of sand are observed going west to east, these are believed to be filled in gullies, with the sediment likely sourced from the nearby river. A strip of silty mud was observed between the two sets of sand bedforms in the north of the survey, this strip is located around the headland and therefore it is speculated the blocking action of the headland creates an area of low turbulence where silt and mud can accumulate.

Map Key

- Sand.
- Silt & mud.
- Rocky Outcrops.

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