Geophysical Habitat Mapping of the Fal Estuary

Falmouth 2014 : Group 2

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Introduction

Video Transects

26 June 2014
MTS XPLORER
Weather conditions:
Heavy rainfall,
8/8 cloud cover
Wind Speed: 3 on Beaufort scale

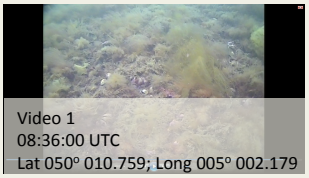
Low water: 11:04:00 UTC at 0.9m

High water: 16:39:00 UTC at 4.9 m

Group A
Departure Time: 07:00:00 UTC

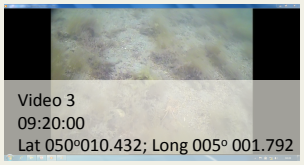
Aims

The aim of this survey was to create benthic habitat map of a portion of the Fal Estuary.



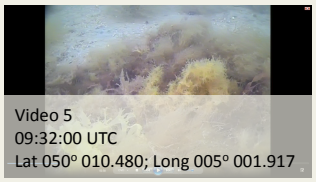
Video 1
08:36:00 UTC
Lat 050º 010.759; Long 005º 002.179

Video 2:
3/8 seaweed coverage
Exposed gravel sediment
Large Crepidula fornicata(00:01:56)
Dead Maerl fragments observed



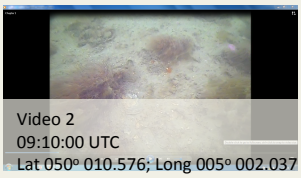
Video 3
09:20:00
Lat 050º010.432; Long 005º 001.792

Video 4:
Exposed Sediment
Very little seaweed coverage
Shell fragments and other biological debris.
Sulphur Sponge (00:04:08)



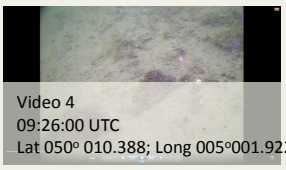
Video 5
09:32:00 UTC
Lat 050º 010.480; Long 005º 001.917

Video 1:
8/8 seaweed coverage
Crepidula fornicata(00:24:39)
Varigated Scallop (00:25:07)
Sea Lettuce



Video 2
09:10:00 UTC
Lat 050º 010.576; Long 005º 002.037

Video 3:
6/8 seaweed coverage
Spider crab (00:00:51)
Common Shore Crab (00:00:53)
Spiny Starfish (00:01:17)



Video 4
09:26:00 UTC
Lat 050º 010.388; Long 005º001.922

Video 5:
7/8 seaweed coverage
Sea lettuce
Corallina officinalis
Sea Noodle
Chondrus crispus

Background

The Fal Estuary is of scientific interest due to its unique location at the joining point of Penryn River, Truro River,Tresillian River and The River Fal. This estuary is the third largest natural harbor in the world.
The Fal Estuary is a distinct example of a drowned prehistoric river valley, known as Carrick Roads[1]. The river channel is roughly 30 m deep where the banks average 10-14 m. Large areas of the Fal Estuary are Special Areas of Conservation (SAC)[2] due to local flora and fauna such as Maerl (calcareous algae) beds just off St. Moors, and sea grass beds that function as nursing grounds for juvenile fish and other organisms[3].

References

[1] Pirrie, D., Camm, G.S., Sear, L.G. and Hughes, S.H. (1997) 'Mineralogical and Geological Signature of Mine Waste Contamination, Tresillian River, Fal Estuary, Cornwall, UK', *Environmental Geology*, 1-2 (29), 58-65

[2] Sites, E.M. & Area, S., The Fal and Helford. , (8).

[3] Perrins, J., Bunker, F. and Bishop, G. (1995) *A Comparison of the Maerl Beds of the Falmouth Estuary Between 1982 and 1992*, Peterborough: English Nature.

Sidescan Sonar

Methods

Sidescan sonar Towfish was deployed at 1m depth in order to analyze three transects across the estuary. Layback was calculated as 11.464 m . In order to support our interpretation of the sidescan sonar data, Ground Truthing was required. This was carried out by use of video transect due to the use of a Vanven grab being forbidden in SAC. Five videos were recorded within the boundaries of the three transects.

Transects

1. 07:51:33 UTC
Lat 050º 010. 758; Long 005º 002.302
Lat 050º 010.339 ; Long 005º 001.832 Lat

2. 08:00:16 UTC
Lat 050º 810.374 ; Long 005º 001.809
Lat 050º 010.776 ; Long 005º002.275

3. 08:09:27 UTC
Lat 050º 010. 791;Long 005º 02.240
Lat 050º 010.389; Long 005º 001.771

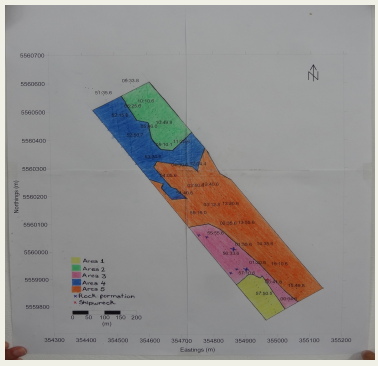


Figure 1: Color coded habitat map derived from the Sidescan Sonar transects shown in Figure 2.

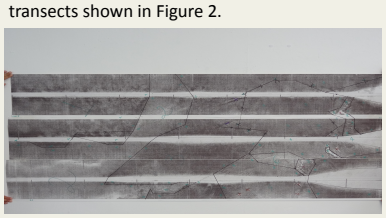


Figure 2: Three Sidescan Sonar transects used to create the habitat map shown in Figure 1.

Interpretation

Area 1 is represented by the color yellow. Video transect 5 was in closest correspondence to this area, along the border between Area 1 and Area 3, shown in pink. The sediment appeared muddy with broken shells and other biological debris. 7/8 seaweed coverage was also observed in these areas as shown above.

Area 2 is represented by the color green. Video transect 1 showed rocky and muddy sediment with broken shell debris. 8/8 seaweed coverage was also observed.

Area 4 is represented by the color blue. Rocky and sandy sediment were observed here in video transect 2. 3/8 seaweed coverage was observed in this area.

Area 5 is the largest area and is represented by the color orange. Video transects 2,3 and 4 showed rocky sediment to be most abundant in this area. The seaweed coverage in this large area ranged from 3/8 to 6/8.