

Ocean acidification: impact on calcifying macroalgae of the genus *Corallina* (Corallinales, Rhodophyta) and their associated biofilms

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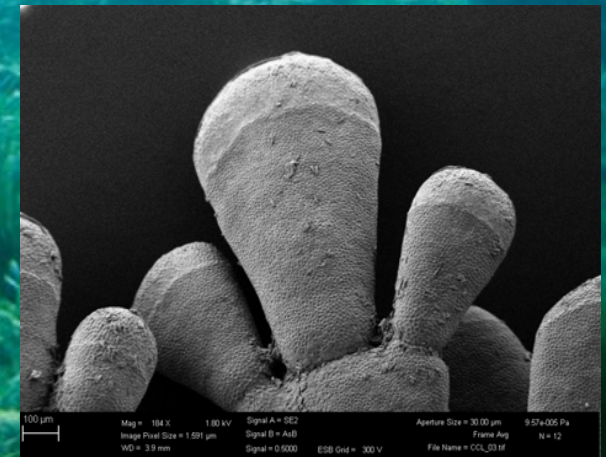
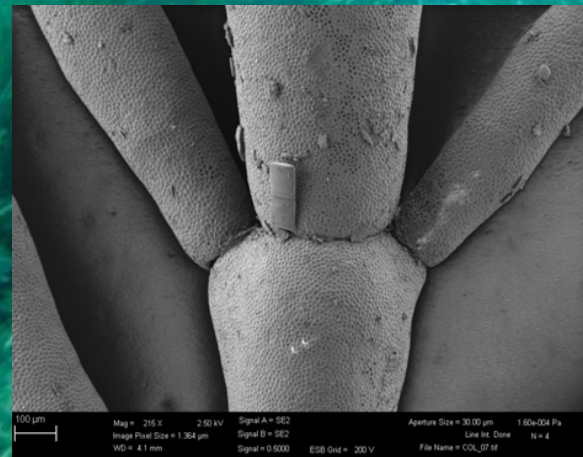
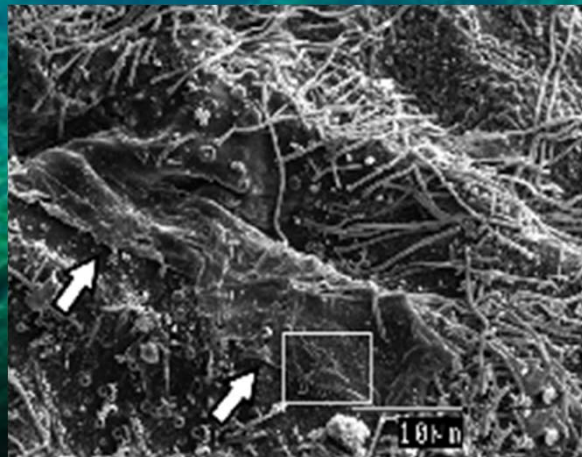


3 species of the genus *Corallina*: *C. caespitosa*, *C. elongata* and *C. officinalis*

- deposit high-Mg CaCO_3
- widespread in shallow rocky temperate and boreal regions
- 'autogenic ecosystem engineers'



Associated biofilms: microalgae (diatoms and cyanobacteria), bacteria, fungi and sediment particles- potentially complex relationships with macroalgae development- understudied element of macroalgae ecology



Develop an understanding of current populations

Seasonal sampling in Northern Spain, UK and Iceland

- growth and calcification
- morphology
- reproductive life histories
- skeletal mineralogy (Mg:Ca)
- **photophysiology**



Biofilm Analysis

- species/genus identification / community composition
- abundance
- pigment quantification



Culturing Experiments

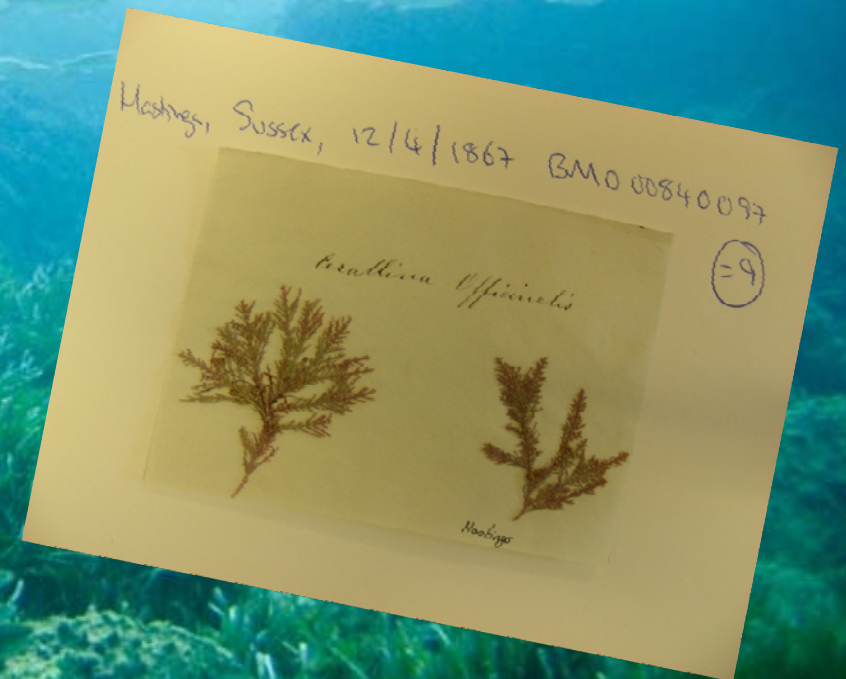
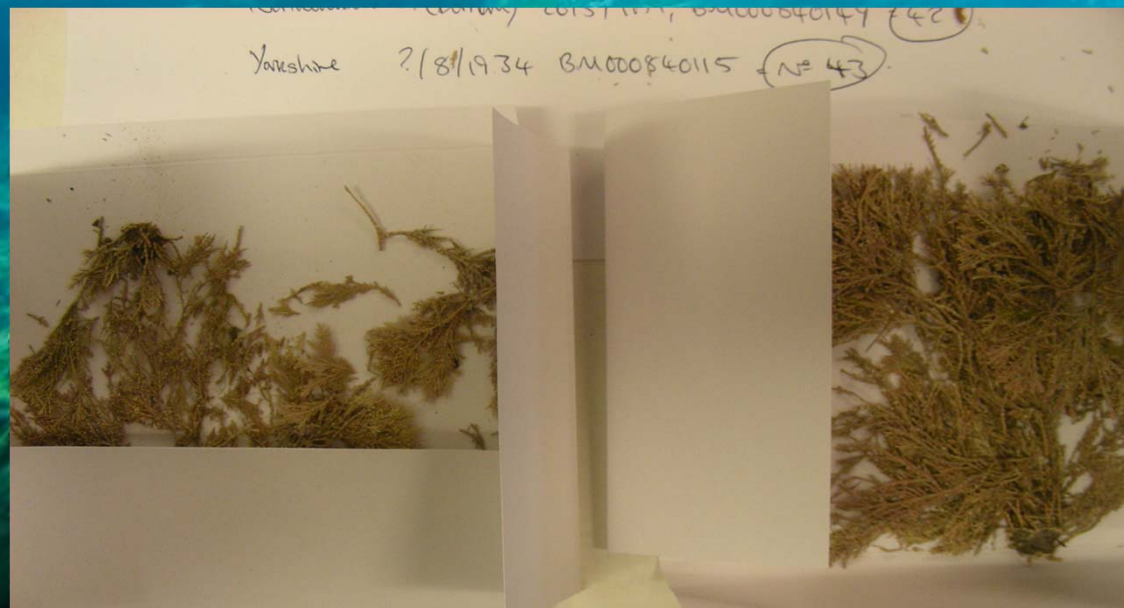
- spore culturing to observe early development
- simple growth rate incubations Vs temperature / irradiance



XRD analysis of NHM herbarium specimens

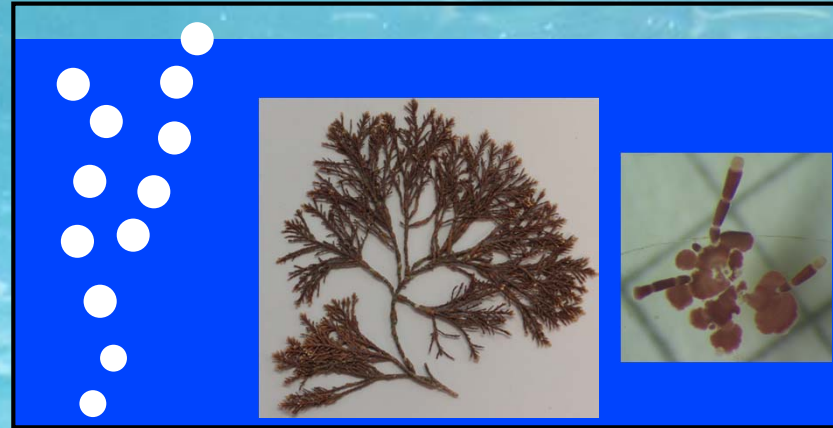


- Collections dating back to ca. 1850
- Inconsistent sampling in space and time
- EPMA in combination with XRD to aid in ageing samples?



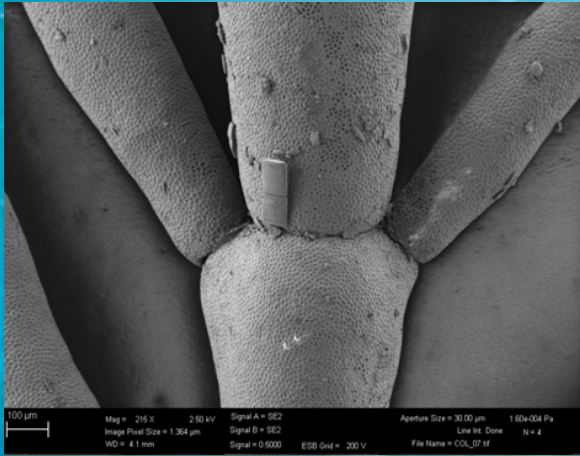
Mesocosm incubations based on future scenarios

- based at Cardiff University
- pH and temperature manipulation
- as long term as possible
- multiple species
- analysis of previously described parameters for comparison with the present day ecology of the *Corallina* species
 - i.e. growth, calcification, morphology, reproductive strategies, skeletal mineralogy, **photophysiology**, early developmental stages, (biofilm community composition and abundance)

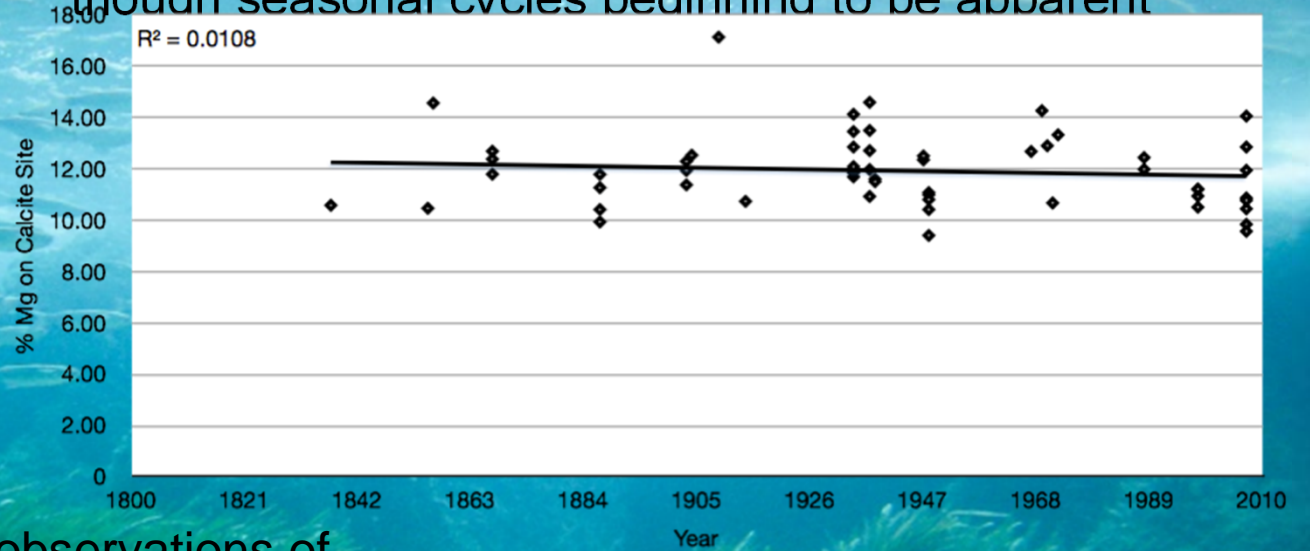


Very Initial Results

- Biofilms seems sparse, but lets wait for spring...



- Perhaps a lack of 'long term' trend in skeletal mineralogy, though seasonal cycles beginning to be apparent



- PAM fluorometry supports observations of species distributions in UK intertidal locations

