

Investigating the larval behaviour of the European flat oyster *Ostrea edulis*

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Why *Ostrea edulis* larvae?

- Throughout Europe there is **interest in restoring** the European oyster to recover its ecological functioning
- This interest is **underpinned by European and national legislation**, which aim to maintain and expand *O. edulis*' current abundance
- To ensure larval recruitment and connectivity between restored sites there is a need to **understand dispersal characteristics**
- While adult oysters have received a large amount of scientific attention, there is a **lack of knowledge on larval ecology**



Fig. 2. European flat oyster *Ostrea edulis* in the wild (Photo: Bill Sanderson)



Fig. 1. European oysters in aquaria as source of larvae for experimentation

From behaviour to dispersal

- Larval **behavior can influence intensity and direction of dispersal** through vertical migrations
- Vertical migration of larvae is often based on a combination of **responses to different cues** acting at different spatial scales
- Understanding larval responses to such cues is **essential for an accurate prediction of larval dispersal**



Fig. 3. *Ostrea edulis* larvae on the water surface as seen through a microscope

Hypotheses

Larval behaviour will influence dispersal from restoration sites:

- Larvae may respond to light and / or gravity and pressure
- Larvae may respond to food
- Larvae may respond differently throughout their larval life cycle
- Swim speeds linked to factors above may cause different outcomes compared to passive drifting



Fig. 4. Oyster larvae observation chamber



Fig. 5. Screen-grab of oyster larvae from USB microscope

Experimental Design and Analyses

Methodological approach

- A novel methodology has been developed that allows accurate, cost-effective observation and quantification of larval behaviour.
- The data collected inform the parameterisation of models of larval movement which, will be incorporated into hydrodynamic models
- Dispersion of larvae will be predicted to inform planned restoration projects

Response Parameters

- Distribution of larvae in observation chamber per treatment
- Swim speeds measured by calibrated USB microscope

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Fig. 6. Experimental set-up for larval behaviour studies