

Can wind farms impact mussel settlement in the Irish Sea?

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Larval dispersal is a function of 1) larval transport (which is also a function of physical transport and larval behaviour), 2) survival, 3) spawning and 4) settlement. Larval transport and settlement depends on physical process (tides, currents, winds) and larval behaviour. Mussels (*mytilus edulis* L.) represent 40 to 50 % of the total gross turnover of Welsh shellfish industries and the industry has been operating sustainably for over 50 years in North Wales. In this context, it is the interest for Mussels companies to understand where the larvae go in order to manage their stocks efficiently. A 2D hydronamic model in Telemac is applied to simulate the tide around the North welsh coast from Anglesey to Liverpool Bay. Then a particle tracking model under Matlab is used to understand the larval dispersal and recruitment. The preliminary results of the model showed that a proportion of mussel larvae (between 15% to 20% depending on the tide of release) are carried away from their native mussel bed to an area where the wind farms are implanted. Indeed, Gwynt yn Mor (the fourth largest wind farm in the world), Rhyl flat and North Hoyle are located between 10 and 15 off the welsh coast. In this state of mind, the wind farms represent a potential site of interest for mussel larvae settlement. Consequently, it could have both negative (less settlement onshore for mussel companies) and positive (improvement of larval survival) impact.

Key words: Wind farm, Hydrodynamic model, mussel settlement.