

# Wave dampening effects of offshore floating solar to promote aquaculture in the North Sea

## Msc. Thesis Opportunity

### Introduction

European seas are undergoing massive developments of marine infrastructure and face increasing competition in respect to spatial claims for activities in the marine environment. Traditional exploitation, such as fisheries, transportation and both oil and gas production are accompanied by new sustainable economic activities, including renewable energies, and tourism. Aquaculture is the fastest growing food producing sector in the world and the marine environment offers much greater possibilities to expand the earth's surface area that can be used for food production.

In January 2020, the European research project '*Multi-use platforms and co-location pilots boosting cost-effective, eco-friendly and sustainable production in marine environments*' (UNITED) started. In this project consisting of 25 European research partners and small-medium enterprises, 5 multi-use pilots will be executed to elaborate on the technical, regulatory, economic, social and environmental viability of different combinations of multi-use components. One of the pilots will be executed in the Dutch part of the North Sea, on one of the plots of the *North Sea Innovation Lab* (15km offshore of Scheveningen). Oceans of energy, a Dutch startup, will deploy and test a prototype system of offshore floating solar platforms in the second half of 2020. It is expected that these platforms have a wave dampening effect which could positively impact other offshore projects/stakeholders like aquaculture in the area behind the system.

### Research Objective

The objective of this research is to investigate the extent of wave dampening due to the solar farm infrastructure, and to define an optimal configuration of various sized offshore floating solar farms to provide optimal conditions for seaweed cultivation in a 'multi-use' setting

### Approach

- Literature research on the state-of-the-art knowledge about floating structures, offshore wave dampening and optimal conditions for seaweed cultivation.
- Analyse field wave measurements to study the effect of the floating farm on the dampening of waves
- Setup of a numerical model to reproduce the wave propagation in the North Sea and dampening effect of the floating platforms
- Validate the numerical model with the measurements collected from the field
- Perform an assessment to optimize the spatial configuration of floating solar farms in relation to seaweed farms

## Oceans of Energy

## Deltares



### The assignment

- this MSc-thesis offers a variety of activities ranging from offshore field work to in-depth data analysis and numerical modelling.
- It is the intention to hire a student for an extended graduation period of 10 months, against a fully paid monthly student allowance.
- The working location is to be further defined. Depending on actual Covid-19 regulations, it will be distributed between the premises of Deltares, Oceans of Energy and home office.

Interested? Please contact Roderik Hoekstra ([Roderik.Hoekstra@deltares.nl](mailto:Roderik.Hoekstra@deltares.nl)) and Brigitte Vlaswinkel ([brigitte.vlaswinkel@oceansofenergy.blue](mailto:brigitte.vlaswinkel@oceansofenergy.blue)) and include your CV, grade list and brief motivation.



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