

## **Report for MASTS Marine Energy Forum Small Grant.**

Sally Rouse,

Final year MASTS Prize PhD Student, based at SAMS.

The MASTS MEF Small Grant provided part funding to complete a three-month internship at Marine Scotland Science in Aberdeen. The internship was based within the Offshore Energy Environmental Advice team at MSS and involved spatial analysis of MSS datasets to quantify the use of oil and gas pipelines by commercial fishing vessels in the North Sea.

### **Project background**

The functioning of the North Sea ecosystem is heavily influenced by anthropogenic activities. Most notably, more than two million tonnes of fish are caught annually, and oil is extracted at a rate of approximately 700,000 barrels per day. The vast majority of North Sea oil under UK jurisdiction is extracted from within Scottish waters, and similarly fishing makes a large contribution to the Scottish economy. Due to the proximity of fishing and oil and gas (O&G) activities, there is occasionally physical interaction between the two industries. It is also anecdotally known that the fishing industry makes use of O&G infrastructure by fishing along pipelines, potentially benefitting from local artificial reef effects of enhanced fish production and/or aggregation.

Under OSPAR 98/3 and other international regulations, O&G operators are legally required to remove platforms, however this obligation does not apply to the 10,000 km of pipelines in UK waters. The decision as to whether pipelines will be left *in-situ* or removed is made on a case-by-case basis. If pipelines are left *in-situ*, operators have a duty to ensure the safety of fishing and navigation and protect the environment. In order to make predictions of the ecological consequences of the removal of infrastructure vs. leaving *in situ*, it is first necessary to comprehend the interaction of subsea oil and gas structures and commercial fisheries. Such an understanding will inform comparative assessments of decommissioning options, considering the economical and societal impacts of removal, through effects on ecosystem services and the fishing industry.

### **Methods**

To explore the interactions between fisheries and the subsea infrastructure, detailed analysis of spatial datasets held by Marine Scotland Science was undertaken. Spatial information of fishing location, obtained from the bi-hourly locations transmitted by vessels (VMS data), was combined with vessel logbooks to provide information of catches and landings value. This was combined with spatial datasets on oil and gas infrastructure held by the UK industry representative (UK Oil and Gas) and the Norwegian Petroleum Directorate. With the data, sections of pipelines that are used for fishing activity were identified, and the properties of those pipelines examined to understand how fishing activity (intensity, gear type) varies according to the type and size of subsea structure.

## **Outputs**

The results of this study have provided insight into the interaction between commercial fishing and the oil and gas infrastructure, and for the first time quantified what, until now, have merely been anecdotal accounts of this type of fishing behaviour. This is a vital first step in predicating the potential adverse effects or benefits of O&G infrastructure removal on the fishing industry and ultimately the marine environment and ecosystem services. A manuscript has been prepared based on the work completed during the 3-month internship. This is being submitted to the *ICES Journal of Marine Science*. In addition to the research outputs of the internship, I was able to advance my skills in spatial analysis and GIS, which will be beneficial to my own PhD research. The internship was a rare opportunity to experience first hand the translation of marine research into policy and provided insight into the role of Marine Scotland in managing and researching Scotland's seas.