TO INVESTIGATE THE SHORT TERM ECOLOGICAL EFFECT OF A LARGE SCALE OFF SHORE WIND FARM IN THE NORTH SEA

Introduction

There has been a thriving fishing industry courtesy the hydrological conditions prevailing in the North Sea, where the mixing of cold and warm currents lead to nutrient rich water and hence the large diversity of marine animals. Trawling is the main mode of fishing in the North Sea. The favourable conditions present in the North Sea have led to over fishing which eventually hit a peak in the 1980's when an output of about 3.5 million tons was reached. This is when the warning bells began to go off all round the region that over fishing and un-sustained exploitation of the sea would lead to disturbed marine food chain dynamics and complete species being wiped out or are on the verge of being wiped out. To counter the rampant fishing there has been a rule put in place by the EU called the Common Fisheries Policy.

A more contemporary issue regarding the North Sea has been the boom in the renewable energy sector and its implications for the North Sea, especially that of wind energy and also tidal power. Last year saw the commissioning of the largest wind farms one by UK and the other by Denmark. The studies show that in the 3 rounds of offshore wind farms the total installed capacity in MW would be about 32200, for the UK alone, the prevailing and permanent winds blowing across the sea makes offshore wind farms feasible.

Scope

Looking into the regions of the North Sea where currently there are developments taking place, in the sphere of renewable energy and especially off shore wind farms. The region has an abundance of wind energy and tapping this is not only a challenge but also a necessity in the view of the eventually doomed relationship with oil and gas.
There are many avenues in the North Sea where feasible harnessing of wind energy is possible, few of the notable ones are The Dogger Bank, where a consortium of Industries tendered for licenses for building a Round 3 Wind Farm, generating around 9000MW by the time it is in full operational status. Hornsea, also has a Round 3 farm in the pipeline, its installed capacity is about 4000MW. Norfolk bank too comes under the same umbrella notching up a 7200MW project. The above Round 3 Wind Farms were announced by the government in 2007, some like the Dogger Bank has been sanctioned, in January 2010. Round 3 wind farms are to be operational no time before 2012 but they will supply electricity to the grid only by 2015. The fears of that construction and movement of material and man at this large scale will affect the ecosystems and destroy the natural habitat, been addressed by a research done by a Dutch team. The no shipping zone and no fishing in the wind farm area means the biodiversity has a largely undisturbed existence. The study was undertaken by IMARES (Institute for Marine Resources and Ecosystem Studies) on a wind farm operating 36, 3MW wind turbines and showed that the farm has affected the diversity positively and increased some populations.

Potential findings

Fish species indigenous to the North Sea, this is a consequence of the vast inflow of nutrient rich waters from the Atlantic mixing with the warmer water from the tropics and the relatively shallow continental shelf, all this contributed to the boom of fish species and bio diversity had been one of the highest, including haddock, cod, whiting, ling, skate, thornback ray, witch, plaice, lemon dab and flounder. Number of the fishes in the region has drastically dropped since the fishing boom and hasn't seen a positive trend ever since. Fishes like Cod, Whiting and Saithe had about numbers in the 12 million + region in the 70s, now around 2000, the numbers have dipped below 4million. Similarly with Herring, Sprat , Sandee, numbers peaked in the 70s to about 16 million and today productions are below 12 million, but this is also due to predatory fishes dying out sooner. The same observation can be noted in the shellfish and seabed living creatures. The numbers showing no upward trend is a worrying sign, but the Dutch research with the effect of off shore wind farms effecting bio diversity. The studies showed the he research team found that new species have become established. They stated that rocks piled around the columns of the turbine have provided new habitats for species and without commercial fishing and shipping traffic the wind farm offers a peaceful sanctuary. The research shows that the fish fauna is incredibly varied and the area provides shelter to Cod and Porpoises. However, some birds, including gannets are avoiding the area, whilst seagull numbers remained stable the number of Cormorants has increased. Today Cod Stocks are in grave danger; this puts all the other fishes in danger as the integrated food web is being stressed heavily. The wind farms has a good potential to become a safe haven for these species and can be a good signs for the future, the population can show positive trends and the fishing industry can grow again.

Figure 1 - Species previously found in the North Sea

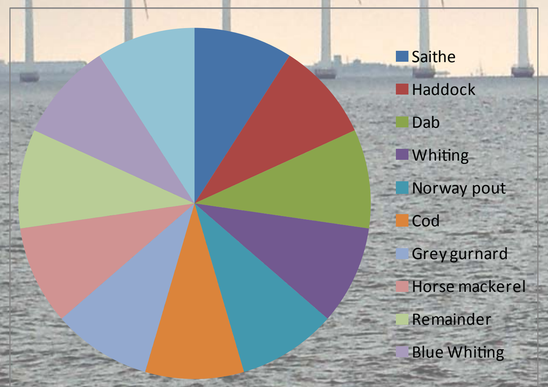


Figure 2 - Endangered and extinct species

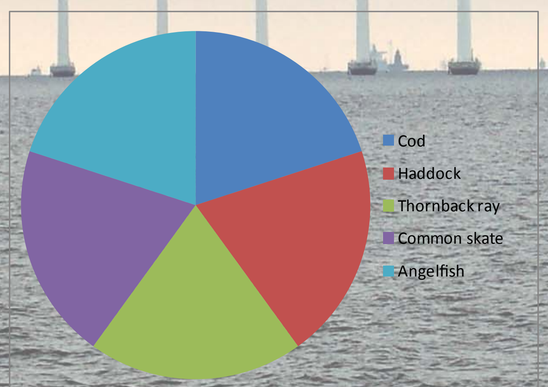
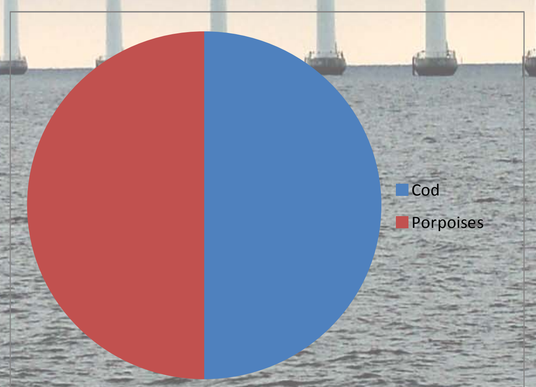


Figure 3 - After wind turbines



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