



Design and analysis of fish farms for exposed seas

Type of project: MSc

Project description:

Land based agriculture is already pushing the limits of sustainability and to feed new generations a more sustainable approach is needed, whereas the oceans portray a great deal of unused potential. 70% of the earth's surface is covered by ocean, yet only 2% of the global food consumption originates from the sea. Wild capture of assesible stocks are in many cases driven to their limits. Most of the fish stocks are already fully fished or overfished. Growth in the current capture fisheries is therefore not likely to occur in the future.

Marine aquaculture can relieve some of the pressure on the fished stocks and its environmental concerns. However, aquaculture production that interferes with the environment (e.g. net pens, floating ropes etc.) must keep a practice that does not cause additional damage to the surrounding environment. Due to low current and waves in sheltered costal areas where most of the existing fish cages are located, pollution have been continuously reported for the near shore fish farms due to the build-up of fish wastes and un-consumed feeds. Sealice is another big concern for the fish-farming industry.

One of the solutions is to move the fish cages to exposed sites, which leads to more space, stronger currents and greater distances from the seabed. The currents will dilute and disperse the fish waste, and thus reduce the pollution. The sea lice settlement on fish is also less successful in the higher current velocities found in offshore waters. Stronger fish-farm designs are thus needed in order to survive in harsher (wave, curent and wind) environments conditions. The project will look at the design optimization and analysis aspects, e.g. stability, hydrodynamics, mooring system and operational limits of the fish farms for exposed seas.

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