Session 2: Sea food production

Generate evidence and advice for management of wild-capture fisheries and aquaculture — to help sustain safe and sufficient seafood supplies

(7) VISTools - Fishing vessels as automatic data-gathering platforms – a win-win for fishers and scientists

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A skipper of a fishing vessel has access to various sources of information that help him manage his work. Sensors track the location (e.g., GPS/VMS), monitor any fishing activity (e.g., towing force, depth), fuel use and register landed catch (i.e., via an electronic weighing scale). These sensors gather valuable data, but none of that are of any use, if data are not integrated, stored or processed.

By automating data collection from conventional equipment on-board and coupling this information with economic parameters (e.g. fish prices and fuel prices), the VISTools-project aims to (1) develop a business intelligence tool for fishers and (2) evaluate the possibility of sharing this information for research purposes. With this approach, we hope fishers gain new insight in the economic performance of their fishery. This could trigger behavioural changes that increase the efficiency of the vessel and simultaneously reduce the impact on the environment. Additionally, the business intelligence tool incentivizes fishers to keep gathering information that have great scientific relevance, and share this information under clearly defined conditions. This data could open new research possibilities including catch prediction models, decision support tools, avoidance of sensitive areas, and real time closures. This high resolution of spatial information can also lead to better advice to fisheries management and governmental bodies (e.g., real time monitoring of quota usage).

The first results of this project have led to the development of a proof-of-concept business intelligence tool that logs the landings of a single test vessel and automatically tracks economic performance. With this tool, a vessel owner can evaluate the economic performance and catches of a vessel at haul level. Since all sensor data have a geographic component, all landings data can be tracked to a certain location and provide insights in the economic performance of the fishing grounds (heat map). The six months' worth of data have already proven to provide interesting insights for the skippers and vessel owner, and is very promising for scientific research.

Work related to ICES via WK SCINDI (Workshop on Science with Industry Initiatives)

(8) Scientific surveys: the backbone to fisheries science

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Within the EU Data Collection Framework, Belgium is responsible for 2 scientific surveys, both supported by ICES: the Belgian beam trawl survey (BTS) and the demersal young fish survey (DYFS). The surveys occur in the third quarter and serve as a data gathering platform to increase knowledge on the marine ecosystem.

During the BTS, 62 stations are sampled along the south-east coast of the UK by RV Belgica. The initial purpose of this survey is to monitor trends in demersal fish stocks, especially sole (Solea solea) and plaice (Pleuronectes platessa) by collecting information on length, weight, age, sex and maturity. The Belgian BTS survey index is used in the assessments of both North Sea sole and plaice. However, all fish species are weighted and measured and since 2009 also epi-benthos is collected, counted and weighted by species. Since 2011, marine litter is collected, categorized and weighted and this data is supplied to OSPAR and WGML.

The DYFS is concentrated in the Belgian Part of the North Sea where 33 stations are sampled by RV Simon Stevin. The purpose is to monitor trends in mainly juvenile flatfish such as sole (Solea solea), plaice (Pleuronectes platessa), dab (Limanda limanda) and round fish such as whiting (Merlangius merlangus) and brown shrimp (Crangon crangon). Catch

numbers are used as input for the assessments of both North Sea sole and plaice. Since 2018 also age information of sole and plaice is collected. Since 2018, marine litter is collected, categorized and weighted.

Besides biological information, also a series of abiotic parameters are collected in both surveys: temperature, salinity, wind speed, etc. Due to the wide range of data on a diversity of species and environmental parameters, the data can be used as input for the Marine Strategy Framework Directive (MSFD), OSPAR, the ecosystem approach or research about fish adaptation to climate change.

The key value of survey data lies in the fact that data are collected every year, same period of the year with the same protocol, same area. This very valuable long-time series does not only serve many ICES working groups but also acts as the backbone in diverse science projects (e.g. EMFF project IRIS2, Pulsvisserij Vlaamse Kust Deel 1, Marine Litter), MSc theses and PhDs.

Work related to ICES via SCICOM, ACOM, EOSG, WGBEAM, WGNSSK, WGISDAA, WGISUR, DATRAS, WGCRAN, PGDATA, WGBIOP, WKREO, WKBECOSS, WKPETSAMP, WKSHARK, WGEF, WGCSE, WGDG, WKICDAT, WGTIFD, WGBYC, WGMEDS, WGML.

(9) Some points to consider for exposed aquaculture: first experiences in Belgium

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Marine aquaculture presents an opportunity for increasing seafood production in the face of growing demand for marine protein and limited scope for expanding wild fishery harvest. With the convergence of environmental and aesthetic concerns, aquaculture, which was already competing for space with other more established and accepted uses, is having an increasingly difficult time expanding in nearshore waters. Farming in offshore marine waters has been identified as one potential option for increasing seafood production and has been a focus of international attention for more than a decade. Investment in robust technologies and investigation in system designs for high energy environments has started but is still in its infancy. Despite the technical challenges for farming in the hostile open ocean environment, there is sufficient rational for pursuing the development of offshore farming.

When mapping the existing human uses, the ocean is a crowed place. Therefore, it is worthwhile to explore possibilities for co-location of facilities, like in this case wind turbines and shellfish farms. Although not obvious, one benefit to be gained is the reduction of the overall footprint of human uses in the ocean. Meeting challenges of multi-use facilities in the open ocean definitely requires innovation. The concept is intriguing however and is consistent with the goals of the Belgian Marine Spatial Plan (2020-2026).

The project “Edulis” (FIVA/EFMZV 16/UP2/05/Aqua) was the first pilot in the world to explore the possibilities to grow blue mussels inside the concession of windfarms in the Belgian part of the North Sea. It was coordinated by Ghent University and involved partners from the private and public sector. Besides the technical challenges, possible synergies were looked at between the production of sustainable seafood and renewable energy as well as the economic reality to grow seafood under exposed conditions in windfarms.

Work related to ICES via WGOOA (newly created Working Group on Open Ocean Aquaculture)

(10) Hakaton: An interactive fish stock assessment tool

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Built as a web application, the interactive fish stock assessment displays a map and allows the user to choose the fish species and the timeline. Once these are chosen, the advice for that time will display with a traffic light system, by displaying an area as green, orange, or red. If there are many years of data available, the data series can be displayed as an animation. If the user clicks on a certain stock, the data that the advice is based on appears. The tool is based on ICES