Theme session H

Drivers of sustainability in fisheries for non-quota and data-poor species

Conveners: Graham Pierce (Spain), Anne-Marie Power (Ireland), Jean-Paul Robin (France)

This session was proposed by Graham Pierce (Spain), Anne-Marie Power (Ireland), Jean-Paul Robin (France), Cristina Pita (Portugal) and Sebastian Villsante (Spain). Pierce, Power and Robin convened the session while Pita and Villasante acted as rapporteurs.

The rationale for this session relates the need to ensure sustainable fishing on data-poor non-quota species such as cephalopods, considering the potential for overfishing if fishers switch to target such species at times when target quota species are less abundant. Such switching occurred in the English Channel in summer 2017, when trawlers targeted cuttlefish and high landings were reported; this led to newspaper reports of “black gold”. This raises questions several questions. Can we forecast high abundance episodes in non-quota and data-poor species? Can we predict when they are likely to come under pressure (why/when will fishers switch to take these species)? And what measures can we take to control or mitigate the effects of intense exploitation of non-quota species?

The session, therefore, aimed to cover topics such as:

- assessment and forecasting for data-poor species, especially those showing wide fluctuations in abundance;
- separation of environmental, fishery, and stock (density dependence) effects on abundance;
- interactions between non-quota and quota species in mixed fisheries;
- understanding economic drivers of fishing on/switching to non-quota species;
- the value chain and markets for such species;
- appropriate management measures (including transnational cooperation) and governance systems; and
- obstacles to sustainability and overcoming them.

In relation to cephalopods, the session drew on work by ICES Working Group on Cephalopod Fisheries and Life History (WGCEPH) and the current INTERREG project “Cephs & Chefs”. The session also attracted presentations focused on data-poor fish species. There were 13 oral presentations and 3 posters.

Three oral presentations (Barnwell et al., Matos et al., Rocha et al.) focused on life cycles, providing information for data-poor cephalopod species and offering insights into implications for assessment methods as well as evidence of spatial and temporal patterns in life history parameters. Thus, in short-lived loliginid squids, size at maturity can vary markedly between years (Barnwall et al.).

Four oral presentations looked at methodology to assess data-poor stocks. Scarcella et al. described three Monte Carlo simulation-based methods. Ramos et al. described

assessment results for four data-poor fish species in Falkland Islands waters. Robin investigated the use of species associations (and hence the abundance of other species) to improve predictions of squid cohort strength. Larivain et al. applied various assessment methods to cephalopod stocks to estimate exploitation rates, in particular the stochastic Surplus Production model in Continuous Time (SPiCT), which can deal with a range of data quality issues. A poster by Pierce et al. speculated on the future of cephalopod stock assessment, including the possible transition to ecosystem-based assessment.

Two other oral presentations concerned the nature and extent of exploitation on non-quota species. Borjesson & Bartolini described a method to distinguish targeting of halibut in the prawn fishery, based on examining the spatial distribution of hauls with high halibut catches. Arkhipkin showed how uncontrolled fishing in the high seas of the SW Atlantic threatens the sustainability of fishing on the squid *Illex argentinus.* A poster by Valeiras et al. looked at the extent to which cephalopod catches are discarded in bottom trawl fisheries in northern Spain.

Three oral presentations looked at distribution or abundance trends over time, in cephalopods (Pierce et al., Oesterwind et al.) and in fish (Rindorf et al.) and possible causes. The squid *Illex coindetii* has apparently shifted its range northwards to become more abundant and probably to breed in the North Sea (Oesterwind et al.). The recovery of several fish species sensitive (to fishing) was investigated (Rindorf et al.), following reductions in fishing effort. The species which continued to decline after reductions in effort were all restricted to the North Sea, which is warming rapidly, and may all be at the southern limit of their range in the North Sea. A poster by Abad et al., looked at environmental correlates of octopus (*Eledone* spp.) abundance.

Finally, Villasante et al. focused on cephalopods in the value chain, describing trends in cephalopod landings, prices and consumption with a focus on Portugal and Spain, countries whose production, trade and consumption of cephalopods are among the highest in the world.

The presentations and discussions highlighted common issues with assessment of data-poor fish and cephalopod stocks, identifying several promising approaches. The need to bring such species under the umbrella of fishery management regimes was also clear, both for non-quota stocks in EU waters and for commercially important species in the high seas. Another emerging message was the reality of climate change effects on non-quota and data-poor species.