

## Theme Session N

### The pelagic fish complexes in the North Atlantic Ocean: Distribution, productivity, and interspecific competition during changing climate

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#### Background

The North Atlantic is the habitat of many large stocks and highly migratory pelagic fish species. Changes in their distribution, migratory patterns, abundance, and productivity cause continuous challenges for sustainable fishery management. A number of publications suggest that these changes are driven by environmental variability and its impact on ecological processes. Many of these pelagic fish stocks support valuable fisheries and have over time showed dramatic fluctuations in stock size and spatial and temporal distribution. Their dynamics are governed by primary and secondary production influencing the survival of early life history stages and thus recruitment dynamics as well as the feeding success of older life stages. Climate change, acting through ecological and environmental factors, can be expected to contribute and facilitate further displacement of pelagic fish stocks in a poleward direction. Changes in spatial and temporal overlap in distribution of these pelagic fish stocks cause variation in interspecies predation pressure and competition for food.

The aims of the session were to:

- 1) Map recent changes in migration patterns of highly migratory pelagic fish stocks on both sides of the northern North Atlantic;
- 2) Explore ecological and stock-related effects of changes in their migration patterns;
- 3) Explore the interaction between different fish stocks as a foundation for a more ecosystem-based fishery management;
- 4) Elucidate the importance and need of multidisciplinary surveys in order to make integrated assessment for the areas and stocks under consideration.

#### Session content

The session contained 19 oral presentations and 9 posters. The posters were also given 5 minute slots in the session. The session was fairly well attended given that it took place on the last day of the conference. Most of the work was empirical, and there was only one spatial model and one multispecies model presented.

There were many presentations given on the NEA mackerel stock, documenting its westwards and northwards expansion. In particular the distribution around Iceland was very well covered, including a presentation regarding spawning of mackerel in this area. There were also several other presentations on changes in distribution of stocks such as capelin, boarfish, and blue whiting. There were also some diet studies as well as a few studies on migration processes on small and large scales. Another recurring theme was stock discrimination using genetics and otoliths. Several studies concluded that micro satellites were inadequate for discriminating between stocks, and were instead developing SNP based techniques.

After the talks there was a general discussion for about 20 minutes. It was noted that a common feature is the coupling of expansion in available habitat and density dependent expansion of distributional range. The value of the empirical studies presented for helping to parameterize future modeling studies was acknowledged. In a summary statement it was stated that the broad focus of the session on the pelagic stocks in this rather large ocean area spanning the entire North Atlantic was very useful as it allowed a comparative view on the stocks and the processes affecting them. Developing integrated assessments in the Northern Atlantic ecosystems will be a great challenge, so it was encouraging to see the amount of good empirical and modeling work being done to increase our understanding of this environment and its dynamic stocks.