DOCTORAL CANDIDATE:	Leonie Färber
DEGREE:	Philosophiae Doctor
FACULTY:	Faculty of Mathematics and Natural Sciences
DEPARTMENT:	Department of Biosciences
AREA OF EXPERTISE:	Marine ecology
SUPERVISORS:	Joël Durant, Øystein Langangen, Nils Chr. Stenseth
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Fish populations fluctuate in their abundance and in their distributions. Often, these dynamics are modulated by the fish's life history. However, the natural variability and distribution changes might intensify under human-induced stressors such as climate change and fishing pressure. The impacts of these stressors can lead to non-linear and unpredictable discontinuous behaviour in the population. Thus, understanding the population dynamics of a fish stock and recognising the impacts of stressors is instrumental for sustainable management. In this thesis, Leonie Färber investigated the response of Atlantic cod (*Gadus morhua*) and Atlantic herring (*Clupea harengus*) stocks to the impacts of climate change and fishing pressure. Both species have high commercial interest and are key species in many ecosystems across the North Atlantic.

The Barents Sea cod stock displays long-distance migrations from its feeding grounds in the Barents Sea to spawning grounds along the Norwegian coast to profit from a seasonal variable environment. Färber investigated the spawning migration of the Barents Sea cod and the associated costs and benefits for the population. The results show that in southern spawning grounds an offspring size advantage can counterbalance parental migration costs.
Additionally, the contribution of climate and/or fishing to changes in the distribution at the spawning grounds was explored. The findings indicate that fishing leading to demographic changes in the stock did not affect the distribution at the spawning grounds in recent years.

Due to their high commercial interest and known strong biomass fluctuations, Atlantic herring stocks were investigated for regime shifts in response to fishing pressure, climate change and changes in predator biomass. Only few stocks displayed abrupt and long-lasting regime shifts and most herring stocks recovered fast after disturbances.

Furthermore, in order to explore the resilience of fish populations to disturbances, Färber tested in a theoretical approach a broad range of fish life histories and their response to environmental variability in combination with fishing pressure. The resilience of a population is determined by its life history, with slow growing and/or small sized species being more vulnerable to disturbances.