

## ICES CM 2016 Theme Session C

### Ticket to spawn: Using economic data to shed light on biological hypothesis

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We analyze 10 years of commercial landing tickets (2004-2013, reported as size-classes) to investigate the hypothesis that Northeast Arctic (NEA) cod (*Gadus morhua*) caught south of Lofoten is larger than cod caught in Lofoten or further north in Finnmark because of higher energetic costs of long migration. NEA cod has its main feeding areas in the Barents Sea. But the adults migrate against the Norwegian Coastal Current to spawning grounds along the Norwegian Coast. During the last decades, the spawning pattern of the NEA cod has changed. The spawning grounds south of Lofoten are currently less used. However, these southern spawning grounds are potentially beneficial for the growth rates of larvae and juveniles due to warmer temperatures compared to more northern spawning grounds. One explanation for this change in behaviour is that the southern grounds might have become too warm due to climatic change. Another reason might be that industrial fishing has affected the cod stock demography by selectively harvesting bigger individuals. This would have left the population with small sized individuals which might energetically not be able to swim to the southern spawning grounds. We would expect to see a higher proportion of large cod caught south of Lofoten compared to the proportion in Lofoten or Finnmark. Otherwise, we would expect the same proportion of large size-classes in all areas. Preliminary results indicate that this approach may shed light on the spawning behavior of NEA cod and its relationship to climate and demographic changes.

**Keywords:** Spawning – NEA cod – Size distribution – Demographic effects – Climate effects

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