Spatial distribution of cod on the Faroe Plateau

– Spawning locations and temperature

Katharina Maj Ottosen | University of the Faroe Islands and Havstovan | katharinao@hav.fo

Background

The Faroe Plateau Water is partially separated from the surrounding oceanic water by a tidal front located at around 130 m depth. The Faroe Plateau has a self sustained plankton and fish community, where the Faroe Plateau cod is one of the species. The Faroe Plateau cod spawn from February to May with peak spawning in late March. There are two main spawning locations close to the tidal front: One in 'Vágahavið' in the west and one in 'Norðhavið' north of the islands (Fig. 1). The preferred spawning temperature of cod varies among cod stocks and ranges from 0 to 6°C. Exceeding 6 °C, the spawning success is probably negatively affected by the temperature. The mean surface temperature in spring on the Faroe Plateau has increased by 0.7°C (from 6.9-7.6°C) during the period from 1999-2012.

There is a need to elucidate how this affects the Faroe Plateau cod in present and future.

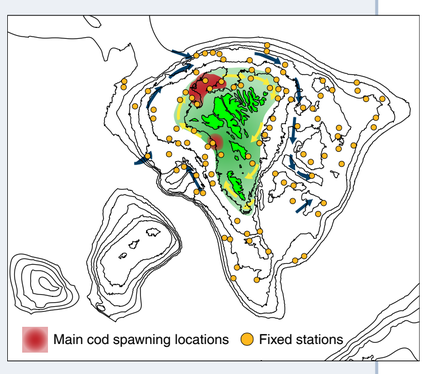

Figure 1. The 100 fixed stations on the Faroe Plateau that are occupied during the groundfish survey in spring. The red areas show the main spawning locations.

Goals

- Does the spatial distribution of the Faroe Plateau cod change over time and what variables are influencing it?
- How does the distribution of cod change during the spawning season and other times of the year?
- Does the distribution of cod change in relation to the distribution of their prey organisms?
- Do the Faroe Plateau cod have a future?

Data

Data has been collected by the RV "Magnus Heinason" in the spring groundfish survey that runs in February and March. Data on cod has been collected from 1994-2013 while surface temperature has been collected from 1999-2012. In spring the survey occupies 100 fixed stations covering the Faroe Plateau area (Fig. 1)

Preliminary results

- Cod spawning distribution varies between years (Fig. 2).
- Cod spawning distribution range from being limited to the western part of the plateau (2a) to cover the whole plateau (3a).
- Sea surface temperature varies between years (Fig. 2b and 3b).
- The CPUE (kg/h) is affected by temperature. High temperature result in low CPUE and vice versa (Fig. 4).
- When CPUE decreases the number of stations with spawning cod increass (Fig. 5a). The distribution is broadened towards east.
- When CPUE decreases the number of spawning cod increases and vice versa (Fig. 5b).

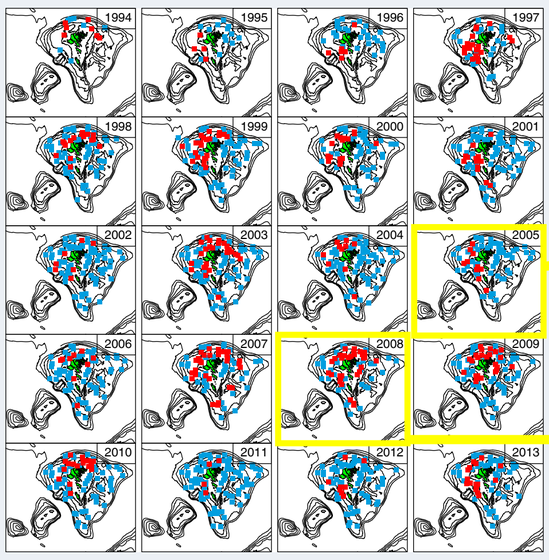

Figure 2. Stations occupied by spawning (■) and non-spawning (■) cod in the period 1994-2013. Data is collected during the groundfish survey in spring.

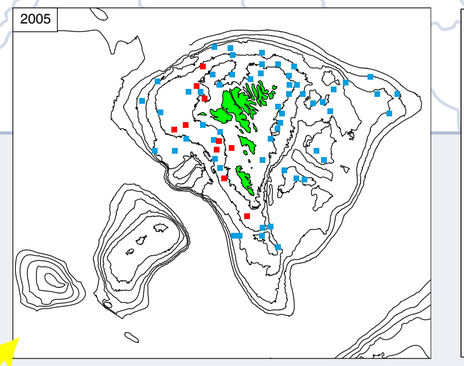

Figure 2a. Stations occupied by spawning (■) and non-spawning (■) cod in 2005.

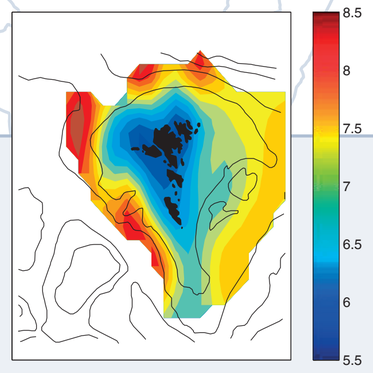

Figure 2b. Surface temperature collected during the groundfish survey in spring 2005.

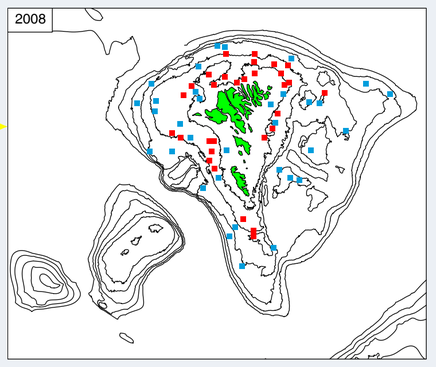

Figure 3a. Stations occupied by spawning (■) and non-spawning (■) cod in 2008.

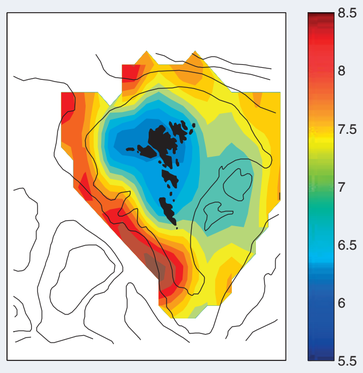

Figure 2b. Surface temperature collected during the groundfish survey in spring 2008.

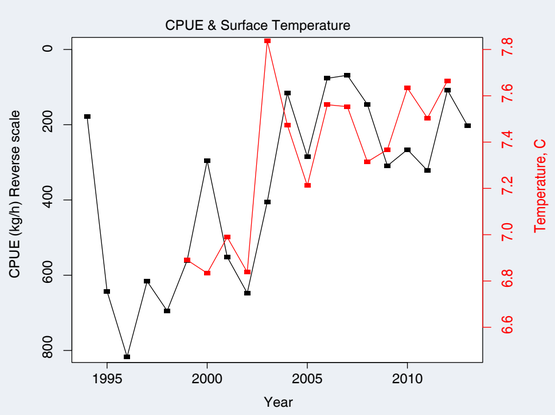

Figure 4. CPUE (kg/h) and surface temperature for the period 1994-2013. Note the CPUE is plotted on reverse scale.

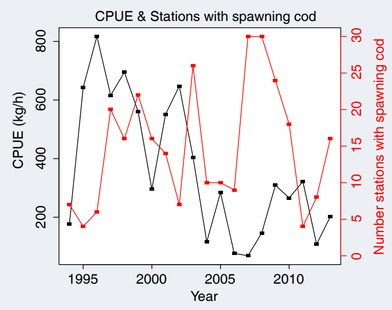

Figure 5a. CPUE (kg/h) and number of stations with spawning cod for the period 1994-2013.

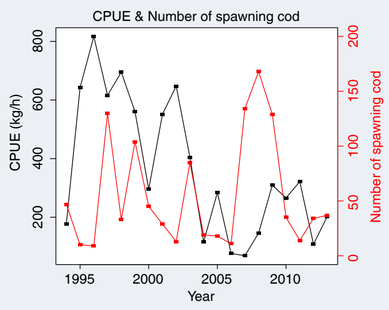

Figure 5b. CPUE (kg/h) and number of spawning cod for the period 1994-2013.

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UNIVERSITY OF THE FAROE ISLANDS
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