

PREDICTION OF CAPELIN GROWTH FOR USE IN CAPTOOL

by

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Background

Since 1999, a 1-year prognosis of capelin has also been made during the assessment, using CapTool. The prognosis gives the abundance of 1+ capelin during the survey in year $y+1$, based on the survey of 1+ capelin in year y , as well as the 0-group survey in year y . The temperature and the cod stock abundance are also taken into account in this prediction. Since capelin is a key species in the ecosystem, e.g. as food for cod (*Gadus morhua*) and other predators, such a 1-year prediction is important for predicting the development of other important stocks in the ecosystem. It also gives some indication of whether the stock will be large enough to support a fishery in year $y+2$. An evaluation of the prediction methodology is given in Gjørseter et al. (this symposium).

A key element in the 1-year predictions is the growth. In this poster, we make regressions in order to improve the 1-year predictions for capelin length growth, which are used in CapTool.

Results of regressions

$$L_{y+1,1} = 0.36L_{y,0} + 8.10 \quad (r^2=0.20, p < 0.05)$$

$$L_{y+1,2} = 0.49LI_{y,1} - 0.26Cap_{y,1+} + 9.29 \quad (r^2=0.66, p < 0.05)$$

$$L_{y+1,3} = 1.37 LI_{y,2} - 1.39 \quad (r^2=0.34, p < 0.05)$$

- $LI_{y,a}$: Mean length (cm) of immature capelin of age a in year y , from capelin survey
- $L_{y+1,a+1}$: Mean length (cm) of (all) capelin of age $a+1$ in year $y+1$, from the capelin survey
- $L_{y,0}$: Mean length (cm) of 0-group capelin, as observed during the 0-group survey in year y
- Cap_y : Biomass (million tonnes) of capelin (1+) in year y

The following variables were tested, but found not to improve the models:

- Kola temperature January-September or August-September.
- Plankton abundance by size fraction or total, from autumn survey.

Conclusions

- Length of age 1-3 capelin depends on length of age 0-2 capelin the year before.
- Growth from age 1 to 2 seems to be density-dependent.
- For growth from year y to $y+1$, no relationship was found to temperature or plankton abundance in year y .
- The equations given will be implemented in CapTool.

Further work

- Break the data (temperature, plankton etc. down by area/water mass.
- Check correlation with ambient temperature and with inflow of water to the Barents Sea.