



# Bio-physical properties of Norwegian coastal cod eggs



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Vertical distribution of fish eggs and larvae is a key factor for transport and retention of the offspring, and for problems linked to mixing/separation between populations, and hence for mechanism maintaining genetic differentiation among local populations, in combination with high site fidelity and natal homing of older cod. The vertical distribution is determined by the combined effects of local salinity structure of the ambient water and by the specific gravity of the eggs. The specific gravity of the eggs is determined their bio-physical characteristics. We have studied bio-physical properties of Norwegian Coastal cod (*Gadus morhua*) eggs from different areas (Porsangen, Tysfjord, and Helgeland).

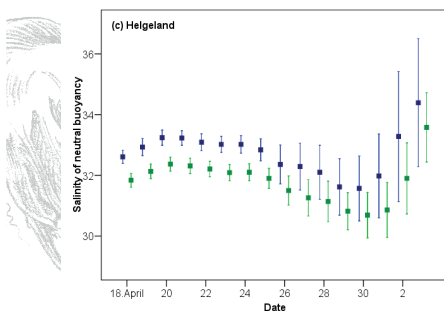
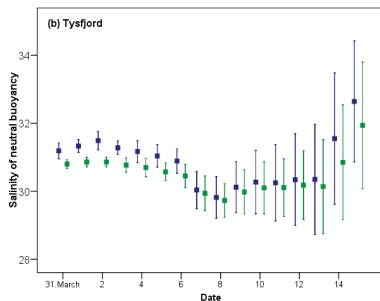
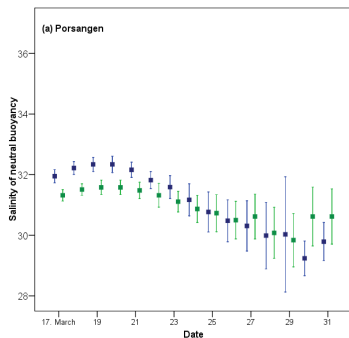


Figure 1. Egg buoyancy from 2-day-old until hatching expressed in ppt salinity where the eggs are neutral buoyant. (a) Porsangen; (b) Tysfjord; (c) Helgeland. Values are mean in each of two replicate columns. Vertical bars are standard deviation.

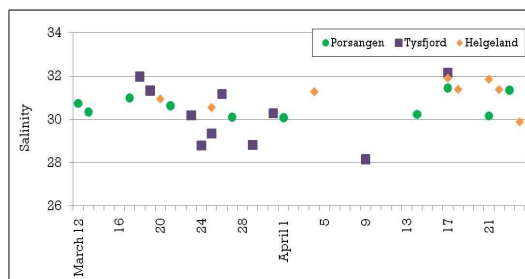


Figure 2. Change in specific gravity during the spawning period. 2 to 3 days old eggs were collected for each local group, Porsangen, Tysfjord, and Helgeland. Values are mean in each batch. N = 100.

## Results :

- According to neutral buoyancy of developing cod eggs, fertilized eggs increased specific gravity until they were 4 to 5 days old, and then became much buoyant toward hatching. All three different groups of eggs showed similar buoyancy pattern during incubation, but Helgeland cod eggs developed more in deeper water (Figure 1).

- While egg buoyancy of Porsangen and Helgeland cod was constant with time, Tysfjord cod eggs had much wider range of neutral buoyancy (Figure 2).

- Porsangen cod eggs were bigger and had more water content than Helgeland cod eggs (Figures 3 and 4).

- Consequently, there might be a clear difference in neutral cod-egg buoyancy between Porsangen and Helgeland area.

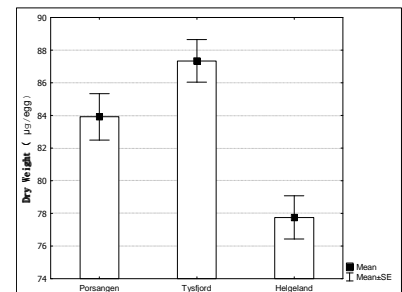


Figure 3. Dry weight ( $\mu\text{g egg}^{-1}$ ) of cod eggs at three local areas during spawning period.

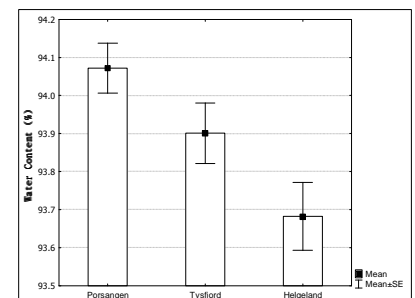


Figure 4. Water content (%) of cod eggs at three local areas during spawning period.

