



From dusk till dawn: Diversity and similarities in the movement patterns of eastern Baltic cod from DSTs

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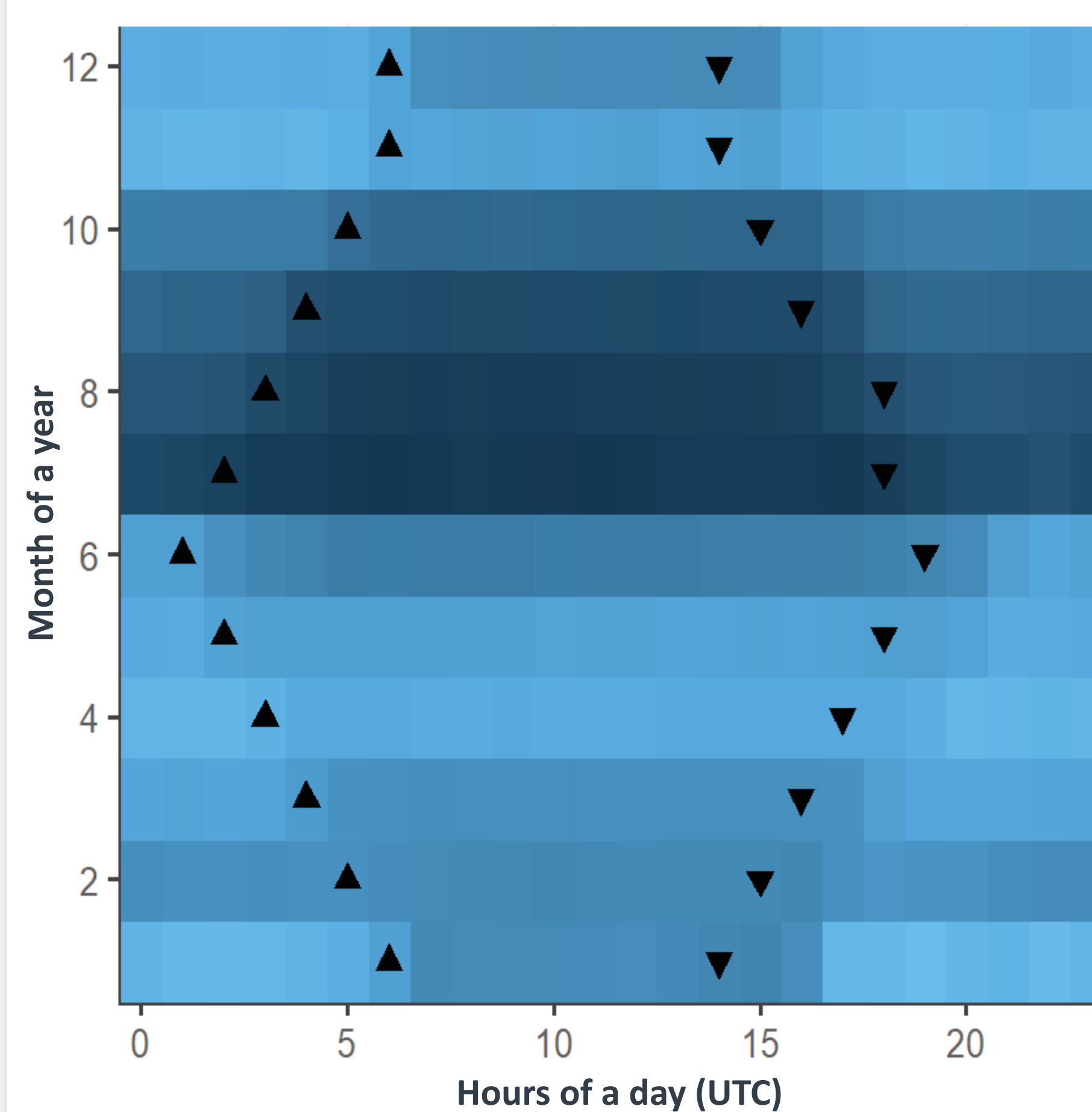
From dusk till dawn: Diversity and similarities in the movement patterns of eastern Baltic cod from DSTs

Stefanie Haase^{1*}, Uwe Krumme¹, Kate McQueen¹, Ulf Gräwe², Michele Casini³, Monica Mion³, Annelie Hilvarsson³, Karin Hüsey⁴

The eastern Baltic cod stock is in distress, but the underlying mechanisms are still poorly understood. Data storage tags (DSTs) implanted in cod (*Gadus morhua*) in the eastern Baltic Sea between 2016 and 2018 revealed new insights into the vertical and horizontal movements.

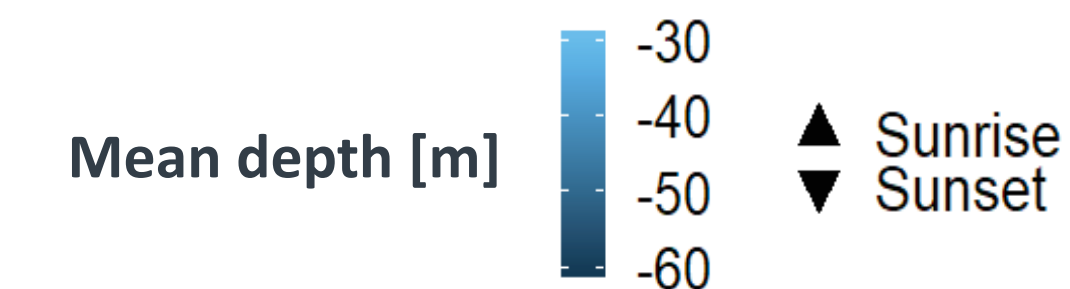
While all individuals showed vertical movements triggered by dusk and dawn, their horizontal migration varied between cod released in Germany, Denmark or Sweden.

Vertical migration: Triggered by dusk and dawn!

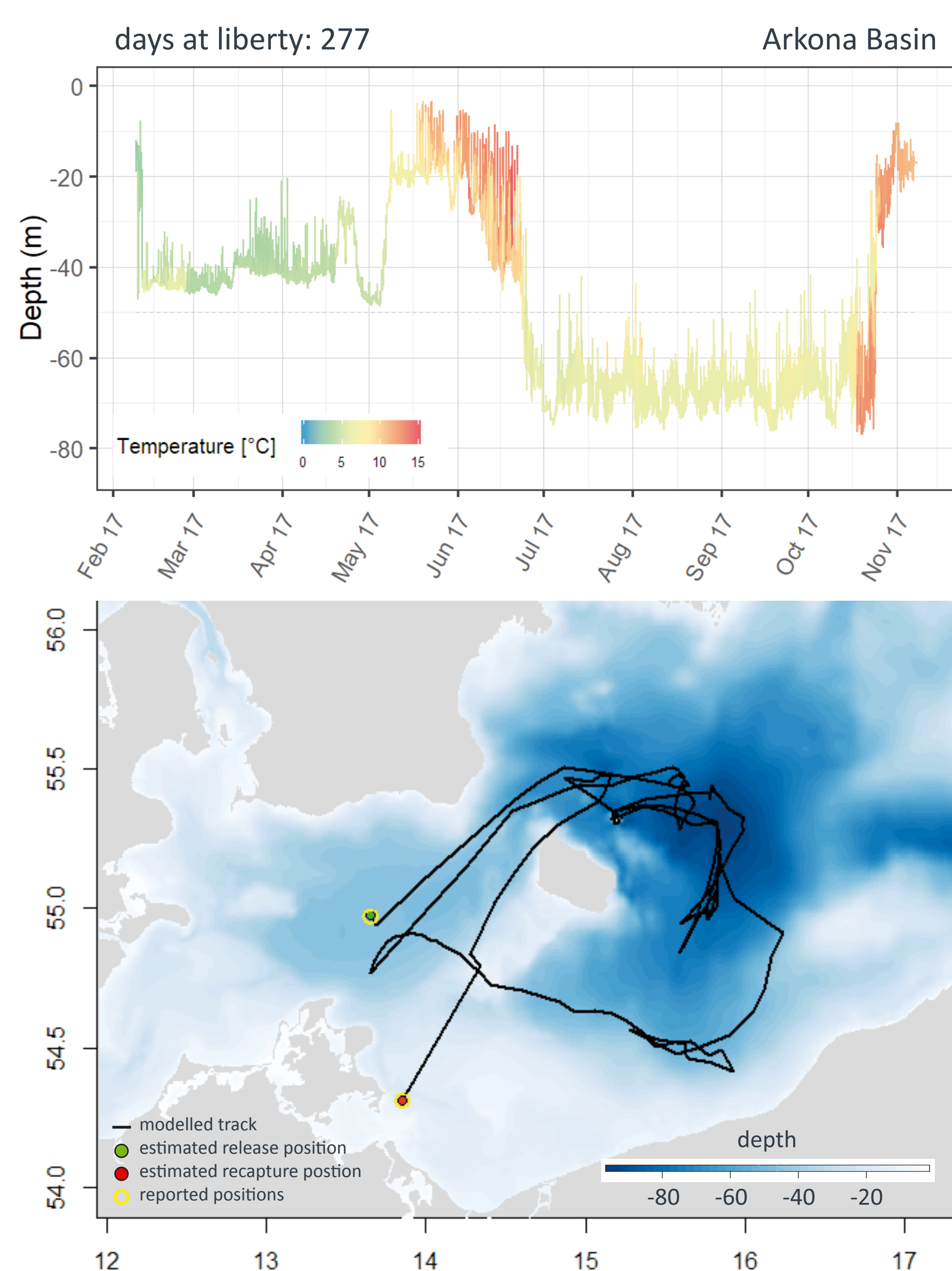


A clear twilight-triggered pattern emerged year-round: with the onset of sunset, cod swam to shallower water or rose in the water column (up to 30 m within 30 minutes) and returned to deeper water at sunrise.

These vertical movements resulted in temperature changes of up to 9.6 °C during single excursions crossing the thermocline. Does this lead to an unknown bias in standard bottom trawl surveys?



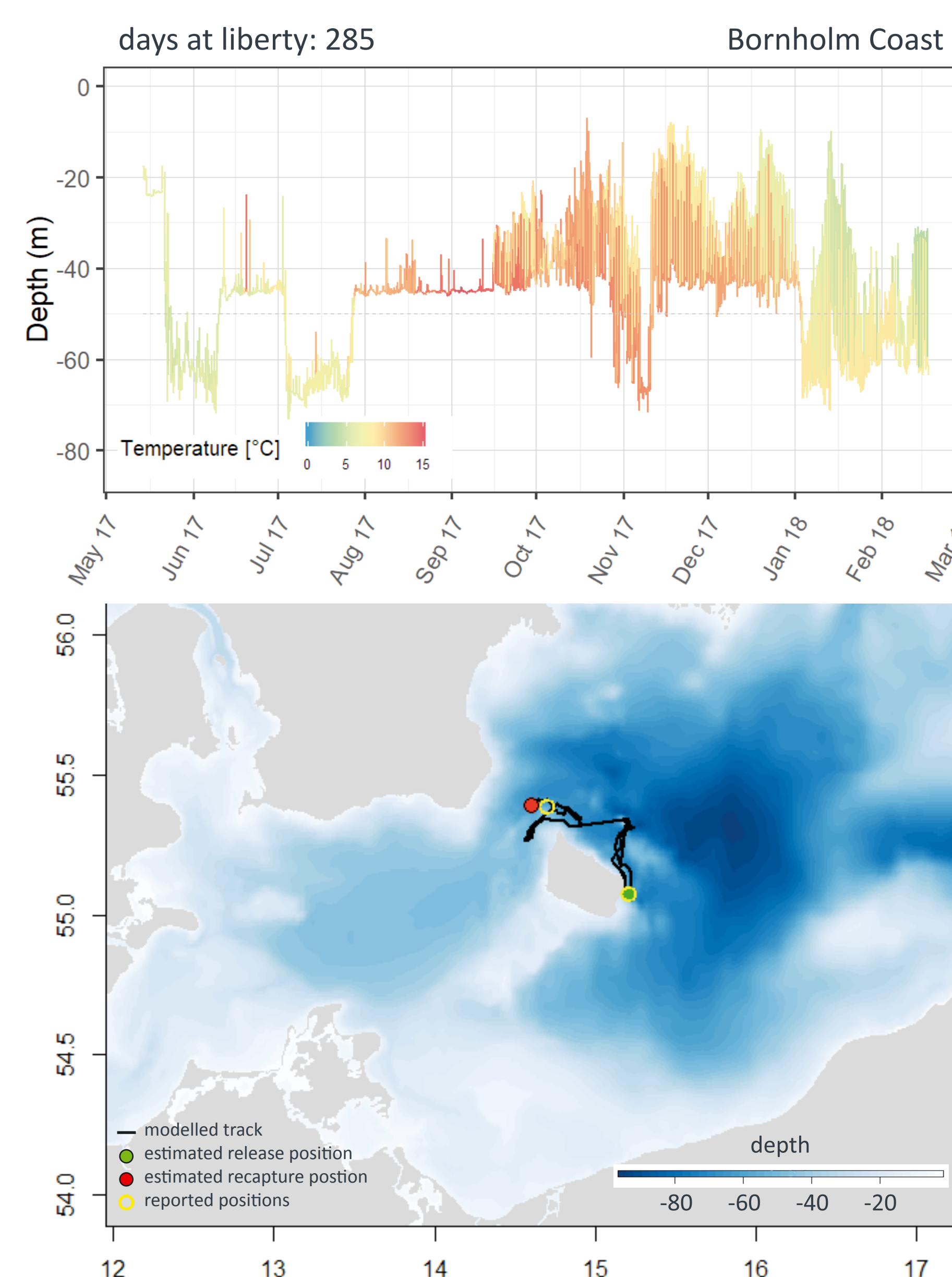
Release location Germany



Migratory cod

- Migration to feeding and spawning grounds
- Migration to Bornholm Basin once a year for extended period
- Continuously remaining in deep waters during spawning period

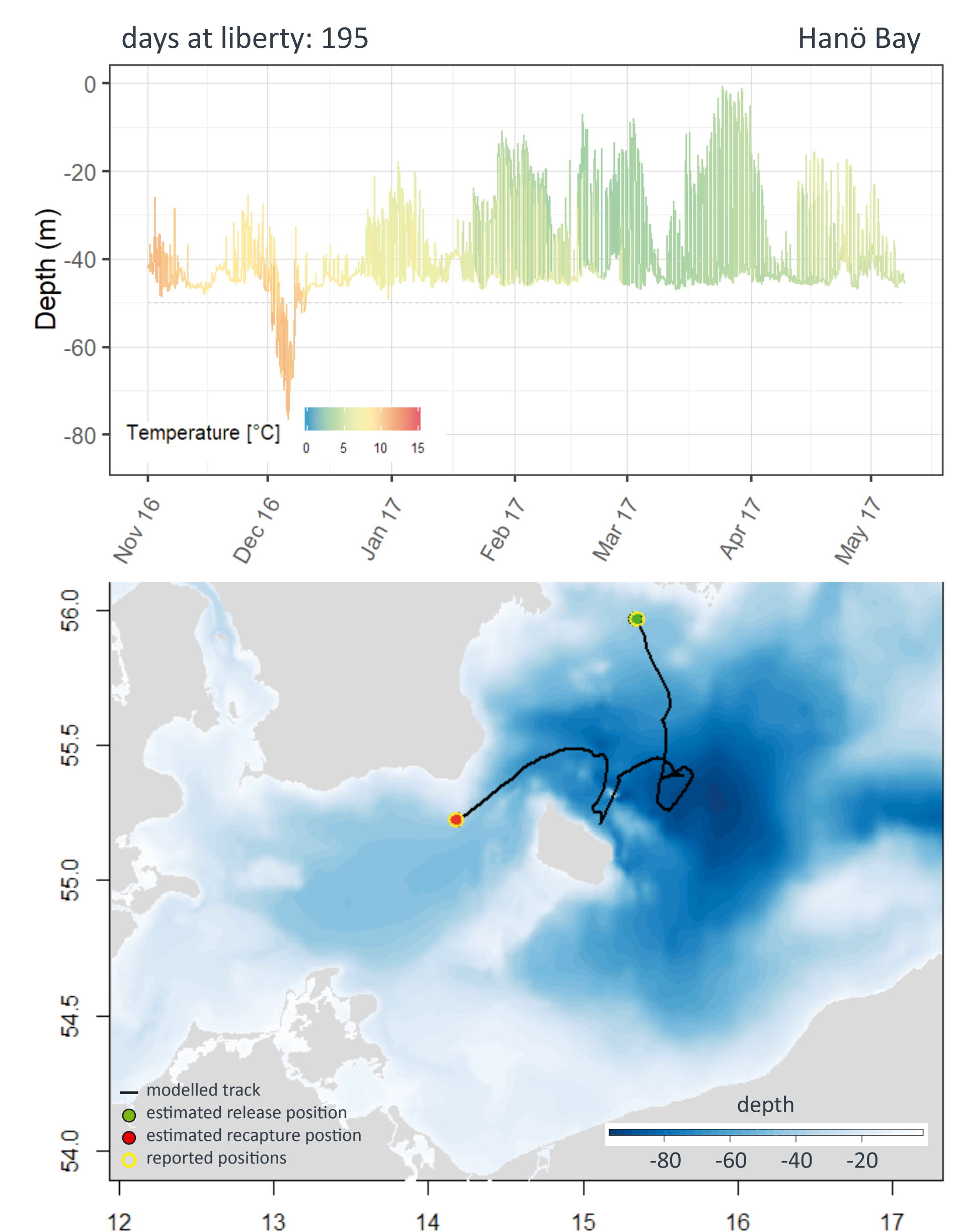
Release location Denmark



Stationary cod

- Close to the spawning area all year round
- Intermittently moving to shallower waters during spawning period

Release location Sweden



Migratory cod

- Migration to feeding and spawning grounds
- Migration into Bornholm Basin outside spawning period