

# 8<sup>th</sup> EGO Meeting and International Glider Workshop

Presented by  
**UG<sup>2</sup> / EGO**

May 21–23, 2019  
Rutgers University, New Jersey

## A multinational glider mission study of water exchange in the Baltic Sea

Kimmo Tikka | Finnish Meteorological Institute

### Co-Authors

Pekka Alenius | FMI; Urmas Lips | TTU/MSI; Laura Tuomi | FMI

### Abstract (Poster)

The Baltic Sea is a shallow marginal sea with stratified brackish waters. The marine research of the Finnish Meteorological Institute (FMI) targets on understanding the processes and consequences of the climate change in the Baltic Sea and its sub-basins. Since 2016, as a part of FMI's study on the water exchange between the underwater sills separated sub-basins of the Baltic Sea, we have deployed our Slocum G2 glider for several short-term coastal missions and two one month and several hundreds of kilometers long missions.

In May 2017, FMI conducted, in co-operation with Department of Marine Systems of Tallinn University of Technology (MSI), the first multinational glider fleet mission in the Baltic Sea. We deployed two gliders in a small trench between two larger sub-basins of the Baltic Sea within a research cruise of R/V Aranda. Shipborne CTD-observations from a dense station network, meteorological observations and moored ADCP current measurements completed the experiment.

Our research area, the Lagskar Deep, is a 36 km long, 12 km wide, 150 m trench, between the Baltic Sea Proper and Aland Sea. To the South, a chain of underwater sills at around 60 depth prevents the anoxic, below halocline deeper Baltic Proper waters from flowing into the sub-basins towards the North. The intermediate, above the halocline waters, usually flow to the North along the basins and are supposed to keep the deep waters of the Bothnian Sea fresh and healthy. In the area, there is only one regular monitoring station which is visited once or twice a year.

Our mission in the area endured for ten days with one glider measuring along the axis of the trench and the other across it. One objective of our mission was to describe better the nature and variability of the trench.

The glider data shows that the Lagskar Deep is highly dynamic with fast moving fronts. Also, we detected lenses of warmer water below the thermocline. In general, the deeper saltier waters flow from the South and fresher waters from the North, as expected.