



Argo-floats and gliders at work in the Baltic Sea

Pekka Alenius, Kimmo Tikka, Laura Tuomi, Tero Purokoski, Petra Roiha, and Simo-Matti Siiriä
Finnish Meteorological Institute, Marine Research, Helsinki, Finland (pekka.alenius@fmi.fi)

Finnish Meteorological Institute (FMI) has used Argo-floats continuously in the very shallow brackish water Baltic Sea since 2012. Finland is a partner of Euro-Argo ERIC and FMI operates Argo-floats in the North Atlantic and in the Baltic Sea. In the Baltic Sea, the usage of Argo-floats began as tests in the Bothnian Sea, a sub-basin of the Baltic, in 2011 and it was operational in 2012. In 2013 FMI extended the operational area to the Gotland Deep in the Baltic Sea Proper and in 2017 the operational area increased to the Bothnian Bay, the northernmost basin of the Baltic.

FMI pilots the floats in order to keep them in desired areas and also in order to be able to react to interesting phenomena in the sea. The floats measure CTD profiles once a week in monitoring mode, but sometimes we tune the measuring interval into much shorter for research purposes. To be environmentally friendly and to save resources, we recover and replace the floats once a year and reuse them after maintenance service. The extension of Euro-Argo to the Baltic Sea has increased the amount of observations in that environmentally vulnerable area considerably. Furthermore the data are publicly available in Coriolis. We have used the data for studies of the Major Baltic Inflows and those from the Bothnian Sea also for analysis of deep water currents there. Recently IO PAN, Poland, began to operate Argo-floats in the Southern Baltic Sea.

In addition to Argo-floats, also gliders are now actively used in the Baltic Sea. Within the European glider infrastructure project GROOM in 2011-2014 FMI and PLOCAN, Spain showed the potential of gliders in the northern Baltic Sea and even inside the Archipelago.

Now both FMI in Finland and Department of Marine Systems (MSI) of Tallinn University of Technology in Estonia has Slocum G2 shallow water gliders. Both gliders have already done several missions in different research projects during the last two-three years. The longest FMI's mission up to now was in the Bothnian Sea in September 2016 when the glider was in the sea for one month and did 700 kilometres long route and measured over 4800 profiles. FMI and MSI have long traditions in cooperation and therefore they conducted the first joint two-glider experiment in the Baltic Sea in May 2017. There the two gliders worked about two weeks together in a project on water exchange between the Baltic Sea Proper and the Gulf of Bothnia.