

The discussion session on the Baltic Sea as a special case of a shelf sea started with a short introduction was presented by Jacek Piskozub, one of the conveners. In his opinion, the Baltic is a special case with much lower salinity and carbon cycle (still poorly constrained) somewhere between the cases of a shelf sea and a large lagoon. After that, the convener concentrated on the example of the gas transfer velocity. According to some well established studies, its parametrization is higher for the Baltic Sea than for open ocean. On the other hand, most factors should indicate lower Baltic gas fluxes at identical winds. The Baltic Sea, similarly to lakes has shorter wind fetch distances than most other seas. The lower salinity should make the bubble component of gas transfer velocity less important than in the open ocean. Finally, larger concentrations of dissolved organic matter should correspond to more surfactants further hampering gas transfer. At the same time, the uncertainty in existing gas transfer data make it impossible to determine whether gas transfer velocity parameterization should be lower, identical or higher than elsewhere. Similar questions exist about other air-sea fluxes, for example the aerosol source function.

The convener initiated the discussion by posing four questions:

- “In the context of air-sea interaction, can the Baltic be treated as a typical coastal shelf sea?”
- Can Baltic data sets be used as part of global ones for process?
- Can universal air-sea flux parameterizations be used in the Baltic with no reservations?
- If the Baltic is different, what is the main reason (salinity, fetch, surfactants, something else)?”

The discussion started from the subject of differences between the Baltic Sea and typical shelves sea and possibility of comparison these two cases. Bernd Jähne reminded of *in situ* experiments conducted in the Baltic Sea region, especially using eddy covariance method and thermography pilot experiment. Unfortunately, so far they have not answered the question due to large uncertainties. It was pointed out that no experiment with tracers has been carried out in the Baltic Sea.

The meaningfulness of applying the oceanic gas transfer velocity parameters for the Baltic Sea was also discussed, especially the possible causes for different parameterization were mentioned, especially the role of surfactants were pointed out. Participants drew attention to high variability of salinity of the Baltic Sea connected with big drainage from the rivers. The question about uncertainties of biological models was raised. However no definite answers were given.

In summary, the discussion indicated the importance of further studies of air-sea fluxes in this very specific basin. The main conclusion of the discussion was that despite the good coverage of the Baltic Sea with measurements performed by several Baltic countries, there are still no simultaneous high quality datasets of all the relevant parameters. The discussion showed that there exists a strong need, as well as motivation, to conduct new international experiments in the Baltic Sea using eddy correlation, tracers and surfactant measurement to resolve the questions.