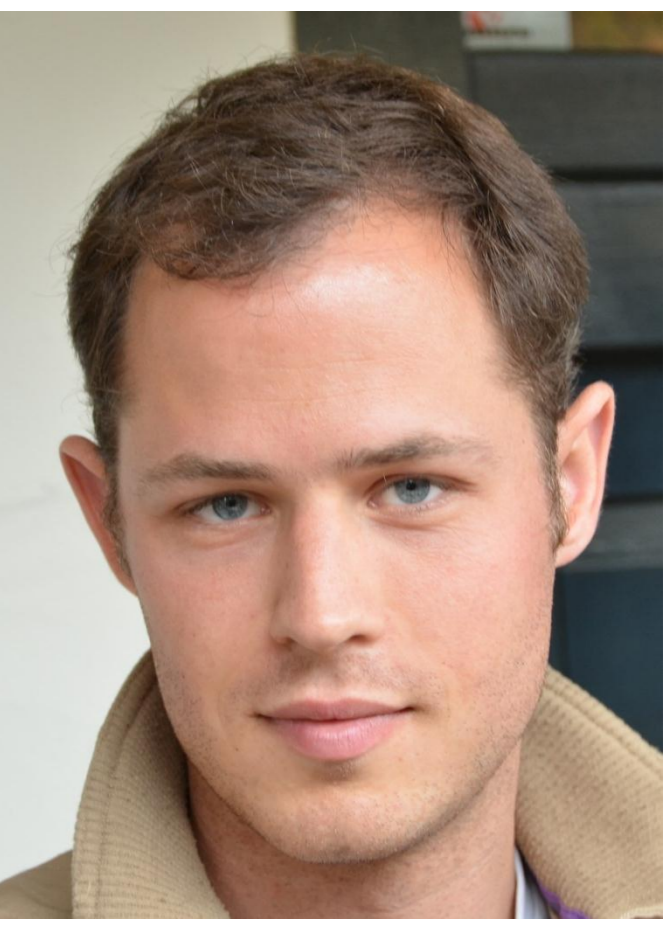




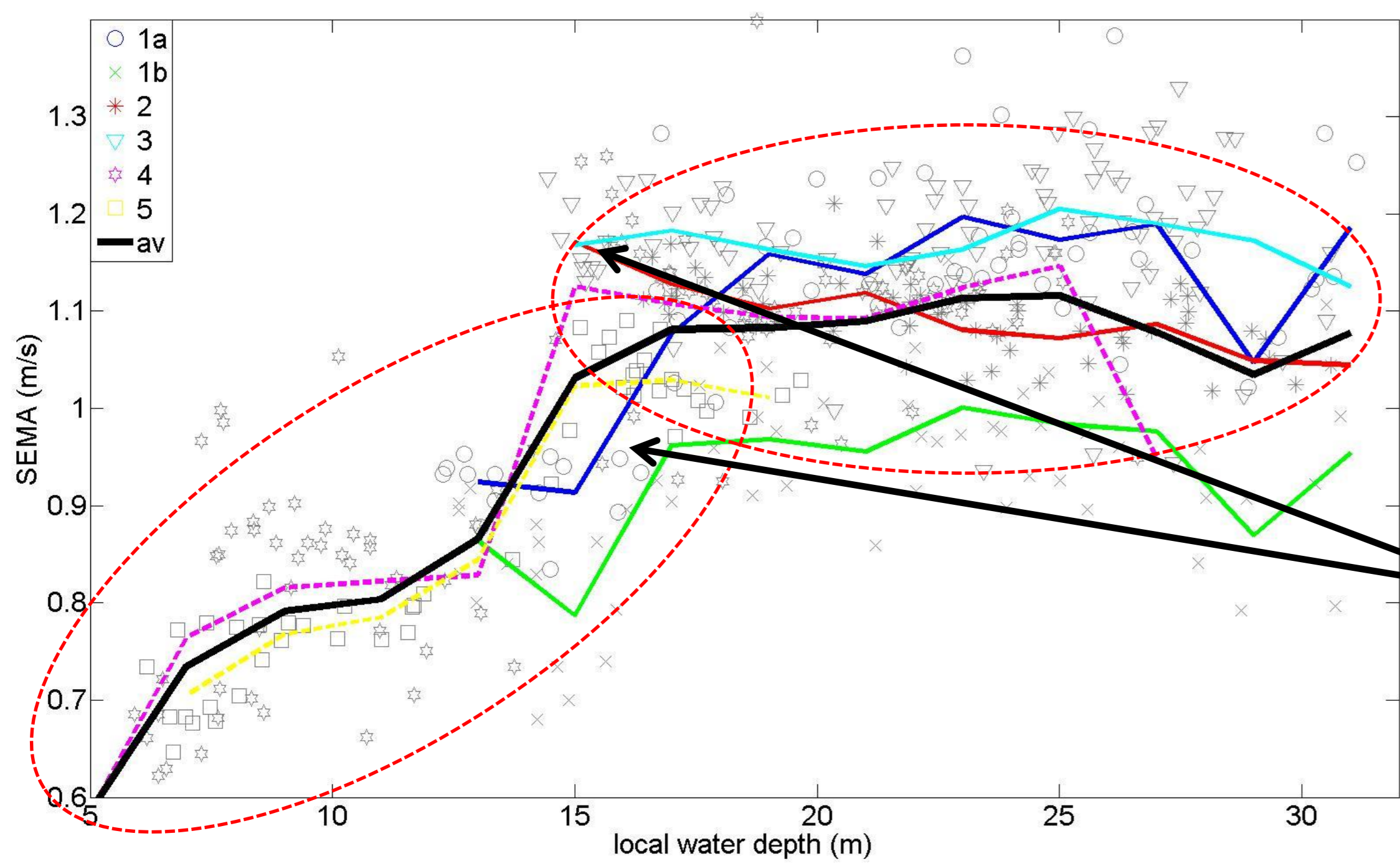
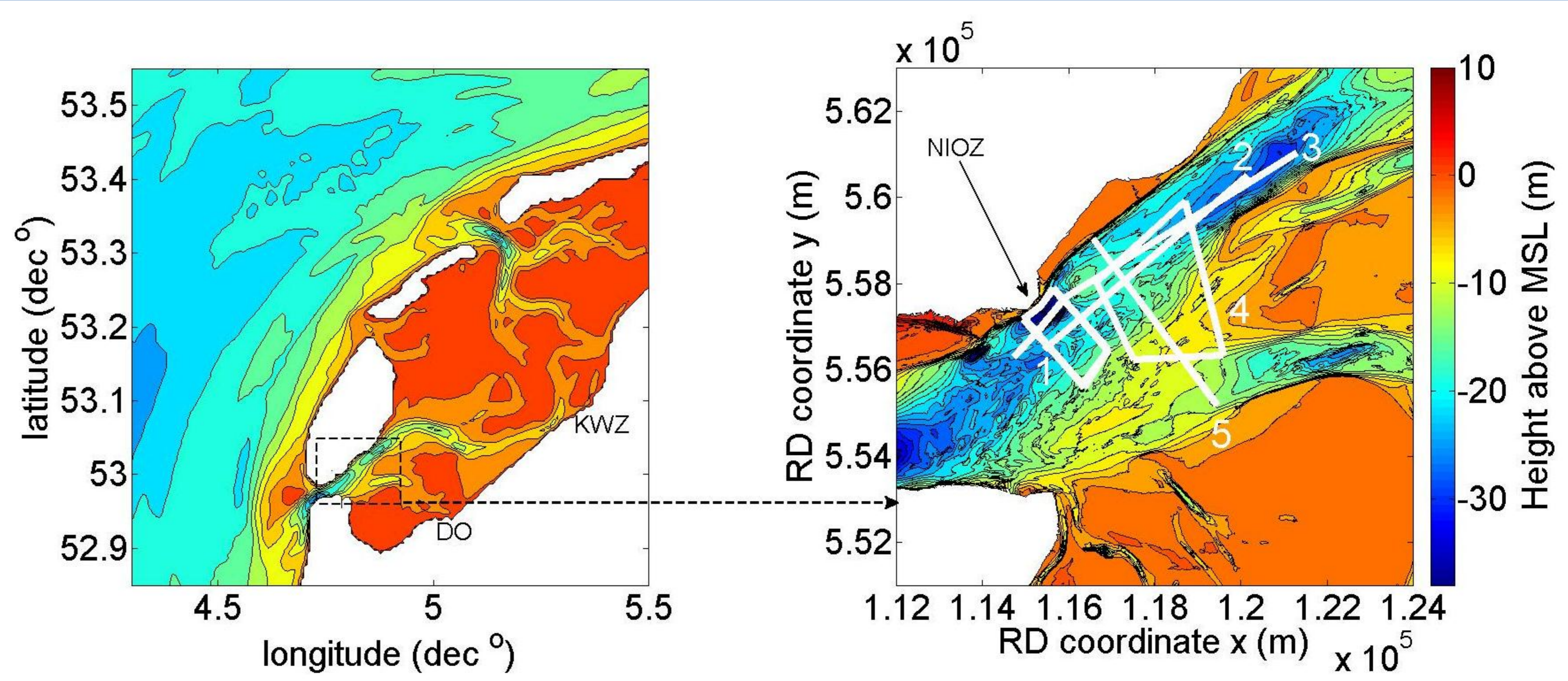
Observations on the spatial and temporal variability of tidal currents in the Marsdiep



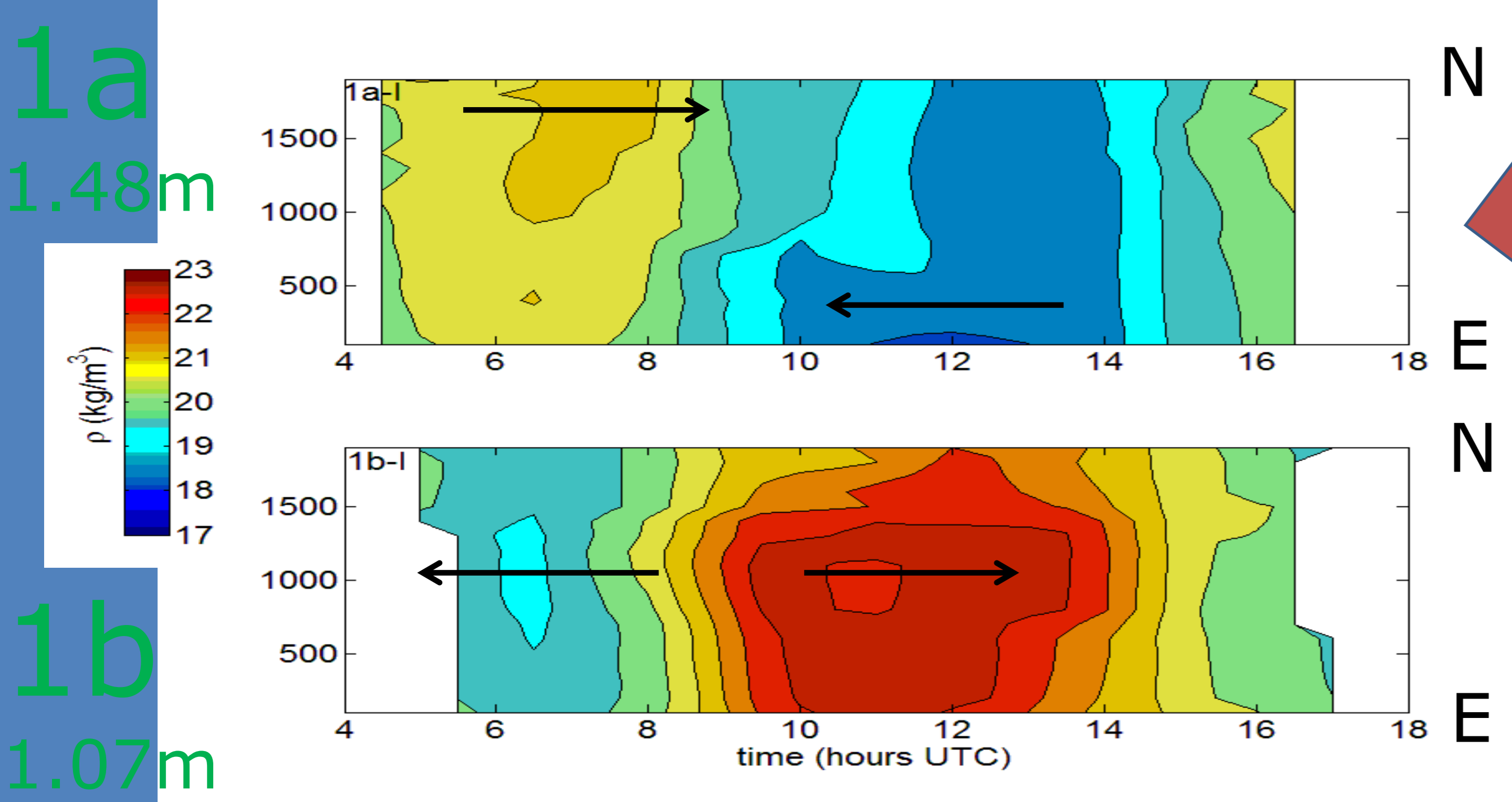
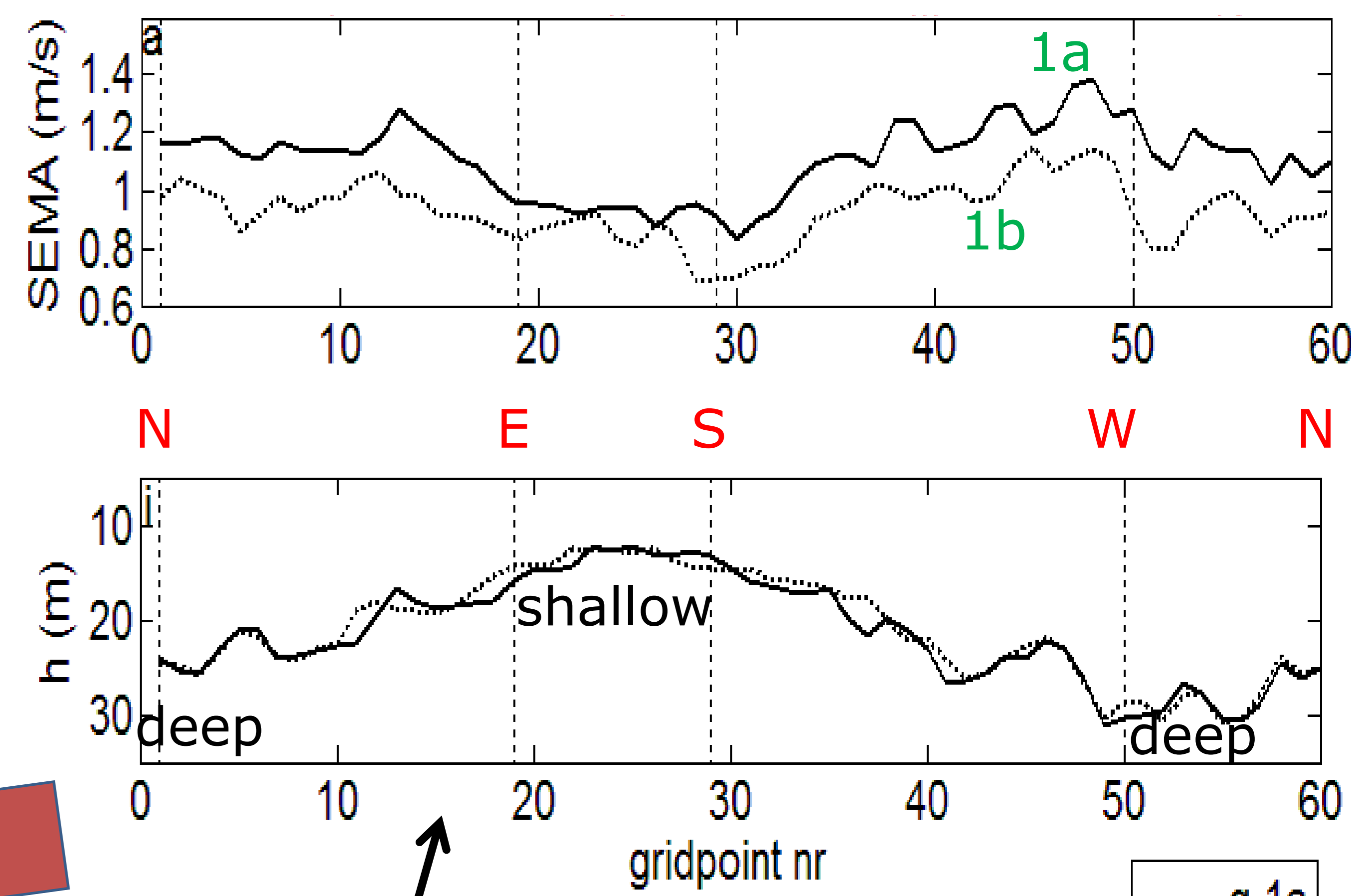
J.J. de Vries, H.M. van Aken, H. Ridderinkhof
 jurre.de.vries@nioz.nl, Royal Netherlands Institute for Sea Research

During 6 surveys of 1 tidal cycle, the flow velocity and density was measured. 1a and 1b and 2 and 3 are repeated surveys.

Survey	Shape survey	Lunar cycle	tidal range
nr			m
1a	Quadrangle	Neap	1.48
2	Line	Mid	1.37
4	Quadrangle	Neap	1.24
1b	Quadrangle	Neap	1.07
3	Line	Spring	1.61
5	Line	Mid	1.51

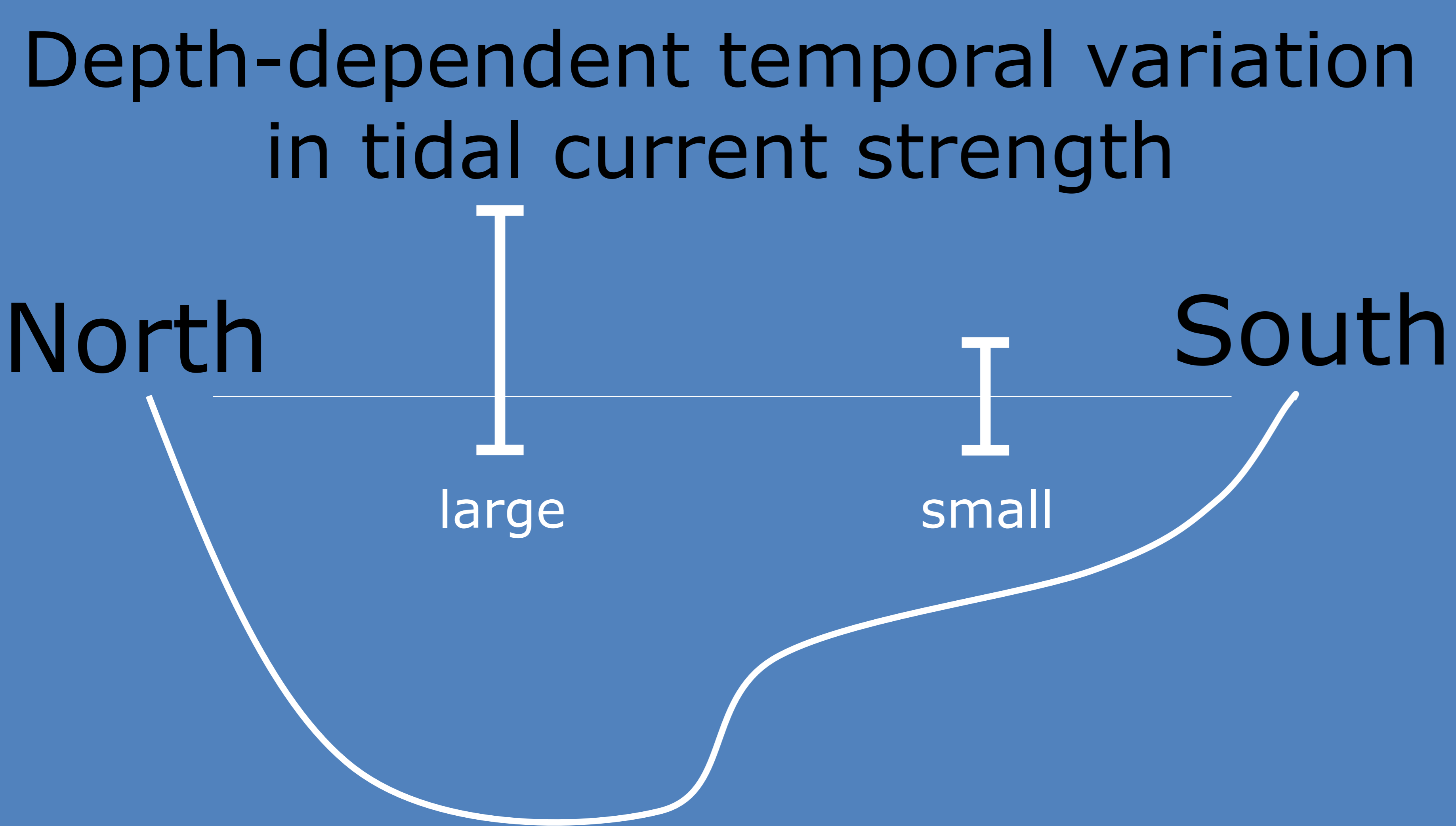
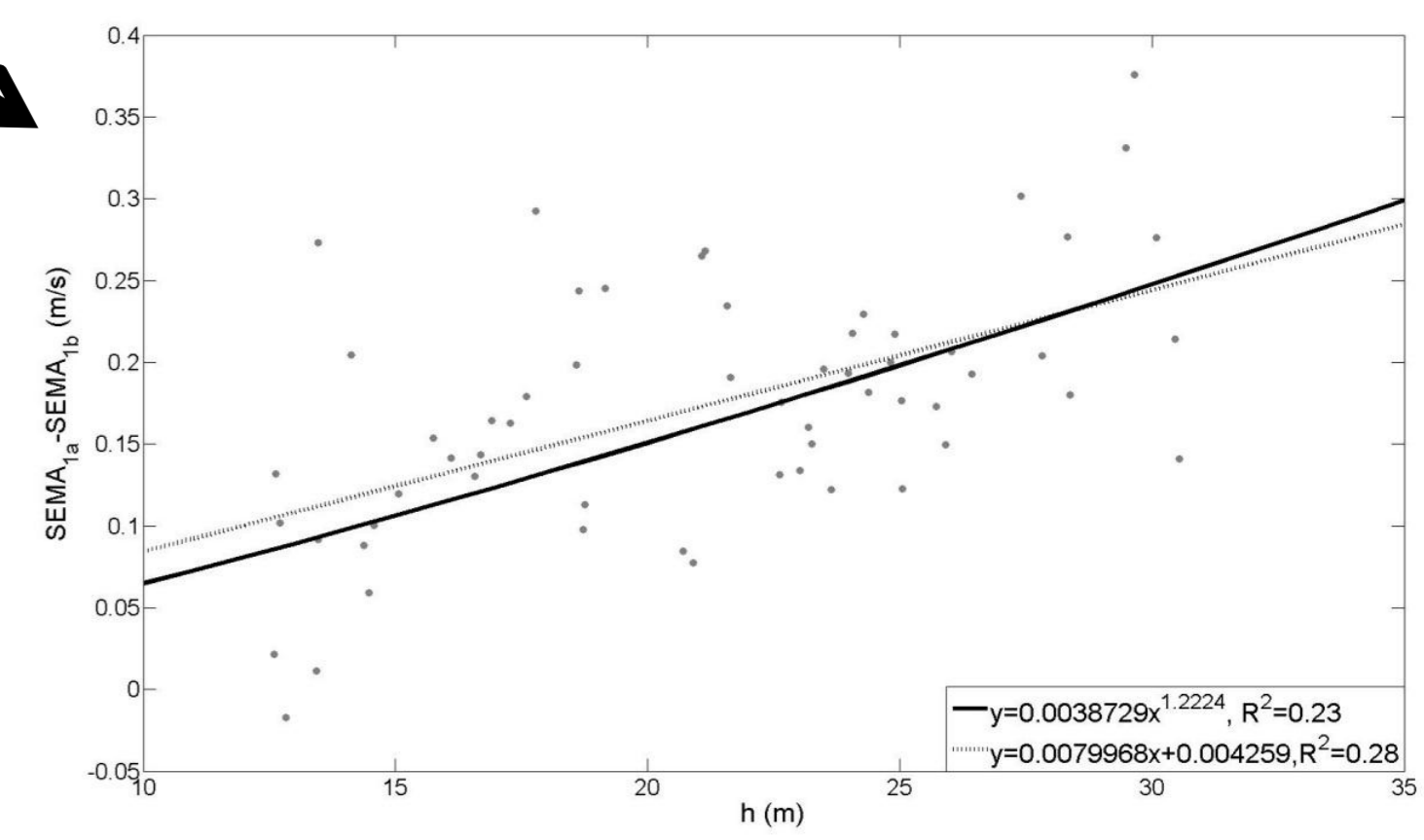


For the repeatedly surveyed transects, there is a divergence of the tidal current strength, SEMA, for water depth larger than 15m



Impact on the density field

Depth-dependent variability of flow strength under different tidal ranges



Conclusions

- Strength of the tidal flow shows a relation with the local water depth: for water depths smaller than 15 m, bed friction is important.
- Changes in tidal range, i.e. tidal forcing, result in a depth-dependent temporal variation in the tidal flow strength.
- The depth-dependent temporal variation in flow strength has implications for the lateral velocity shear and the density field. It also suggests that there is a modulation of the longitudinal fluxes.

Future work

- Investigate the role of cross-stream density differences on the formation of vertical stratification