



The influence of atmospheric pressure on geostrophic surface currents in the North Atlantic determined by satellite measurements

Kaija Jumppanen Andersen (1) and Ole Baltazar Andersen (2)

(1) University of Copenhagen, Niels Bohr Institute, Climate and Geophysics, Denmark (kaija.j.a@kratvej28c.dk), (2) DTU Space, Geodesy, Denmark (oa@space.dtu.dk)

Geostrophic currents are by definition steady in time and space, and are currents in balance between the Coriolis force and pressure gradient. But the mean sea level atmospheric pressure differences and corresponding geostrophic winds vary over the years, which affect the pressure gradient in the ocean and the wind stress, and thereby the geostrophic currents. It is therefore interesting to examine how the currents are affected by the changing atmospheric pressure and winds, both in strength and location.

Geostrophic surface currents can be calculated from satellite altimetry. This is done in the North Atlantic with data along three satellite tracks from the TOPEX/Poseidon, Jason-1 and -2 satellites in the period Jan 1993 to Aug 2012. When the currents are calculated, they are compared to drifter data in same period for validation.

Afterwards the currents are compared to the atmospheric surface pressure, to determine any correlation between the two. This result is then compared to a similar work by Flatau et al. (2003).

Finally the correlations will be basis for establishing an empirical model between the surface pressure and the currents. The efficiency of this model will be tested using independent data and the model will be used to improve the prediction of the surface currents from the pressure.