Ocean Sci. Discuss.,
https://doi.org/10.5194/os-2019-2-RC1, 2019

Ocean Science
Discussions

Interactive comment on "Water exchange between the Sea of Azov and the Black Sea through the Kerch Strait" *by* Ivan Zavialov and Alexander Osadchiev

Anonymous Referee #1

Received and published: 18 March 2019

The premise of this paper is a study the water exchange through the Kerch Strait. My assessment is that the authors rather studied sediment resuspension due to wind/wave events which is insufficient to infer the true water exchange that also exists without sediment addition.

Sediment resuspension is highly variable, but this should not be used to claim that the water exchange is too. More specific ocean data with mooring measurements and/or calibrated hydrodynamic modelling would be better suited to quantify this water exchange. Without such, most of the paper remains pure speculation and is of little scientific value.

A starting point should be to explore the seasonal cycle of density differences across the strait to identify any possible seasonality of the forcing. The existence of a density gradient (in conjunction with a barotropic pressure gradient) should induce a steady exchange circulation typical for positive estuaries. Indeed the water exchange through the mouth of a positive estuary is typically a two-way process with in- and outflows happening at the same time. Indeed, this exchange may be weaker or enhanced by winds as demonstrated in several studies before. To claim that winds are the sole initiator of episodic exchange flows is not aligned with previous studies on density-driven exchange flows in positive estuaries. The findings are heavily biased and misguided by the highly episodic nature of sediment resuspension events. To this end, I can only recommend this paper to be rejected for publication.

Other points:

Section 2: Give information on seasonal variations of density and differences across the Strait. Page 4, line 21: A persistent residual tidal flow of $\sim$5 cm/s could move substantial volumes of water through the strait as compared with rare episodes. Page 7: The authors claim that the area of an AP can substantially increase over time. In fact, it's the effect of mesoscale eddies (as obvious from the images) and the associated entrainment that causes this effect. However, this feature does NOT imply any increase in freshwater discharge rate.

Interactive comment on Ocean Sci. Discuss., https://doi.org/10.5194/os-2019-2, 2019.