

## ***Interactive comment on “On the use of the Strouhal/Stokes number to explain the dynamics and water column structure on shelf seas” by A. J. Souza***

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This will be a nice paper and a solid addition to studies of the dynamics of shelf seas and estuaries. It offers insightful ideas with compelling figures. It contains necessary information to add to existing literature because it highlights the importance of the too-frequently-overlooked element of rotation in relation to the frictional depth.

I recommend this manuscript for publication; it has the potential to become an impacting piece of cross-scale literature. However, the paper could be strengthened if three minor issues are addressed by the author:

1. Include more physical description. The paper states that there are shallow areas of  
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the region where tidal ellipticity is near one (cyclonic) where rotation strongly impacts the extent of the frictional layer. A more explicit description of the physical processes linking the water depth and these tidal elements with rotation to govern the development of the bottom boundary layer would be beneficial to the reader. This could be added in Section 2 or 3.

2. Expand section 5 by describing the model more in depth. Are the figures at a single time snapshot or averaged over a time interval? Are they during spring or neap tides? Summer or winter? Along these lines, what is the time scale for the rotational Stokes number being a robust predictor for the position of tidal mixing fronts? Does wind forcing alter these results? Is there observational evidence of the predictability of the fronts using the Stokes number?

3. Correct the spelling and grammar and improve the language a bit. It is understandable to have some mistakes at this stage, but please reread it for errors.

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Interactive comment on Ocean Sci. Discuss., 9, 3723, 2012.