Reponses to comments by Reviewer #1
(Reviewer's comments are shown in *Italic*)

Dear Reviewer #1,

Thank you very much for your helpful review. We have carefully studied the comments and suggestions and revised our paper accordingly. The following are our point-by-point responses to the general and specific comments. We hope that our responses adequately address the comments. Below is our response to the issues raised in the review.

This is a well-prepared and well-documented paper. Besides some minor editing that is required, the paper is well written. I presume the publisher will take care of the English editing and minor corrections. (just as a reminder, please make sure to replace dumping by damping in P.12, L29.

Our reply: Some minor corrections have been realized and the English style improved in the revised MS in response to the reviewer's comments.

The case of analysing an extreme spring tide in an intensively used estuary is very relevant. It is definitely a cutting-edge case study. The study has been very well done, and it is based on a very detailed data set of intensive measurements. This makes this paper very interesting and relevant for HESS.

Our reply: Thank you for your thorough review and salient observations. It is our sincere hope that this paper provides the necessary science.

In Figure 10, and also in Table 5, we three moments in time for HWS, TA and LWS. This is strange, because at every cycle, there is only one moment of HWS, LWS and TA. Is this because the authors did not observe the moment of slack, but just derive it from the temporal observation of the salinity (as in Figure 6). But if that is so, than the maximum value corresponds to HWS, the minimum value to LWS and the time-average value to TA. There should not be multiple values. Also in Figure 10, I don't understand why the differences between the observations that are only 20 min apart are so large. In Figure 6 the maximum values of the salinity curves are rather flat. So the differences should not be large.
Maybe the authors determined the moment of HWS on the basis of the hydraulic model. But that would be wrong, since the hydraulic model may determine the moment of slack wrongly. The correct moments of slack, if not observed in the field should correspond with the maximum and minimum observed salinities.

Our reply: We agree with the comments from reviewer that there is only one moment of slack for HWS and LWS at every cycle, which occurs when the water velocity is lower, starting so many minutes after HW and LW. In our case, the measured velocity for slack time is very minimal (less than 0.05m/s). Experimentally, water velocity was measured using cords attached to floats. In addition, the slack duration was approximately 40 min at HWS and 47 min at LWS. The moment of TA occurrence was estimated in reference to HWS and LWS occurrence. The above curve in Fig.10 at HWS and the below curve at LWS during 1st and 2nd cycle correspond to the two slack moments. The two other curves (at HWS and LWS) have been incorporated in the old version of the MS only to help us identifying the exact slake moments. In the revised paper we shows just the curves for the exact HWS and LWS slack moments (see figure 10 below), which corresponds respectively to the maximum and the minimum of the observed salinities (figure 6).

Minor comments:

If the hydraulic model is calibrated on the Roughness, then it is useless to present the composite equation for the Manning roughness (16).
Similarly, if the dynamic 1-D salt balance equation is calibrated on the Dispersion, then don't mention (19) in the paper. Moreover equation (19) is not at all appropriate for salt intrusion. It refers to rivers only. So eqs (16) and (19) should be removed from the paper.
Also use the same parameters throughout the paper. So if you use K_manning in one equation then don't use n in another.

Our reply: The Manning-Strickler friction coefficient (**K_s**) is clarified in revised MS (i.e., **Ks** is the inverse value of n (**K_s=1/n**), n: Manning's coefficient). Authors think the Manning-Strickler equation can help the readers to well understand the calibration process. Authors have no problem to remove this equation if requested in the final stage of the manuscript editing. The equation (19) is removed in the revised MS.

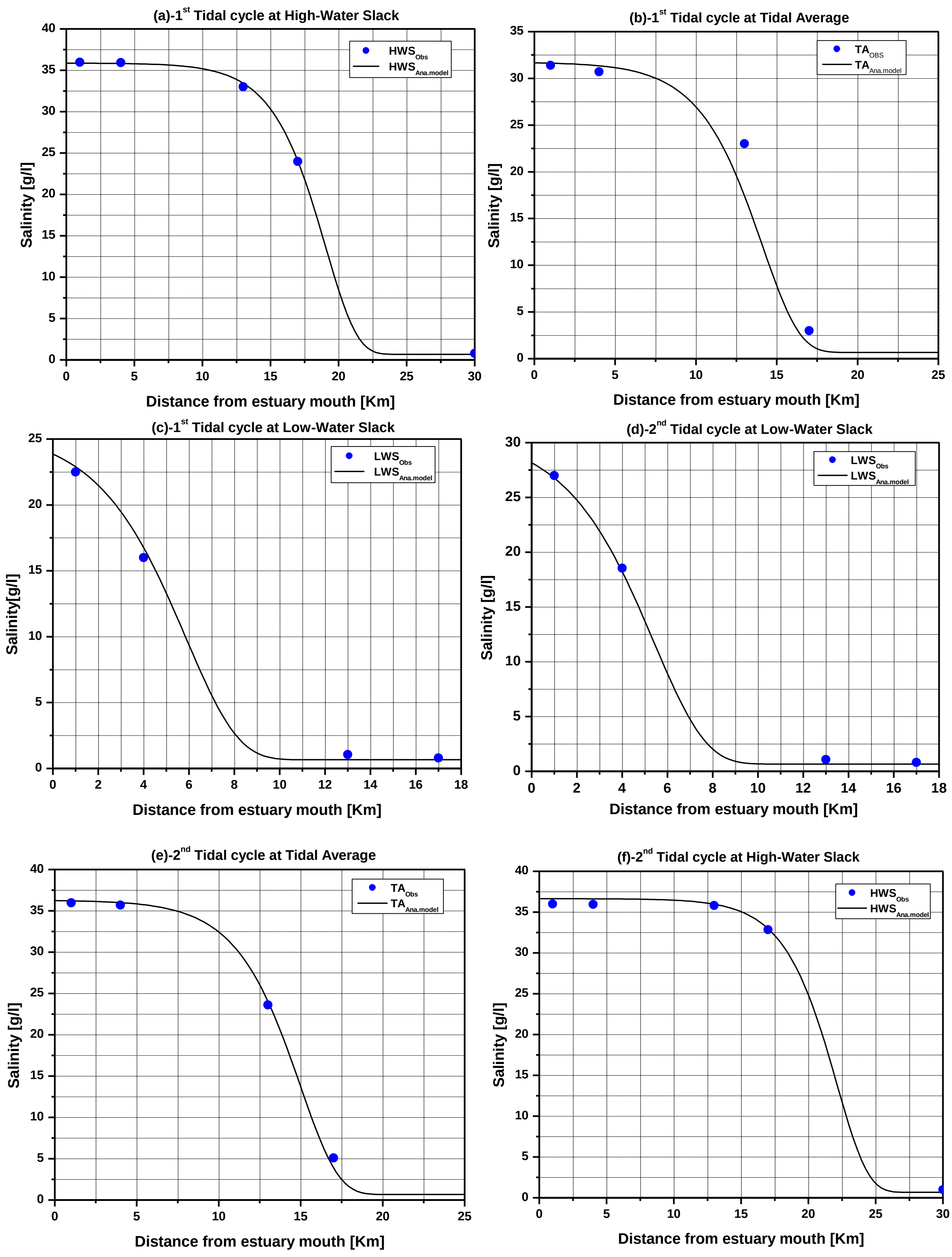

Fig. 10- Observed and analytically computed longitudinal salinity distribution along the Sebou estuary (surveyed on 28th September 2015) during 1st cycle (a, b, c) at LWS, TA and HWS, and 2nd cycle (d,e,f) at LWS TA and HWS.