

Modelling the impact of anthropogenic measures on saltwater intrusion in the Weser estuary

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Dear Prof. Huthnance,

Thank you very much for your time and your valuable feedback. Please find below our reply to your comments in italics.

10 *Kind regards,*

Pia Kolb on behalf of all authors

Lines 96-98. “We discuss . . . the effect of channel deepening on processes governing saltwater intrusion.” I think the extent to which you discuss processes is the main point of possible dispute between you and the referees. Several times in your response you refer to the “focus” of your manuscript and not wanting to analyse processes further. I am sympathetic to this because your salinity intrusion extends into a relatively narrow section of the estuary and your breakdown is likely to be sufficient there. Given that, it is better not to raise reader expectations too far. I think it would be good at this point in the introduction to specify (in line 98) which processes you are considering. Then perhaps check that the Discussion explains why this appears to be sufficient for the present purpose (as well as foreseeing further investigation as you do already).

20 *Action: We now specify in the introduction: “[...] the effect of channel deepening on processes governing saltwater intrusion i.e. the barotropic flux, tidal pumping, and the estuarine circulation for a characteristic cross-section in the brackish water zone” (line 98f). Moreover, we added in our discussion: “Even though our analysis was conducted for one cross-section only, we expect that due to the channel-like geometry of the Lower Weser this is sufficient as a first characterization of the governing processes. However, we suggest for further investigations a more complete characterization which includes analyses at*

25 *different cross-sections and different hydrological situations.” (line 489 ff).*

Figure 2 panels (b), (c). Presumably the notation •48, •49, •50 marks Weser-km; this should be stated (in the caption).

30 *Action: We added an explanation in the caption: "Notations 48, 49 and 50 in (b) and (c) mark the position (Weser-km) along the navigation channel."*

There needs to be a Data Availability statement; see https://www.ocean-science.net/policies/data_policy.html

Action: We added the Data Availability statement in line 522 ff.