Hydrology and
Earth System
Sciences
Discussions

Interactive comment on "Understanding coastal wetland conditions and futures by closing their hydrologic balance: the case of Gialova lagoon, Greece" *by* Stefano Manzoni et al.

Anonymous Referee #2

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Manuscript: Understanding coastal wetland conditions and futures by closing their hydrologic balance: the case of Gialova lagoon, Greece Number: HESSD2019-382 Authors: Stefano Manzoni, Giorgos Maneas, Anna Scaini, Basil E. Psiloglou, Georgia Destouni, Steve W. Lyon

The manuscript presents a coupled water-salt mass balance model for estimating water fluxes of coastal water bodies. The approach was tested for the Gialova lagoon in Greece. Different water sources and fluxes were calculated for today's climate and three different climate change scenarios. The results indicate different and variable contributions of fresh water and salt water fluxes going into and out of the lagoon

throught the year. Future scenarios show that salinity will increase in the lagoon. Therefore, management options have to be developed to maintain freshwater input into the system.

The manuscript is very well written and the results are interesting; also for other coastal wetlands in similar climatic areas. I have some recommendations that are outlined below.

Main comment:

1) What is the salinity of surrounding aquifers? Is the saline water flux solely coming from the Mediterranean Sea or can it also be from groundwater?

2) Evaporation is considered; however, what is the impact of evaporation on the increase of salinity? How is it considered here?

3) The average depth is given (0.6 m). What is the range of depths though? At which depths were samples taken? How is the salt distribution with depths? This can be relevant if salinity increases with depth or if there are local depression within the lagoon with higher salt content that are not completely mixed with the rest of water in the lagoon. Some of it is discussed, but more information could be provided.

4) The water level in the lagoon was kept to current conditions also in the scenarios. How would a decline in groundwater levels due to increased evapo(transpi)ration affect the water levels and the water balance? This could be included in the discussion.

Other, specific comments: - Figure 1a: the map is really small and difficult to identify the lagoon - Figure 1b: in the figure title, it says mean annual precipitation, but actually monthly values are given; error bars would be good to add - Figure S2: error bars (standard deviation) for the spatial average salinity are missing; this applies to other figures showing mean values too; this will help to get some idea about the uncertainty of the calculations - line 326: indicate what hypersaline means in brackets

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