

## ***Interactive comment on “Temporal variations of groundwater table and implications for submarine groundwater discharge: A three-decade case study in Central Japan” by Bing Zhang et al.***

**Anonymous Referee #2**

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This paper delivers important information on the link between climate change and SGD. The approaches are valid, and the manuscript is well written. However, followings should be taken into consideration before this manuscript is accepted for publication in HESS. (1) Relationship between groundwater and SGD: authors cite the paper Zhang et al., 2005 in order to calculate SGD based on a water table. This is very critical part and thus should be clearly explained with respect to methods, assumptions, uncertainties, and limitations. In addition, the results of this approach on SGD can be compared with the salinity data from coastal waters if there are any links (of course, there are many other factors controlling seawater salinities). (2) Implications for SGD: Authors state the importance of SGD on marine productivity and ecosystems. If they

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have dissolved inorganic nitrogen (DIN) data in groundwater, authors can strengthen this paper much more. If they do not have those data, they can use some reasonably assumed data to calculate SGD-driven nutrient fluxes and their changes for the last three decades. Then, new production supported by SGD can be inferred from these calculations and state implications on ecosystems. (3) Rounding off problems: authors include many values (42.72 for water table, 14.76 for rain increase, 634.9 mm, and 15.36, 7.68 in Table 2...) throughout the entire manuscript. I think that they cannot measure the values with such accuracies. Please take care of all significant figures. (4) References: Authors should include important original papers and latest papers in references.

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