



Interactive comment on “Discharge of groundwater flow to the Potter Cove on King George Island, Antarctic Peninsula” by Ulrike Falk and Adrián Silva-Busso

Anonymous Referee #2

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Hydrological research for Antarctic Peninsula (AP) is very important due its vulnerability to climate change. However, related studies are relatively few due to limited data records for the Antarctica. This study calculated the glacial runoff and groundwater flow discharge on a small hydrological catchment Potter Basin in the edge of AP. The value of this study lies on improving our knowledge for the hydrological cycle in the edge of AP and potentially revealing the biogeochemical effects associated with the water cycle over this region. I have some suggestions that may improve the quality of this article.

Major comments:

C1

1. The authors stressed the importance of climate change on the hydrological cycle for the study domain. However, they did not actually discuss the impacts based on their computed data. This much reduced the meaningfulness and value of the article. Though I understand it is difficult to collect related data to plot a time series to show the change of runoff during climate change, I recommended the authors to explore more about it using both their data and previous published research.

2. This is a very local work. To add value on this study, I recommend the authors to extrapolate the knowledge we got from this local site to the whole AP or even the cryosphere of Earth. I think this is also required by HESS journal to show a universal value that can benefit more generic readers.

Specific comments:

P1, L10, “. . .2719.9 10⁻⁵. . .”: Please use symbol “ \times ” at here, also for the other places across the manuscript.

P6, L17-18, “The groundwater hydraulic gradient. . .obtained from the piezometric map.”: Please show more detail for how to get the groundwater hydraulic gradient.

P10, L3-4, “Based on the above. . .used here as input.”: Please discuss uncertainties caused by using topographical gradients instead of hydraulic gradients in the model computation.

P10, L7, “criopeg”: cryopeg?

P13, L7-9, for equations (13) and (14): It is not clear that how the authors got the Q_{\max} , Q_{\min} , $R_{t,\max}$ and $R_{t,\min}$, and how they transferred the range of Q and R to the uncertainty range of parameters.

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C2