

The manuscript titled “Proposing Sources for Discrete Groundwater Discharges to Patterned Pools in Three Regional Raised Northern Peat Bogs” offers new hydrological evidence on how minerogenous groundwater discharges and influences ombrotrophic patterned pools of peatlands in Maine, USA. Using multiple geophysical and geochemical techniques, the authors were able to show how groundwater discharges from peatland edges through glaciofluvial aquifers outflowing to the center of the northern peat bogs. There were multiple lines of evidence that were used 1) ground-penetrating radar, 2) transient electromagnetic induction surveys, 3) uncrewed aerial systems and handheld thermal imaging, and 4) *in situ* measurements of temperature, specific conductivity, and trace metal concentrations. Although groundwater discharge was not quantified, these multiple lines of evidence suggest the occurrence of groundwater discharge. I recommend publication after the below comments have been addressed to improve scientific clarity.

Major comments:

- The results should be re-organized, specifically the presentation of the figures.
 - For example, the GPR results from each of the three northern bogs can be presented in one figure. Furthermore, the GPR images should be annotated or marked both in the manuscript and in the supplementary.
 - Similarly, the TEM inversion images from the three bogs may be presented in one figure. This will reduce the total number of figures.
- With the re-organization of the figures, the results section can be improved much further, and repetitive descriptions may be avoided.
- While the groundwater index (Gi) metric appears to be a useful tool for groundwater discharge, can the authors provide further justification for using this metric? In addition, several other parameters could have also been considered. For example, pH or DIC concentration could be an additional indicator of groundwater influence. Furthermore, please expound why water samples were not taken from the bottom of the pools where groundwater influence could have been greater rather than at 0.25 m below surface.

Minor comments:

1. Figure 1: could be re-arranged to avoid confusion. Caribou Bog and Meddybemps Heath could go down while Thousand acre Bog could go to the upper right area and the Main map goes to the upper left.
2. Subheadings can be further shortened.

3. Line 366, 367: Table S2?
4. Please cite other papers on groundwater discharge in peatlands.
5. Line 557 – 560, sources?