

Interactive comment on “Working backwards from streambed thermal anomalies: hydrogeologic controls on preferential brook trout spawning habitat in a coastal stream” by Martin A. Briggs et al.

Anonymous Referee #3

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This paper presents a very interesting and important study on revealing what variables are important to fish for choosing their favorite spawning sites. There is a wide variety of data collected and presented in the manuscript, which provides a solid foundation for making this work a highly valuable contribution to the scientific community and to decision makers. However, the presentation of the paper could be improved by making it clear the linkages between what is observed and what can be concluded. Here are a few general comments for the authors to consider:

1. On the title, it sounded very exciting but it didn't come across to me why this is

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called "working backwards" after I read the entire manuscript multiple times. So I would suggest to either change the title or emphasize in the paper why this is considered "working backwards" compared to existing practices.

2. It was very hard to follow all the data on a spatio-temporal map as they were taken at different places and at different times. It would be helpful to orient the readers where and when all those measurements were taken using a plot or table. It would be critical for this study to present the time window that is important for the fish habitat and whether the measurements were taken during that window. If they don't overlap, then explanations on why those measurements are relevant and useful would be needed.

3. It was not clear when the drivepoint and minipoint samples were taken. If they were taken during the time when the fiber optic and other temperature profiles were deployed it would be helpful to indicate the sampling time on the temperature and seepage plots.

4. The impacts of hydrogeologic properties on the seepage and DO concentration could be demonstrated using a simple flow model, which could strengthen the paper substantially in linking all the valuable data together and generate useful insights.

A few other specific comments:

1. The locations of the fiber optic measurements are not found in Figure 2C.
2. most of the readers would need more information on how to read the GPR images.
3. why there is no GPR information around spawn3?
4. On Figure 6, not all lines show up on every plot, so more explanation is needed. The two legend boxes were meant to be one? x-axis with actual dates might work better for readers than the ordinal day.
5. Figure 8, it might be helpful to plot 1-to-1 scatters for colocated specific conductivity and DO.

