Author response

We thank the reviewers for their suggestions, and are pleased that they feel the majority of the issues with the manuscript have been resolved. Responses to the final two minor points are detailed below in blue. Thank you again to all the reviewers for their insightful contributions throughout the peer review process.

Minor point raised by Reviewer #1: "To the best of my understanding, the authors use the “test” split for hyperparameter tuning/model selection and the “validation” split to report results. I would suggest to switch the naming of these splits, in line with common practice in the machine learning field."

Thank you for noticing this, we have made this change throughout the manuscript.

Reviewer #2 still has an issue with your statement that unlike other methods CH4Net does not require any time series of images: "The authors response doesn't quite answer the issue. Both your model and the multi-pass retrieval models have temporal information. The difference is that Ehret/Varon/MBMP/etc models put temporal information into the retrieval, while you are putting temporal information into the learning algorithm. For example, CH4Net relies on multiple images (in time) of a few select sites in order to create a robust model. So yes, at the time of prediction, all you need is a single overpass. However, in order to make a successful prediction, you need temporal information. I would hope the authors address this in the manuscript."

Thank you for this comment. We agree that this is an important distinction to make and have made the following alterations to the manuscript.

- Line 53: we have noted the distinction between our method and previous methods by adding the explanation “In contrast to previous methods, CH4Net learns background characteristics of the sites by processing multiple passes over each location during training without the need for a time series of previous images, reference image, or manual verification step.”
- Updated references to CH4Net only requiring a “single image” with “single image at test time” throughout the manuscript.