Dear Authors and Colleagues

Thank you for your contributions
Thanks for the authors for the replies to the reviews of your paper and for the revision.

The published time series on lake bathymetry on the Arctic Coastal Plain of Northern Alaska is of importance. The manuscript, the data description and data publication do not yet fulfill the requirements of ESSD and improvements are needed. A major revision of the manuscript and a minor revision of the dataset is needed.

The manuscript provides a lot of detailed information on the generation of the Landsat-derived lake bathymetric data. However, the focus on the data sets is lost in the complexity of the paper. This happens because the article is not exclusively focused on the datasets. Recommendations to the authors: ESSD is not publishing research papers, the focus of the manuscript needs to be on data sets and products.

Please change your title accordingly, the focus needs to be on the main data products, e.g. Landsat derived Lake bathymetry, …

Throughout the manuscript: avoid the term 'study', introduce that you provide datasets and description of the data.
P2, L47 Deep lakes that are the focus of this study are located on the Pleistocene Sand Sea -> change this sentence that you provide a lake bathymetry data set of deep lakes that are located ….

L65 delete 'The ultimate goal of this research' – change to a sentence that includes that you provide data sets

In fact, you provide at least two data sets that you need to list in the abstract, results and conclusions: the sonar-derived lake depth data and the Landsat-derived lake bathymetry raster data. You even have produced a 3rd data set: the lake water volumes, consider to also publish the lake volume data set with Lake ID, coordinates and volume data

Chapter 2 Data and methods

provide a flow chart of sources, processing steps and outcomes

These are editorial requirements: Please stay consistent: provide separate chapters on sonar data acquisition and processing

and on Landsat satellite data processing – with subchapters for the Landsat satellite data processing until the final product -keeping the sonar-derived lake depth data generation separate

2.1 Field methods -> change to Lake bathymetric data

Include in this chapter all processing steps of the sonar data processing

single-beam soundings?

Move several parts of chapter 3 results to chapter 2: content on P 5 chapter 3, Lines 242 to P 6 L258, and all content on P 6 from L268 on

As ESSD cannot publish a remote sensing research study paper this parts belong to Data and Methods

Include an estimate of the accuracy of the lake water volume data derived from the accuracy of the lake depth data.

These are editorial requirements: please provide in results a chapter with a detailed description of your published lake bathymetry data sets and lake water volume data

You can e.g. show frequency distributions, discuss shallow and deep lakes, are they evenly distributed? skewness or symmetry of lake depth data,

Show a figure of the mosaic of all bathymetry lake data with lake IDs

These are editorial requirements:

As you apply optical remote sensing for the derivation of your data set, you need to include more relevant work, specifically authors who also applied band ratio –based methods:

Please include

Clark et al. 1987. Bathymetry calculations with Landsat 4 TM imagery under a generalized ratio assumption. Appl. Opt. doi: 10.1364/AO.26.4036_1

Hodúl et al. 2018. Satellite derived photogrammetric bathymetry. ISPRS J. Photogramm. Remote Sens. doi: 10.1016/j.isprsjprs.2018.06.015.

Pacheco et al. 2015. Retrieval of nearshore bathymetry from Landsat 8 images: A tool for coastal monitoring in shallow waters. Remote Sens. Environ. doi: 10.1016/j.rse.2014.12.004

Pope et al 2016. Estimating supraglacial lake depth in West Greenland using Landsat 8 and comparison with other multispectral methods. Cryosphere. doi: 10.5194/tc-10-15-2016.

Yunus et al 2019 Improved Bathymetric Mapping of Coastal and Lake Environments Using Sentinel-2 and Landsat-8 Images. Sensors. doi: 10.3390/s19122788

Data publication: ESSD requires an optimization of the published data sets.

Please publish a new data publication with: a read me document describing the format of the data: e.g. geotiff, which projection, band variable: lake depth in meter, please include the description of the value for the land around the lake.

Editorial requirements: in the existing data publication, currently the land surrounding in at least some of the lake files seems to be noisy, consisting of 2 values: minus 1 and other values, please provide a consistent value for the land background only, it would be optimal if this would be NaN (no

data value). Please check also the land background in the mosaic if it consists of one data value only, if not please publish also an enhanced raster version of the mosaic.