Response to comments

Paper #: essd-2022-289

Title: Lake Surface Temperature Dataset in the North Slave Region Retrieved from Landsat Satellite Series – 1984 to 2021

Journal: Earth System Science Data

Reply to Reviewer #2

Thank you for creating "Lake Surface Temperature Dataset in the North Slave Region Retrieved from Landsat Satellite Series". Without a doubt, it will be useful for both scientific and applied research in the country with the largest number of lakes on the planet. Its relevance increases in the conditions of global and especially regional (high latitudes) warming.

We are thankful to the reviewer, and we appreciate their suggestions and valuable and positive comments for improving the manuscript. We have addressed or responded to all comments to improve the quality of this manuscript. Below, we provide the answers to the comments and questions raised by the reviewer. For convenience, comments from this Reviewer are provided in black text. Responses to each comment are provided in blue text.

Firstly, this refers to the typification of lakes according to the origin of their bottoms. Despite quite probable differences in morphometry, lake bottoms of the same origin have common similar patterns in the distribution of depths and, consequently, temperature characteristics, including the surface temperature of lake waters. The genetic grouping of lakes will make it possible to better understand the features of the temperature regime of lakes and their changes in space and time.

Secondly, the temperature regime of lakes is largely influenced by whether they are transit for runoff or not (without outflow). Grouping lakes on this basis will make your database even more valuable for science and practice.

It is quite obvious that the temperature regime of lakes is influenced by a much larger set of factors. However, the above groupings will take a big step forward in effectively using the database you have created

We appreciate the comment and acknowledge the necessity of grouping lakes based on genetic properties such as origin of lake bottoms, as well as lake inflow and outflow. Unfortunately, we do not have such information on the vast number of lakes in our study area. However, going along the lines of the recommendation, all other geographical properties and parameters we could access from other sources for lakes studied have been included in the modified dataset. The data was derived from the HydroLAKES data cited in our manuscript and included in the data description. A table with the summarized names and properties is included below and will be included in the manuscript. We believe that with this added information, users of the dataset can set thresholds for

which they choose to group lakes based on geographical and morphometrical properties. For example, they can group lakes based on depth, area, volume and elevation, among others.

Table 1: Columns names of the tabular dataset and the description.

Column	Description
Lake_Name	Name of the Lake from which the lake surface temperature was retrieved. The name of lakes was predominantly derived from the Water file-Lakes and Rivers polygons data from Statistics Canada. Lakes' unknown names were prefixed "NoNameLake" and a number
Date	The date which the lake surface temperature(LST) represents
Year	The year of the LST in the format "YYYY."
Month	The month of LST in the format "MM."
Day	Day of LST in the format "YY."
Maximum_Temperature	The maximum LST recorded on the lake at a given time in degrees Celcius (°C)
Minimum_Temperature	The maximum LST recorded on the lake at a given time in degrees Celcius (°C)
Median_Temperature	The median LST from all available pixels in degrees Celcius (°C)
Mean_Temperature	The mean LST from all available pixels degrees Celcius (°C)
Total_Pixels	Total number of Pixel representing the lake
LST_Pixels	Number of pixels with LST values retrieved from the lake
Percentage_LST_Pixels	Total percentage of pixels with LST values captured from the lake. Values are rounded to the nearest 1
Count_Water_Pixels	Number of LST pixel values greater than 0 retrieved from the lake at a given time
Count_Ice_Pixels	Number of LST pixels values less than 0 retrieved from the lake at a given time
Percentage_Ice_Pixels	Total percentage of ice pixels captured from the lake at a given time. Values are rounded to the nearest 1.
Landsat_Row_Path	Tile name, Row and path of the Landsat from which LST was retrieved
Lake_Area	Surface Area of the Lake in square kilometres (km^2)
HyLak_ID	The ID derived from the HydroLAKES dataset
HyLak_Depth	The average depth of the lake derived from the HydroLAKES dataset in meters (m)
HyLak_Volume	The volume of the lake derived from the HydroLAKES dataset is million cubic meters (1 mcm = $0.001km^3$)
HyLak_Elevation	Elevation of the lake surface derived from HydroLAKES dataset in meters above sea level
Long(m)	Longitude point on the lake in meters
Lat(m)	Latitude point on the lake in meters
Long(DD)	Longitude point on the lake in decimal degrees

Lat(DD)	Latitude point on the lake in decimal degrees
Monthly_Mean	The mean LST on the lake for a given month
Monthly_Minimum	The minimum LST on the lake for a given month
Monthly_Maximum	The maximum LST on the lake for a given month