Dataset name: **iCUPE Dataset (DS) from Deliverable 3.3.2:**

Time series of lake size changes in Northeast Greenland

Author(s) and affiliations: **Ludwig Schröder, Niklas Neckel and Angelika Humbert**

Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research - Am Alten Hafen 26, 27568 Bremerhaven, Germany

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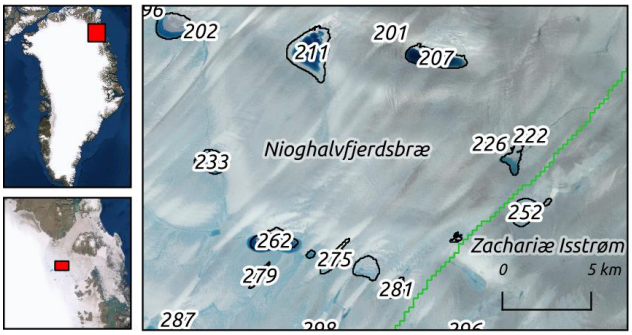
E-mail: ludwig.schroeder@awi.de, nikals.neckel@awi.de, angelika.humbert@awi.de
Phone: +49 471 4831 1194 (Ludwig Schröder)

The produced dataset contains information about supraglacial lakes at the two main glacier systems of the Northeast Greenland Ice Stream, Nioghalvfjerdsbræ (also known as 79°N Glacier) and Zachariæ Isstrøm. The dataset was derived from Polarimetric Synthetic Aperture Radar observations (PolSAR) of the ESA satellites Sentinel-1A and Sentinel-1B and consists of two files.

Lake Outlines Definitions (S1_79NG_ZI_lakes.geojson)
Vector file (GeoJSON format) of lake outlines, derived by automatic classification of ice sheet surface types from PolSAR observation. Besides the lake polygons, this dataset contains additional attribute fields with a unique ID for each lake, the lake area in km², the location of the lake centroid (longitude, latitude), a corresponding elevation from the ArcticDEM (https://doi.org/10.7910/DVN/OHHUKH) and the drainage basin according to the ice flow at the surface (https://doi.org/10.1594/PANGAEA.908594).



lake_id	area	cntr_lon	cntr_lat	cntr_elev	basin
88	0.27	-23.2778	79.40577	347.77	Nioghalvfjerdsbræ
89	0.7	-22.86363	79.37452	84.46	Nioghalvfjerdsbræ
90	0.14	-23.23233	79.39727	331.92	Nioghalvfjerdsbræ
91	0.31	-23.41909	79.41472	436.77	Nioghalvfjerdsbræ
92	0.63	-22.83572	79.36865	83.53	Nioghalvfjerdsbræ
94	0.12	-23.12277	79.37735	297.34	Nioghalvfjerdsbræ
96	1.49	-24.19089	79.46359	735.26	Nioghalvfjerdsbræ
99	0.13	-23.52845	79.39724	503	Nioghalvfjerdsbræ

Figure 1. Lake Outline Definitions and additional attribute information.

Lake Time Series (S1_79NG_ZI_lake_ts.nc)

NetCDF file containing time series of several parameters and additional information for each lake. The 1D parameters describing the lakes are a unique identifier (*lake_id*), the total area of the lake outline polygon and the coordinates of the centroid.
The 2D parameters of the time series contain data for each lake (*lake_id*) and the time steps (*time*), given as Modified Julian Date (MJD, days since 1858-11-17). The parameters are *area* (area classified as water within the lake outline in km² in this epoch), *area_fract* (fraction of the classified water of this epoch w.r.t the total lake area) and the mean Sentinel-1 backscattered power in the channels HH and HH-HV.

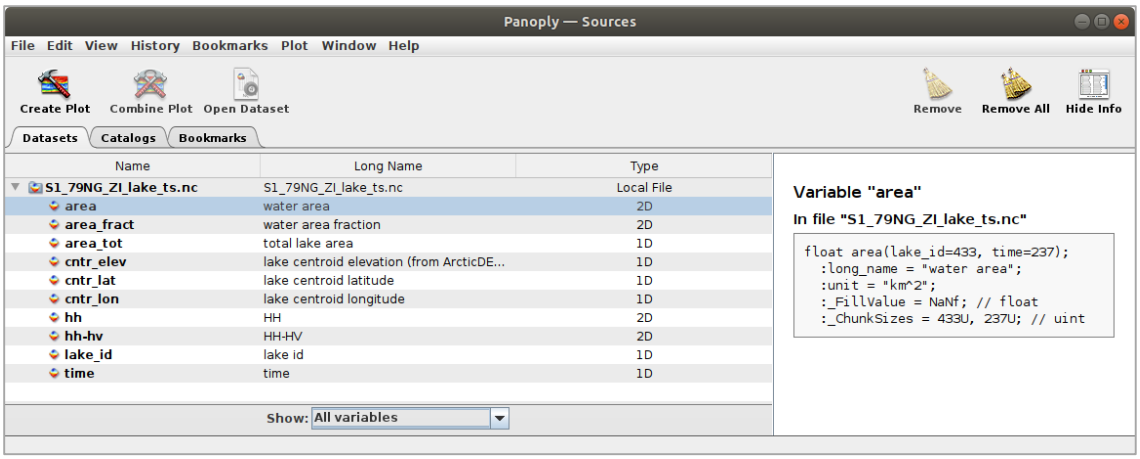


Figure 2. Content of the Lake Time Series NetCDF file in Panoply

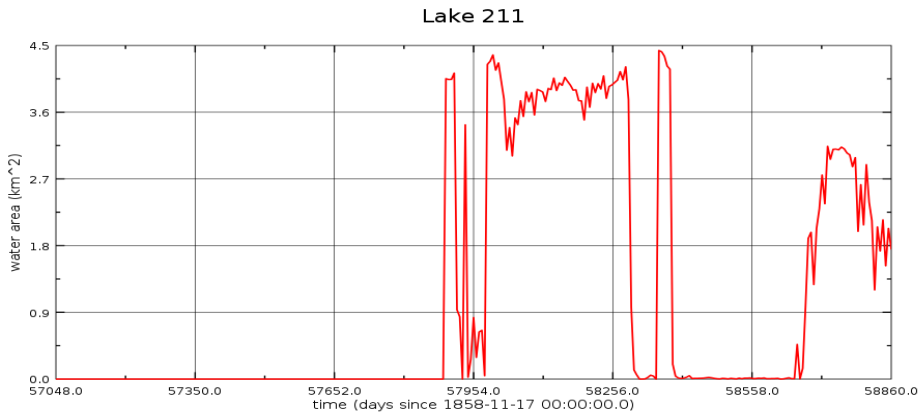


Figure 3. Lake area time series example for lake 211. Before 21th May 2017 (MJD=57894) Sentinel-1 observed the region in HH polarization only. After that date, observations were performed in dual-pol mode, which is a prerequisite in our classification algorithm.