

Inventory of Meteorological Records in the Labrador/Nunatsiavut and Southwestern Greenland Carried Out by the Moravian Brethren and their Successors Since the 18th Century

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As part of the National Science Centre research project entitled “Reconstructions of Climatic and Bioclimatic Conditions in Greenland and Labrador/Nunatsiavut ca. 1770 to 1939 from Moravian Missionary Observations (MORCLIM)”, we visited numerous Moravian Church archives across Europe, including the Moravian Church House in Muswell Hill, London; the Unity Archives – Moravian Archives Herrnhut in Germany; and the Moravian Archives in Bethlehem in USA. Additionally, we consulted and checked several other archives and libraries where we suspected early instrumental meteorological data might be located for stations in southwestern Greenland and Labrador (see Fig. 1). A complete list of the archives and libraries visited is available on the project website: <https://morclim.umk.pl/pages/research/>.

During this preliminary archival research, we captured thousands of photographs of original handwritten manuscripts containing early instrumental meteorological data and weather notes (see Fig. 2), as well as secondary compilations of meteorological data found in 18th- and 19th-century scientific publications.

Many of these data, pertaining to air temperature, atmospheric pressure, as well as wind speed and direction, have already been transcribed, quality-controlled, and made available in the open data repository of the Centre for Climate Change Research (<https://repod.icm.edu.pl/dataverse/ncu-cccr>) under an open license, in accordance with the **FAIR** principles. Accordingly, the datasets by Demarée et al. (2023), Singh et al. (2023, 2024), and Chmist et al. (2024) are fully **F**indable, **A**ccessible, **I**nteroperable, and **R**eusable for further research and analysis.

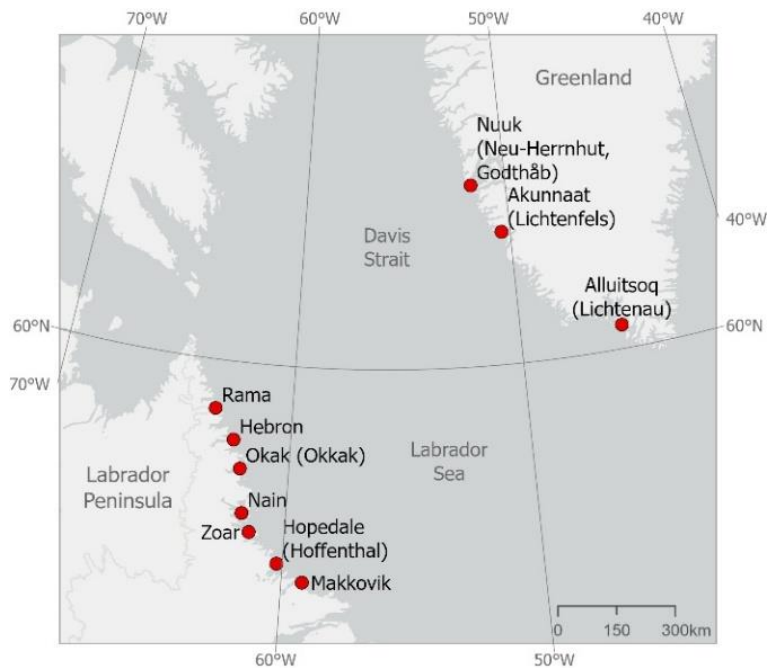


Fig. 1. Location of historical Moravian Brethren missions where meteorological measurements were carried out.

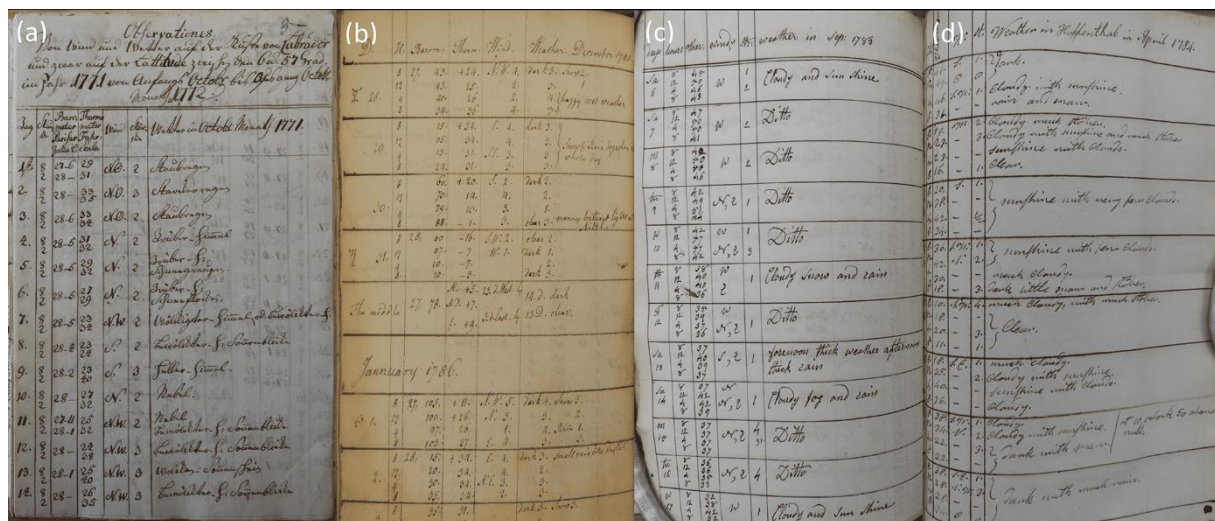


Fig. 2. Examples of manuscripts presenting meteorological observations: (a) Nain (1 October 1771 to 31 July 1786), source: Unitätsarchiv MDF.1817, the Moravian Archives in Herrnhut (Germany), data presented in the manuscript for 1 to 14 January 1771; (b) Nain (22 August 1777 to 31 July 1786), source: R.S.MA 143, The Archives of the Royal Society in London, data presented in the manuscript for 28 December 1785 to 11 January 1786; (c) Okak (1 August 1779 to 31 July 1784), source: R.S.MA 144, The Archives of the Royal Society in London, data presented in the manuscript for 6 to 17 September 1780; (d) Hopedale (1 October 1782 to 16 August 1786), source: R.S.MA 144, The Archives of the Royal Society in London, data presented in the manuscript for 25 March to 8 April 1784 (after Singh et al. 2025).

The oldest meteorological data series for southwestern Greenland and Labrador date back to the 18th century (see Fig. 3). For these series, we have detailed knowledge of their content, temporal coverage, and resolution. After the departure of the Moravian missionaries, meteorological observations in many of the aforementioned locations were continued throughout the 19th and 20th centuries by the national meteorological services of Denmark, Germany, and Canada. The data have been collected; however, they still require thorough cataloguing in terms of their content and potential use in further scientific research.

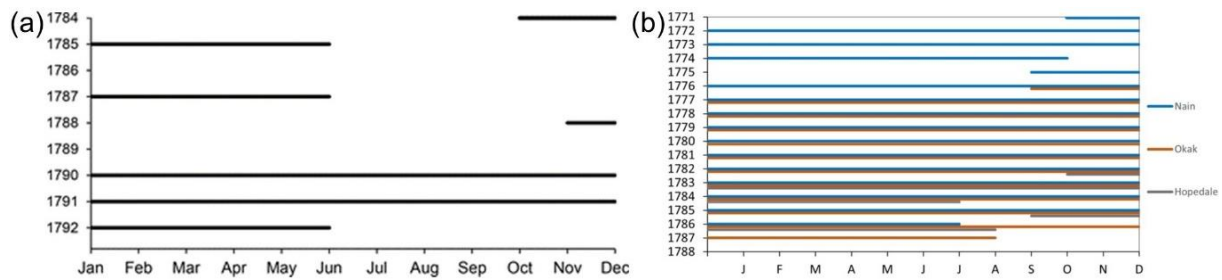


Fig. 3: (a) Coverage of air temperature data in Nuuk (previously Godthaab), 1784–1792 (after Przybylak et al. 2024) and (b) air temperature data availability for Labrador for the late 18th century (after Singh et al. 2025).

In this article, we present a detailed inventory of all archival materials collected to date containing early instrumental meteorological data for the coasts of Labrador and SW Greenland from the 18th to the beginning of the 20th century. This includes an in-depth analysis of their temporal coverage and observational gaps, the meteorological variables measured, and their resolution, as well as key metadata such as measurement methodologies, instruments used, observers, and other relevant contextual information.

Acknowledgments. We express our gratitude to the local Inuit communities of Nunatsiavut and the southwestern coast of Greenland, who welcomed the Moravian missionaries to their lands in the 18th and 19th centuries, as well as to the National Science Centre (grant no. 2020/39/B/ST10/00653) for financially supporting our research.

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Received 15 September 2025

Accepted 20 October 2025