

## The Science Behind Moravian Meteorological Observations for Late-18th Century Labrador

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From the time they established their first shelter among the Inuit population of the northern coast of Labrador in 1771, the brethren of the Moravian Church began producing series of daily instrumental and qualitative meteorological observations of significance to science networks of the day (Macpherson, 1987, Demarée & Ogilvie, 2008). Contrary to what is understood, missionaries did not make these observations for their own purposes. Rather, they responded to requests from scientists who commissioned the data. Scientists also equipped these undertakings. The enlightened observers provided handwritten copies that were publicized in England and continental Europe by individuals and their philosophical and scientific institutions. This pattern of producing reliable records specifically for scientists was true for the 15-year span of Moravian meteorological observations for all 3 Labrador stations in the late 18th century; the 40-year span of records for 10 Moravian stations in Labrador and Greenland in the mid-19th century; and the observations from 5 Labrador stations commissioned for the 1st international Polar Year, 1882, and continuing for several decades afterward, and longer in the case of Nain. When Nain data is combined with that from the Canadian meteorological service, we have a relatively straight run from 1882 to 2015.

In this paper, we examine the late-18th century Moravian meteorological observations for qualitative information of interest to modern scientific research. The daily entries comprise not only measurements of temperature and air pressure, but also other weather observations, such as wind direction, estimated wind speed, cloudiness, information which has already allowed us to begin tracking polar lows travelling from Labrador to Greenland across the Labrador Sea. The annual missionary reports of Moravians provide critical supplementary data identifying recurring local phenological events in nature, which offer an integrated signal of weather conditions, such as the timing and lengths of the seasons (Menzel, 2002; Dose and Menzel, 2006). Phenological data also display impacts of climate change (Rosenzweig et al., 2007). So far, historical phenological records are unknown for the Labrador coast. Thus, a systematic digitalization of the original meteorological observations will provide unique material on historical paleoclimatic data about an environmentally sensitive and understudied region. And, if we expand the spatial scope of our future research, we will explore comparable meteorological and phenological data generated (1774-1811) by the Hudson Bay Company for the Royal Society of London at a dozen company trading posts in subarctic Canada. Like the Moravians, post managers also kept daily post journals. These contain an abundance of phenological data that will help amplify the cryptic information in HBC meteorological journals. Five company posts on James Bay and Hudson Bay are examples.