

ACRE education and outreach: The HMS Plover historical data intercomparison project

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The usefulness of historical weather data depends on knowing what methods were used to collect it and thus how the observations might have been influenced in ways unrelated to the actual variable being measured. The type of instrument, how it was set up, the number of times per day the values were recorded and other factors like these can all influence the results. For air temperature measurements the kind of instrument shelter or radiation screen in which the thermometer is placed can have a large effect. Quantifying the bias associated with different shelter designs and other variations in method is therefore an important and sometimes difficult step toward making historical and modern data comparable. In this project students from two high schools in New York and Alaska evaluate the air temperature data (and associated metadata) recorded by the crew of the HMS Plover during its stay at Point Barrow, Alaska, from 1852 to 1854. The Plover, a British navy ship, was dispatched to Point Barrow to aid in the search for the missing Arctic expedition led by Sir John Franklin. Working with their teachers and NOAA and ACRE scientists, the students have developed a research plan that addresses the following general objectives: 1. Design and build a replica of the Plover's thermometer shelter based on the description provided by the ship's surgeon. The replica will be outfitted with a standard electronic temperature sensor and deployed at the NOAA Barrow Observatory for a period of one year, beginning July 2011. 2. Use the data from the Plover replica and the Barrow Observatory's standard instruments to estimate the measurement bias due to the shelter design. Evaluate other metadata-related issues such as the calibration and performance of the Plover's actual instruments under Arctic conditions. With a quantitative estimate of the bias induced by the Plover's instrument shelter the students will be able to describe how the historical observations should be interpreted in the context of modern temperature data and the climatology of Barrow.