Session: C20 Poster: T190A

Forgotten not lost: Old Weather and the new climate of the Arctic

Kevin Wood[†]; Philip Brohan; Gilbert Compo; James Overland; Igor Smolyar
[†] University of Washington, USA
Leading author: Kevin.R.Wood@noaa.gov

To understand the physical processes related to lower-frequency climate variability in the Arctic we need longer, higher resolution and spatially comprehensive data sets. In principle these may be built using historical observations. For centuries scientists and sailors have left records of the weather and environmental conditions they encountered, in many cases every hour for years at a time. Millions of these instrumental observations exist but are inaccessible - buried in thousands of handwritten logbooks and weather journals. If these observations were converted into a digital format we could reconstruct long climate time series at the sub-daily resolution required for dynamical reanalysis. While the manuscript data resource is huge, converting it into a usable data format is difficult. Manual transcription of these records is unavoidable and time consuming. However, one solution is to use public outreach to attract volunteers to the task. The Old Weather initiative (www.oldweather.org) has proven to be an effective way to obtain rapid and accurate transcriptions of ship logbooks. Within 3 months of its initiation more than 250,000 manuscript logbook pages from World War I era Royal Navy ships were transcribed by some 6000 citizen volunteers. These transcriptions include hourly meteorological variables, sea-surface temperature, as well as information on the movements of the ship and events on board. Quality is assured by the fact that every data point is independently transcribed at least three times. With the collaboration of the U.S. National Archives and other partners brought together by the international ACRE initiative (http://www.met-acre.org), we have extended the scope of Old Weather to include ships that sailed the Arctic and high-latitude oceans since the late 18th century, with an initial focus on the North Pacific - Arctic. In addition to meteorological and oceanographic measurements, non-instrumental variables like sea ice reports are also extracted for integration into new or updated data products. As well as providing direct information about the regional climate, newly digitized observations provide input to future extended surface-input reanalysis products like the 20th Century Reanalysis. Data recovered from high latitudes will greatly enhance reanalysis skill, especially over the sparsely-observed North Pacific and Arctic regions. With these tools not only will we be equipped to distinguish bellwether climate events from rare but ordinary fluctuations, but we will also have better access to their particular meteorological, oceanographic and dynamical underpinnings and hence the possibility of an improved forecast capability.