



Towards a new common Greenland Ice Core Chronology for the last 5000 years

Mai Winstrup (1), Sune Olander Rasmussen (1), Bo Møllersøe Vinther (1), Eliza Cook (1), Anders Svensson (1), Joe McConnell (2), and Jørgen Peder Steffensen (1)

(1) University of Copenhagen, Centre for Ice and Climate, Niels Bohr Institute, Copenhagen, Denmark (mai@gfy.ku.dk), (2) Desert Research Institute, Reno, Nevada, USA

Since the development of the Greenland Ice Core Chronology 2005 (GICC05), it has been widely used as a reference chronology in paleoclimate research. However, recent research (Sigl et al, 2015) demonstrated that this timescale has small, but significant, issues over historical time. These discrepancies were found by counting annual layers in high-resolution chemistry records from the NEEM S1 shallow core, and confirmed by linking via ^{10}Be marker horizons to the layer-counted WAIS Divide ice core, Antarctica, and accurately-dated tree-ring series.

This work showed that a revision of GICC05 is required prior to 1250AD. We here refine and extend this work. Layer-counting in a single core will always involve some uncertainty, and we hence use data from multiple Greenland ice cores, for which high-resolution impurity records recently have been measured. These ice cores have been synchronized using volcanic marker horizons, and the layer-counting is performed automatically using the StratiCounter algorithm (Winstrup et al, 2012), while ensuring that the number of layers between volcanic horizons are the same in all cores.

Based on this extended multiple-core data set, we are further able to extend the new Greenland timescale another few thousand years back in time. This will, among others, provide a new ice-core date for the catastrophic volcanic eruption (~ 1600 BC) that destroyed the Greek Minoan culture, an important time marker in Greek history.