Evidence of WAIS Loss during MIS 5e: Siple Dome and more

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Evidence has been accumulating that a future deglaciation of the deep basins of the West Antarctic Ice Sheet (WAIS) would be a replay of earlier events, with the most recent marine deglaciation probably during Marine Isotope Stage 5e. The strongest evidence may be the height and pattern of far-field sea-level records, which together indicate a southern contribution to the 5e high-stand, of magnitude similar to the sea-level equivalent of the marine portions of WAIS (e.g., Kopp et al., 2009, *Nature*). Sedimentary records from under (Scherer et al., 1998, *Science*) or just in front of (Naish et al., 2009, *Nature*) the Ross drainage of WAIS, coupled to ice-flow modeling (Pollard and DeConto, 2009, *Nature*), indicate Pleistocene deglaciation. Excess warmth in East Antarctica during 5e and earlier deglaciations (Holden et al., 2011, *J. Quat. Sci.*), and the patterns of relatedness of bryozoans (Vaughan et al., 2011, *Geochem. Geophys. Geosys.*) and octopi (Strugnell et al., 2012, *Molecular Ecology*) around the coast, are most easily explained if WAIS deglaciated recently. The meltwater channels incised into bedrock in deep water in Pine Island Bay, and rising away from the ice sheet, have been explained as resulting from: i) deglaciation of the marine basins but with ice remaining on the highlands; ii) cooling-induced ice-shelf formation fed by the ice on the highlands, bridging the deep basins and grounding on higher seafloor beyond; iii) thickening of this ice cover in response to the greater friction from the grounding, pressurizing the water trapped in the deep basins, concurrent with ice advance into Pine Island Bay; and iv) subglacial outburst flooding forming the observed channels (Alley et al., 2006, *Geomorphology*). New data are being collected from the deep ice of the Siple Dome core. Results so far indicate deposition at significantly higher, colder elevation than the top of the modern dome (Alley and White, 2000, *WAIS Workshop abst.*), likely recording grounding of an ice shelf fed from highlands, followed by formation of the dome "trapping" ice from higher elevation in the dome. Very careful modeling of existing data, new ice cores situated to find similar signals, and rapid-access drilling to study cosmogenic isotopes in bedrock and perhaps subglacial microfossils and other indicators, offer the possibility of confirming this hypothesis. (Note: This abstract is similar to one presented at the WAIS Divide meeting just before the WAIS meeting; we hope that the results will be of interest to the full breadth of the community.)

Theme: Changes in WAIS from observations (*The Times They are a-Changin'*)