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STATE OF THE CLIMATE OVER WEST ANTARCTICA BASED ON RESULTS FROM US ITASE AND SIPLE DOME DEEP DRILLING

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The International Trans Antarctic Scientific Expedition (ITASE) is a 20-nation consortium that is developing a continent-wide array of annually resolved, instrumentally calibrated records of past climate (temperature, net mass balance, atmospheric circulation, chemistry of the atmosphere, and forcing) covering the last 200-1000 years. The first phase of the US component of ITASE concentrated on West Antarctica. These US ITASE results in combination with results developed from the US deep drilling at Siple Dome provide a synthesis of past climate over West Antarctica that has both spatial (through ITASE) and temporal (through Siple Dome) perspective.

Utilizing this multi-dimensional approach the modern state of climate over West Antarctica is set within the context of the last ~10,000 years (Holocene). Changes in Holocene climate over West Antarctica have notable similarities and differences relative to a global array of Holocene climate records (Mayewski et al., 2004; Maasch et al., 2005). Perhaps most notable is the apparent lead and lag association noted between the Antarctic and Arctic, respectively, for the last major naturally forced abrupt climate change event of the Holocene (Mayewski and Maasch, in review).

Underpinning by natural climate variability is an important countering force relative to the human impact of both greenhouse gas increases in the troposphere and ozone depletion in the stratosphere. It is unclear how long this countering force in combination with moderating effects of the Southern Ocean can stem the influence of human impact on the climate of the Antarctic. Current warming of the Antarctic Peninsula and model projections for warming throughout much of Antarctica over the next several decades affirm the necessity for ITASE-like reconstructions of the past 200-1000 years of climate as a baseline for interpreting future climate over Antarctica.