

**MAJOR ION, TRACE ELEMENT AND WATER ISOTOPE MEASUREMENTS FROM THE 2002/2003 AND 2003/2004 US ITASE TRAVERSES**

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Over-snow traverses, such as those conducted by the International Trans-Antarctic Scientific Expedition (ITASE), provide us with the data needed, at a high enough spatial and temporal resolution, to form a more accurate assessment of regional differences in climate. This study focuses on a collection of cores and surface snow samples collected along the 2002/03 and 2003/04 US ITASE traverses. The 02/03 traverse started from Byrd Station, West Antarctica, and progressed southward, ultimately ending at the South Pole. The 03/04 traverse began at the South Pole and proceeded over the interior of East Antarctica to AGO4. The traverse then travelled northward along the Transantarctic Mountain seismic sensor line, passing through the Megadunes area and finishing up at Taylor Dome. Surface snow samples were collected every ~30-50 km along both traverses along with a total of fifteen shallow ice cores and several snowpits. All samples were analysed for soluble major ion content (Na, K, Mg, Ca, Cl, NO<sub>3</sub>, SO<sub>4</sub>). The surface snow samples are additionally analysed for their delta-O<sub>18</sub>, H/D, and trace element content (Sr, Cd, Sb, Cs, Ba, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Pb, Bi, U, As, Tl, Al, S, Ca, Ti, V, Cr, Mn, Fe, Co, Cu, Zn). Core top data (high (low) SO<sub>4</sub> (Na) concentrations) indicate summer precipitation for most of the surface snow samples. Summer concentrations of (Sr, Cs, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Er, Tm, Yb, Lu, U, As, Al, Ca, Mn, Co, Cu, and Zn) in West Antarctica are generally below detection limits. There are high particle concentrations (of Cd, Cs, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Pb, Bi, U, As, Mn, Fe, and Cu) around the South Pole and Megadunes areas. This may be a consequence of chemical and/or precipitation differences between the two traverse years (The 02/03 traverse took place during "the summer from hell" which resulted in large amounts of fresh snow. The ITASE-03 traverse took place during a "normal" year in East Antarctica). The Megadunes area is most likely composed of redistributed or reworked (probably through ablation processes) snow. The ablation has the effect of concentrating chemistry on the ice sheet surface.