The SPRESSO South Pole Ice Core.

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The South Pole SPRESSO (South Pole Remote Earth Science and Seismological Observatory) ice core was drilled during 2002, at 89.93°S, 144.39°W, to a depth of 292 meters as part of the International Trans Antarctic Science Expedition (ITASE). The ice age-depth relationship was determined from visual layer counting by Tony Glow and Debra Meese. In previous work by Meyerson et al (2002) the ice core recovered from South Pole was analyzed for the marine biogenic sulfur species methanesulfonate (MS) and showed a ~500 year long proxy record of the polar expression of the El Niño-Southern Oscillation (ENSO) and southeastern Pacific sea-ice extent variations.
The SPRESSO core presents an opportunity to extend this record to about 2000 years ago. We will conduct high resolution sampling of a ~200 meter section of the SPRESSO core using our Climate Change Institute continuous melter system. All samples will be analyzed for MS, soluble major ions (Na^{2+}, K^{+}, Mg^{2+}, Ca^{2+}, Cl^{-}, NO^{3-} ,SO_4^{2-}), trace elements (Zn, Pb, Hg, Cd, Cu, V, Mn, Ni, As, Al, Fe, Se, and REEs), and stable oxygen isotopes ratios. We will use the ABAKUS particle counter for the first 50 meters (covering the last 350 years) to determine the insoluble dust content.