South Pole Snow Pit, 1988 and 1989, Version 1

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

Whitlow, S. et al. 2004. *South Pole Snow Pit, 1988 and 1989, Version 1.* [Indicate subset used]. U.S. Antarctic Program (USAP) Data Center. https://doi.org/10.7265/N5T43R0R. [Date Accessed].

FOR QUESTIONS ABOUT THESE DATA, CONTACT NSIDC@NSIDC.ORG

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/NSIDC-0086

National Snow and Ice Data Center

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1 DETAILED DATA DESCRIPTION

Six meter Snow Pit dug close to South Pole in austral summer1988-89 by the Glacier Research Group of the University of New Hampshire.

Location: 38 km on grid 90 from South Pole station, (eastern margin of clean air sector)

Data set: Major ion chemistry, oxygen isotopes, H2O2, and beta from 6 meter snow pit covering the period 1955 to 1989. Also major ion chemistry for a series of surface snow samples collected on the traverse to the pit. Samples were collected by Glacier Research Group using established clean techniques. Major ion chemistry determined on a Dionex system using suppressed chromatography with a Fast Cation I and Fast Cation II (for cations) and AS4A (for anions) at the University of New Hampshire. Sample loop size was 0.5 ml. Data was collected using the Dionex AI-450 software. Duplicate aliquots were analyzed for 20 per cent of the samples. Samples for major ion chemistry were melted quickly in a warm water bath, aliquoted, and analyzed within two hours of melting. Oxygen isotopes were analyzed at the University of Washington. H2O2 was measured at the University of New Hampshire using peroxidase-catalysed reaction measured by fluorescence spectrophotometry. Beta samples were melted, filtered through cation exchange filters. They were counted with a gas-flow proportional counter at the University of New Hampshire.

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Publications: Mayewski, P.A and Legrand, M.R., 1990, Recent increase in nitrate concentration of Antarctic snow. Nature, 346, 258-260.

Whitlow, S., Mayewski, P.A., and Dibb, J.E., 1992, A comparison of major chemical species seasonal concentration and accumulation at the South Pole and Summit, Greenland. Atmos. Envir., 26A, 2045-2054.

Dibb, J., Mayewski, P.A., Buck, C., and Drummey, S., 1990, Beta radiation from snow, Naure 344, 25.

Data fields for chemistry file Top depth, in meters, 0 is the ground surface with numbers increasing with depth Bottom depth of sample, in meters Year, the date is indicated at the approximate midpoint of the year's austral summer interval Oxygen isotopes, standard per mil notation Na (sodium), microequivalents per liter, precision is 3%, limit of detection 0.004 K (potassium), microequivalents per liter, precision is 11%, limit of detection 0.001 Mg (magnesium),

microequivalents per liter, precision is 8%, limit of detection 0.004 Ca (calcium), microequivalents per liter, precision is 28%, limit of detection 0.0125 Cl (chloride), microequivalents per liter, precision is 4%, limit of detection 0.07 NO3 (nitrate), microequivalents per liter, precision is 2%, limit of detection 0.07 SO4 (sulfate), microequivalents per liter, precision is 2%, limit of detection 0.09 H2O2 (hyrdogen peroxide), micromoles per liter, precision is 3% Data fields for beta file Top depth, in meters, 0 is ground surface with numbers increasing with increasing depth Bottom depth, in meters Beta, counts per hour per kilogram Data fields for the surface snow traverse file Distance from South Pole station in miles Oxygen isotopes, standard per mil notation Na, microequivalents per liter, precision is 3%, limit of detection 0.004 K, microequivalents per liter, precision is 11%, limit of detection 0.001 Mg, microequivalents per liter, precision is 8%, limit of detection 0.004 Ca, microequivalents per liter, precision is 28%, limit of detection 0.005 Cl, microequivalents per liter, precision is 4%, limit of detection 0.07 NO3, microequivalents per liter, precision is 2%, limit of detection 0.07 SO4, microequivalents per liter, precision is 2%, limit of detection 0.09 H2O2, micromoles per liter, precision is 3% No data is indicated by the value -888. Values below the limit of detection are indicated by -999. The precision of the major ion chemistry is the average value of the coefficient of variation of each pair of duplicate analysis. The precision decreases as the concentration decreases, i.e., for Ca values less than 0.025 microequivalents per liter the precision is 100%. The files have been screened for samples contaminated by handling. Contaminated samples have been removed from the data set (the judgement has been very conservative, if the determination was questionable, the sample was left in the data set). If a sample is characterized by high Na, K and Cl values, with a relatively greater increase in K, it is considered contaminated.