

1835 TO 1998 HIGH-RESOLUTION RECORD OF ATMOSPHERIC AND PRECIPITATION CHEMISTRY FROM JAMES ROSS ISLAND, ANTARCTICA

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A unique, continuous ice-core analytical system was used to develop high-resolution, broad-spectrum elemental and chemical records of atmospheric and precipitation chemistry from ice cores collected from James Ross Island, Antarctica. In the analytical system, called Continuous Flow Analysis with Trace Elements Dual (CFA-TED), an ice core melter is coupled to both a traditional Continuous Flow Analysis (CFA) system and to two high-resolution, magnetic sector Inductively Coupled Plasma Mass Spectrometers (HR-ICP-MS) and one Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES). This analytical system makes possible continuous, exactly co-registered trace and ultra-trace-level measurements of more than 30 elements and chemical species at depth resolutions of less than 1 cm. Measurements were made on sections from two ice cores collected from

Dalinger Dome on James Ross Island in 1998 under the direction of the

Laboratorio de Estratigrafía Glaciar y Geoquímica del Agua y de la Nieve (Instituto Antártico Argentino) in with cooperation with the Laboratoire de Glaciologie et Géophysique de l'Environnement, the Laboratoire des Sciences du Climat et l'Environnement, and the [Núcleo de Pesquisas Antárticas e Climáticas](#). The combined ice core measurements form a near continuous record of atmospheric and precipitation chemistry from 1835 to 1998, with more than 40 measurements per year over the entire period. These glaciochemical records are used to investigate changes in fluxes of sea salt, dust, industrial pollution, and volcanic fallout at the northern tip of the Antarctic Peninsula over the past 170 years.