

Aerosol deposition in East and West Antarctica during recent millennia from continuous ice core measurements

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Continental dust and other aerosols emitted from biomass burning, volcanoes, and industrial activities alter chemistry and radiative processes in air and snow, yet little is known about past sources, atmospheric transport pathways, or fluxes prior to recent decades. Dust mobility and biomass burning emissions are linked to climate and glaciers and ice sheets contain detailed records of these aerosols. We use continuous, high-depth-resolution, trace and ultra-trace measurements of a broad range of elements and chemical species in a widely distributed array of ice cores from East and West Antarctica to evaluate changes in aerosol concentrations and deposition rates around the continent during recent centuries to millennia. Included in the array are intermediate cores from the WAIS Divide deep drilling site and other sites in Marie Byrd Land in West Antarctica, Law Dome, the Antarctic Peninsula region, and a series of sites along the Norwegian-U.S. scientific traverse of East Antarctica including South Pole. We first will give an overview of the continuous analytical system used to develop these unique data sets and then present a number of aerosol records from these sites around Antarctica and discuss their implications for climate research.