



Black carbon frozen in ice

Sea spray, desert dust, and soot from volcanoes and fires are among the aerosols that affect Earth's climate, primarily by scattering or absorbing incoming solar radiation. To provide a long observational record for assessing climate models, Joseph McConnell of the Desert Research Institute in Reno, Nevada, and his colleagues used elemental, chemical-species, and isotope measurements taken from six Antarctic ice cores to reconstruct the variability in black carbon and soot aerosols in the Southern Hemisphere over the past 2000 years. Those aerosols form from the incomplete combustion of fossil fuels, wood, or other biomass. Robert Mulvaney of the British Antarctic Survey, pictured here in 2008, led the drilling of one of the cores, from the northern Antarctic Peninsula. The five other cores were collected by collaborators from the US, Argentina, Germany, and Norway.

In the ice at a depth that corresponds to a time frame of 1297 ± 30 CE, the researchers found a striking threefold increase in the deposition of black carbon in the northern Antarctic Peninsula but not in the continental Antarctic records. A similar depositional pattern in atmospheric models is reproducible if the source of the burning came from a location poleward of 40° S. Tasmania, New Zealand's South Island, and Patagonia satisfy that criterion, and the researchers expected that natural fires in those areas were responsible for the black carbon observations. They were surprised to learn, however, that only the paleofire record from New Zealand matched the timing of the black carbon jump. The Indigenous Maori population first settled there in the early 1300s. (J. R. McConnell et al., *Nature* **598**, 82, 2021; image courtesy of Jack Triest.)

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