

Volcanism and Climate in the North Atlantic: The Problem of Local vs. Global Influences During the Last Millennium

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The Koch sea ice index for Iceland reveals a climate record that is quite different from comparable historical temperature or sea ice records from western Europe. While the western European records match reasonably well records of solar irradiance from the last millennium, the Iceland sea ice index does not. If the solar-climate connection in Europe reflects the global climate, as has been suggested, why is the Icelandic record different? An answer may lie in the close match between the Icelandic sea ice index and the historical record of explosive activity in Iceland. Perhaps Icelandic volcanism impacted mainly the Icelandic climate and had a much smaller influence on climate elsewhere in the North Atlantic region. The frequency of volcanic sulfate events measured in Greenland ice cores over the last millennium also seems to resemble that of Icelandic explosive volcanism, suggesting a strong influence of Icelandic eruptions on the Greenland record. If so, then recent estimates of volcanic forcing of global climate during the Little Ice Age (1300 AD to 1890 AD) based on the Greenland records of volcanism may be incorrect.