



Tree rings, volcanic eruptions and multi-elemental chemistry: The potential of dendrochemical techniques for the absolute dating of past volcanism

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Investigations of volcanic impact on human society and the environment are presently restrained by a lack of absolute dates for eruptions prior to the last few hundred years. The degree of impact and recovery, and the scope of any sociological repercussions can only be fully explored if working from a precise, known, starting point. A potential means to high resolution dating for the majority of the Holocene lies with globally available, absolutely dated tree ring chronologies. Many of these have been shown to record short term climatic alterations in periods following volcanic eruptions of known or approximate date. This argument however, has been based on an apparent correlation between the dates of specific tree ring growth anomalies and the dates of a number of eruptions in the recent historical period. The statistical correlation is less than decisive and the exact volcano-climate-tree growth linkage is by no means universally agreed. It has been suggested that a potential means to solving this problem and attaching an absolute date to a volcanic eruption via tree rings may lie in the chemistry of the annual woody increment. Presenting data from a series of pilot studies, this paper reviews the prospects for a dendrochemical resolution to the problem of attributing an absolute date to the volcanic eruptions of prehistory.