



The volcanic fingerprint of four weather regimes over the N-Atlantic as seen in ECHAM5-wiso millennial run from 800-2000 AD.

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The volcanic fingerprint on the atmosphere circulation over the North Atlantic is analyzed in a coupled atmospheric-ocean climate model (ECHAM5-wiso MPI-OM) run driven by volcanic aerosols, solar forcing, greenhouse gases, land-use and orbital variations for the 800-2000 AD. By methods of clustering four weather regimes were identified in the 500mb geo-potential height: Atlantic Ridge, Scandinavian blocking, negative phase of the North Atlantic Oscillation and positive phase of the North Atlantic Oscillation. Large volcanic events are known to affect the North Atlantic Oscillation, forcing it into a positive phase but other weather regimes have received less attention. Here we present results from volcanic analysis on these four weather regimes of both equatorial eruptions and high latitude eruptions. A significant increase in NAO+ reaches a maximum in year 3 and 4 for high latitude and equatorial eruptions respectively. The decadal and bi-decadal signal is also observed for all regimes although the bi-decadal signal is more dominating for high latitude eruptions. The K-means clustering method also resulted in the first millennial frequency reconstruction of the ruling weather regimes in the North Atlantic, and the first millennial reconstruction of North Atlantic weather regimes other than the NAO.