Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03970, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03970
EGU General Assembly 2008

A multiproxy reconstruction of decadal scale winter NAO variations over the past millennium

V. Trouet (1), J. Esper (1), N. Graham (2), A. Baker (3), D. Frank (1)

(1) Swiss Federal Research Institute WSL, Switzerland, (2) Scripps Institution of Oceanography, USA, (3) The University of Birmingham, United Kingdom (trouet@wsl.ch)

Decadal scale variations in a speleothem-based precipitation proxy from Scotland and a tree-ring based drought proxy from Morocco reflect quasi-regular occurrences of contrasting precipitation regimes over the last Millennium. These proxy records are located centrally in opposing North Atlantic Oscillation (NAO) driven precipitation teleconnection regions. Analogous to the instrumental based NAO index, we combined both records to develop a near millennium-long (1049-1993) record of winter NAO (wNAO) extremes. Extreme phases in the difference record (Morocco minus Scotland) corresponded to typical wNAO related geopotential height, precipitation, and temperature anomaly patterns over Europe over the last three centuries. Low frequency NAO phases over the 20th century are well captured in the proxy record. On longer time-scales, the multidecadal variations in our wNAO reconstruction are similar to the ones found in previous NAO reconstructions. Our wNAO record, however, is 350 years longer than the currently longest reconstructions and extends into the Medieval Warm Period (MWP), for which a persistent positive mode is reconstructed. The prolonged positive wNAO mode during the MWP suggests that the increasing wNAO trend since the 1970s is not exceptional in a millennium-long context and lies within the range of natural variability.