



Late Holocene NAO and oceanic forcing on high-altitude proglacial sedimentation (Lake Bramant, Western French Alps)

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Comparison of glacially-derived clastic inputs in high altitude proglacial lake Bramant (Western French Alps) with measured North Atlantic Oscillation winter (NAOw) index reveals an inverse correlation between AD 1884-1968 at the pluridecadal time scale (20-25 years). This reflects periodical variations in snow accumulation over Lake Bramant catchment area partly influencing the glacier mass balance in the watershed. Further comparisons with reconstructed NAOw index since AD 1500 highlight spatial and temporal variations of the pluridecadal NAOw influence on this alpine climate, especially at the end of the Little Ice Age. In addition, wavelet analysis of continuous proxies of clastic sedimentation over the last 4150 years indicate significant pluridecadal variability at frequencies compatible with the NAO (30 years), while periods centered at 60-70 years could also be linked to the North Atlantic Ocean-atmosphere internal variability (Atlantic Multidecadal Oscillation). The influence of the North Atlantic deep water production on the regional alpine climate is also suggested by a significant 550 years cycle of clastic inputs since 2800 cal BP. Coupling between the North Atlantic Ocean and the atmosphere seems therefore to play a fundamental role on glacier mass balance and climate during the Late Holocene in the western Alps.

Keywords: Proglacial lake, ITRAX, wavelet, NAO, AMO, Late Holocene, Western French Alps.