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Holocene land-ocean-atmosphere interactions on the eastern seaboard of North America

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Holocene palaeoclimate records from the mid and eastern North Atlantic region show a persistent cyclical pattern of centennial- to millennial-scale changes in key climate drivers, such as North Atlantic Deep Water formation and the Atlantic Meridional Overturning Circulation. This pattern is relatively well expressed in terrestrial records from Europe; however, the picture differs in the western North Atlantic since this region is proximal to the major discharge routes from the Laurentide Ice Sheet. Here eastern seaboard climates were affected by repeated meltwater discharges into the ocean of varying magnitudes that continued until *ca*. 6.8 ka BP.

The coastal plateau bogs from Maine to northern Newfoundland are well placed to provide detailed palaeoclimate archives describing the impacts of Laurentide deglaciation and the postglacial re-organisation of atmospheric conditions. Terrestrial responses to meltwater-climate-ocean interactions can be clearly expressed in oceanic raised bogs because they are isolated from ground and surface waters, receiving almost all of their water and nutrition from meteoric sources. Specifically, summer precipitation/evapo-transpiration conditions are a major control on bog surface wetness which is in turn a key factor determining the composition of peat-forming communities.

The **PRECIP** project (Palaeo **RE**constructions of ocean-atmosphere **C**oupling **I**n **P**eat) aims to exploit the close coupling between raised bogs and the atmosphere to reconstruct the spatial-temporal pattern of moisture balance changes associated with past variability in the Gulf Stream and the Labrador Current on the eastern seaboard of North America. The reconstructions will be used to test a set of hypotheses concerning the relationships between thermohaline circulation variability, atmospheric circulation and terrestrial responses to climate change.

A multi-proxy approach will be used to reconstruct past change in atmospheric moisture balance at multi-decadal to millennial timescales using plant macrofossils and testate amoebae. These reconstructions will be compared with measurements of $\delta^{18}O$ and δD in *Sphagnum* peat cellulose which can be used to determine past changes in precipitation moisture source.