



Onset and demise of coral reefs, relationship with regional ocean circulation on the Wyville Tompson Ridge

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Results from a sediment core collected on the continental platform (300 m water depth) North of Scotland on the Wyville Tompson Ridge provide a unique history of deep water coral reef growth and demise during the Holocene period. U-series dated fossil corals (*L. pertusa* and *M. occulata*) span the period from 8.2 to 2 ka. An independent age model derived from planktonic foraminifera *G. bulloides* stable isotope profiles suggests that the base of the sediment core is dated around 15 ka. Analyses of siliciclastic laser grain size and clay mineralogical composition (XRD) provide information about sedimentary sources and dynamic of sediment transport to the corals reef link to glacial ice-sheets retreat and deep water circulation changes. Clay fraction is dominated by smectite (75 to 96 %) during the the time interval between 15 and 12.7 ka and then decrease with the sea level rise during the deglaciation. The time interval after 8.5 ka is associated to low content of smectite (between 14 and 30 %) and high contents of illite and chlorite that reach up to 49 % and 25 %, respectively. This mineralogical changes marked between 13 and 8.5 ka indicate large variations of sediment sources from the volcanic province of the Iceland–Faroe Ridge (smectite) to a crustal province of the north Scotland (illite and chlorite). This mineralogical change is also associated to a strong decrease of the siliciclastic grain-size implying also a strong decrease of IRD deposits links to the retreat of the northern glacial ice-sheet. Our results show that the onset of coral reef growth on the Wyville Tompson Ridge occurred around 8-8.5 ka and was associated the post glacial sea level rise and with sudden changes in bottom water currents that induce favourable sedimentological and hydrological conditions for corals grow.