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Carbonate mounds and cold water coral reefs on the NE Atlantic Margin; Moundforce progress

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Carbonate mounds in the geological record provide ample evidence of microbial mediation in mound build-up and stabilisation. Until recently, there was little evidence of mud-mound formation from Late Cretaceous times onwards, however, investigations over the past decade have increasingly reported occurrences of large mounds and mound clusters on modern ocean margins, in particular along the NE Atlantic margin, from Norway to the Gulf of Cadiz. These investigations have shown that along the NE Atlantic margin carbonate mound provinces, with single and clustered mound complexes of up to 350 m high form significant ocean margin systems, which until some years ago have been largely overlooked. Questions presently addressed are how the geologic setting of the recently recognised mound provinces relates to examples from the geological record, what the role of fluid flow or gas venting is or was in the genesis of large mound structures, how, and how fast modern mound provinces develop. Mound studies over the last years have concentrated on characterisation of the present day oceanographic and geologic settings, to define to what extent carbonate mounds and their associated cold water coral reefs are forced by external (oceanographic) or internal (fluid flow) drivers, how the mounds develop through time, and what their age of initiation is. Recent studies of mound and reef provinces occurring offshore Norway, on the Rockall Trough and Celtic margin, as well as in the Gulf of Cadiz indicate a direct relationship of cold water coral development with near bed hydrodynamic conditions such as strong bottom currents- likely forced by internal waves- , and enhanced turbidity . Preliminary stable isotope studies of corals and hardgrounds show a clear marine signature and so far no isotope signatures have been measured which identify anoxic methane oxidation or fluid venting as driving forces. A num-

ber of mound growth models has been developed and will be highlighted, and the constraints on forcing conditions and timing of their growth phases will be discussed.