



Holocene marine ^{14}C reservoir corrections for the Norwegian Sea based on paired U/Th and AMS ^{14}C dating of the coral *Lophelia pertusa*.

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To be able to make paleoclimate reconstructions for the Holocene researchers rely heavily on Accelerator Mass Spectrometry radiocarbon dates. These dates, when calibrated to calendar ages, provide the framework for determining the age for different paleoenvironmental records. The dating marine records is complicated by the marine reservoir age. The reservoir age is basically the residence time of CO_2 , and the bicarbonate formed from it, in the ocean; that is, the length of time spent in transit in the ocean between the time of absorption of the gas from the atmosphere and its ventilation back to the atmosphere. In general, the modern regional marine reservoir age is used to correct marine dates for the reservoir effect. The temporal variability of the marine reservoir age back through time is less known. We show, based on paired U/Th and AMS ^{14}C dating of the cold-water coral *Lophelia pertusa*, that the marine reservoir correction (ΔR) off the coast of Norway varied by over 200 years during the last 3000 years. During early Holocene, from 10000 to 9000 years ago, the marine reservoir correction increases with close to 600 years, probably as a result of melt water discharge. These results stress the importance of determining the regional time dependency of the marine reservoir age.