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Temperature and nutrients changes during MIS 11c and the Holocene on the Portuguese margin

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The interglacial marine isotope stage (MIS) 11c and the Holocene are often considered the most similar interglacial periods in terms of orbital parameters and greenhouse gas concentrations. In the North Atlantic some studies record rather similar conditions during these 2 periods, while others show significant differences. To contribute to this puzzle we have generated trace element ratio (Mg/Ca, Ba/Ca, Cd/Ca) and stable isotope records of 3 planktonic foraminifera species (*G. ruber* (white), *G. bulloides*, *G. inflata*), and biomarker records for Portuguese margin site MD03-2699 (39°N; 10.7°W). During the Holocene *G. ruber* (white) Mg/Ca based temperatures shows values around 19°C, i.e. 2°C higher than the mean annual alkenone SST-U_k'37. MIS 11c temperatures were slightly warmer than during the Holocene. During the early phase of both interglacials (MIS 11c: 426–412 ky; Holocene: 11-4 ky), stronger upwelling and intensification / persistence of the wintertime warm

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subtropical current was recorded for most of the temperature and nutrient proxies used, than during later phase (MIS 11c: 412-395 ky; Holocene: 4 ky-Present). However, the interval of high nutrient supply/higher productivity lasted longer during MIS11c than during the Holocene.