P215-TU

HIGH-RESOLUTION BIOMARKER RECORDS FROM NORTH ATLANTIC DRIFT SEDIMENTS (ODP SITES 980, 984) REFLECTING CLIMATE AND OCEAN DYNAMICS OVER THE PAST 20.000 YEARS

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The North Atlantic plays an important role as the source region for northern component waters of the thermohaline circulation. The hydrological system is highly sensitive to climatic changes. Underlying drift sediments record both changes in the hydrological system (lateral advection) and in 'direct' material input from surface waters (primary production and eolian supply), and therefore represent excellent archives for past ocean and regional climate variability. Two sediment cores from North Atlantic drift sediments were taken during ODP Leg 162 (Site 980, Feni Drift, 55ºN 15ºW, water depth 2179 m, and Site 984, Bjørn Drift, 61ºN 24ºW, water depth 1648 m). While both sites experience similar atmospheric forcing, the present-day Bjørn Drift is bathed by Iceland-Scotland Overflow Water, while the Feni Drift is influenced by more southern sourced waters. Both sites exhibit exceptionally high sedimentation rates and thus enable the reconstruction of climate-related changes within the North Atlantic with high temporal resolution. The composition of the organic matter (OM) in these sediments is closely coupled to the dynamics of the environment. Key factors that control quantity and quality of OM from marine and terrigenous sources in the drift sediments are surface water temperature and nutrient supply (marine primary productivity), wind speed (eolian supply of terrigenous OM), and strength and direction of bottom water currents (lateral redistribution of OM and export from continental margins).

This study seeks evidence for rapid climate changes through development of multi-molecular records of the varying composition of the sedimentary OM. We present high-resolution (< 100 yr) organic proxy records from both ODP sites that indicate changes in heat transport, marine productivity, and terrigenous supply from the last glacial maximum to the present. Long-chain fatty acids, *n*-alkanes and *n*-alcohols as well as alkenones deriving from marine algae and terrigenous plant waxes serve as the primary molecular tools. Fluxes of marine biomarkers document past changes in climate-controlled marine productivity. Variations in the degree of saturation of alkenones ($U^{K}_{37}{}'$) are used to reconstruct sea surface

temperatures (SST). Vascular plant lipids transported and spread over the oceans as aerosols or via bottom currents are interpreted in terms of eolian or advective terrigenous fluxes. Each of these processes is closely linked to specific climate conditions.

We also compare ^{14}C AMS ages of bulk OM and marine biomarkers (alkenones) to those of planktonic foraminifera in order to examine current-driven sediment redistribution and advective transport. Preliminary ^{14}C data indicate that bulk OM tends to be generally older than foraminiferal carbonate in both cores. As the age offsets appear to be coupled to sedimentation rate changes we investigate whether they reflect changes in current-driven redistribution of marine OM or supply of pre-aged terrigenous OM.