N_2O and CH_4 distribution in the North Atlantic: observations from oceanic platforms

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The spatio-temporal distribution N_2O and CH_4 concentrations have been determined at different sites in the North Atlantic through periodic measurement performed at two observational platforms: the ocean Fixed Time series GIFT the repeated hydrography section OVIDE. At the GIFT, located in the Strait of Gibraltar where the Mediterranean Sea and the Atlantic Ocean meets, data were collected during six oceanographic campaigns carried out from July 2011 to November 2014. The temporal variability of the gas air-sea exchange in the area during that period was assessed, with the vertical distribution of N_2O and CH_4 in Atlantic and Mediterranean waters being also examined. In addition, N_2O exchange between both adjacent basins was also analyzed, and a net export from the Mediterranean Sea towards the Atlantic was observed and quantified. In parallel, the OVIDE section that connects the Portuguese coast to Greenland was sampled twice for N_2O determinations during two cruises conducted between June-July 2012 and between May –June 2014. The extensive observational database together with an analysis of the water masses, allow to discriminate the contribution of ventilation versus biology as controlling mechanism for the N_2O distribution in the North Atlantic. Results presented here are the first records in this two key oceanic observational systems.