

ATMOSPHERIC NITROGEN INPUT INTO THE NORTH SEA: ORGANIC NUTRIENT DETECTION

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The levels of gaseous organic nitrogen compounds (alkyl nitrates - ANs) together with identification of the possible sources of these compounds in the air were studied. Seasonal trends were investigated by conducting the sampling campaigns during the spring, summer and winter time. The air-mass backward trajectories (BWTs) were calculated for the sampling periods by Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model (Draxler and Rolph, 2003). These BWTs were considered for the determination of the influence of the Atlantic Ocean, the North Sea and the continent as possible sources of ANs. An adapted set-up for low and high volume samplings, extraction and minimized clean-up, identification and quantification capabilities resulting from the complementary use of GC-ECD and GC-MS methods is reported. The AN levels were found to be in the range of a few to 7400 pg.m⁻³ in the air. The AN fraction consisted of primarily the 2C₄, C₅ and C₆ isomers, which contribute largely to the total AN level. The N-fluxes by ANs were more pronounced for the summer periods than for the winter/spring months, organic nitrates were the most abundant in the Atlantic/Channel/UK air-masses.

References

Draxler R.R., G.D. Rolph. 2003. HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) Model access via NOAA ARL READY Website (<http://www.arl.noaa.gov/ready/hysplit4.html>). NOAA Air Resources Laboratory, Silver Spring, MD.