



## **Influence of soil moisture on the chemical composition of the boundary layer during AMMA 2006.**

**D. Stewart (1), C. Taylor (2) and C. Reeves (1)**

(1) School of Environmental Sciences, University of East Anglia, UK.

(2) Centre for Ecology and Hydrology, UK.

In the summer 2006 AMMA (African Monsoon Multidisciplinary Analysis) aircraft campaign based in Niamey, Niger, measurements of NO and NO<sub>2</sub> were made on board the FAAM BAe-146 Atmospheric Research Aircraft.

In this study data is presented from flights which had the aim of measuring concentrations of NO<sub>x</sub> above soils over Niger and Mali. These flights consisted of a series of long low-level transects at different altitudes over arid areas that had experienced recent rainfall. Satellite-derived land surface temperature anomalies (LSTA) were used to plan the flights so that the aircraft passed over both dry and wetted regions.

Elevated levels of NO<sub>x</sub> were observed over recently wetted bare soils and also in one case over soils that had been wetted ~60 hours previously. The areas in which these NO<sub>x</sub> enhancements were observed tended to be correlated with a reduction in air temperature and increase in humidity and with negative LSTA, indicative of wet soils. The observed elevated levels of NO<sub>x</sub> are not associated with elevated levels of CO – ruling out an anthropogenic / combustion source

The observed NO<sub>x</sub> levels over these areas are of the order 0.8-1.4 ppb as compared to background levels of 0-0.2 ppb over dry soils in the same area and ozone levels are often also enhanced leading to speculation that local ozone production fuelled by the NO<sub>x</sub> emissions is taking place.