ATMOSPHERE-SURFACE EXCHANGE OF OXIDES OF NITROGEN, OZONE AND AMMONIA

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Von 1984-10-01 bis 1986-05-30

Projektdetails

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Koordinator

NATURAL ENVIRONMENT RESEARCH COUNCIL
c/o Bush Estate
EH26 0QB PENICUIK
United Kingdom
See on map

Ziel

1. TO MEASURE RATES OF EXCHANGES OF NO, NO2, O3, AND NH3 BETWEEN THE ATMOSPHERE AND DIFFERENT TERRESTRIAL ECOSYSTEMS (AGRICULTURAL CROPS, ROUGH GRASSLAND, NATURAL MOORLAND...).
2. TO IDENTIFY PHYSIOLOGICAL, PHYSICAL AND CHEMICAL FACTORS CONTROLLING EXCHANGE RATES.

TWO APPROACHES TO FIELD MEASUREMENT ARE PLANNED.

(A) A MICROMETEOROLOGICAL GRADIENT SYSTEM WILL BE BUILT FOR DETERMINING FLUXES FROM MEASUREMENTS OF MEAN GRADIENTS OF NO, NO2 AND O3 OVER EXTENSIVE UNIFORM SURFACES. THE SYSTEM WILL BE PORTABLE AND WILL INITIALLY BE USED AT SITES WHERE GAS CONCENTRATIONS ARE LARGE ENOUGH TO GET ADEQUATE PRECISION. SURFACES ARE LIKELY TO INCLUDE GRASSLAND (MANAGED AND NATURAL), SHORT CROPS, AND MOORLAND. INITIALLY THE METHOD WILL REQUIRE SIMULTANEOUS MEASUREMENTS OF WINDSPEED, TEMPERATURE AND HUMIDITY; ULTIMATELY A SONIC ANEMOMETER, AT PRESENT UNDER TEST, MAY ALLOW SOME SIMPLIFICATION OF THE INSTRUMENTATION. RESULTS WILL BE RECORDED AND ANALYSED ON-LINE BY A COMPUTER-LOGGER SYSTEM.

(B) A CHAMBER FOR ENCLOSING VEGETATION AND MEASURING NO, NO2, AND O3 EXCHANGE, WILL BE DESIGNED SO THAT OBSERVATIONS CAN BE EXTENDED TO A WIDER RANGE OF SITES INCLUDING FOREST SOILS AND UNDERSTOREY. INITIALLY MEASUREMENTS WILL BE POSSIBLE USING CHAMBERS ENCLOSING BARLEY OR BARE SOIL AT GLASGOW, WHERE IT WILL BE POSSIBLE TO INTRODUCE EXPERIMENTAL MODIFICATIONS, E.G. THE ADDITION OF NITROGEN FERTILIZER, BY SUITABLY MODIFYING THE APPARATUS IT IS INTENDED TO MEASURE AMMONIA FLUXES EITHER BY WET CHEMISTRY OR WITH A MODIFIED GAS ANALYSER.