

Annual Cycles of Atmospheric Trace Gases in the Tropical Marine Boundary Layer: First Measurements from the Cape Verde Observatory

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Long-term monitoring of atmospheric trace gas species has become a fundamental tool in the identification of key issues such as the globally increasing background concentration of tropospheric ozone (and also of aerosol), and in the understanding of the intercontinental transport of pollutants. Measurements of radiatively active species such as ozone along with the precursor compounds which lead to their presence have long been lacking in the tropical marine boundary layer, a crucial measurement region due to the high solar radiation and abundance of water vapour. The Cape Verde Observatory (16.848N, 24.871W) was established in October 2006, through the Natural Environmental Research Council (NERC) funded SOLAS (Surface Ocean Lower Atmosphere Study) initiative, as a long-term monitoring facility in order to address this lack of knowledge. Almost continuous measurements of ozone, carbon monoxide, nitric oxide, nitrogen dioxide, total reactive nitrogen, C₂-C₈ non-methane hydrocarbons, acetone, acetaldehyde, methanol, dimethyl sulphide and halocarbons have been obtained during its first 18 months of operation.

The observatory is additionally supported by the EU-funded project TENATSO (Tropical Eastern North Atlantic Time-Series Observatory) which contributes measurements of aerosol (physical and chemical characterization), and also of greenhouse gases including CO₂, CH₄, N₂O, and SF₆. Longer-term funding (until at least 2010) for the trace gas measurements will be through the NERC National Centre for Atmospheric Science (NCAS). The site has recently been given a WMO-GAW “global station” status for ozone, carbon monoxide and Volatile Organic Compounds (VOC) measurements.



Figure 1. The Cape Verde Observatory at Calhau on São Vicente, Cape Verde.