**Recent Science from the Cape Verde Atmopsheric Observatory (CVAO)**

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The CVAO (16,848°N, 24.871°W), a subtropical marine boundary layer atmospheric monitoring station situated at Calhau on the island of São Vicente, has been in operation since October 2006. Almost continuous measurements of the trace gases $O_3$, CO, NMVOC, NO, and $NO_2$ have been obtained. Other data from the CVAO, for example of greenhouse gases, aerosol (physical and chemical parameters), halocarbons, halogen oxides, are also available over various timescales (see http://ncasweb.leeds.ac.uk/capeverde/ for more details). The prevailing strong on-shore winds bring marine air masses with varying inputs of Sarahan dust and of long range transport from North American Europe, thus the CVAO is an appealing location for both short- and long-term research into a variety of atmospheric phenomena.

Aged air masses from North America, Europe, and Africa influence the measurements at the observatory, but fresh emissions from coastal Africa and the ocean may also play a major role. Through the use of the United Kingdom Met office's NAME model (http://www.metoffice.gov.uk/research/modelling-systems/dispersion-model) it has recently been possible to classify the air received by the site and this has since been employed in further interpretation of the datasets (Carpenter et al., 20102).

Measurements from the last six years will be presented at the conference together with comparisons with the output of the CAM-Chem and GEOS-Chem global chemistry transport models (Read et al., 2012). The GEOS model shows a significant underestimate in the $NO_x$ concentration compared to the observations. The model calculates an annual mean $NO_x$ concentration of 8.5 pptv +/- 2 pptv whereas the equivalent observation are 25 pptv +/- 24 pptv[3]. The impact of this on the composition of the marine troposphere is profound. Figure 1 shows the impact of forcing the tropical boundary layer $NO_x$ in the GEOS model to be a minimum of 25 pptv (the observational mean), with significant (50 to 200%) increases in $O_3$ observed. It is clear that the tropical marine boundary layer is very sensitive to perturbations in the $NO_x$ concentrations, that the model fails to simulate these concentrations at Cape Verde.

The CVAO is a Global Atmospheric Watch (GAW) station and so data is submitted regularly on daily, monthly and yearly timescales to the World Centre for the Greenhouse Gases http://gaw.kishou.go.jp/wdcgg/ in addition to the British Atmospheric Data Centre http://badc.nerc.ac.uk/home/index.html along with associated instrument metadata. GAW audits are planned for CO, $O_3$ and the greenhouse gas species later this year.

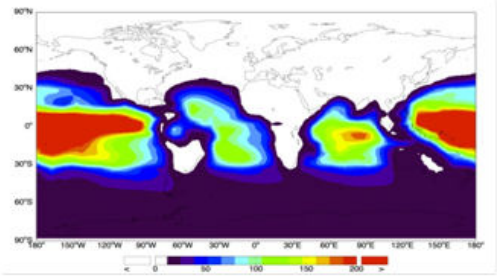

**Figure 1.** The impact on ground-level ozone of forcing the tropical boundary layer $NO_x$ in the GEOS-Chem model to be a minimum of 25 pptv (the observational mean).