



## **Assessment of recent changes in ozone and the oxidizing capacity in the Southern Hemisphere mid- latitudes**

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Recently ozone has been increasing in the lower troposphere but there have not been any trends in the free and upper troposphere of the Southern Hemisphere (SH) mid- latitudes; reasons for this behaviour have yet to be understood. A main component of tropospheric ozone in the SH is transport from the stratosphere, but anthropogenic emissions occurring mainly in the industrial Northern Hemisphere can also contribute to tropospheric ozone changes in the SH through long-range transport of ozone precursors. Here, we use a coupled stratosphere-troposphere chemistry-climate model to investigate potential drivers for recent tropospheric ozone variability and trends at Lauder, New Zealand, a clean-air site representative of SH mid-latitudes. We compare the model results to the long-term Lauder ozone sonde data to derive observed trends and seasonal variability in the troposphere and the lower stratosphere over the last decade. We explore linkages between changes in the stratospheric and tropospheric ozone, and assess the role of emission changes and the influence of climate variability, and the consequent changes in the oxidizing capacity with a set of sensitivity simulations.