

Supplementary Materials

Air Pollution Dispersion over Durban, South Africa

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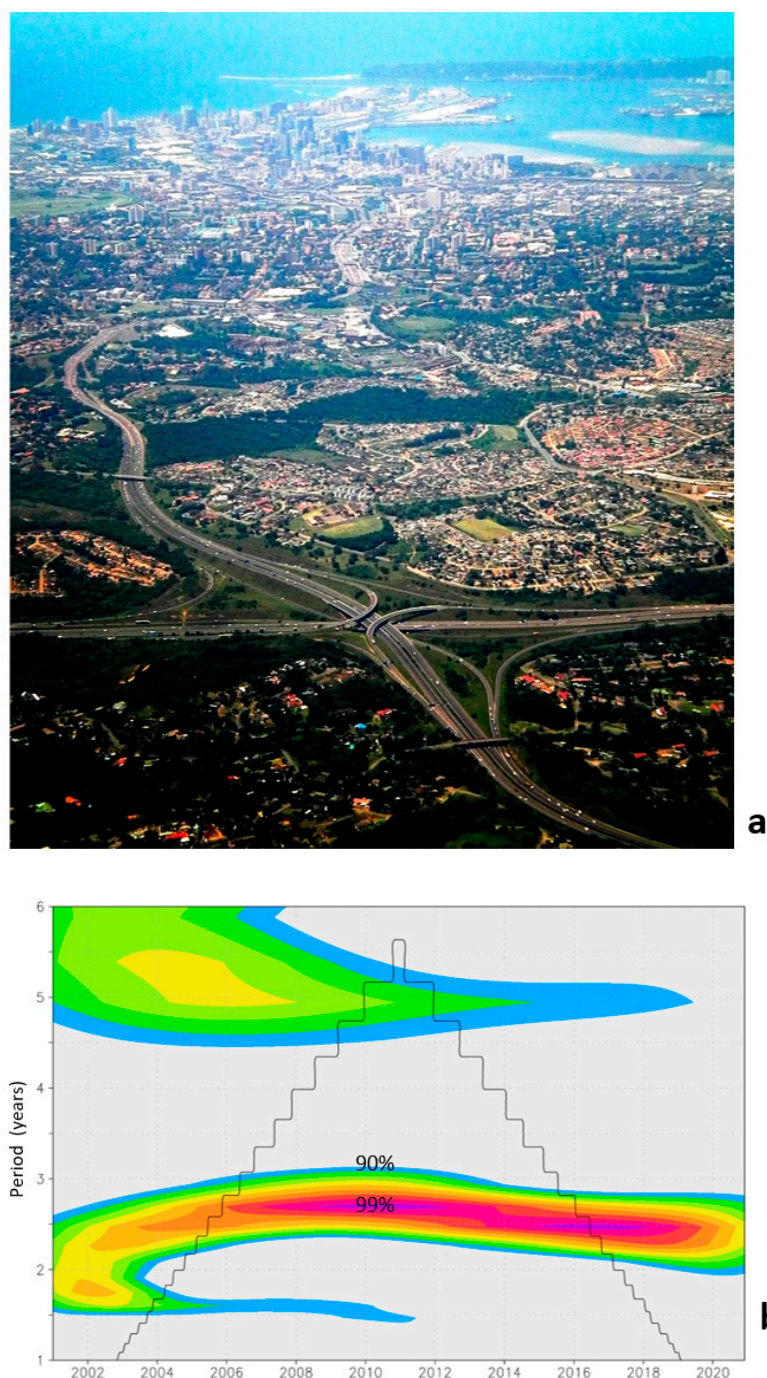


Figure S1. (a) Aerial photo of Durban looking southeastward above the intersection of N-2 and N-3 highways. Reprinted from ref. [61] (b) Wavelet analysis of inter-annual filtered Durban-area API: reflecting ~2.5 & 5 yr cycles within the cone of validity. Spectral energy shaded from 90 to 99% confidence.

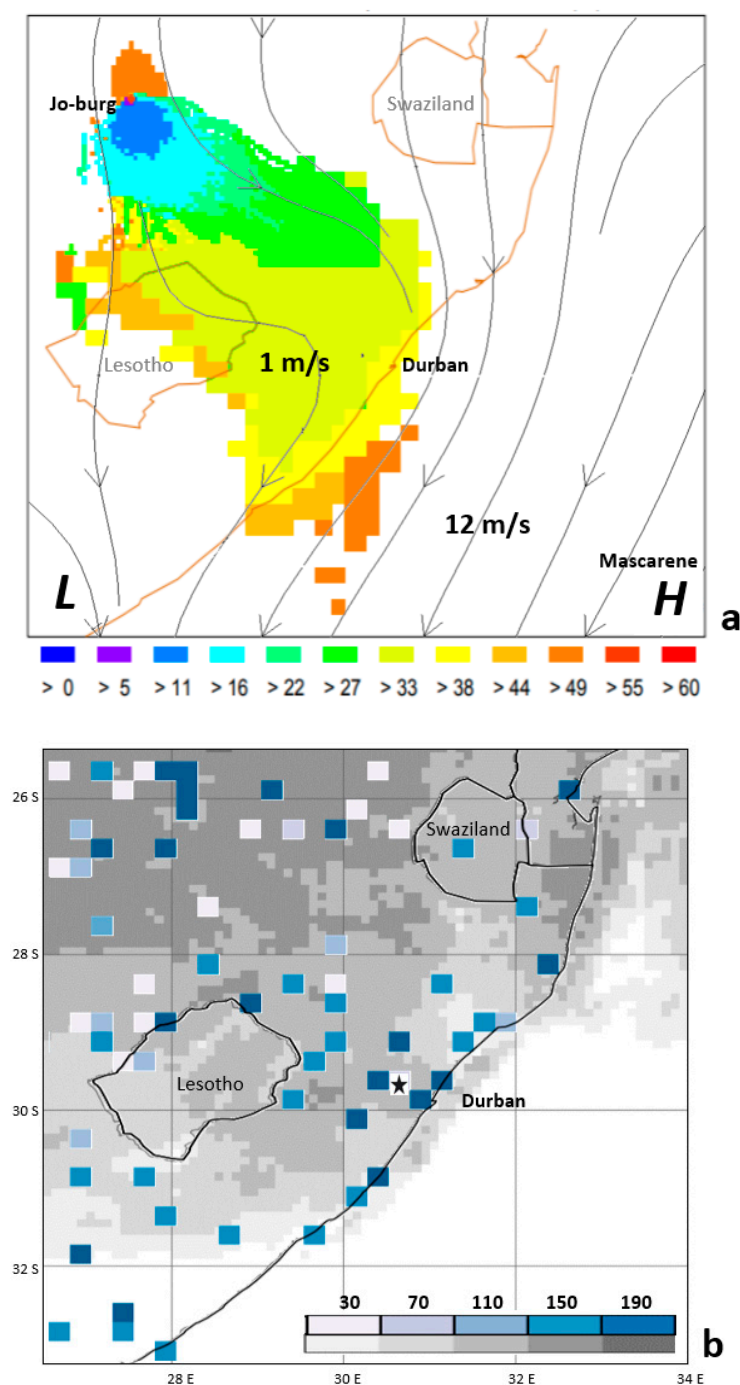


Figure S2. (a) Plume arrival time in hours during a top-10 day of Durban-area API, based on a HYSPLIT dispersion simulation of virtual emissions from the Highveld near Johannesburg (30–31 July 2009). Prefrontal weather of > 36 hr duration brings air pollution from the interior. Objectively analyzed 850 hPa wind streamlines are superimposed and min/max speeds are labelled. (b) Long-term mean surface reporting frequency: grey-shaded 3rd order stations and ships, blue squares 2nd order stations (#/month) from SAWS, star is the station used for dewpoint validation (Figure S3c).

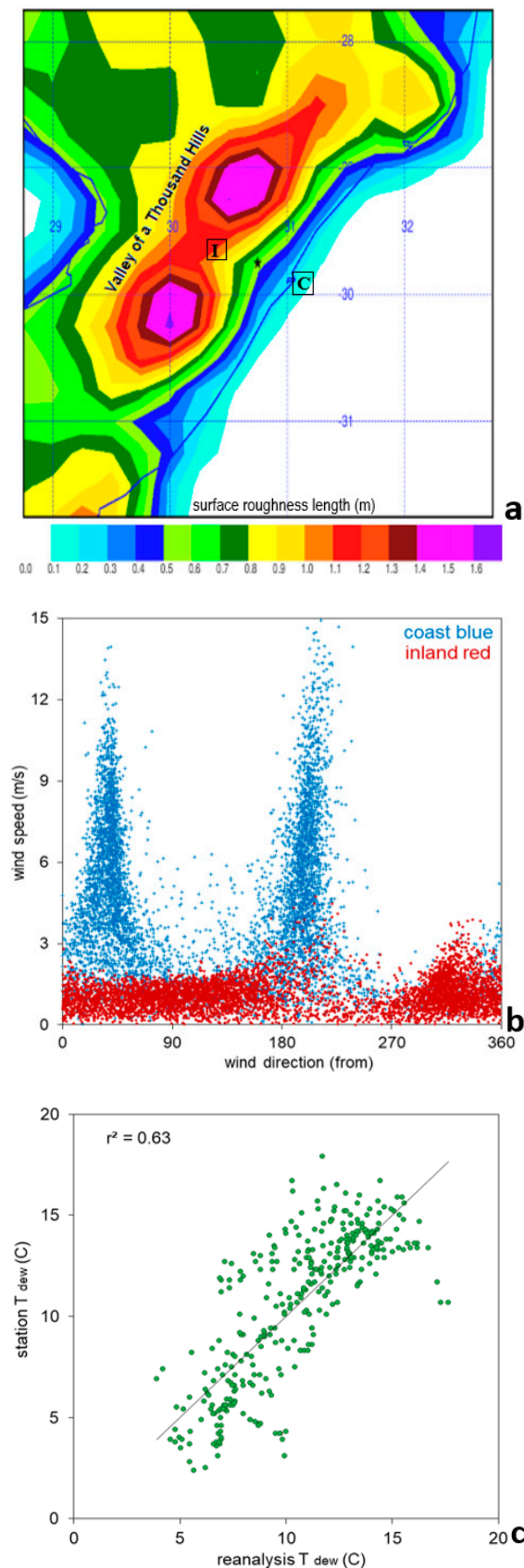


Figure S3. (a) Surface roughness parameterization at 25 km resolution over KZN. (b) Scatterplot of daily ERA5 surface wind speed & direction: inland 29.6°S, 30.4°E vs coast 29.9°S, 31°E (2005–2020) at I & C on map (N=5840). (c) Comparison of 10–24 July 2015 hourly dewpoint temperature station vs ERA5 reanalysis with linear fit at * on map (N=360).