2005-2017 ozone trends and potential benefits of local measures as deduced from air quality measurements in the north of the Barcelona Metropolitan Area

Jordi Massagué[1, 2], Cristina Carnerero[1, 2], Miguel Escudero[3], José María Baldasano[4], Andrés Alastuey[1], Xavier Querol[1]

[1] Institute of Environmental Assessment and Water Research (IDAEA-CSIC), Barcelona, 08034, Spain.

[2] Department of Civil and Environmental Engineering, Universitat Politècnica de Catalunya, Barcelona, 08034, Spain.

[3] Centro Universitario de la Defensa, Academia General Militar, 50090 Zaragoza, Spain.

[4] Department of Projects and Construction Engineering (DEPC), Universitat Politècnica de Catalunya, 08028 Barcelona, Spain.

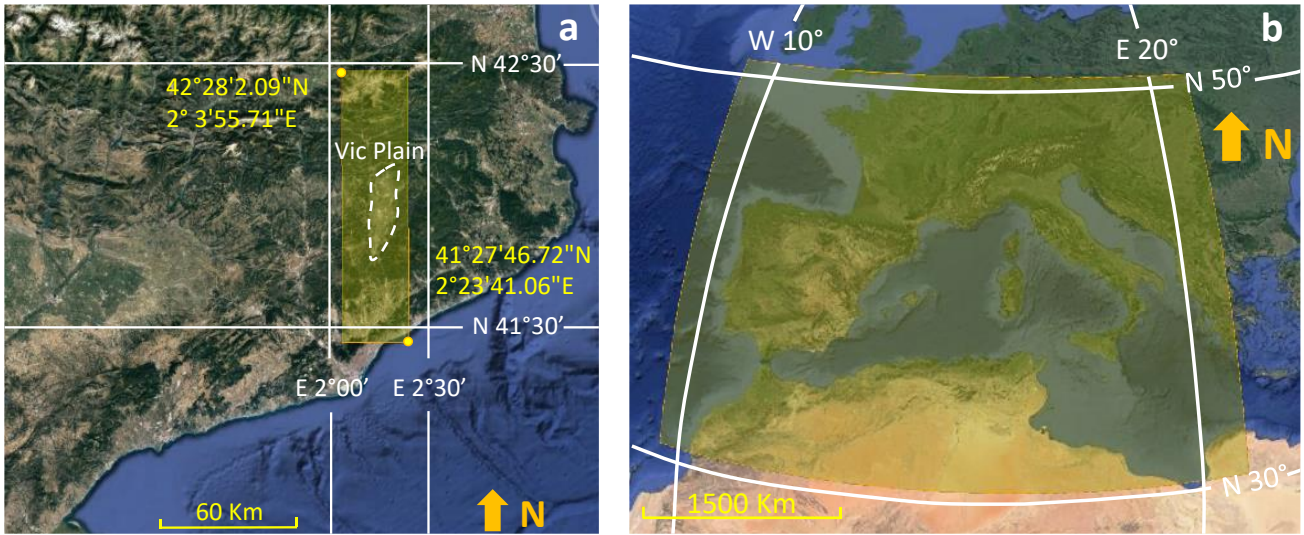
SUPPLEMENTARY MATERIAL

FIGURES

Figure S1. Selected regions for retrieval of OMI Tropospheric Column NO_2 in yellow: (a) area along the S–N axis (~3,040 km^2) which includes northern Barcelona Metropolitan Area (BMA), the Vic Plain and an area of the Pre-Pyrenean range to analyze quantitatively the time trends and patterns and (b) across Western Europe (~6,514 × 10^6 km^2) to analyze qualitatively the NO_2 spatial patterns in the two scenarios considered (when the amount of O_3 in the Vic Plain is high and when it is low).

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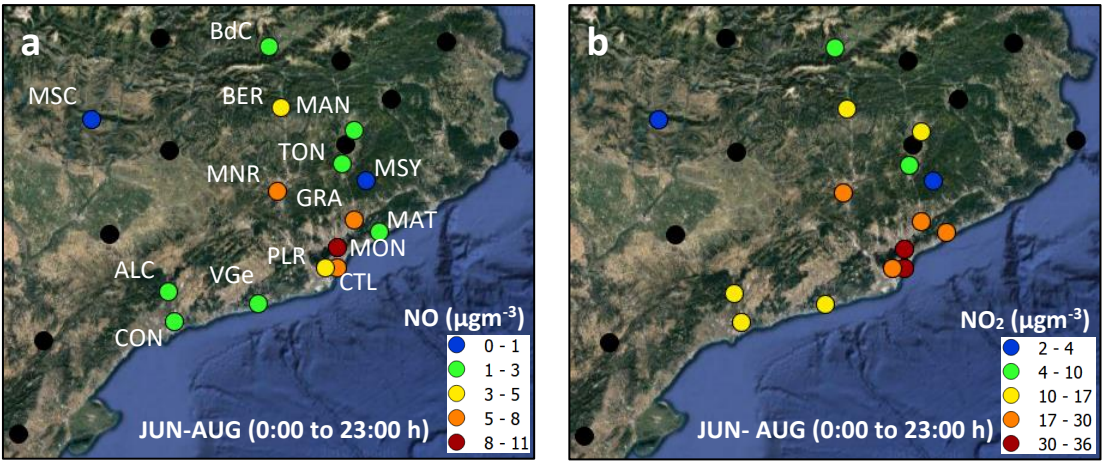
24 Figure S2. (a) Spatial variability of mean June–August NO (a) and NO$_2$ (b) concentrations observed in selected
25 AQ sites. Data from Ciutadella (CTL), Palau Reial (PLR), Montcada (MON), Granollers (GRA), Montseny (MSY),
26 Manlleu (MAN), Tona (TON), Montsec (MSC), Bellver de Cerdanya (BdC), Berga (BER), Mataró (MAT),
27 Manresa (MNR), Vilanova i la Geltrú (VGe), Constantí (CON) and Alcover (ALC) air quality monitoring stations.

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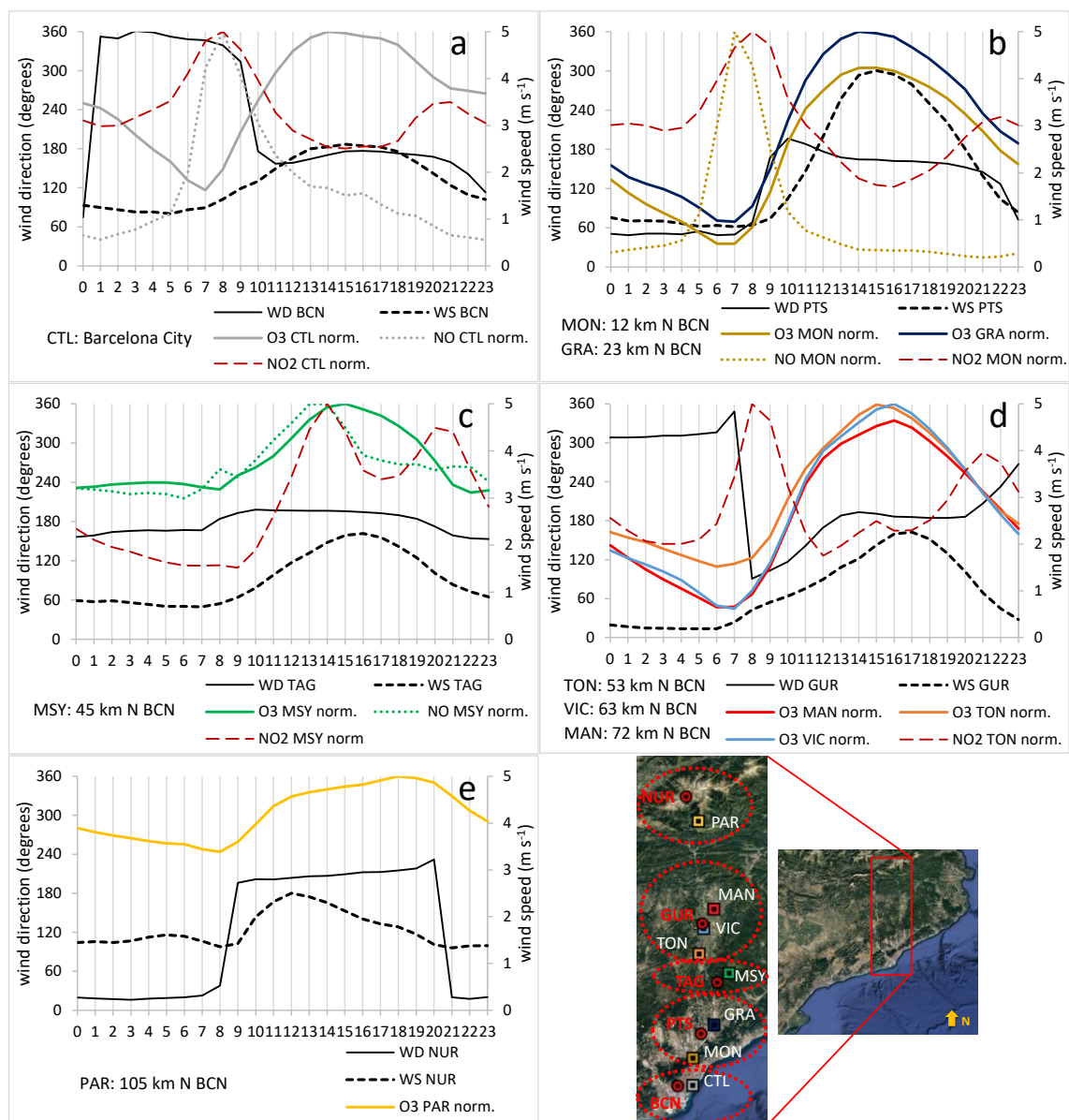
Figure S3. Normalized O_3, NO and NO_2 cycles and wind patterns for July (wind coming direction in the left vertical axis and wind speed in the right vertical axis). Pollutants' concentrations (O_3, NO and NO_2) are normalized to the highest average value to emphasize the shape of the cycles, in the case of more than one O_3 cycle in a graph (b and d plots), the O_3 concentrations are normalized to the highest O_3 values of the site that measured them. July average wind speeds and directions data come from meteorological stations located near the corresponding AQ sites (air quality CTL monitoring site with meteorological BCN; air quality MON and GRA monitoring sites with meteorological PTS; air quality MSY monitoring site with meteorological TAG; air quality TON, VIC and MAN monitoring sites with meteorological GUR; air quality PAR monitoring site with meteorological NUR). The map shows the location of air quality monitoring sites (white codes; squares) and close meteorological sites (red codes; circles) grouped by pointed circles. Air quality data are from monitoring sites along the S–N axis. In general, the highest O_3 levels occur when the wind blows from the south (location of the Barcelona Metropolitan Area, BMA) at its maximum velocity, confirming the clear influence of the BMA plume transport.

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