Supplemental Materials for "Contrasting influence of Gobi and Taklimakan deserts on the dust aerosols in western North America" by Lin Liu, Jianping Guo, Hainan Gong, Zhanqing Li, Wen Chen, Renguang Wu, Lin Wang, Hui Xu, Jian Li, Dandan Chen, and Panmao Zhai, submitted to _Geophysical Research Letters_, July 26, 2019.

This document contains Supplementary Figures referenced in the main text.
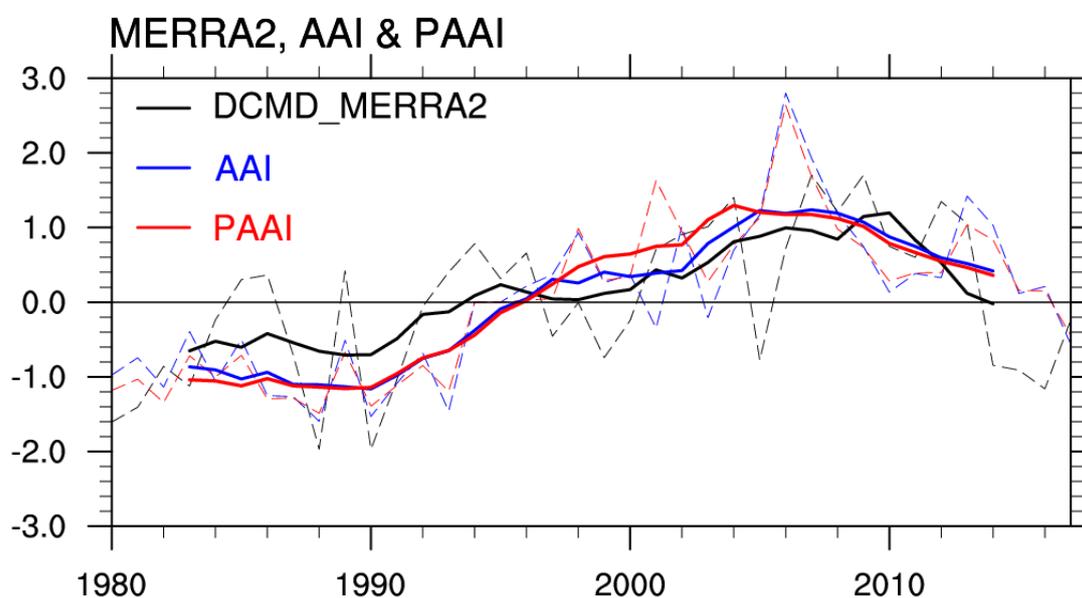
Figure S1. Normalized time series of DCMD (black dashed line), AAI (blue dashed line), and PAAI (red dashed line) in the dust sources over East Asia (35°-45°N and 75°-110°E). The 7-year running mean results are shown with the corresponding solid lines.
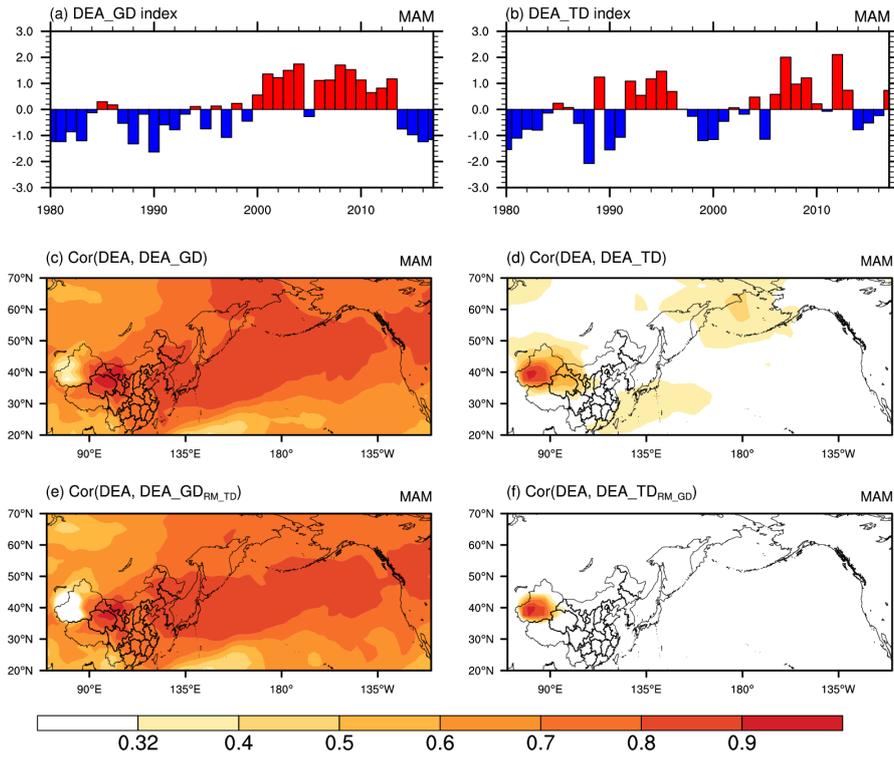
Figure S2. (a) Normalized time series of spring DEA_GD index. (b) As in (a), but for DEA_TD index. (c) Correlation maps between DEA_GD index and DEA spanning from East Asia to western North America (EA&WNA). (d) As in (c), but for the DEA_TD index. (e)–(f) As in (c)–(d), but for DEA_GD$_{RM\_TD}$ and DEA_TD$_{RM\_GD}$, respectively.
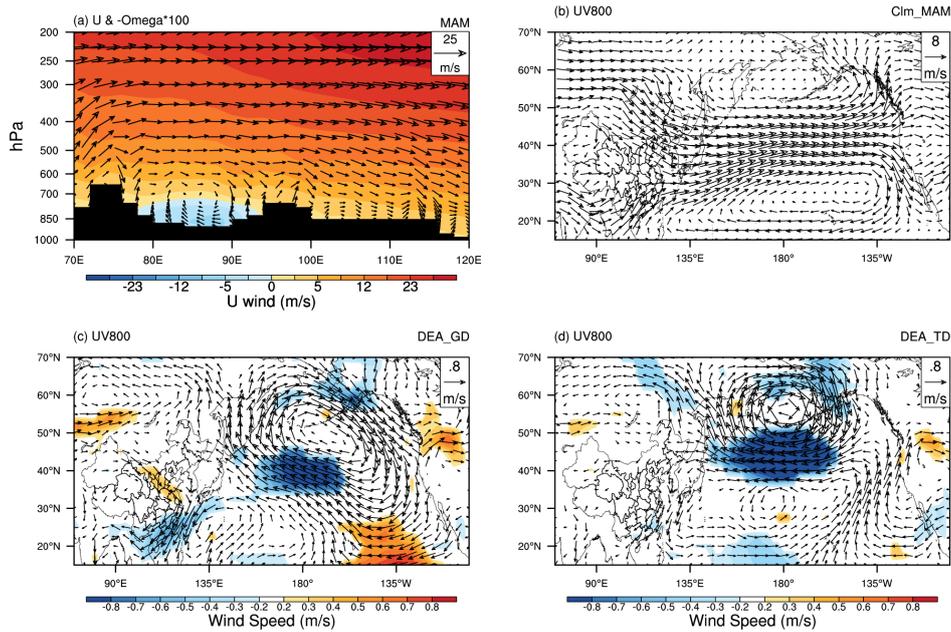
Figure S3. (a) Cross sections of the wind vectors consisting of zonal wind (m/s) and vertical velocity (0.01 Pa/s) with longitude (70°–120°E) along 40°N during spring (March–April–May) for the period 1980 to 2017. The black shading regions represent the terrain. (b) The climatological 800-hPa winds (vector) over the EA&WNA for the period 1980–2017. (c) The regression maps of 800-hPa winds (vector) and wind speed (shading) anomalies against the normalized DEA_GD index for the period 1980–2017. (d) As in (c), but for the DEA_TD index. The wind anomalies less than 0.1m/s are masked in (c)-(d). The 95% significant level is 0.32 in 38-year correlation coefficient between two time series.
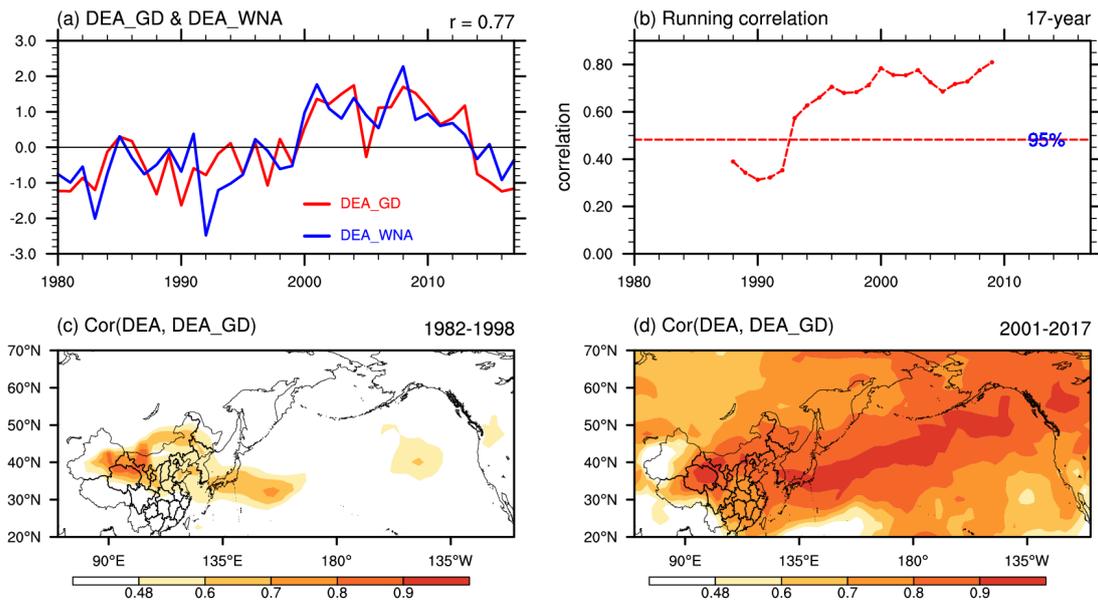
Figure S4. (a) Time series of normalized spring DEA_GD index and DEA_WNA index. (b) Sliding correlation between the spring DEA_GD index and DEA_WNA index displayed at the central year of a 17-year window. (c) and (d) are the correlation maps between DEA_GD index and DEA spanning from East Asia to western North America (EA&WNA) during 1982-1998 and 2001-2017, respectively. The 95% significant level is 0.48 in 17-year correlation coefficient between two time series.
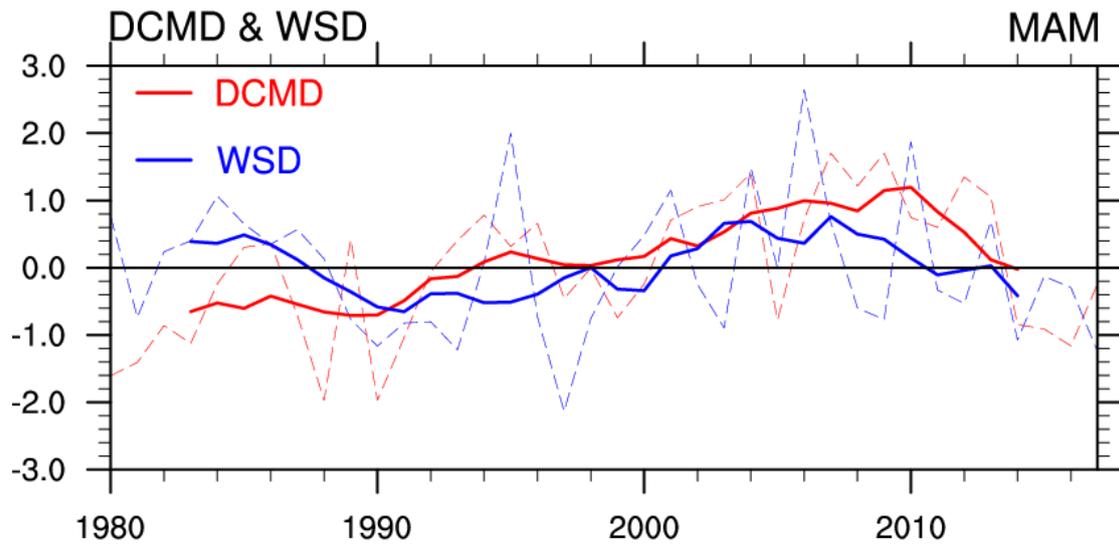
Figure S5. Normalized time series of spring DCMD index obtained from MERRA2 data (red dashed line) and the 800hPa wind speed index calculated from an independent ERA-interim data (blue dashed line) in dust sources over East Asia (35°-45°N, 75°-110°E). The 7-year running mean results are shown with the corresponding solid lines.