Figure S1. Climatological seasonal maps for AOD, AOD_F, AOD_C, FMF (AOD_F/AOD) retrieved by POLDER-3 at 550 nm over the period March 2005-October 2013. Seasons are ordered from the top to the bottom : Winter is December-January-February, Spring March-April-May, Summer June-July-August, Autumn September-October-November.
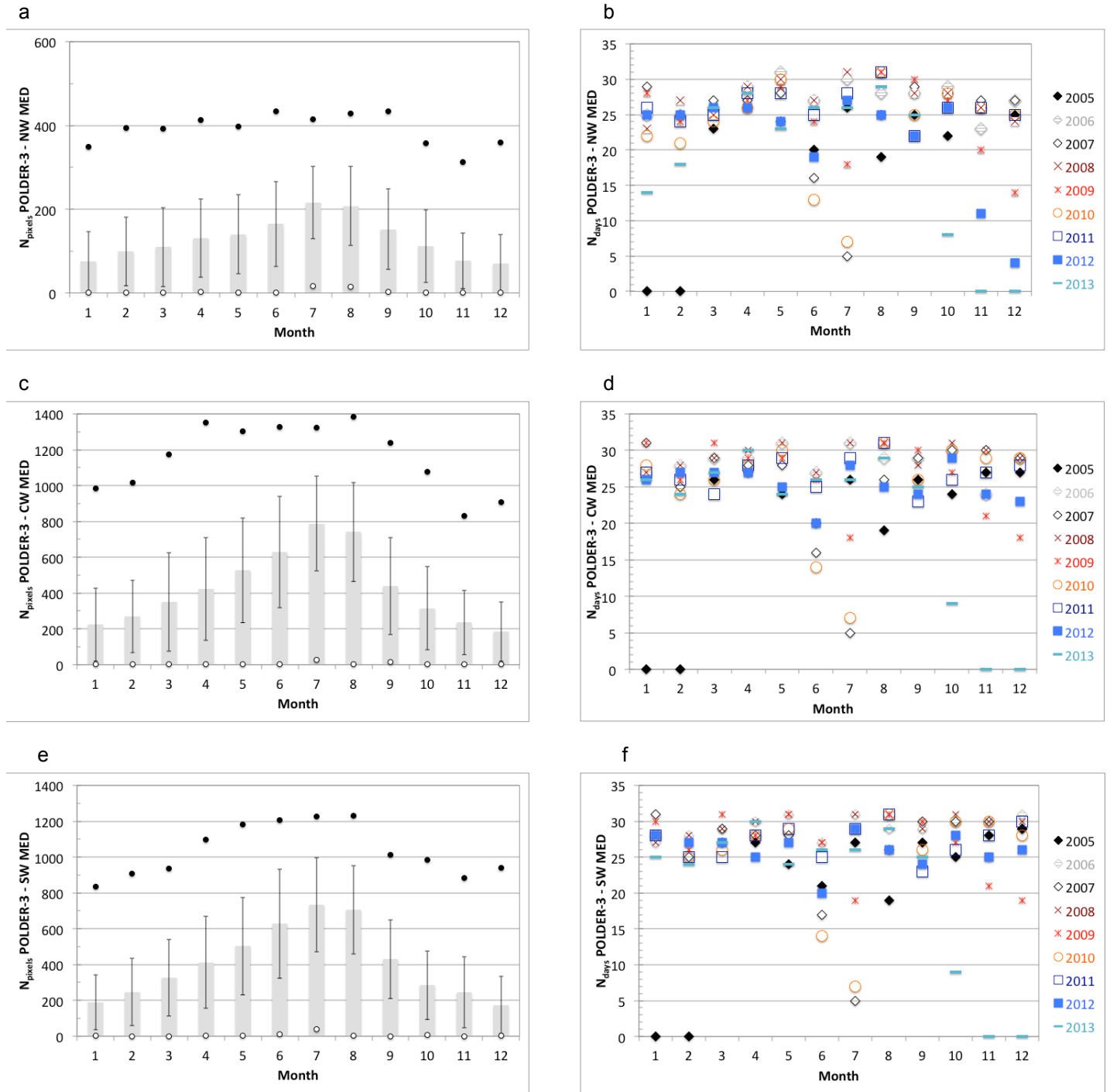
Figure S2. Statistics of available POLDER-3 clear-sky pixels. Left column, the average number for each month over the period March 2005 – October 2013 for the NW MED (a), CW MED (c), and SW MED (e) sub-regions (defined in Figure 2). Standard–deviations, maximum (filled circles) and minimum (open circles) number of pixels are reported. Bars represent the standard deviations. Right column, number of days with POLDER-3 observations available by month and by year for the NW MED (b), CW MED (d), and SW MED (f) sub-regions.
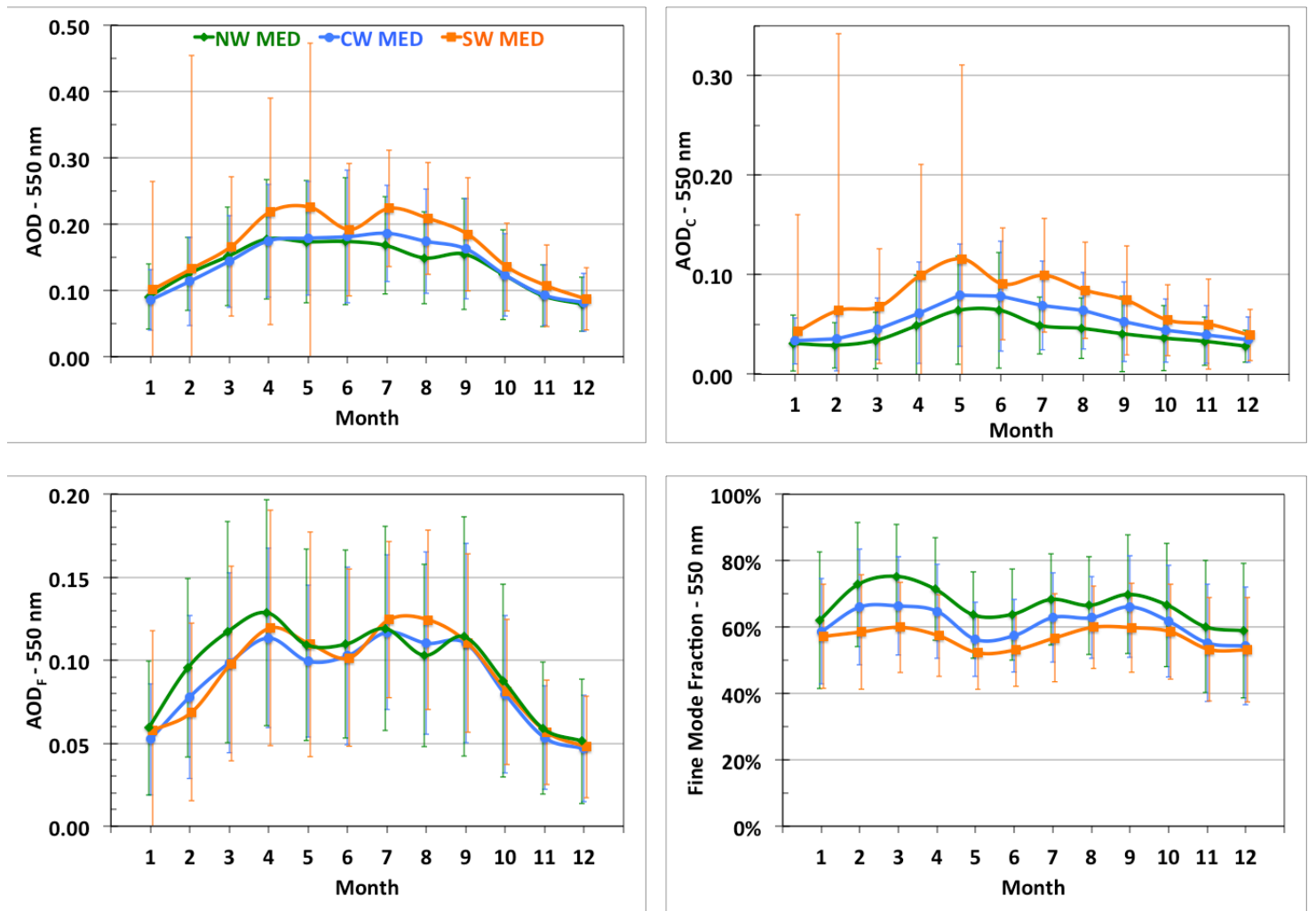
Figure S3. The 9-year (March 2005 – October 2013) climatological seasonal cycle of AOD (top) and AOD$_{Fine}$ (bottom) in left column, AOD$_{Coarse}$ (top) and Fine Mode Fraction (bottom) in right column, derived from POLDER-3 at 550 nm. The green, blue, orange curves are respectively for the north (NW MED), central (CW MED), and south (SW MED) parts of western Mediterranean basins (defined in Figure 2).
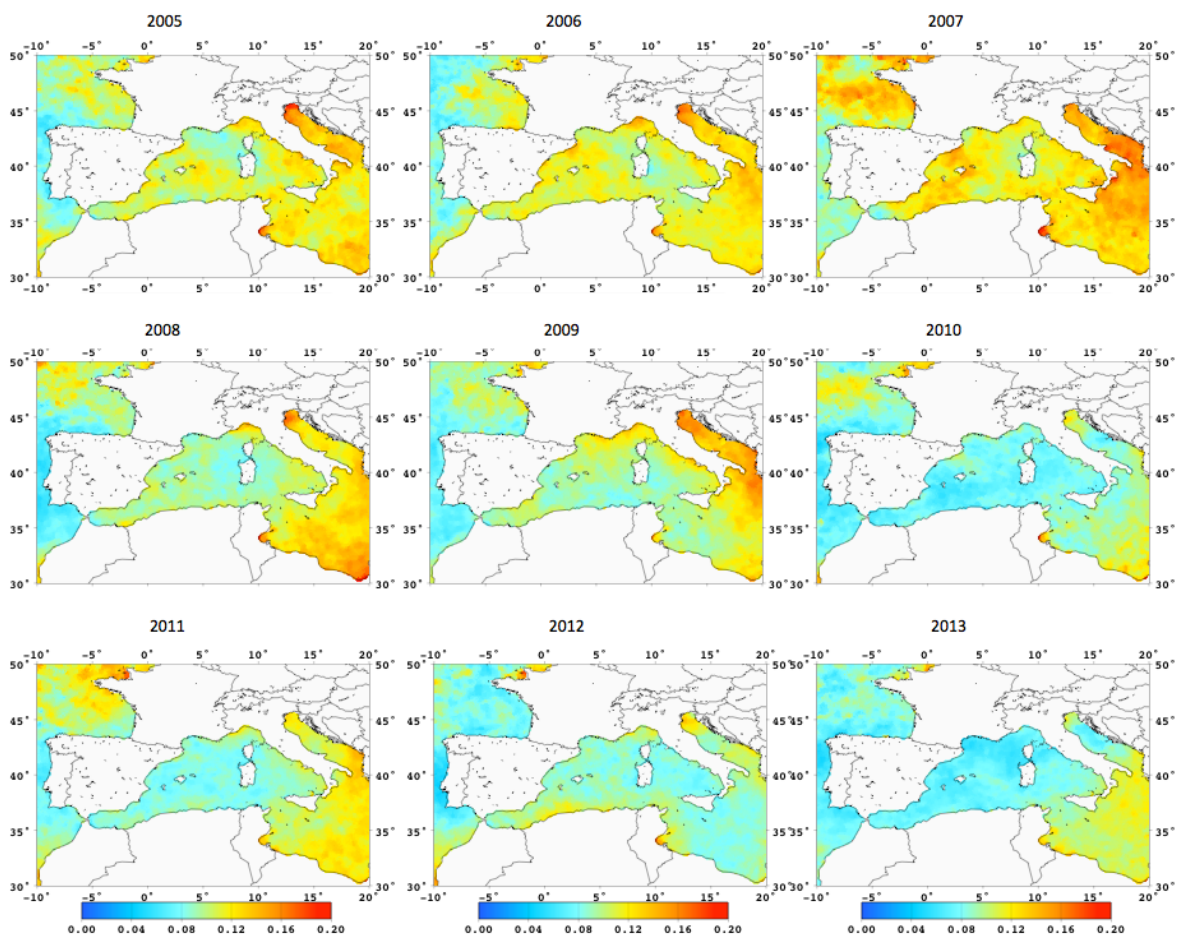
Figure S4. March-October annual averages of POLDER-3 AOD_F at 550 nm from 2005 to 2013.

Trend per year Region	AOD 550 nm		AOD$_{COARSE}$ 550 nm		AOD$_{FINE}$ 550 nm	
	Annual means	Monthly anomalies	Annual means	Monthly anomalies	Annual means	Monthly anomalies
NW MED	**- 0.0059 ± 0.0016****	**- 0.0058 ± 0.0009****	- 0.0008 ± 0.0008	**- 0.0009 ± 0.0004***	**- 0.0051 ± 0.0013****	**- 0.0049 ± 0.0008****
CW MED	**- 0.0060 ± 0.0014****	**- 0.0059 ± 0.0009****	- 0.0012 ± 0.0007	**- 0.0012 ± 0.0005***	**- 0.0049 ± 0.0011****	**- 0.0047 ± 0.0007****
SW MED	**- 0.0054 ± 0.0022***	**- 0.0061 ± 0.0014****	- 0.0017 ± 0.0014	**- 0.0022 ± 0.0009***	**- 0.0037 ± 0.0011***	**- 0.0040 ± 0.0007****

Table S1. POLDER-3 550 nm AOD, AOD$_{COARSE}$ and AOD$_{FINE}$ trends per year derived from March-October annual means and monthly mean anomalies over the 2005-2013 period for NW MED, CW MED, SW MED. The corresponding annual evolutions are shown in Figure 8. Trends (year^{-1}) are shown with their standard deviations (± 1s). Values in bold indicate statistically significant trends at * 95% confidence level and ** 99% confidence level, as determined by the Student t-test.

Trend per year Station	AOD 550 nm		AOD$_{COARSE}$ 550 nm		AOD$_{FINE}$ 550 nm	
	Annual means	Monthly anomalies	Annual means	Monthly anomalies	Annual means	Monthly anomalies
Ersa	**- 0.0068 ± 0.0016****	**- 0.0059 ± 0.0010****	- 0.0009 ± 0.0010	- 0.0008 ± 0.0007	**- 0.0059 ± 0.0008****	**- 0.0051 ± 0.0009****
Barcelona	**- 0.0088 ± 0.0025***	**- 0.0082 ± 0.0014****	- 0.0017 ± 0.0015	- 0.0015 ± 0.0008	**- 0.0071 ± 0.0014****	**- 0.0067 ± 0.0010****
Lampedusa	- 0.0054 ± 0.0030	**- 0.0043 ± 0.0020***	- 0.0016 ± 0.0023	- 0.0006 ± 0.0014	**- 0.0038 ± 0.0008****	**- 0.0037 ± 0.0009****

Table S2. POLDER-3 550 nm AOD, AOD$_{COARSE}$ and AOD$_{FINE}$ trends per year derived from March-October annual means and monthly mean anomalies over the 2005-2013 period for Ersa, Barcelona, and Lampedusa. The corresponding annual evolutions are shown in Figure 9. Trends (year^{-1}) are shown with their standard deviations (± 1s). Values in bold indicate statistically significant trends at * 95% confidence level and ** 99% confidence level, as determined by the Student t-test.