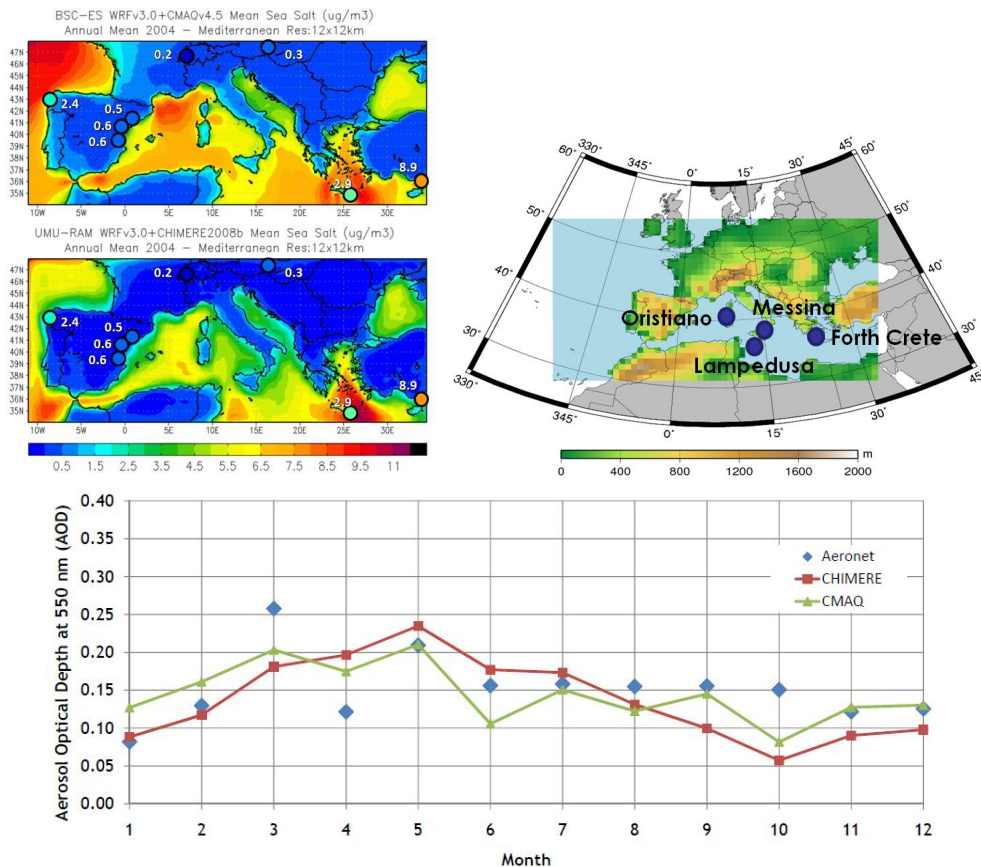
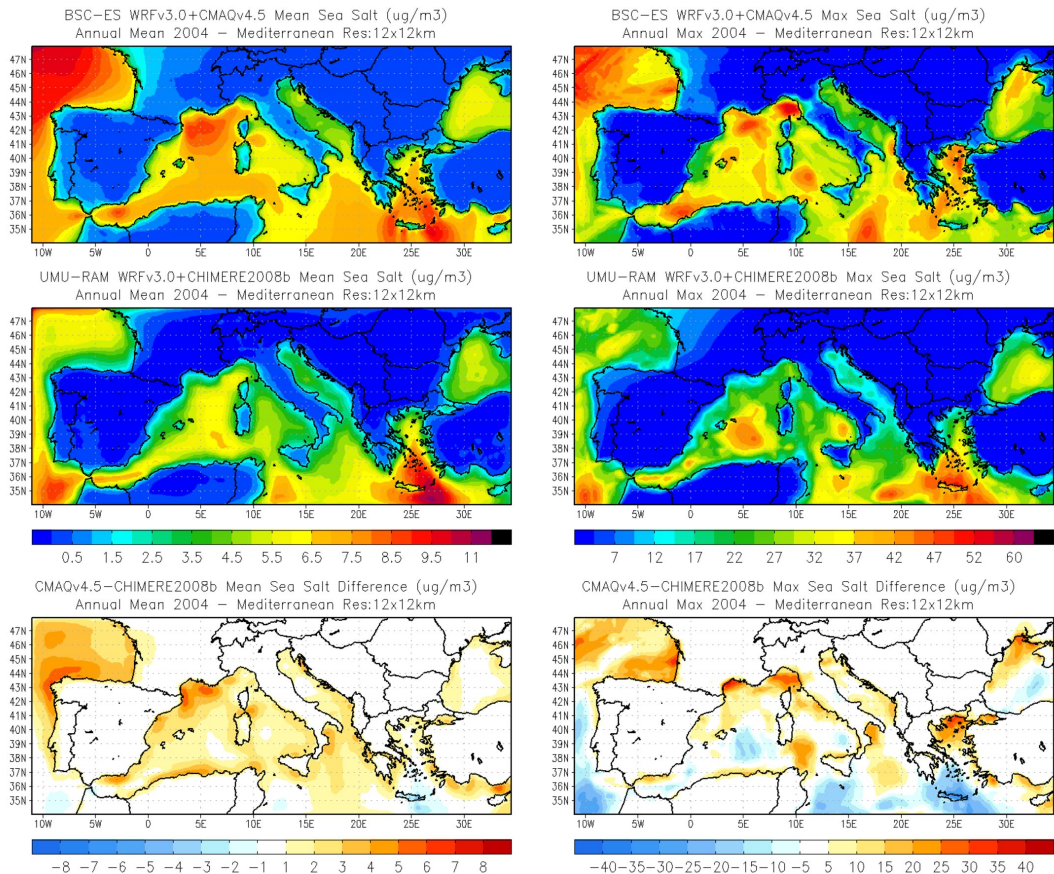


**Fig. 1.** (Top) Map of the spatial distribution of the monthly MAE of 10-m wind speed (left) for January and (right) July 2004 (color legend in the right panel; units in  $\text{m s}^{-1}$ ); (Down) Seasonal averages of modeled meteorological fields involved in SSA production: winter (left) and summer (right) 2-m temperature ( $^{\circ}\text{C}$ ), relative humidity (%), precipitation ( $\text{mm day}^{-1}$ ) and wind speed ( $\text{m s}^{-1}$ ).

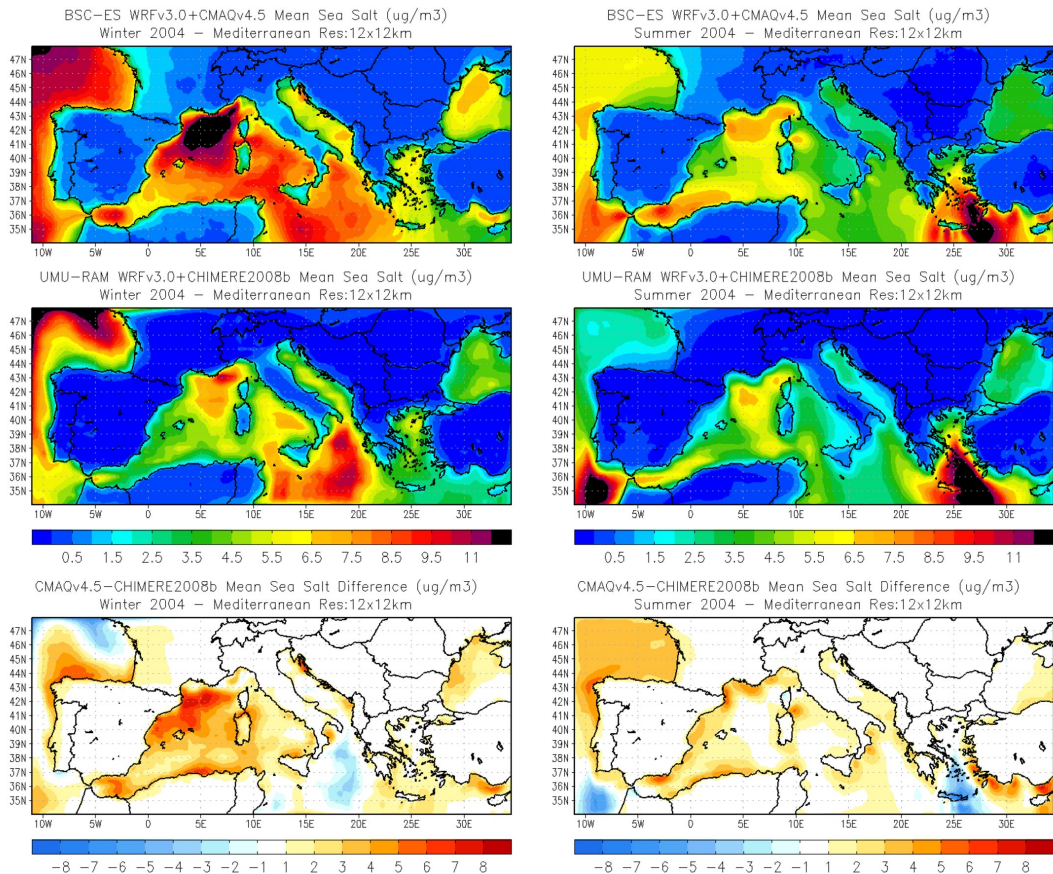


**Fig. 2.** (Up, left) Modeled annual mean SSA concentration ( $\mu\text{g m}^{-3}$ ) for WRF+CMAQ (top) and WRF+CHIMERE (bottom) simulations. Filled circles indicate the concentrations at the stations reported by Querol et al. (2009); (Up, right) Location of the Aeronet stations used in this work for evaluation; (Down) Average results of Aerosol Optical Depth for Aeronet stations (blue diamonds), CHIMERE (red line) and CMAQ (green line). The numerical results of the statistical evaluation are shown in Table 2.

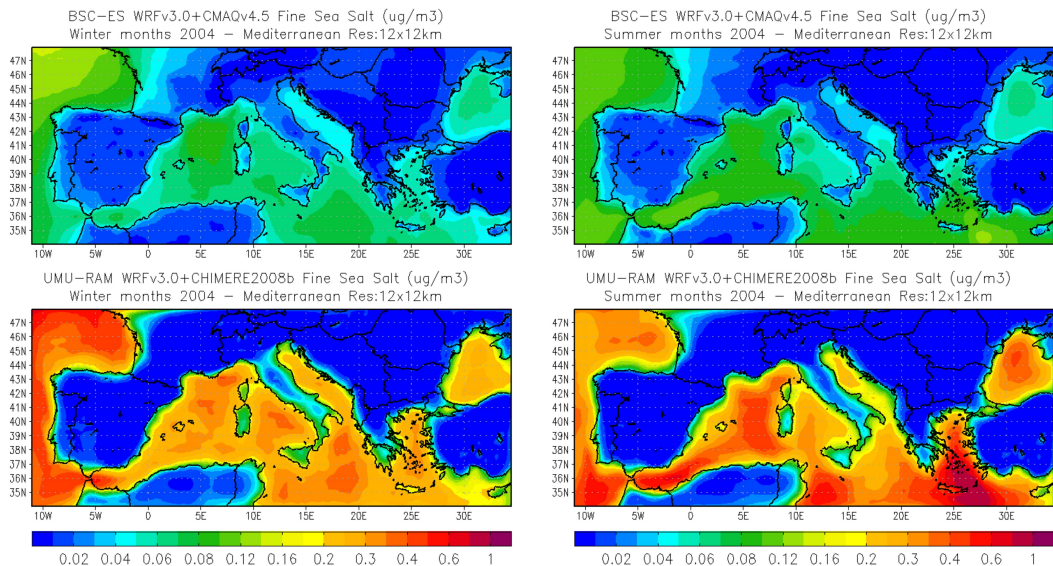


**Fig. 3.** (Left) Modeled annual mean SSA concentration ( $\mu\text{g m}^{-3}$ ) for WRF+CMAQ (top), WRF+CHIMERE (center) and difference between CMAQv4.5-CHIMERE2008b mean SSA concentrations (bottom); (Right) Modeled annual maximum SSA concentration ( $\mu\text{g m}^{-3}$ ) for WRF+CMAQ (top), WRF+CHIMERE (center) and difference between CMAQv4.5-CHIMERE2008b maximum SSA concentrations (bottom).

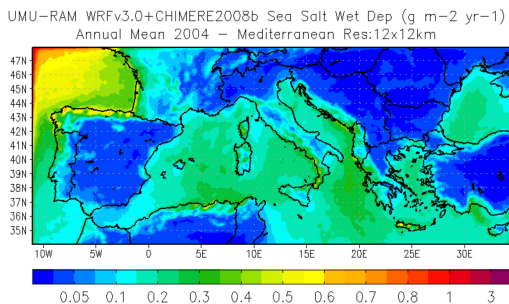
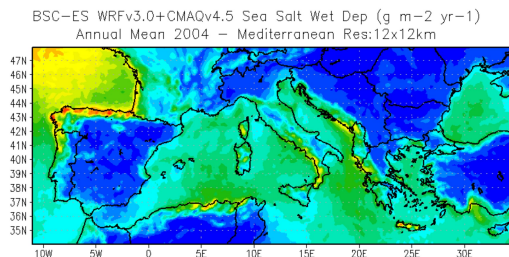
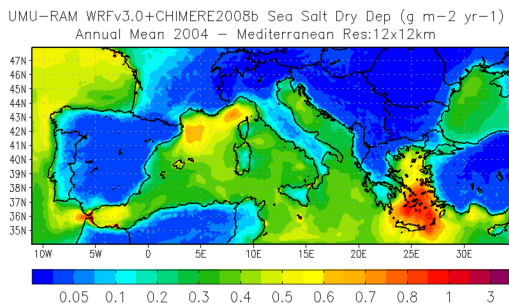
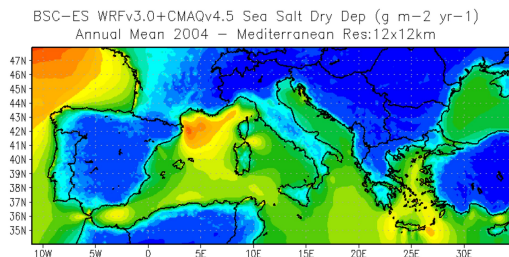




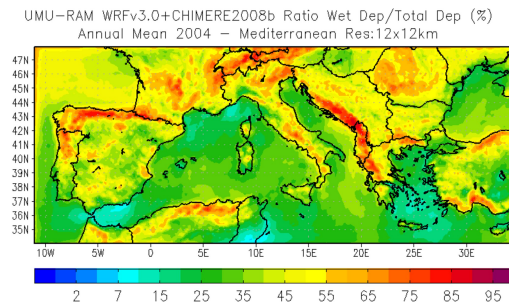
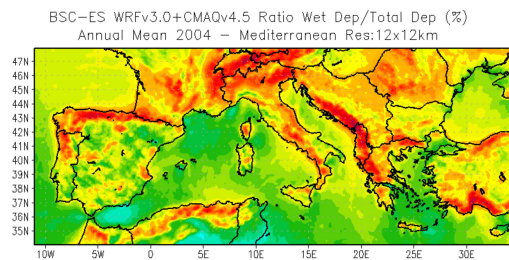
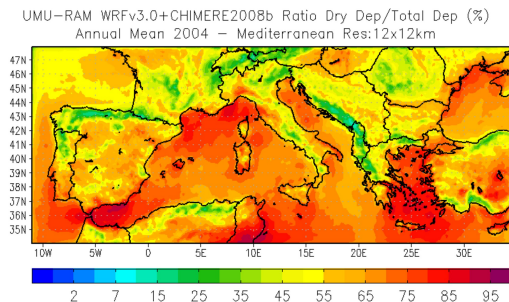
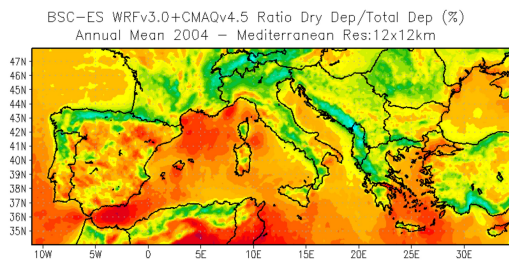
**Fig. 4.** (Left) Modeled winter (DJF) mean SSA concentration ( $\mu\text{g m}^{-3}$ ) for WRF+CMAQ (top), WRF+CHIMERE (center) and difference between CMAQv4.5-CHIMERE2008b winter mean SSA concentrations (bottom); (Right) Modeled summer (JJA) mean SSA concentration ( $\mu\text{g m}^{-3}$ ) for WRF+CMAQ (top), WRF+CHIMERE (center) and difference between CMAQv4.5-CHIMERE2008b summer mean SSA concentrations (bottom).



**Fig. 5.** (Left) Modeled winter (DJF) mean fine SSA concentration (PM2.5) ( $\mu\text{g m}^{-3}$ ) for WRF+CMAQ (top) and WRF+CHIMERE (bottom) simulations; (Right) Modeled summer (JJA) mean fine SSA concentration (PM2.5) ( $\mu\text{g m}^{-3}$ ) WRF+CMAQ (top) and WRF+CHIMERE (bottom).



**Fig. 6.** Accumulated annual SSA deposition fluxes ( $\text{g m}^{-2} \text{yr}^{-1}$ ) for WRF+CMAQ (top) and WRF+CHIMERE (bottom) simulations: (Left) dry deposition (Right) wet deposition.



**Fig. 7.** (Left) Ratio Dry Deposition/Total Deposition (%) for WRF+CMAQ (top) and WRF+CHIMERE (bottom); (Right) Ratio Wet Deposition/Total Deposition (%) for WRF+CMAQ (top) and WRF+CHIMERE (bottom)