Supplement Materials

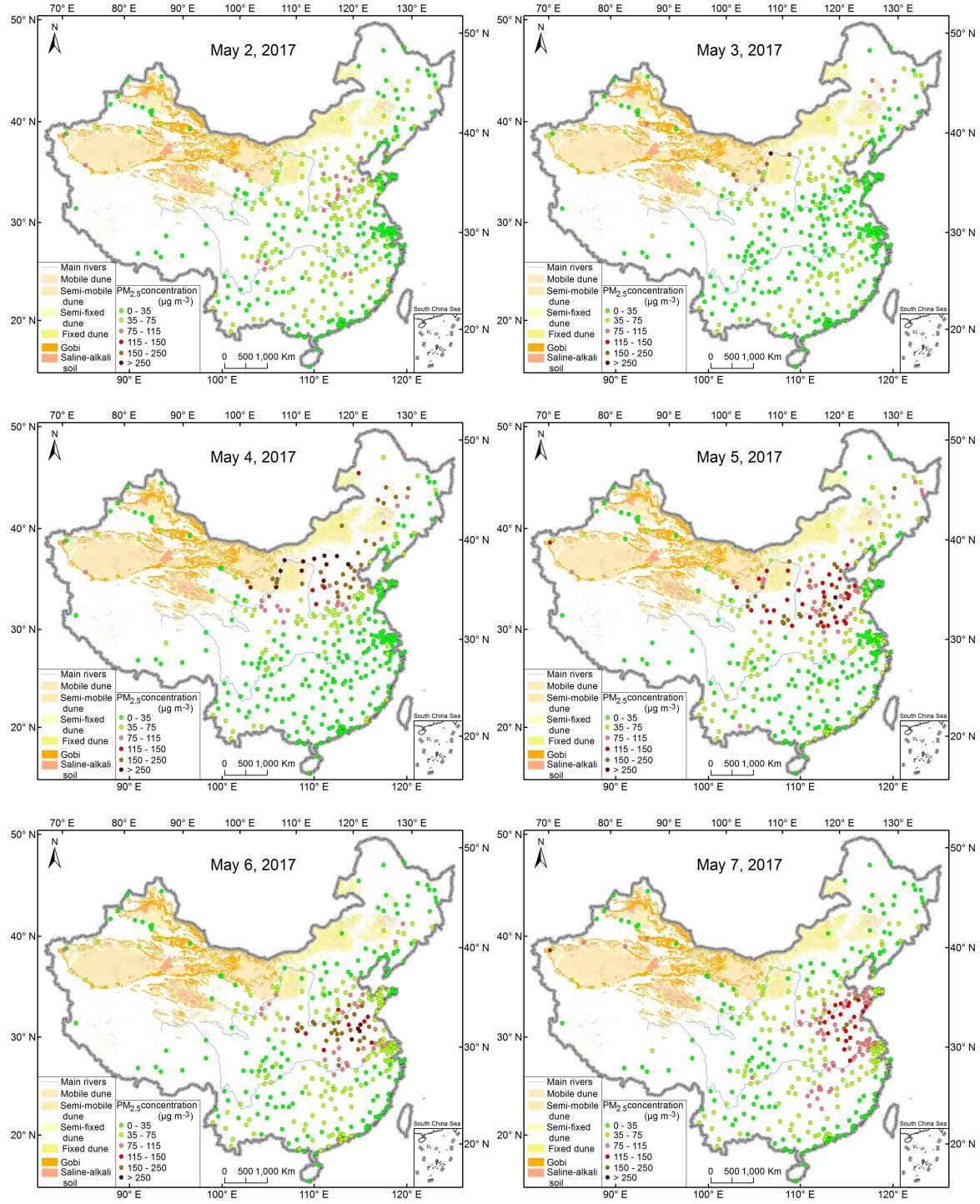

Figure S1. Observations of $PM_{2.5}$ concentrations across China during 2-7 May, 2017.

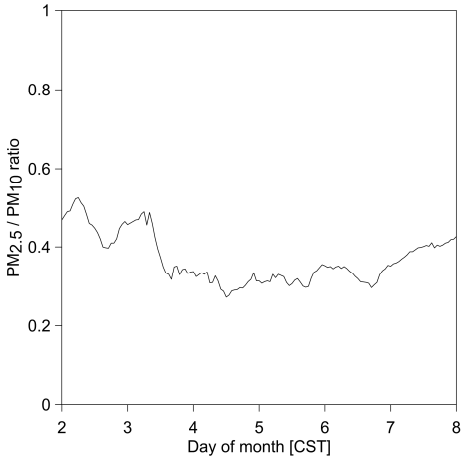

Figure S2. Changes of ratio between hourly $PM_{2.5}$ and PM_{10} concentration in 367 studied Chinese cities during 2-7 May, 2017.

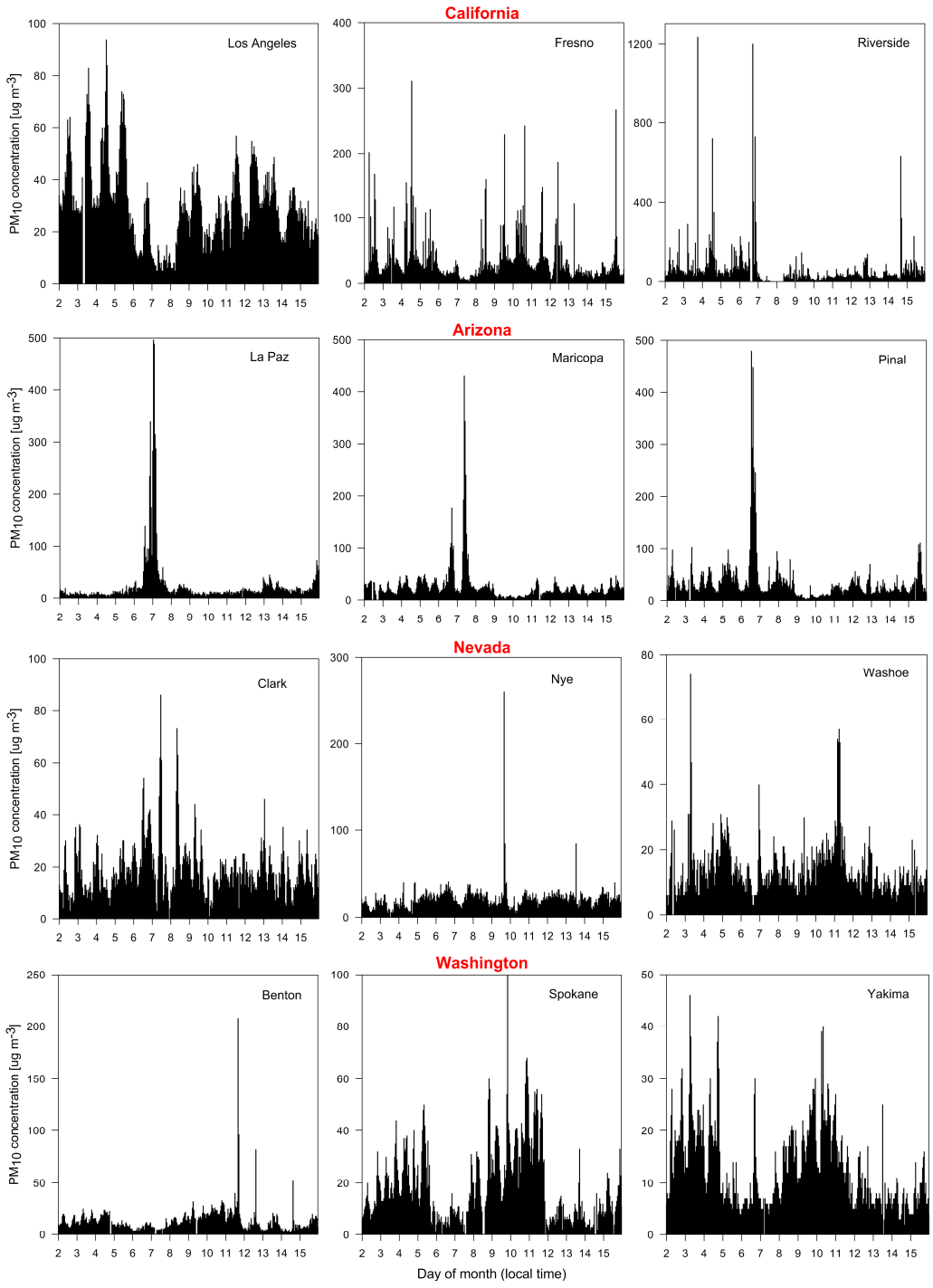

Figure S3. Hourly PM_{10} concentrations change in western coast of United States during 2-15 May, 2017.

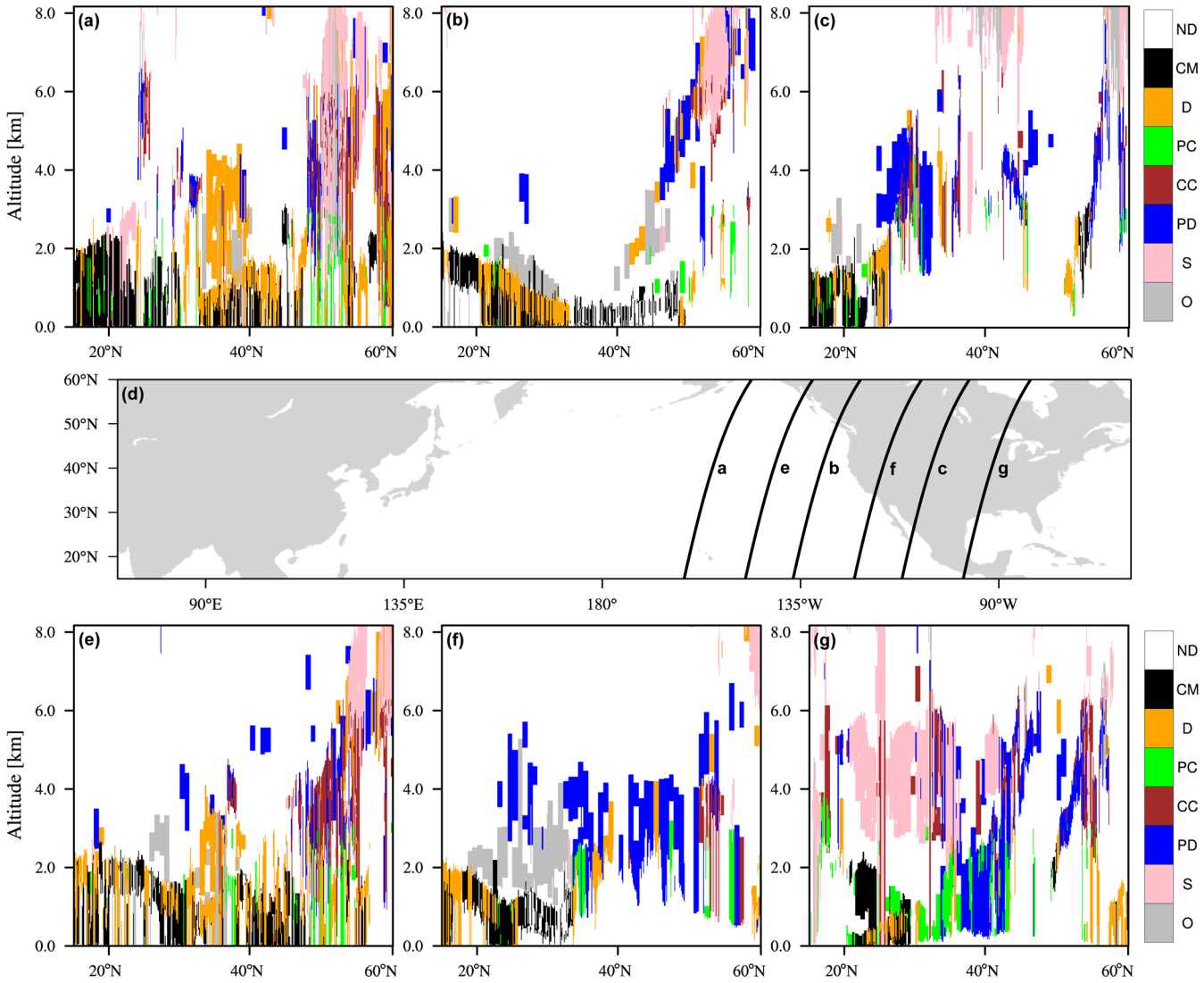

Figure S4. Vertical profiles of atmospheric features derived from CALIPSO satellite VFM data on 9 May (Fig. S4a, S4b and S4c) and 10 May (Fig.S4e, S4f, and S4g), 2017. (ND=Not determined, CM=Clean marine, D=Dust, PC=Polluted continental, CC=Clean continental, PD=Polluted dust, S=Smoke, O=Other). Each Satelllite trajectories of vertical profiles were presented in Fig. S4d.