Supporting Materials to

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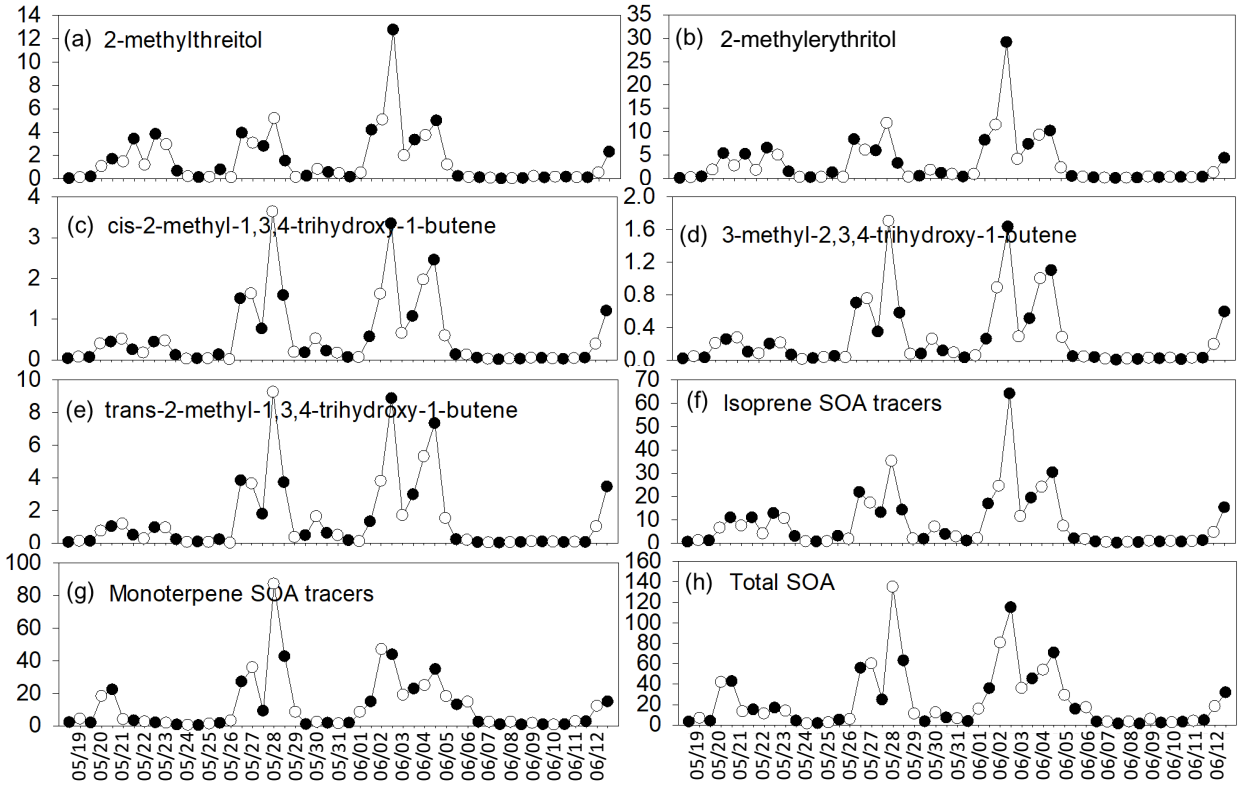


**Figure S1.** Temporal variations in biogenic SOA tracers detected in marine aerosols over the East China Sea during May to June 2014. The open and shaded circles represent the daytime and nighttime samples, respectively.

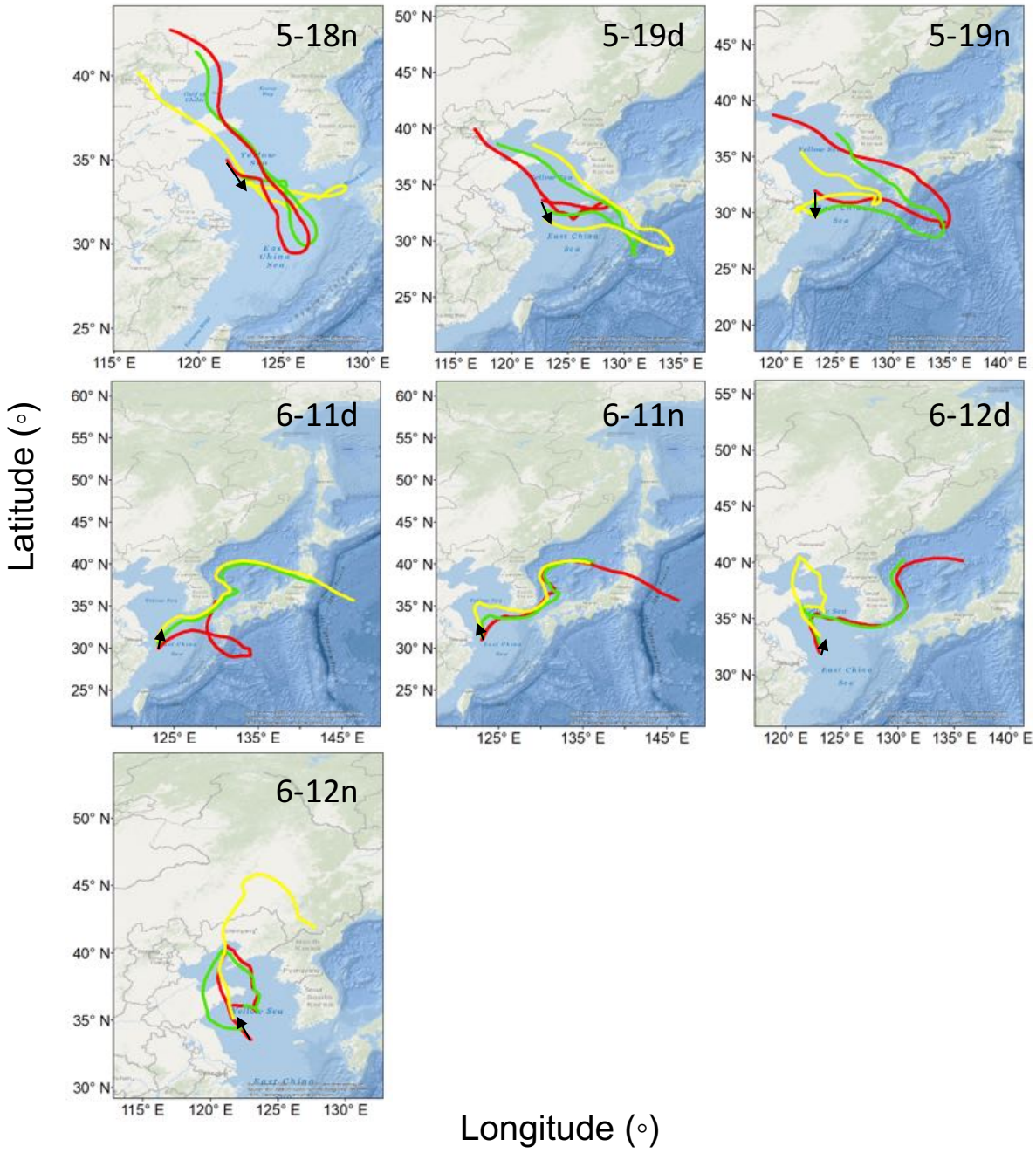


**Figure S2.** Five-day HYSPLIT back trajectories initiated over waters north of East China Sea with the altitude of these trajectories remaining below 200m in the 120h of the runs. The trajectories were calculated every 4 or 5 h. The black arrows indicate cruise tracks.

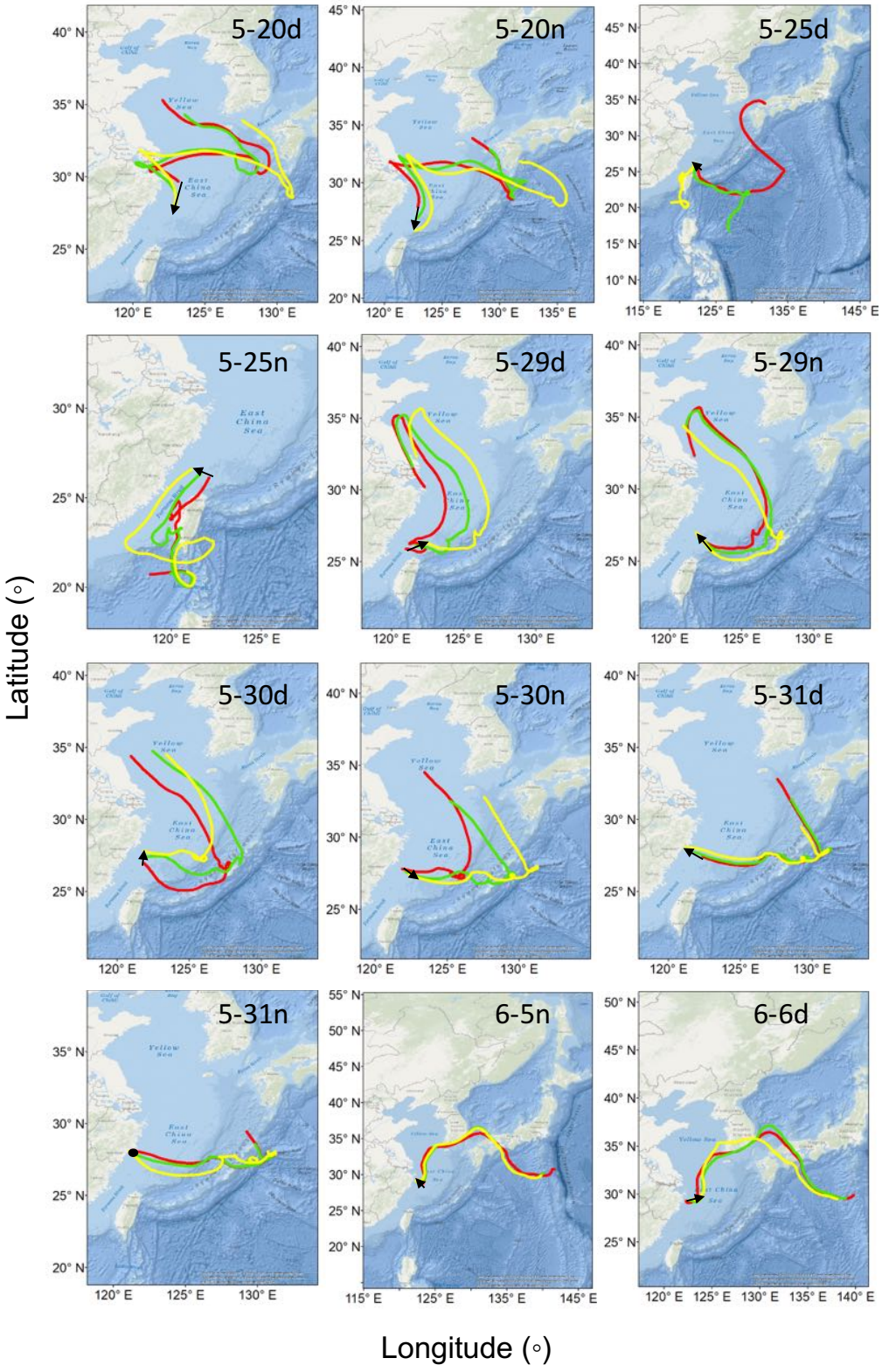


**Figure S3**. Five-day HYSPLIT back trajectories initiated over East China Sea with the altitude of these trajectories remaining below 200m in the 120h of the runs. The trajectories were calculated every 4 or 5 h. The black arrows and dots indicate cruise tracks.

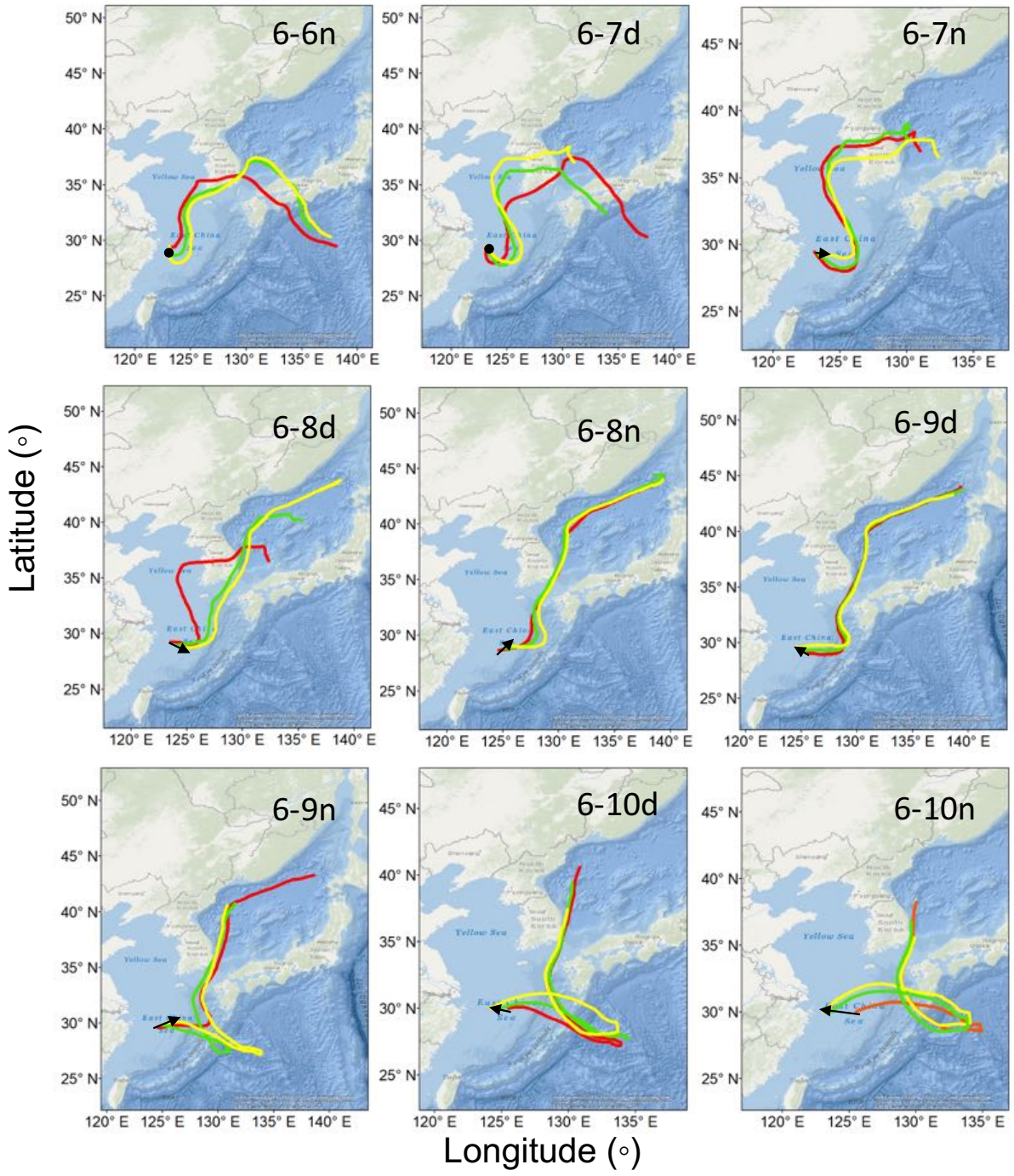


**Figure S3**. (Continued).

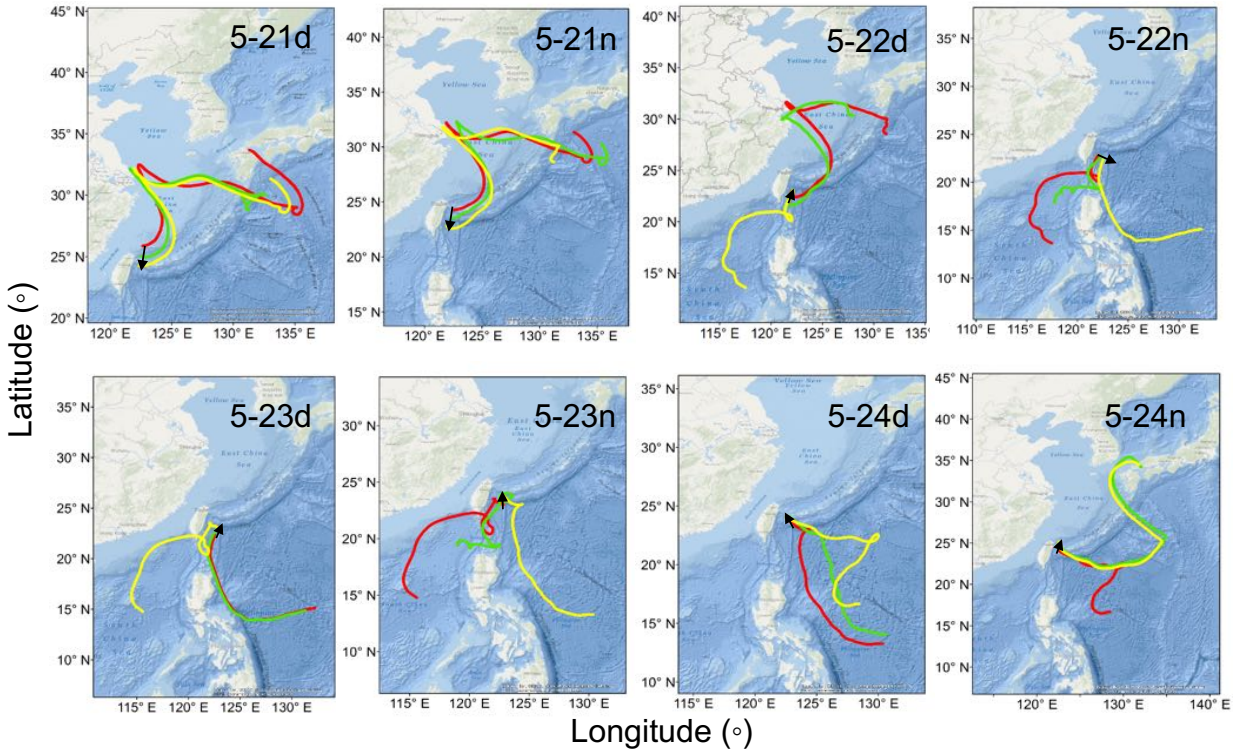


**Figure S4.** Five-day HYSPLIT back trajectories initiated over eastern waters off Taiwan with the altitude of these trajectories remaining below 200m in the 120h of the runs. The trajectories were calculated every 4 or 5 h. The black arrows indicate cruise tracks.

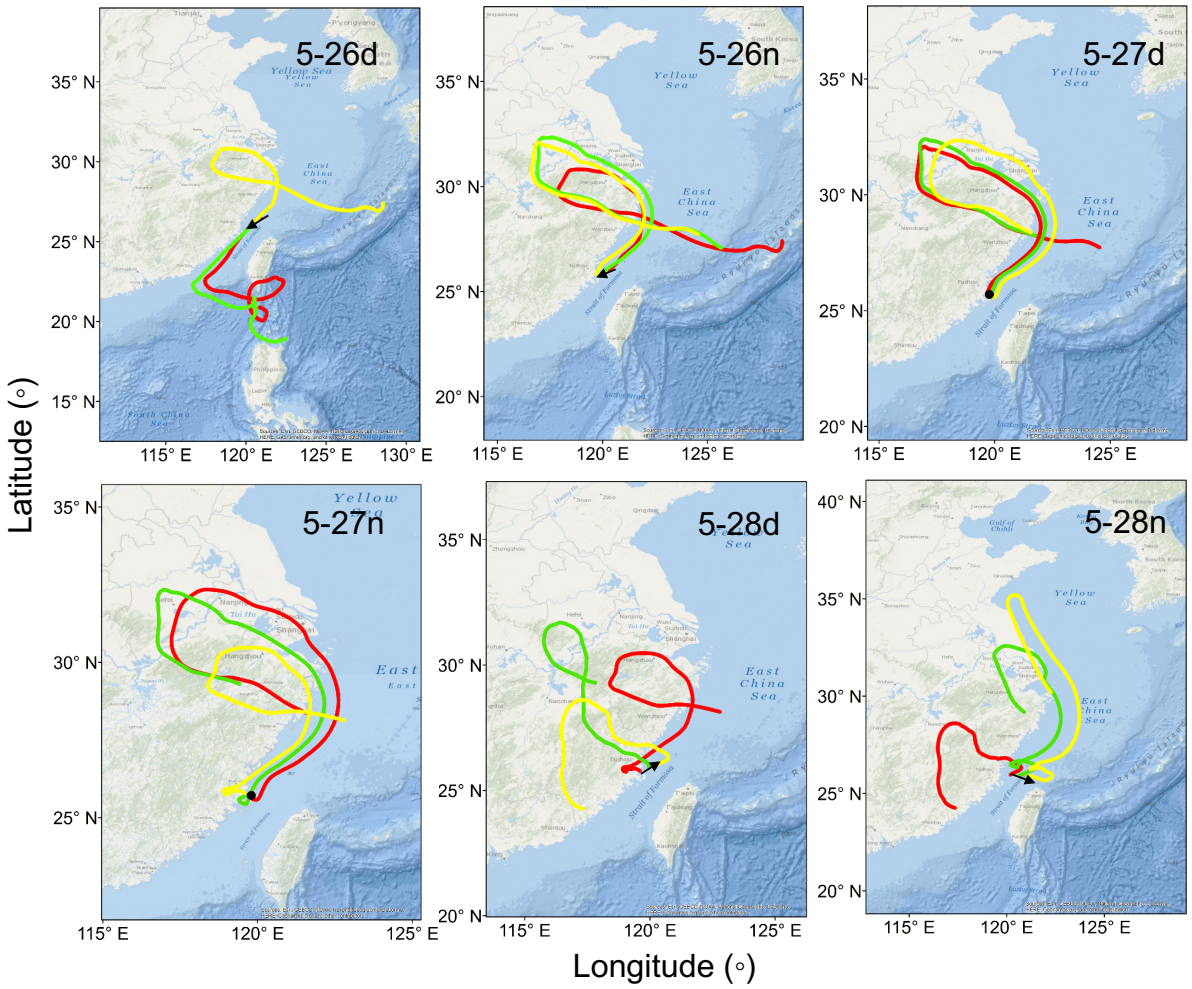


**Figure S5**. Five-day HYSPLIT back trajectories initiated over waters near Fujian province with the altitude of these trajectories remaining below 200m in the 120h of the runs. The trajectories were calculated every 4 or 5 h. The black arrows and dots indicate cruise tracks.

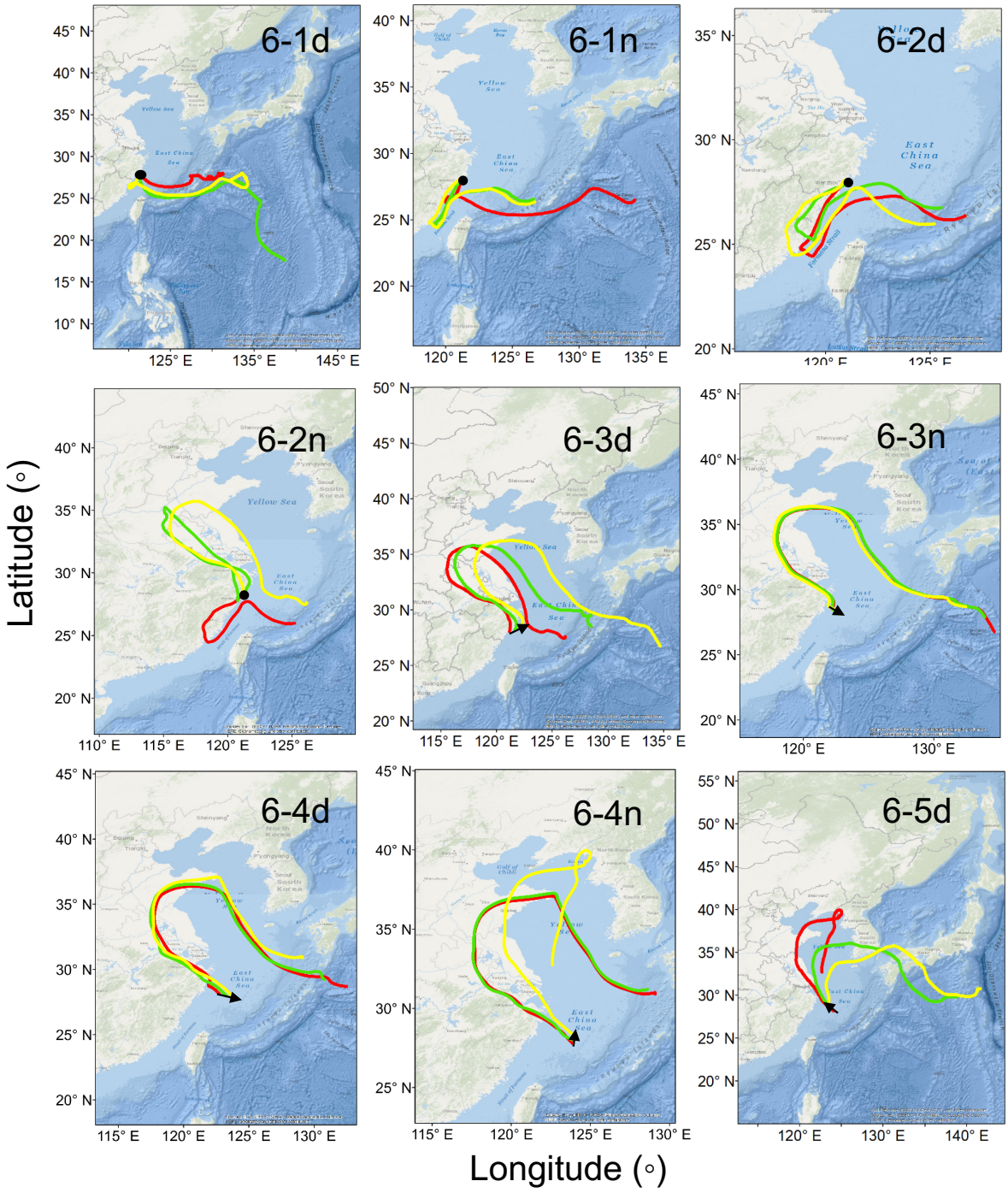


**Figure S6.** Five-day HYSPLIT back trajectories initiated over waters near Zhejiang province with the altitude of these trajectories remaining below 200m in the 120h of the runs. The trajectories were calculated every 4 or 5 h. The black arrows and dots indicate cruise tracks.

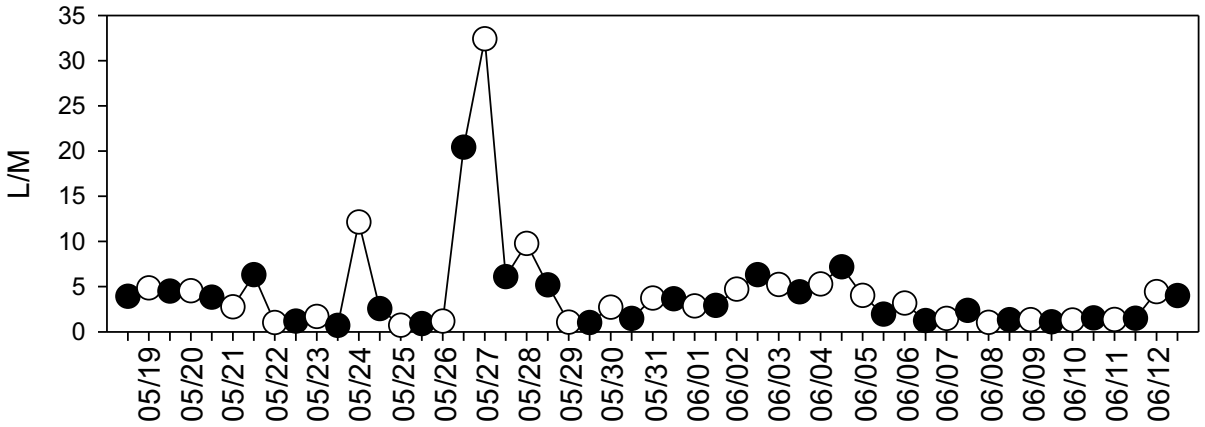


**Figure S7.** Temporal variations of the concentration ratios of levoglucosan to mannosan (L/M) in the marine aersols over the East China Sea during May to June 2014. The open and shaded circles represent the daytime and nighttime samples, respectively.

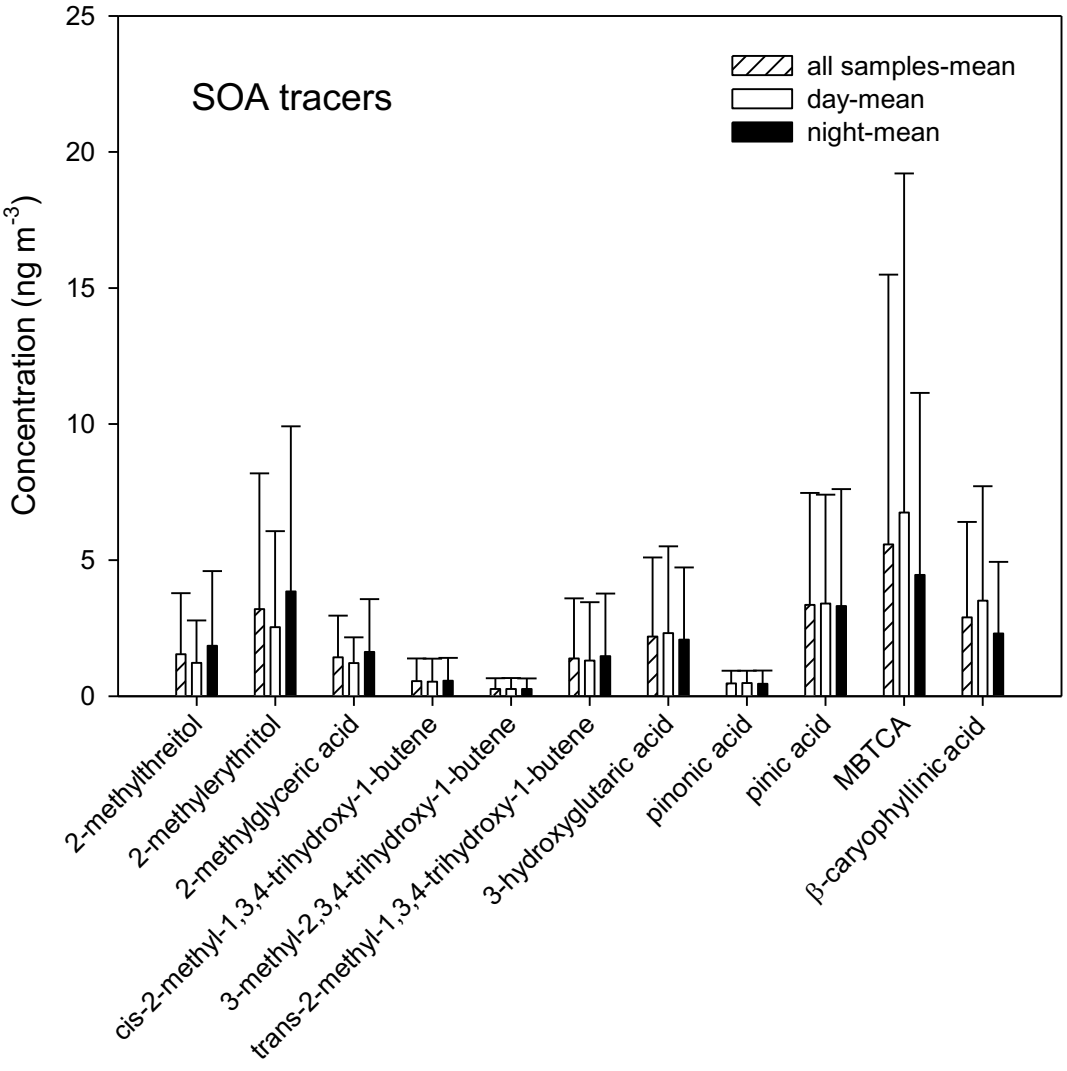


**Figure S8.** Average concentrations of SOA tracers detected in marine aerosols over the East China Sea.

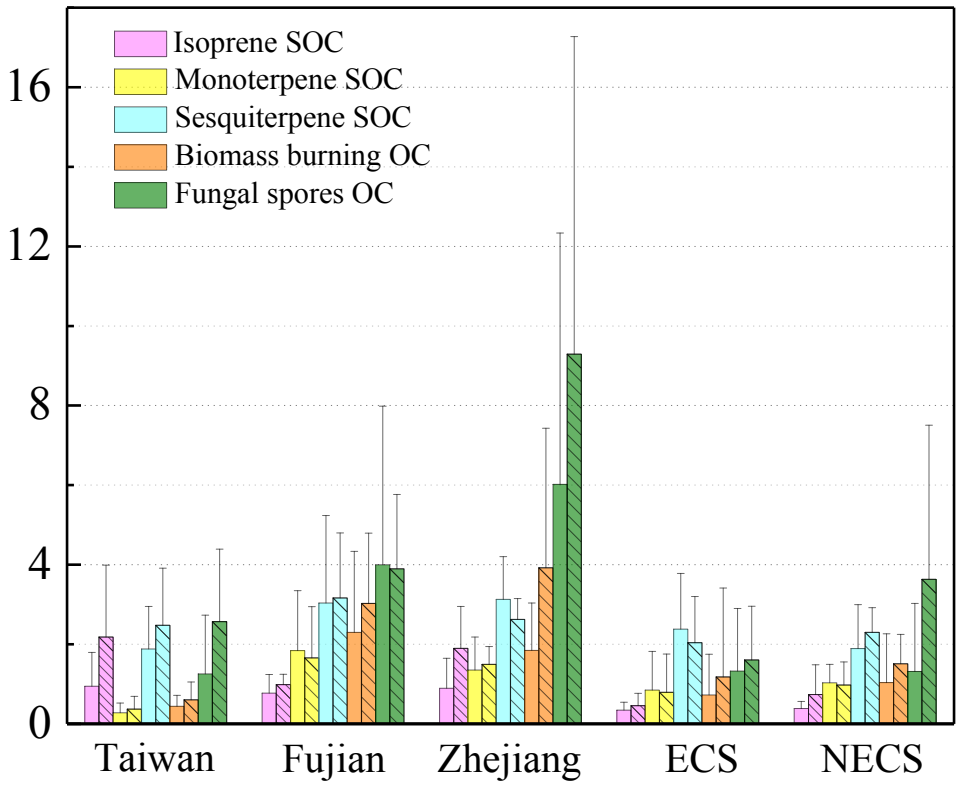


**Figure S9**. Comparison of daytime and nighttime contributions of OC (ngC $m^{-3}$) from biogenic primary emission (biomass burning OC and fungal spore OC) and biogenic SOC to OC (%) in different sampling regions. Taiwan, Fujian and Zhejiang refer to the waters around Taiwan, Fujian and Zhejiang; ECS represents East China Sea waters; NECS represents northern waters of ECS. Forward slash represents nighttime values.

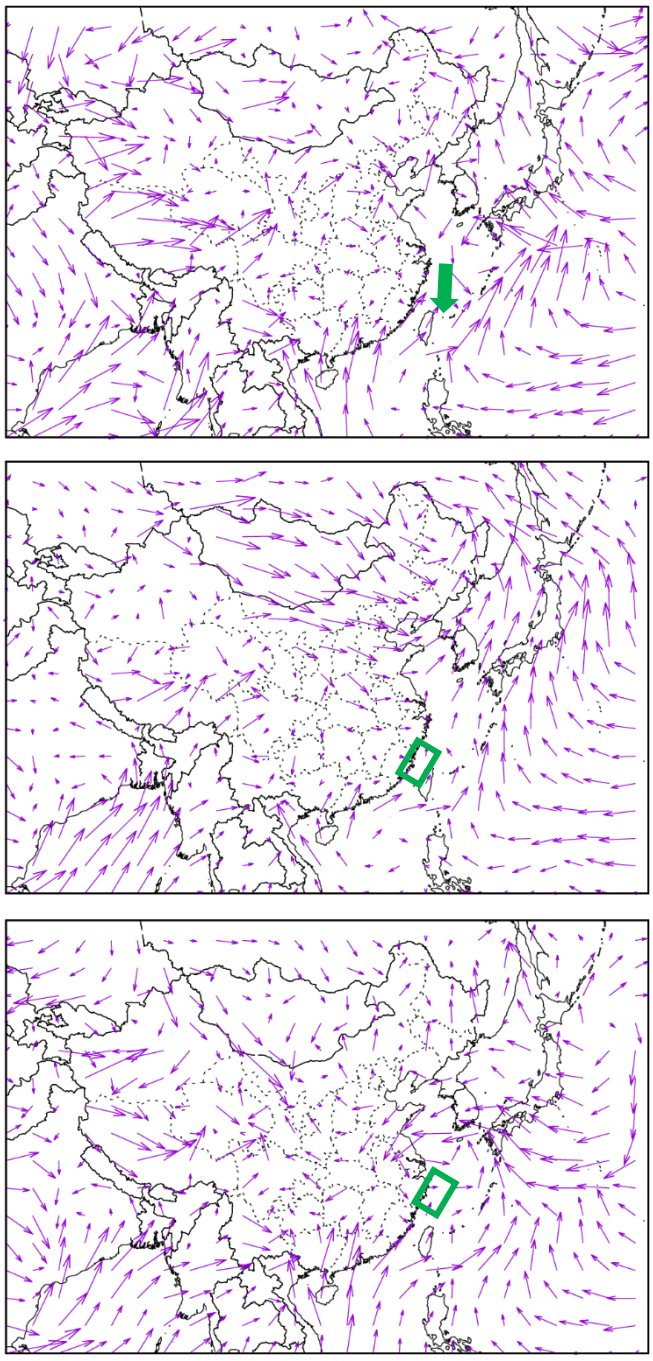

**Figure S10**. Wind vectors for chosen sampling periods on May 20 (top), May 26-28 (center), and June 2-5 (bottom). (green lines represent sampling areas corresponding to cruise time).