Supplementary Information

Terpenes and their oxidation products in the French Landes forest: insight from Vocus PTR-TOF measurements

Haiyan Li[1], Matthieu Riva[2], Pekka Rantala[1], Liine Heikkinen[1], Kaspar Daellenbach[1], Jordan E. Krechmer[3], Pierre-Marie Flaud[4,5], Douglas Worsnop[3], Markku Kulmala[1], Eric Villenave[4,5], Emilie Perraudin[4,5], Mikael Ehn[1], Federico Bianchi[1]

[1] Institute for Atmospheric and Earth System Research / Physics, Faculty of Science, University of Helsinki, Finland

[2] Univ. Lyon, Université Claude Bernard Lyon 1, CNRS, IRCELYON, F-69626, Villeurbanne, France

[3] Aerodyne Research Inc., Billerica, Massachusetts 01821, USA

[4] Univ. Bordeaux, EPOC, UMR 5805, F-33405 Talence Cedex, France

[5] CNRS, EPOC, UMR 5805, F-33405 Talence Cedex, France

Correspondence: Haiyan Li (haiyan.li@helsinki.fi) and Matthieu Riva (matthieu.riva@ircelyon.univ-lyon1.fr)

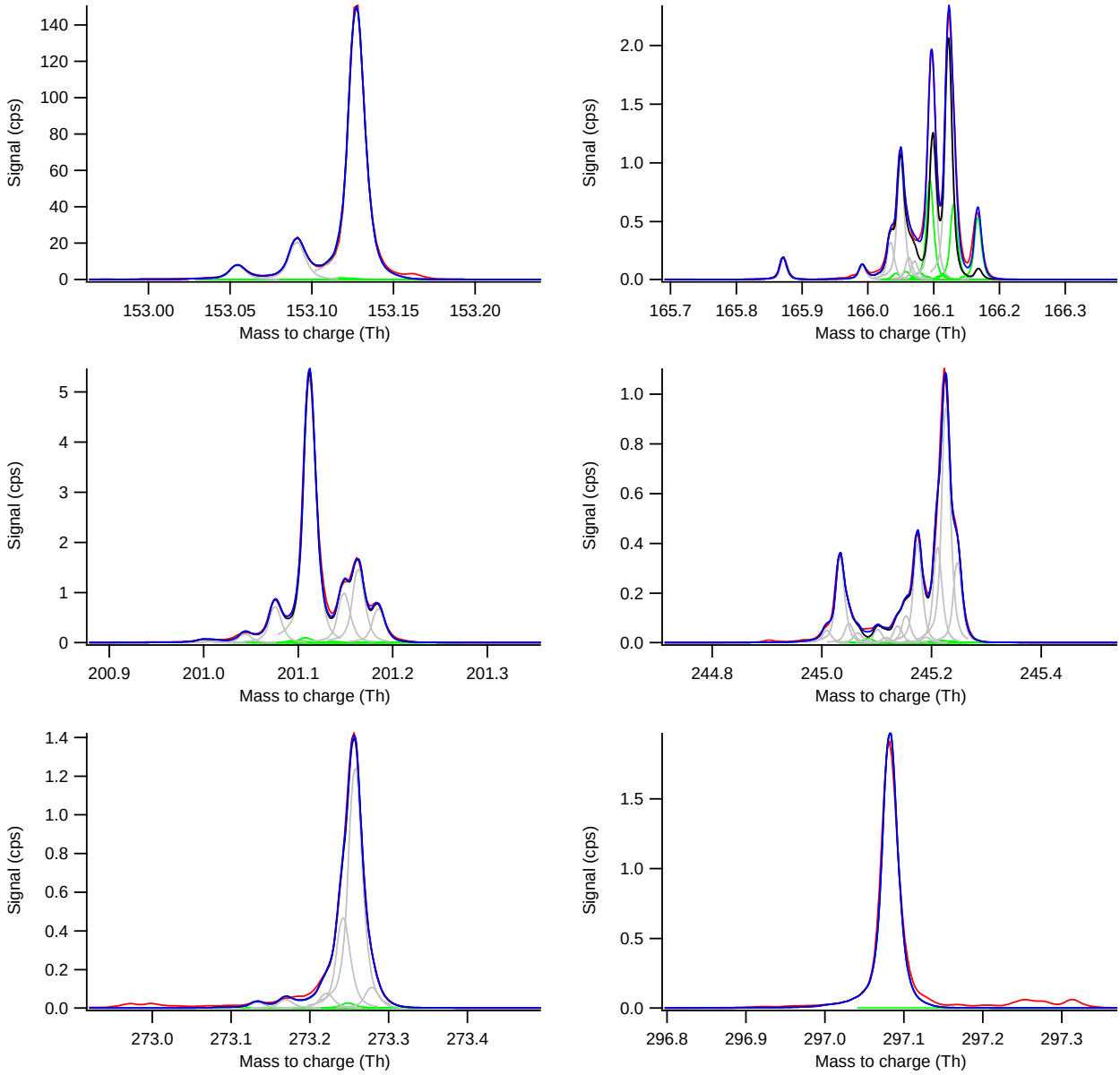

Figure S1. Examples of peak identification with the LTOF mass analyzer.

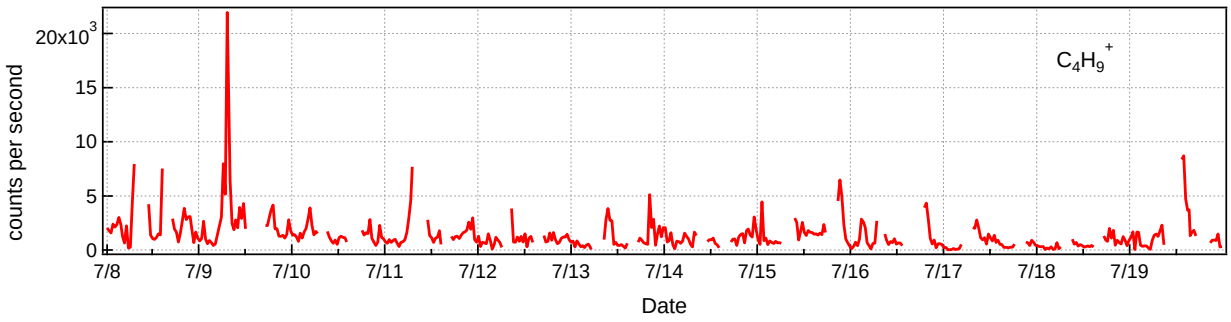

Fig. S2. Time series of the identified $C_4H_9^+$.

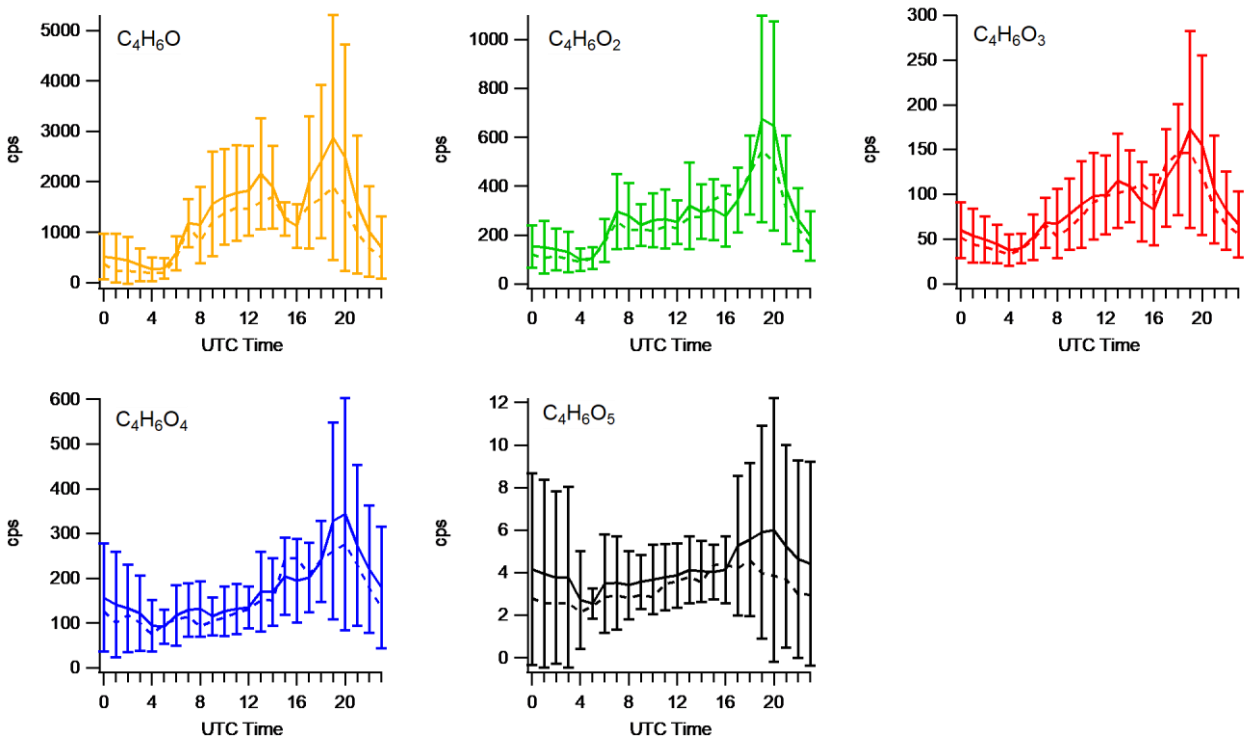

Figure S3. Diurnal patterns of non-nitrate isoprene oxidation products: (a) C_4H_6O, (b) $C_4H_6O_2$, (c) $C_4H_6O_3$, (d) $C_4H_6O_4$, and (e) $C_4H_6O_5$.

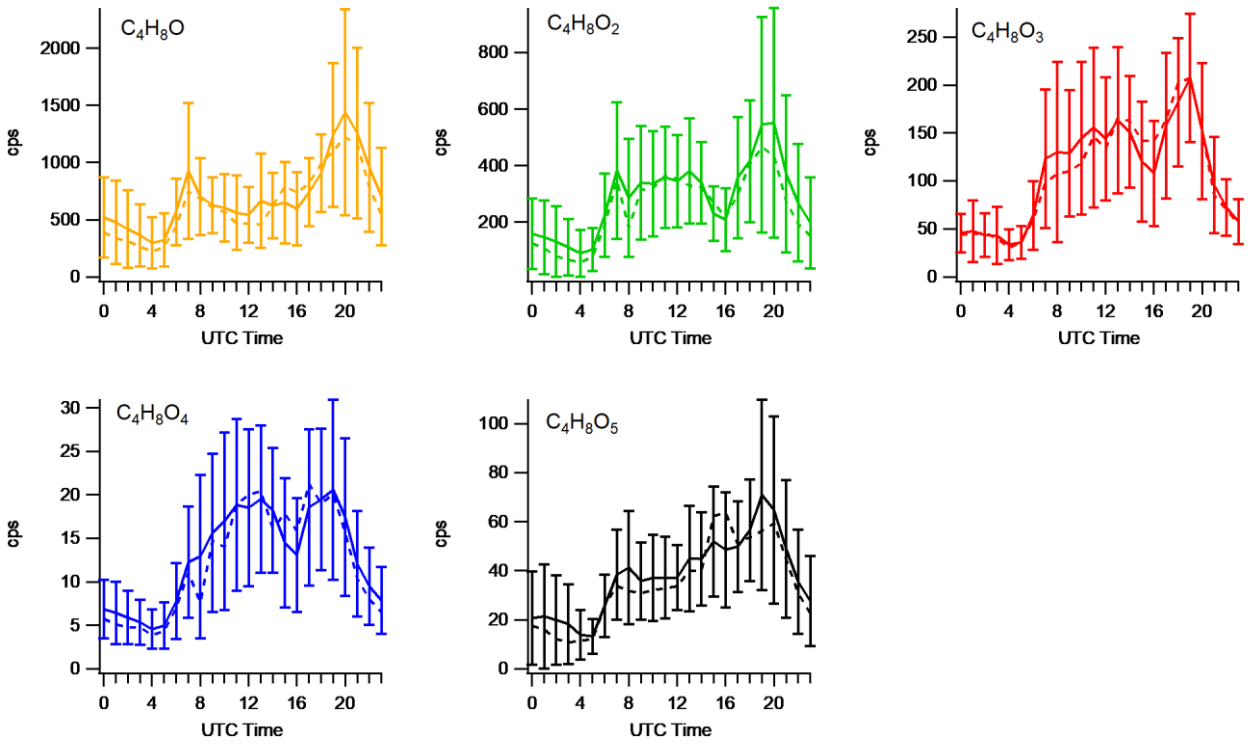

Figure S4. Diurnal patterns of non-nitrate isoprene oxidation products: (a) C_4H_8O, (b) $C_4H_8O_2$, (c) $C_4H_8O_3$, (d) $C_4H_8O_4$, and (e) $C_4H_8O_5$.

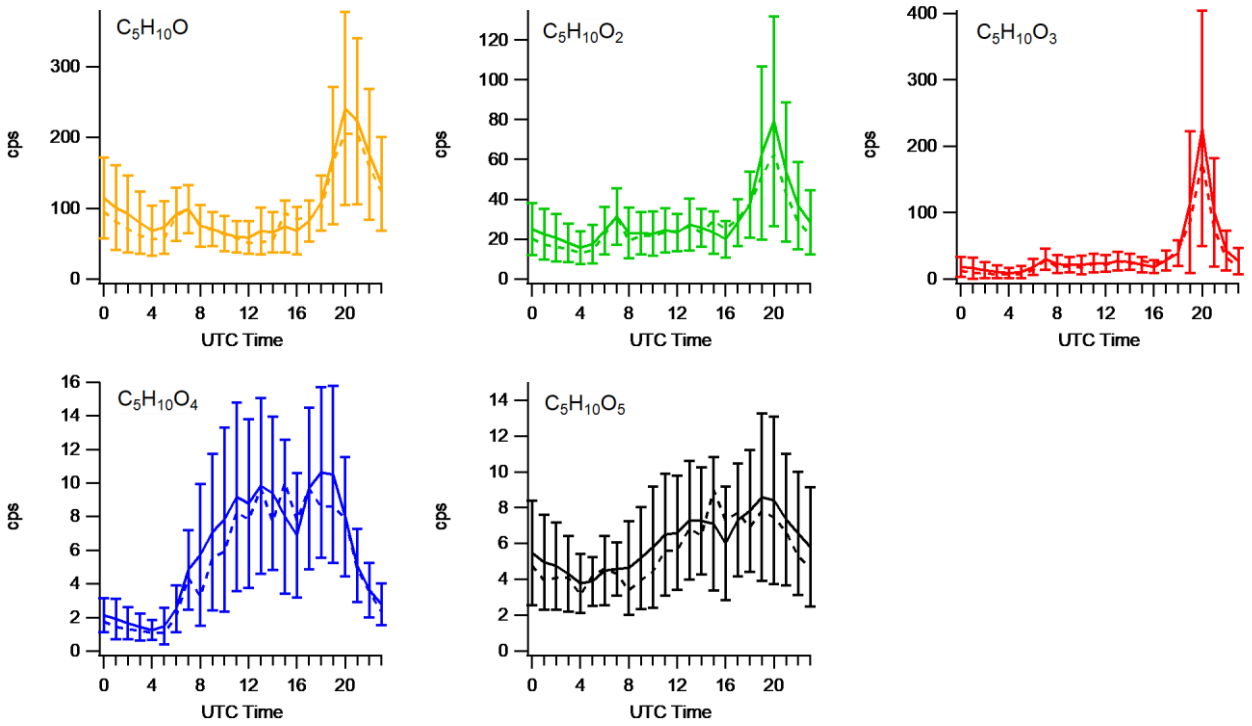

Figure S5. Diurnal patterns of non-nitrate isoprene oxidation products: (a) $C_5H_{10}O$, (b) $C_5H_{10}O_2$, (c) $C_5H_{10}O_3$, (d) $C_5H_{10}O_4$, and (e) $C_5H_{10}O_5$.

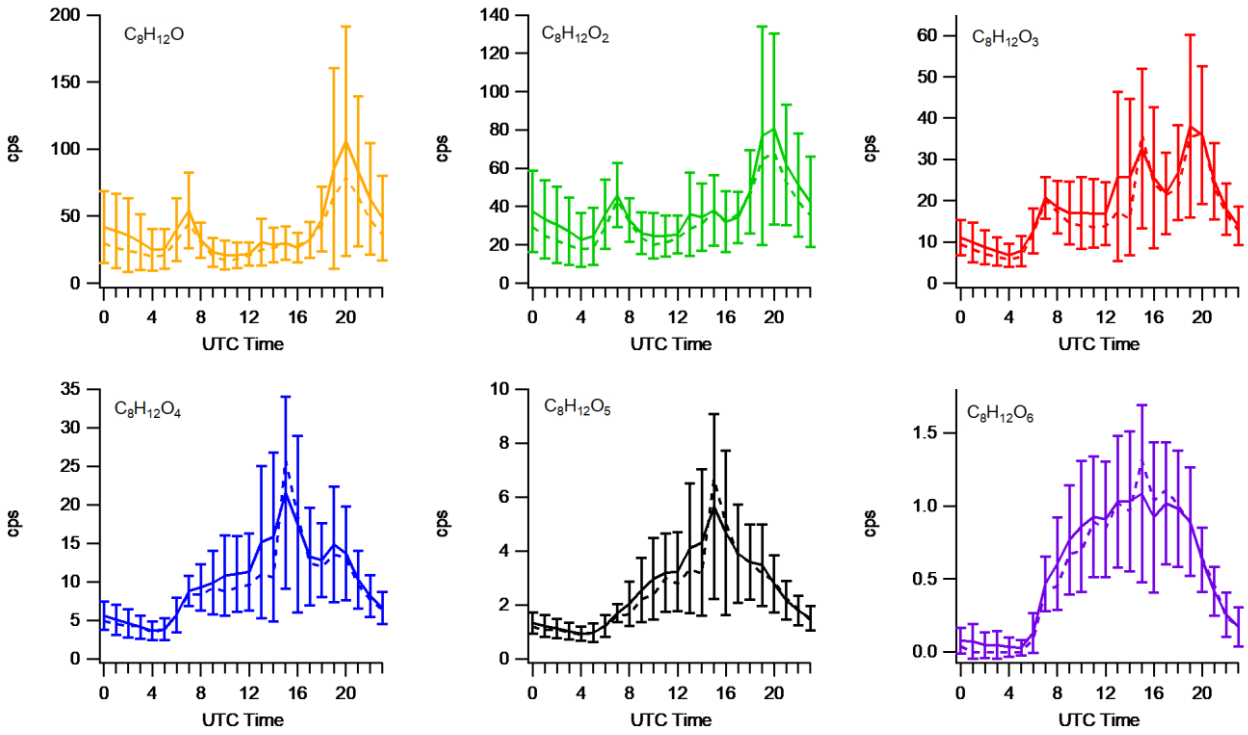

Figure S6. Diurnal patterns of non-nitrate monoterpene oxidation products: (a) $C_8H_{12}O$, (b) $C_8H_{12}O_2$, (c) $C_8H_{12}O_3$, (d) $C_8H_{12}O_4$, (e) $C_8H_{12}O_5$, and (f) $C_8H_{12}O_6$.

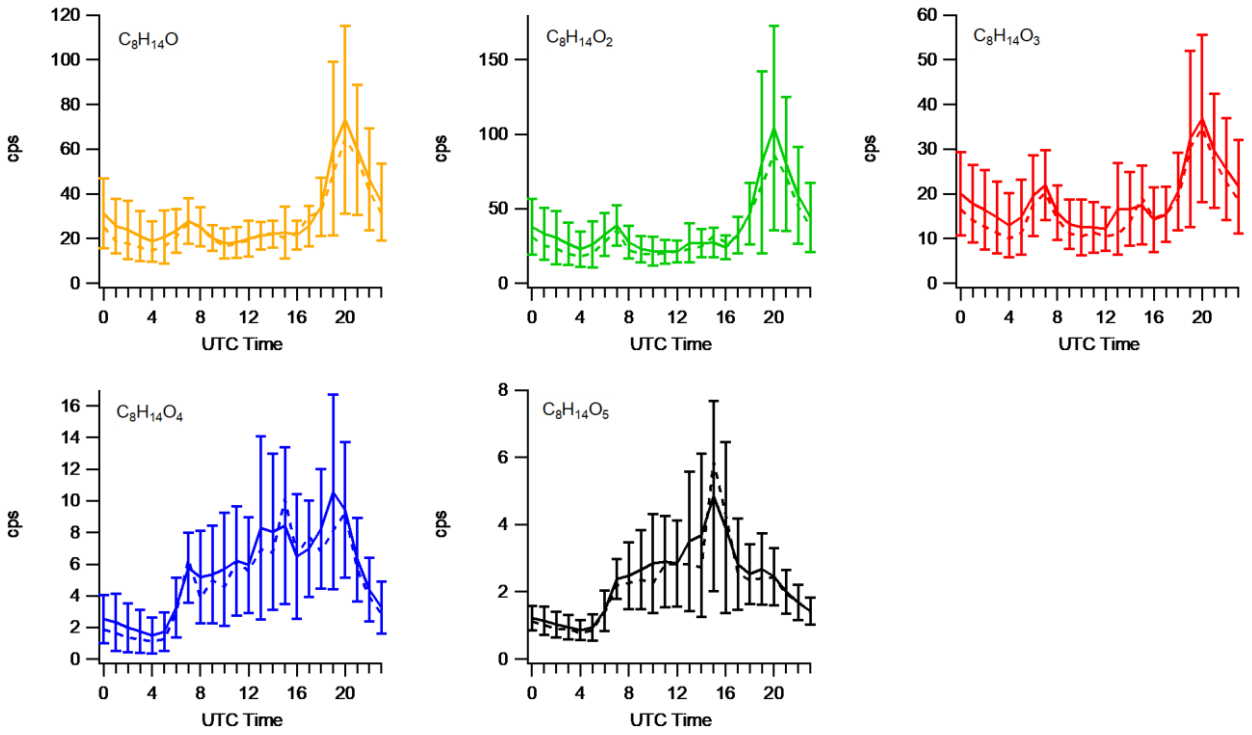

Figure S7. Diurnal patterns of non-nitrate monoterpene oxidation products: (a) $C_8H_{14}O$, (b) $C_8H_{14}O_2$, (c) $C_8H_{14}O_3$, (d) $C_8H_{14}O_4$, and (e) $C_8H_{14}O_5$.

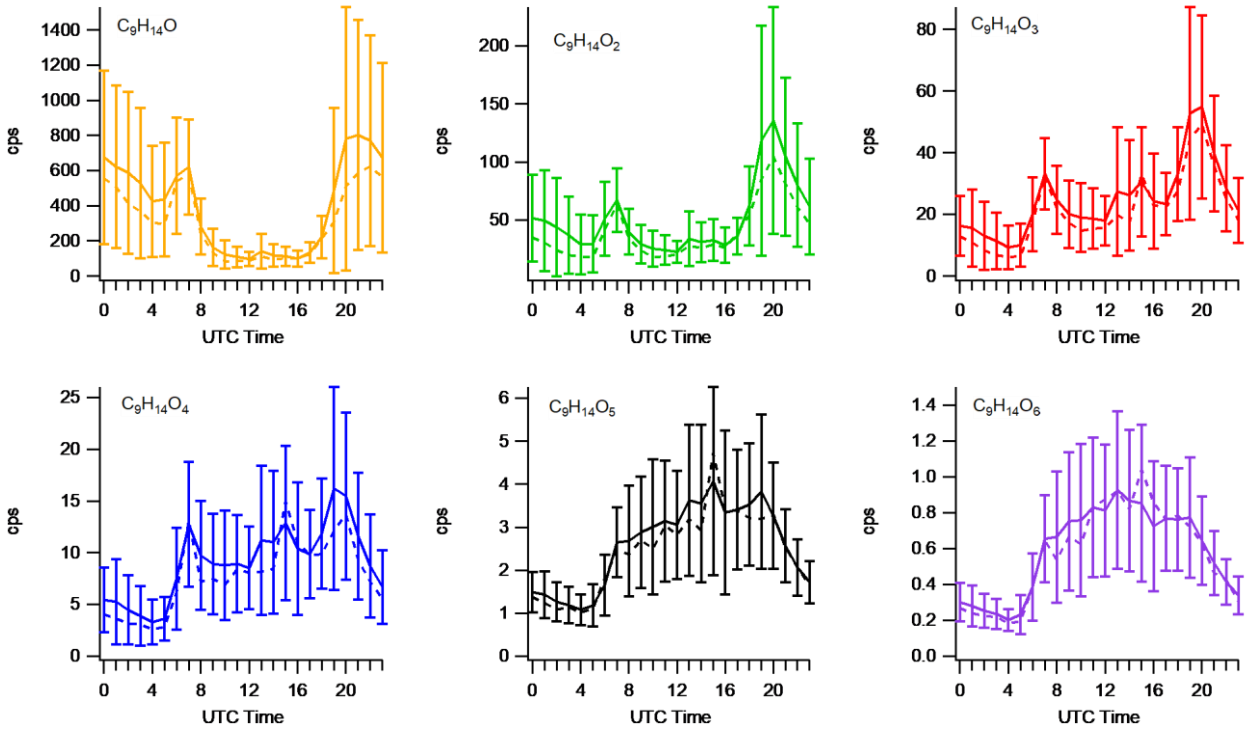

Figure S8. Diurnal patterns of non-nitrate monoterpene oxidation products: (a) $C_9H_{14}O$, (b) $C_9H_{14}O_2$, (c) $C_9H_{14}O_3$, (d) $C_9H_{14}O_4$, (e) $C_9H_{14}O_5$, and (f) $C_9H_{14}O_6$.

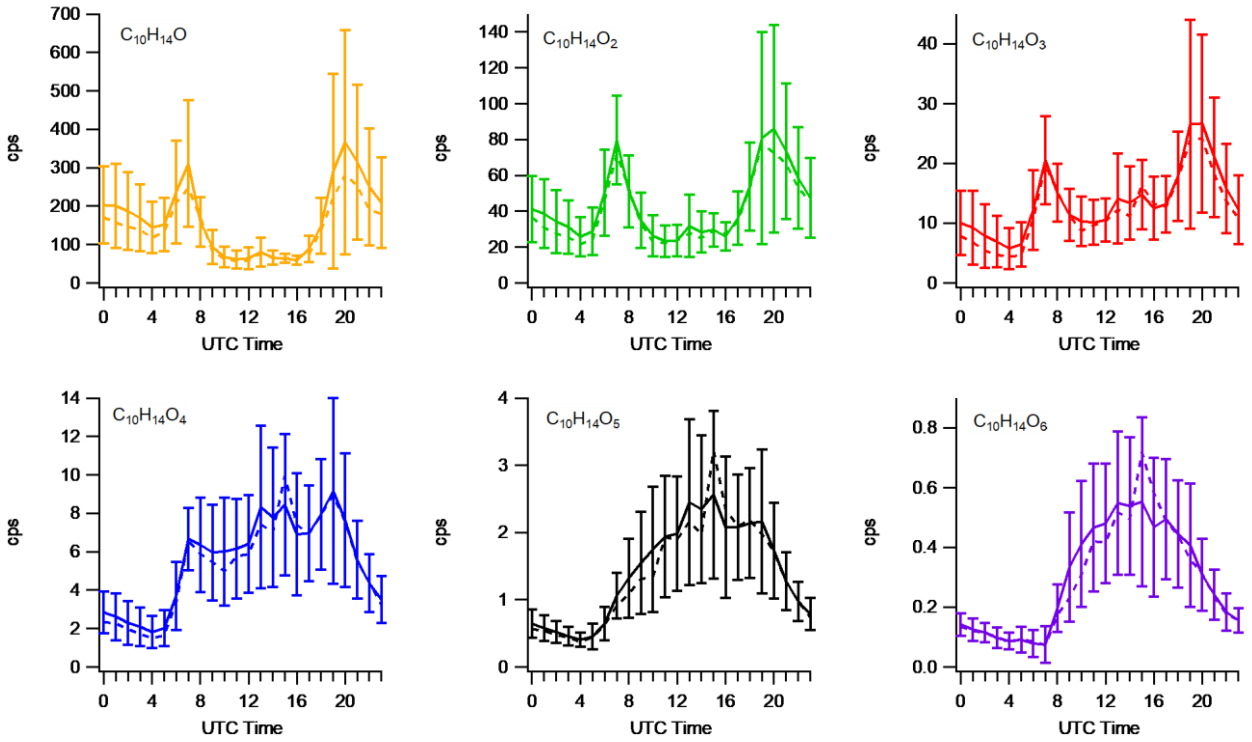

Figure S9. Diurnal patterns of non-nitrate monoterpene oxidation products: (a) $C_{10}H_{14}O$, (b) $C_{10}H_{14}O_2$, (c) $C_{10}H_{14}O_3$, (d) $C_{10}H_{14}O_4$, (e) $C_{10}H_{14}O_5$, and (f) $C_{10}H_{14}O_6$.

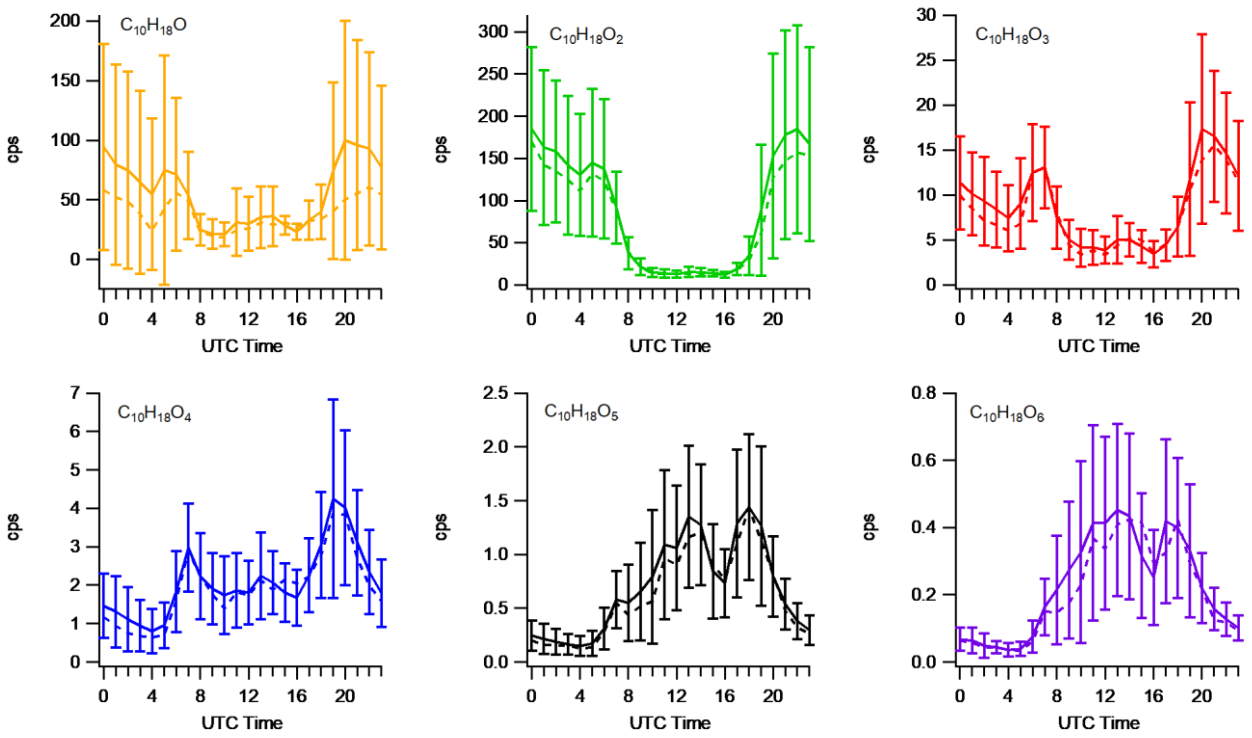

Figure S10. Diurnal patterns of non-nitrate monoterpene oxidation products: (a) $C_{10}H_{18}O$, (b) $C_{10}H_{18}O_2$, (c) $C_{10}H_{18}O_3$, (d) $C_{10}H_{18}O_4$, (e) $C_{10}H_{18}O_5$, and (f) $C_{10}H_{18}O_6$.

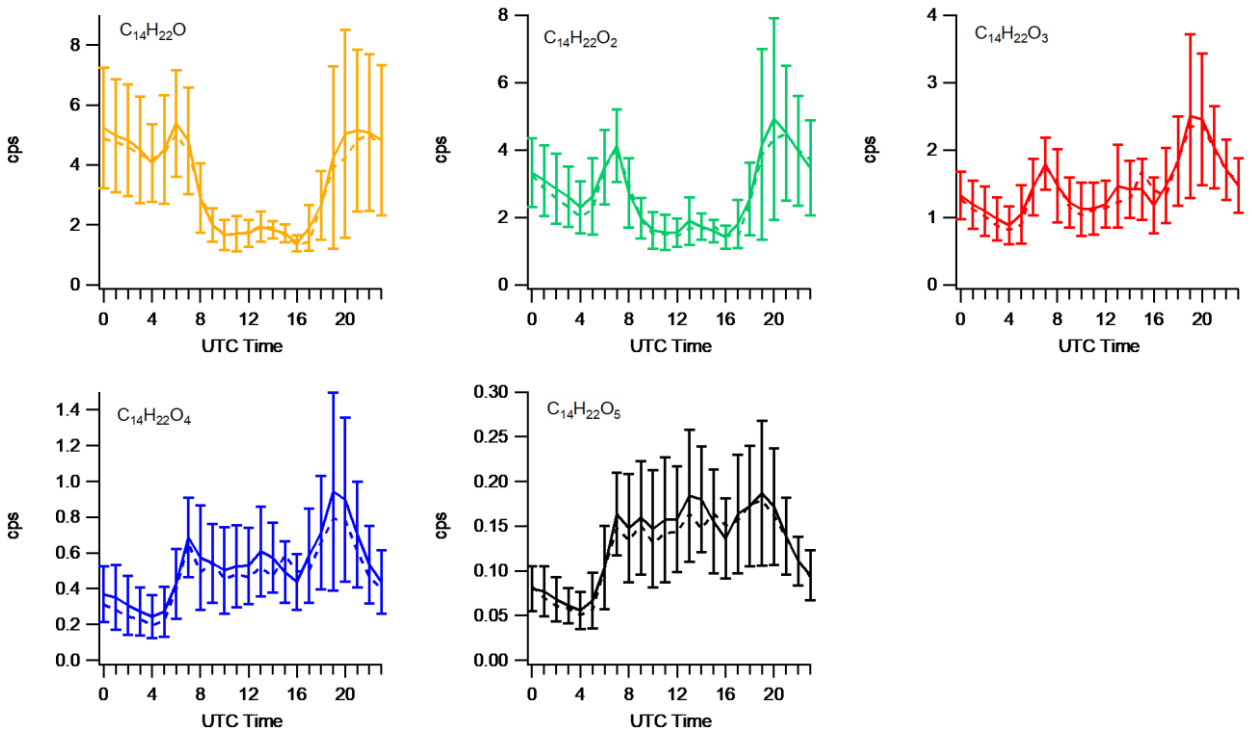

Figure S11. Diurnal patterns of non-nitrate sesquiterpene oxidation products: (a) $C_{14}H_{22}O$, (b) $C_{14}H_{22}O_2$, (c) $C_{14}H_{22}O_3$, (d) $C_{14}H_{22}O_4$, and (e) $C_{14}H_{22}O_5$.

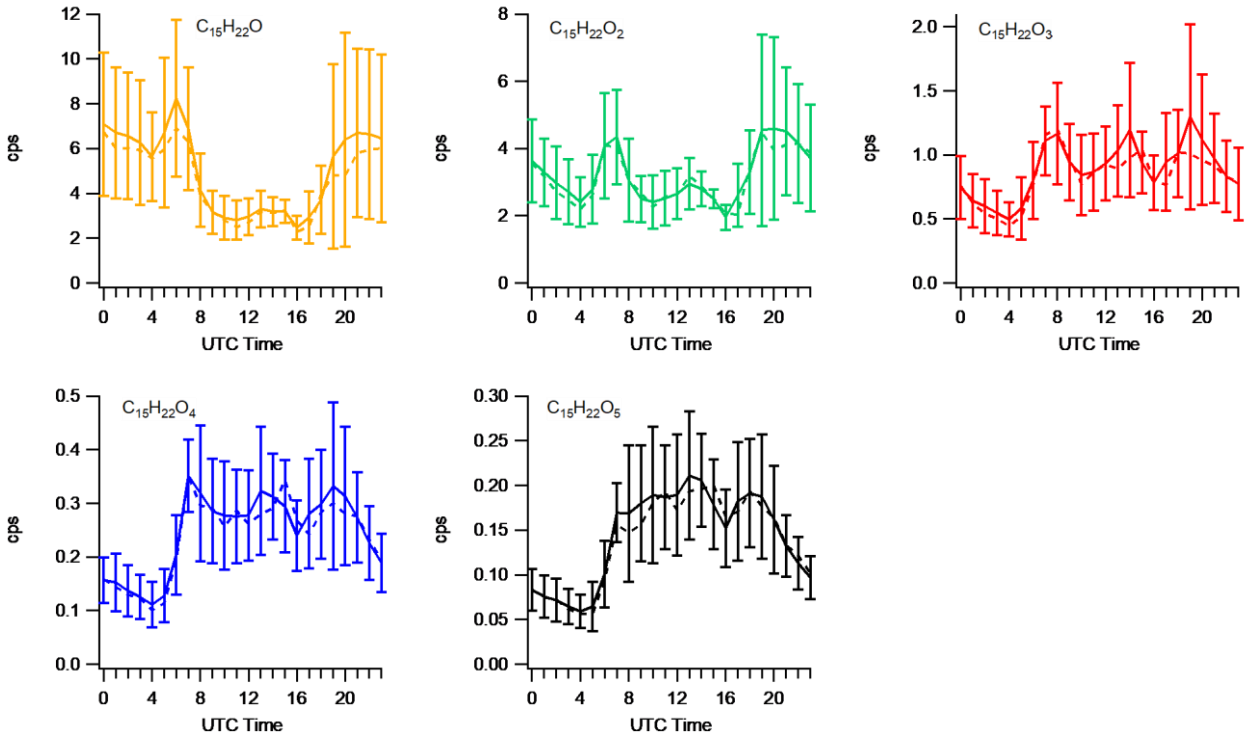

Figure S12. Diurnal patterns of non-nitrate sesquiterpene oxidation products: (a) $C_{15}H_{22}O$, (b) $C_{15}H_{22}O_2$, (c) $C_{15}H_{22}O_3$, (d) $C_{15}H_{22}O_4$, and (e) $C_{15}H_{22}O_5$.

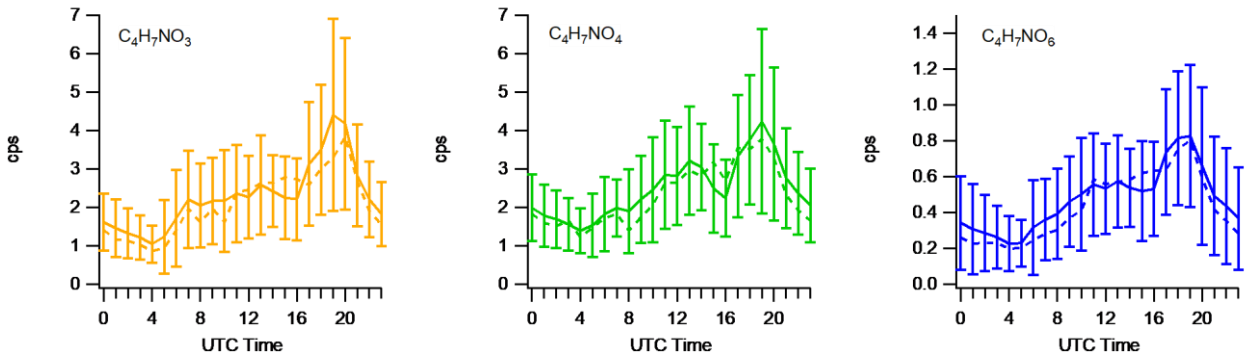

Figure S13. Diurnal patterns of isoprene-derived organic nitrates: (a) $C_4H_7NO_3$, (b) $C_4H_7NO_4$, and (c) $C_4H_7NO_6$.

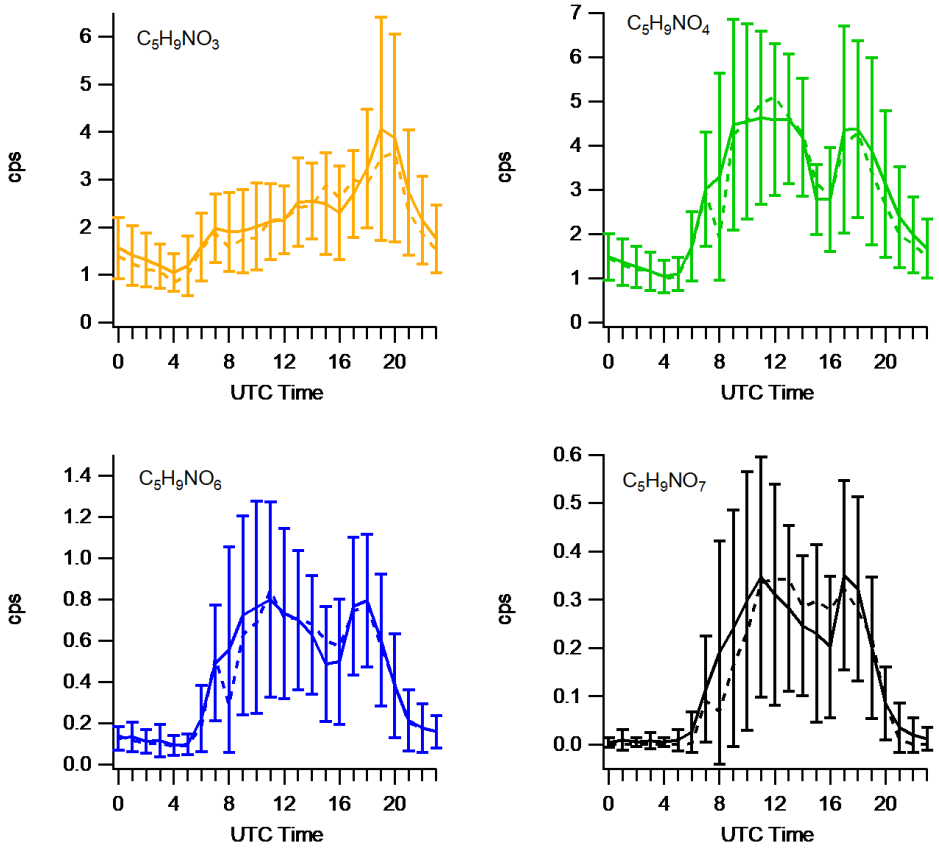

Figure S14. Diurnal patterns of isoprene-derived organic nitrates: (a) $C_5H_9NO_3$, (b) $C_5H_9NO_4$, (c) $C_5H_9NO_6$, and (d) $C_5H_9NO_7$.

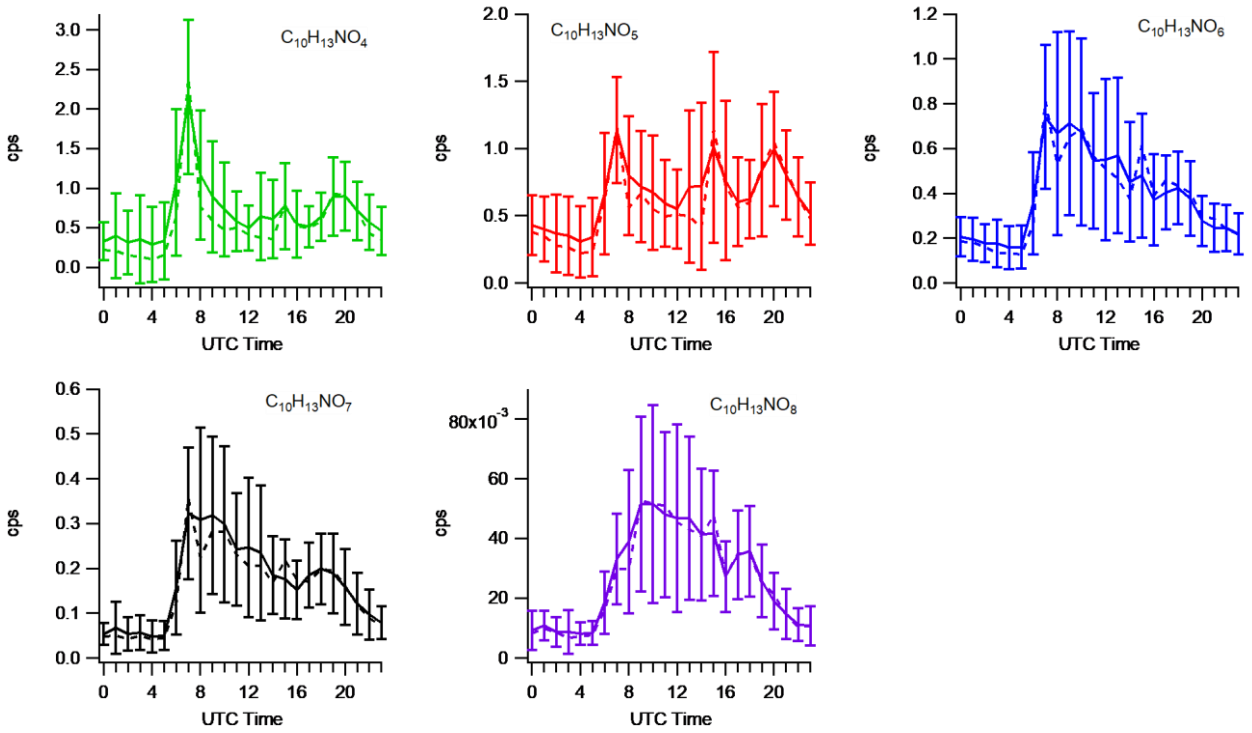

Figure S15. Diurnal patterns of monoterpene-derived organic nitrates: (a) $C_{10}H_{13}NO_4$, (b) $C_{10}H_{13}NO_5$, (c) $C_{10}H_{13}NO_6$, (d) $C_{10}H_{13}NO_7$, and (e) $C_{10}H_{13}NO_8$.

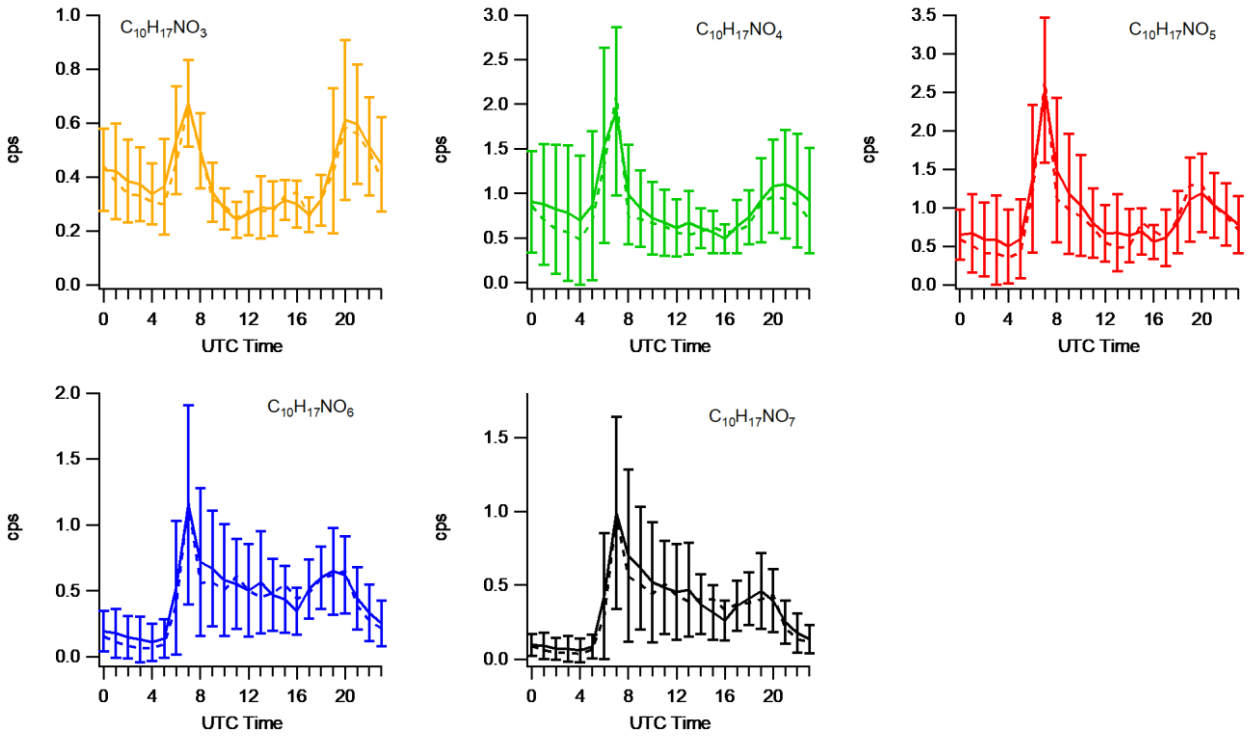

Figure S16. Diurnal patterns of monoterpene-derived organic nitrates: (a) $C_{10}H_{17}NO_3$, (b) $C_{10}H_{17}NO_4$, (c) $C_{10}H_{17}NO_5$, (d) $C_{10}H_{17}NO_6$, and (e) $C_{10}H_{17}NO_7$.