

Supplemental Information for

Chemical Signatures of Water-Soluble Organic Carbon (WSOC) Fraction of Long-Range Transported Wildfire PM_{2.5} from Canada to the United States Mid-Atlantic Region

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Oxygen to Carbon ratio

$$O:C \text{ ratio} = \frac{\text{No. of Oxygen atoms}}{\text{No. of Carbon atoms}}$$

$$\text{Bulk } O:C = \sum_i (O:C \text{ ratio} \times \text{relative peak intensity})$$

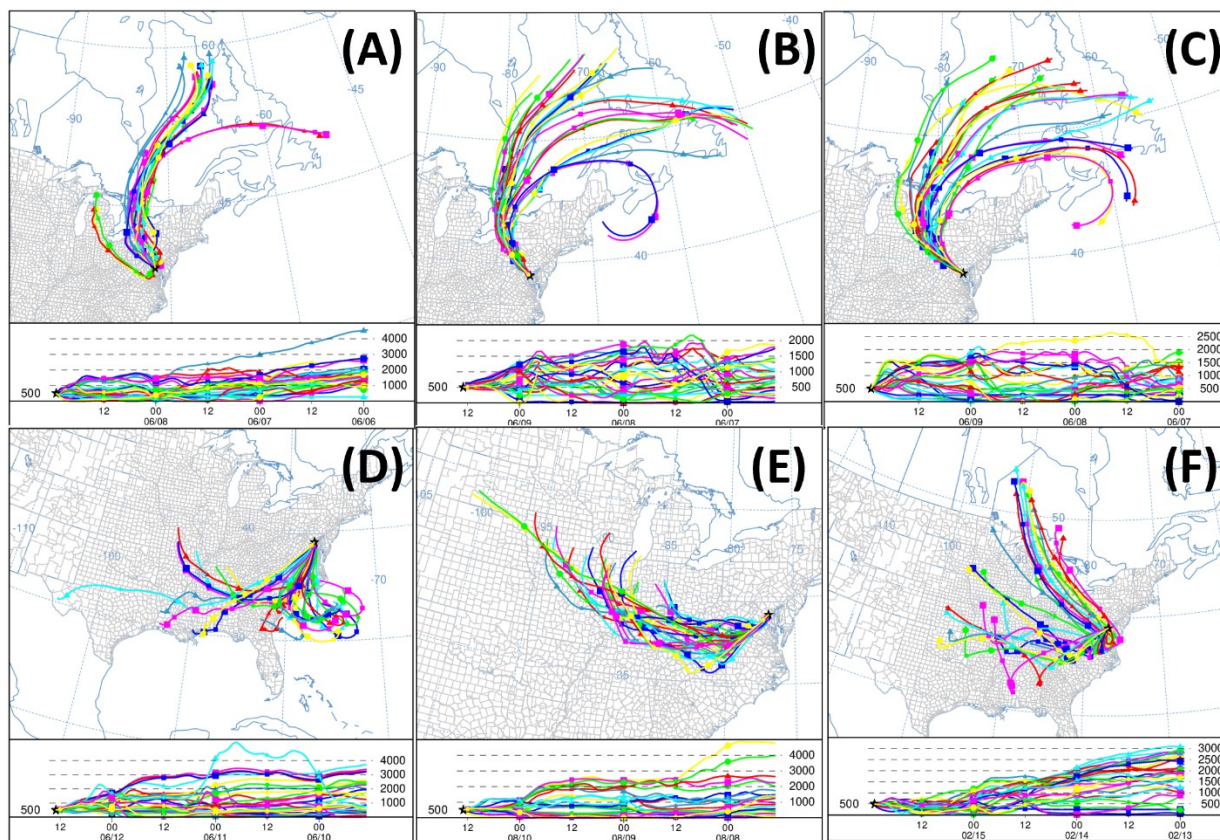


Fig. S1: Other HYSPLIT Images Not Shown in Manuscript

- A. WF-D1
- B. WF-N2
- C. WF-D2
- D. WF-2.5
- E. WF-2M-N
- F. WF-8M-D

Chemical Speciation Samples Collected During the Wildfire Season

Table S1: CHO and CHON ions

Compound Group	Molecular Formula
CHO	C ₄ H ₂ O ₄
	C ₆ H ₁₂ O ₆
	C ₁₅ H ₂₂ O ₄
	C ₂₀ H ₂₄ O ₃
	C ₆ H ₁₀ O ₇
	C ₁₉ H ₂₂ O ₃
	C ₁₂ H ₁₄ O ₄
	C ₈ H ₆ O ₄
	C ₅ H ₈ O ₅
	C ₄ H ₆ O ₅
	C ₃ H ₆ O ₄
	C ₁₂ H ₂₀ O ₁₂
	C ₂₁ H ₂₆ O ₃
	C ₇ H ₈ O ₅
	C ₉ H ₁₄ O ₄
	C ₄ H ₄ O ₄
	C ₃₀ H ₃₀ O ₁₀
	C ₇ H ₆ O ₂
	C ₅ H ₆ O ₂
	C ₆ H ₈ O ₇
	C ₆ H ₁₂ O ₂
	C ₂₅ H ₂₈ O ₁₂
	C ₆ H ₈ O ₆
	C ₃₈ H ₆₂ O ₉
	C ₈ H ₁₂ O ₄
	C ₄ H ₈ O ₄
	C ₈ H ₈ O ₅
	C ₁₉ H ₁₆ O ₆
	C ₄ H ₆ O ₆
	C ₈ H ₈ O ₃
	C ₁₈ H ₃₂ O ₁₆
	C ₅ H ₈ O ₂
	C ₉ H ₁₈ O ₃

	$C_{10}H_{18}O_4$
	$C_{10}H_{16}O_5$
	$C_6H_8O_5$
	$C_5H_6O_5$
	$C_{18}H_{16}O_6$
	$C_{10}H_{16}O_3$
	$C_{18}H_{14}O_7$
	$C_{17}H_{26}O_5$
	$C_{16}H_{28}O_4$
	$C_{10}H_{18}O_5$
	$C_4H_6O_2$
	$C_9H_{14}O_5$
	$C_{25}H_{26}O_{11}$
	$C_{10}H_{16}O_{10}$
	$C_{14}H_{28}O_3$
	$C_{11}H_{18}O_5$
	$C_{11}H_{16}O_4$
	$C_{17}H_{12}O_6$
	$C_{13}H_{22}O_4$
	$C_{11}H_{22}O_3$
	$C_4H_8O_2$
	$C_{19}H_{30}O_6$
	$C_3H_4O_4$
	$C_8H_{12}O_5$
	$C_{11}H_{20}O_3$
	$C_9H_8O_4$
	$C_{26}H_{28}O_{13}$
	$C_{12}H_{22}O_3$
	$C_{10}H_{16}O_4$
	$C_{24}H_{24}O_{12}$
	$C_8H_{12}O_4$
	$C_7H_{10}O_5$
	$C_9H_{16}O_3$
	$C_7H_{10}O_4$
	$C_8H_{14}O_3$
	$C_{11}H_{18}O_4$
	$C_{17}H_{16}O_5$
	$C_{23}H_{22}O_{10}$
	$C_{16}H_{32}O_4$

	$C_{14}H_{26}O_3$
	$C_{18}H_{22}O_6$
	$C_{15}H_{16}O_4$
	$C_{10}H_{14}O_3$
	$C_7H_{10}O_4$
	$C_{20}H_{22}O_4$
	$C_4H_6O_4$
	$C_6H_{10}O_8$
	$C_{23}H_{22}O_{11}$
	$C_9H_{16}O_9$
	$C_{19}H_{14}O_7$
	$C_8H_8O_3$
	$C_{32}H_{54}O_4$
	$C_7H_{10}O_7$
	$C_{12}H_{22}O_4$
	$C_{12}H_{20}O_5$
	$C_4H_{10}O_2$
	$C_{24}H_{24}O_{11}$
	$C_{18}H_{36}O_2$
	$C_{21}H_{34}O_7$
	$C_{19}H_{14}O_6$
	$C_{19}H_{38}O_3$
	$C_{24}H_{24}O_{10}$
	$C_{11}H_{20}O_4$
	$C_7H_{12}O_4$
	$C_{11}H_{12}O_6$
	$C_{19}H_{14}O_8$
	$C_7H_{14}O_3$
	$C_{18}H_{32}O_4$
	$C_{10}H_{16}O_5$
	$C_4H_6O_3$
	$C_{12}H_{18}O_5$
	$C_{18}H_{14}O_5$
	$C_6H_8O_4$
	$C_{16}H_{26}O_6$
	$C_{18}H_{12}O_6$
	$C_{16}H_{24}O_4$
	$C_{22}H_{22}O_5$
	$C_{21}H_{18}O_9$

	$C_{11}H_{22}O_4$
	$C_{10}H_{10}O_5$
	$C_{16}H_{30}O_4$
	$C_{23}H_{24}O_5$
	$C_{11}H_{18}O_4$
	$C_{13}H_{24}O_3$
	$C_{14}H_{20}O_5$
	$C_{12}H_{20}O_4$
	$C_{12}H_{16}O_5$
	$C_{18}H_{36}O_4$
	$C_8H_{18}O_3$
	$C_7H_{12}O_3$
	$C_8H_{12}O_4$
	$C_8H_{14}O_4$
CHON	C_5H_9NO
	$C_{20}H_{14}N_4O_3$
	$C_5H_4N_4O$
	$C_{12}H_{15}NO_4$
	$C_{30}H_{46}N_6O_6$
	$C_9H_{17}NO_3$
	$C_6H_5NO_3$
	$C_6H_5NO_3$
	$C_{34}H_{60}N_4O_{11}$
	$C_{31}H_{22}N_2O_6$
	$C_{12}H_{14}N_4O_7$
	$C_{23}H_{37}NO_3$
	$C_5H_6N_2O_3$
	$C_{21}H_{25}N_3O_9$
	$C_{10}H_{19}NO_3$
	$C_{14}H_{18}N_4O_9$
	$C_{32}H_{65}NO_4$
	$C_{22}H_{41}NO$
	$C_{40}H_{66}N_6O_7$
	$C_{15}H_{23}NO_3$
	$C_{29}H_{37}NO_5$
	$C_{14}H_{27}NO_4$
	$C_{11}H_{22}NO_2$
	$C_5H_6N_2O_2$
	$C_{12}H_{20}N_2O$

	$\text{C}_{26}\text{H}_{29}\text{NO}_9$
	$\text{C}_{24}\text{H}_{21}\text{NO}_6$
	$\text{C}_5\text{H}_{11}\text{NO}_2$
	$\text{C}_{13}\text{H}_{23}\text{NO}_2$
	$\text{C}_{29}\text{H}_{25}\text{N}_5\text{O}_3$
	$\text{C}_{22}\text{H}_{43}\text{NO}$
	$\text{C}_{27}\text{H}_{31}\text{N}_3\text{O}_7$

Table S2: CHOS, CHONP, DCONS, CHOP, CHX ions

Compound Group	Molecular Formula
CHOS	C ₅ H ₈ O ₃ S
	C ₁₄ H ₁₈ O ₅ S
	C ₁₆ H ₂₀ O ₈ S
	C ₁₂ H ₁₂ O ₄ S
	C ₁₈ H ₁₆ O ₁₁ S
	C ₈ H ₆ OS
	C ₁₅ H ₁₈ O ₄ S
CHONP	C ₃₄ H ₆₆ NO ₉ P
	C ₁₅ H ₂₄ N ₂ O ₁₇ P ₂
	C ₁₀ H ₁₆ N ₅ O ₁₄ P ₃
CHONS	C ₁₉ H ₂₀ N ₂ O ₇ S ₃
	C ₇ H ₆ N ₂ O ₂ S ₂
	C ₂₇ H ₃₉ N ₂ O ₅ S
	C ₁₃ H ₁₄ N ₂ O ₄ S ₂
	C ₁₇ H ₁₉ N ₃ O ₃ S ₂
	C ₈ H ₆ N ₂ O ₂ S
CHOP	C ₃ H ₉ O ₆ P
	C ₅ H ₁₁ O ₈ P
	C ₃ H ₇ O ₆ P
	C ₄₁ H ₇₃ O ₇ P
CHX	C ₁₀ H ₁₀ Cl ₂
	C ₃₀ H ₂₇ ClO ₇
	C ₂₀ H ₁₉ Cl ₃ O ₆
	C ₇ H ₄ BrClO ₃
	C ₂₀ H ₂₆ ClN ₃ O ₆ S ₂
	C ₁₃ H ₉ F ₃ N ₂ O ₂
	C ₇ H ₄ BrClO ₃
	C ₂₂ H ₂₁ ClN ₂ O ₂ S
	C ₁₂ H ₁₃ ClO ₅
	C ₆ H ₁₁ C ₁₃ Osi
	C ₉ H ₉ ClO ₄
	C ₂₀ H ₂₆ ClN ₃ O ₆ S ₂
	C ₈ H ₉ ClO ₃
	C ₁₀ H ₁₅ BrO ₂

Table S3: CHOSi, CHN, CHS, CH ions

Compound Group	Molecular Formula
CHOSi	C ₁₄ H ₂₂ OSi
CHN	C ₂₁ H ₂₈ N ₂
	C ₇ H ₁₀ N ₂
CHS	C ₃ H ₈ S ₃
CH	C ₈ H ₁₂