



APPENDIX AVAILABLE ON THE HEI WEB SITE

Research Report 177

National Particle Component Toxicity (NPACT) Initiative: Integrated Epidemiologic and Toxicologic Studies of the Health Effects of Particulate Matter Components

Morton Lippmann et al.

Study 4. Mortality and Long-Term Exposure to PM_{2.5} and Its Components in the American Cancer Society's CPS-II Cohort

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Appendix H. Inhalable Particle Network

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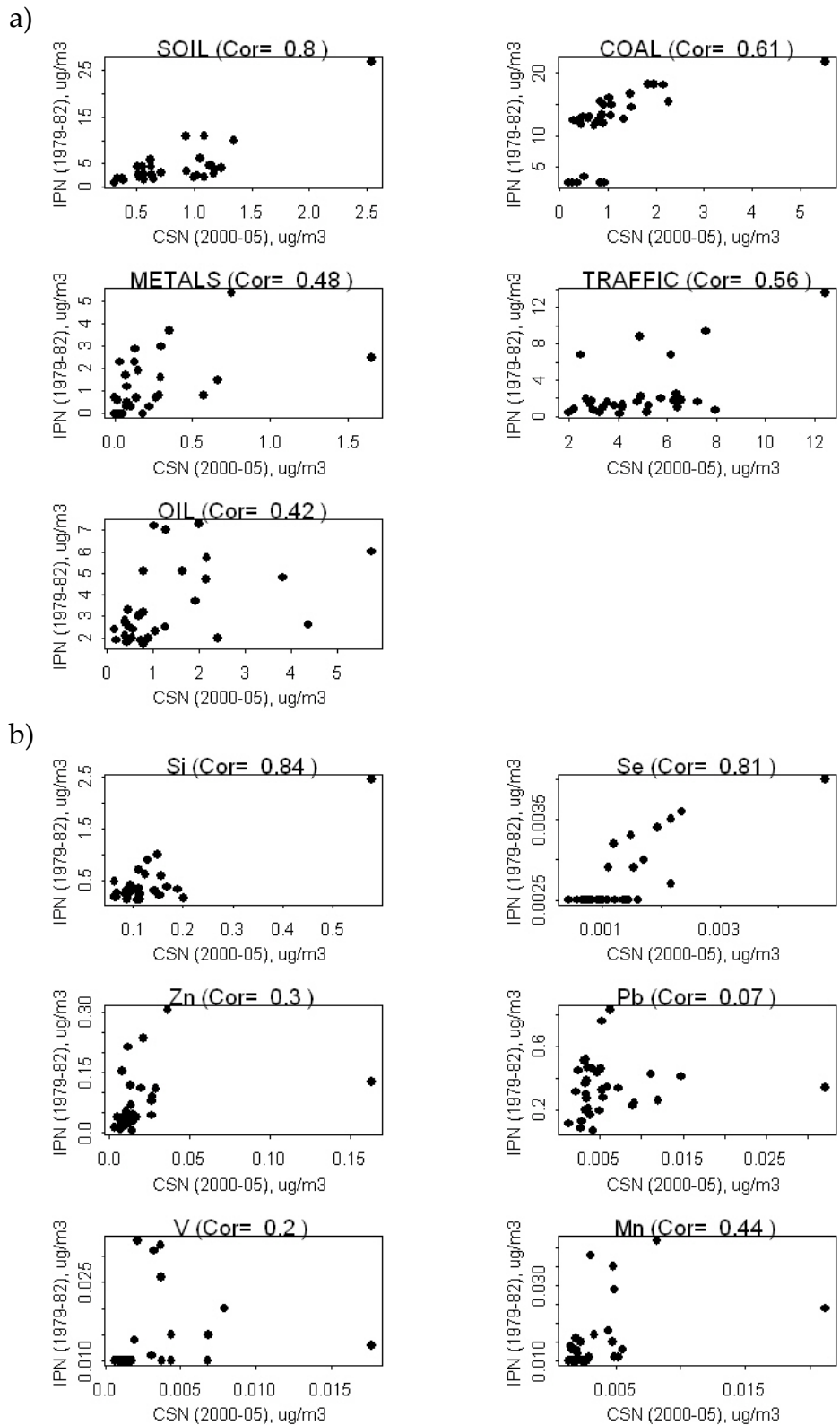
Appendix H. The Inhalable Particle Network

The Inhalable Particle Network (IPN) operated from mid-1979 to end of 1982. Particle mass sampling was conducted every sixth-day nationwide. All samples were collected for 24 hours (midnight to midnight). Samples were analyzed by the U.S. EPA for sulfate ion and nitrate ion by automated colorimetry, and for elemental composition via x-ray fluorescence (Watson et al, 1981). The results of applying oblique rotation PCA to the IP Network data from 48 U.S. sites in 36 MSAs are shown in Table H.1 (Thurston et al., 1984; Ozkaynak and Thurston, 1987). Correlations of trace element and source contribution concentrations from the IP Network data versus those for this new CSN work are presented in Figure H.1 (where the $r_{critical}$ for $p < 0.05$ is 0.34 for $n=32$). Most tracer and source associations are at or near statistically significance, except notably for Pb, which is no longer a gasoline additive. Interestingly, the correlation of the traffic components is significant, suggesting that, although the traffic tracer has changed with time, the locales with high or low traffic $PM_{2.5}$ impacts have been reasonably consistent over time. Overall, these results suggest that, while levels of $PM_{2.5}$ impacts have decreased over time, there is generally a consistency in the MSA's with high or low impacts from the various source categories.

Appendix Table H.1. Factor Analysis Results for IPN dataset (1979-82).

Element	Identified Principal Components				
	Soil	Motor Vehicles	Residual Oil	Iron/Steel Industries	Coal Combustion
Si	0.86	0.14	0.00	0.16	0.05
Fe	0.88	0.13	0.05	0.54	0.18
K	0.83	0.23	0.08	0.38	0.26
Br	0.15	0.97	0.16	0.17	0.04
Pb	0.22	0.95	0.23	0.36	0.17
V	0.00	0.12	0.88	0.00	0.04
Ni	0.06	0.25	0.84	0.28	0.13
Zn	0.17	0.30	0.13	0.83	0.27
Mn	0.57	0.12	0.07	0.79	0.08
Se	0.14	0.09	0.04	0.18	0.90
S	0.17	0.00	0.34	0.40	0.60

Source: Thurston et al., 1984



Appendix Figure H.1. Scatter plots of (a) source-related impacts ($\mu\text{g}/\text{m}^3$) and (b) key trace species ($\mu\text{g}/\text{m}^3$) for past historical (IPN) vs. current (CSN) data ($n = 32$ MSAs).

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