



Air Resources Laboratory



Publications – FY 1993

- ALVAREZ, R.J. II, H. Moosmüller, C.M. Edmonds, R.M. Turner, D.H. Bundy, and J.L. McElroy
Ozone measurements with the U.S. EPA UV-Dial: Preliminary Results. Proceedings, of the
16th International Laser Radar Conference, Cambridge, MA, July 1992 95-98 (1992).
- Allwine, K.J., B.K. Lamb, and R. ESKRIDGE. Wintertime dispersion in a mountainous basin at
Roanoke, Virginia: Tracer Study. *Journal of Applied Meteorology* 31:1296-1311 (1992).
- ANGELL, J.K. Comparison of stratospheric warming following Agung, El Chichon and Pinatubo
volcanic eruptions. *Geophysical Research Letters* 20(8):715-718 (1993).
- ANGELL, J.K. Reexamination of the relation between depth of the Antarctic ozone hole, and
equatorial QBO and SST, 1962-1992. *Geophysical Research Letters* 20(15):1559-1562
(1993).
- ARTZ, R.S., and R.F. Lavrinenko. Background precipitation chemistry monitoring in the Soviet Union.
Environmental Monitoring and Assessment 26:1-25 (1993).
- BALDOCCHI, D.D. A lagrangian random-walk model for simulating water vapor, CO₂ and sensible
heat flux densities and scalar profiles over and within a soybean canopy. *Boundary-Layer
Meteorology* 61:113-144 (1992).
- BALDOCCHI, D.D. Scaling water vapor and carbon dioxide exchange from leaves to a canopy:
Rules and tools. In: *Scaling Physiological Processes, Leaf to Globe*, R.R. Ehleringer and C.B.
Field, (eds.) Academic Press, New York, 77-114 (1993).
- BENJEY, W.G. Agricultural pesticide emissions associated with common crops in the United States.
Abstracts Book, Air & Waste Management Association 86th Annual Meeting, Denver, CO,
June 13–18, 1993. Air & Waste Management Association, Pittsburgh, 93-WP-96.01 (1993).
- BENJEY, W.G. Status and needs for toxic emission inventories for regional dispersion and deposition
modeling. In: *Emission Inventory Issues in the 1990s*. VIP-22. Proceedings, of an AWMA
International Specialty Conference on Emission Inventory Issues, September 1991, Durham,
NC. Air & Waste Management Association, Pittsburgh, 221-231 (1991).
- BENJEY, W.G., and D.H. COVENTRY. Geographical distribution and source type analysis of toxic
metal emissions. Proceedings, of the 1992 U.S. EPA/AWMA International Symposium on

- Measurement of Toxic and Related Air Pollutants, Durham, NC, May 4-9, 1992, 1029-1034 (1992).
- BRIGGS, G.A. Final results of the CONDORS Convective Diffusion Experiment. *Boundary Layer Meteorology* 62:315-328 (1993).
- BRIGGS, G.A. Plume dispersion in the convective boundary layer. Part II: Analyses of CONDORS field experiment data. *Journal of Applied Meteorology* 32:1388-1425 (1993).
- BRIGGS, G.A. Stagnation diffusion observed in a deeply pooling valley during STAGMAP. Preprints, Tenth Symposium on Turbulence and Diffusion, September 29 - October 2, 1992, Portland, Oregon. American Meteorological Society, Boston, 155-162 (1992).
- BRIGGS, G.A., A.H. HUBER, W.H. SNYDER, and R.S. Thompson. Discussion of "Diffusion in building wakes for ground-level releases". *Atmospheric Environment* 26B:513-515 (1992).
- Brown, M.J., S.P.S. Arya, and W.H. SNYDER. Vertical dispersion from surface and elevated releases: an investigation of a non-Gaussian plume model. *Journal of Applied Meteorology* 32:490-505 (1993).
- BULLOCK, O.J., Jr. A workstation concept for the production of dynamically-constrained meteorological characterizations for use in air-quality modeling. Preprints, Ninth International Conference on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology, January 17-22, 1993, Anaheim, CA. American Meteorological Society, Boston, 9-14 (1993).
- BYUN, D.W. Influence of the planetary boundary layer on the photochemical ozone production: Preliminary study with RADM. Preprints, Conference on Atmospheric Chemistry, January 17-22, 1993, Anaheim, CA. American Meteorological Society, Boston, 39-46 (1993).
- CARTER, R.G., T.B. WATSON, D.J. HOOVER, and G.E. START. Utah Valley 1991-1992 Study. Final Report. Addendum: Supplemental Measurements. State of Utah Department of Environmental Quality, Salt Lake City, UT, 116 pp (1993).
- Castro, I.P., A. Kumar, W.H. SNYDER, and S.P.S. Arya. Removal of slightly heavy gases from a valley by crosswinds. *Journal of Hazardous Materials* 34:271-293 (1993).
- CHING, J.K.S., F.S. BINKOWSKI, and T.L. CLARK. Deposition of semi-volatile air toxic pollutants to the Great Lakes; A regional modeling approach. 1993 Abstracts Book, Measurement of Toxic and Related Air Pollutants, Durham, NC, May 4-7, 1993. U.S.

Environmental Protection Agency, Research Triangle Park, NC, and Air & Waste Management Association, Pittsburgh, (1993).

CHING, J.K.S., and J.S. IRWIN. Modeled mesoscale meteorological fields with four-dimensional data assimilation in regional scale air quality models. In: *The Role of Meteorology in Managing the Environment in the 90's*. VIP-29. Proceedings, of an International Specialty Conference, Scottsdale, Arizona, January 1993. Air & Waste Management Association, Pittsburgh, 219-230 (1993).

CLARK, T.L., P. Blakley, and G. Mapp. Model calculations of the annual atmospheric deposition of toxic metals to Lake Michigan. Proceedings, of the 85th Annual Meeting of the Air & Waste Management Association, Kansas City, Missouri, June 21-26, 1993. Air & Waste Management Association, Pittsburgh, 92-84.17 (1993).

CLARKE, J.F., and E.S. Edgerton. Dry deposition flux calculations for the National Dry Deposition Network. EPA/600/R-93/065, Atmospheric Research and Exposure Assessment Laboratory, Research Triangle Park, NC, 91 pp. (1993).

CLARKE, J.F., E.S. Edgerton, and R.P. Boksleitner. Routine estimation and reporting of dry deposition for the U.S.A. Dry Deposition Network. Proceedings, Fifth International Conference on Precipitation Scavenging and Atmospheric-Surface Exchange Processes, Richland, WA, July 15-19, 1991.

COOTER, E.J., B.K. EDER, S.K. LEDUC, and L.E. TRUPPI. Climate Change, Models and Forest Research. *Journal of Forestry* 91:38-43 (1993).

COOTER, E.J., S.K. LEDUC, and L.E. TRUPPI. Climate research for ecological monitoring and assessment: A New England Example. *Climate Research* 2:101-112 (1992).

CRAWFORD, T.L., R.J. DOBOSY, and K.L. BIRDWELL. Airborne measurements of mass, momentum, and energy fluxes for the Boardman-Arm Regional Flux Experiment--1991 Preliminary Data Release. NOAA TM ERL ARL-202, 58+pp. (1993).

CRAWFORD, T.L., R.T. MCMILLEN, T.P. MEYERS, and B.B. HICKS. Spatial and temporal variability of heat, water vapor, carbon dioxide, and momentum air-sea exchange in a coastal environment. *Journal of Geophysical Research* 98(D7):12,869-12,880 (1993).

DENNIS, R.L., J.N. McHenry, W.R. Barchet, F.S. BINKOWSKI, and D.W. BYUN. Correcting RADM's sulfate underprediction: discovery and correction of model errors and testing the corrections through comparisons against field data. *Atmospheric Environment* 27A(6):975-997 (1993).

- DENNIS, R.L., J.N. McHenry, D.W. BYUN, T.L. CLARK, and S.D. Reynolds. Delineation of the influence of major emissions regions on the annual acidic deposition at sensitive areas. In: *Air Pollution Modeling and its Application VIII*. Han van Dop and Douw G. Steyn (eds.). Plenum Press, New York, 125-132 (1992).
- DENNIS, R.L., J.N. McHenry, S.K. Seilkop, and J.S. Chang. Characterization of the nonlinear change in annual sulfur deposition for a change in emissions. In: *Air Pollution Modeling and its Application VIII*. Han van Dop and Douw G. Steyn (eds.). Plenum Press, New York, 135-142 (1992).
- DENNIS, R.L., and J.H. NOVAK. EPA's third generation modeling system (Models-3): an overview. In: *Tropospheric Ozone and the Environment II, Effects, Modeling and Control, TR-20*. Ronald L. Berglund (ed.). Air & Waste Management Association, Pittsburgh, 137-147 (1992).
- DiCristofaro, D.C., G.E. Moore, J.S. TOUMA, and L.W. Richards. The PLUVUE II Visibility Modeling System. Abstracts Book, Air & Waste Management Association 86th Annual Meeting, Denver, CO, June 13-18, 1993. Air & Waste Management Association, Pittsburgh, 93-TP-49.05 16 pp. (1993).
- Doran, J.C., F.J. Barnes, R.L. Coulter, T.L. CRAWFORD, D.D. BALDOCCHI, L. Balick, D.R. Cook, D. Cooper, R.J. DOBOSY, W.A. Dugas, L. Fritschen, R.L. Hart, L. Hipps, J.M. Hubbe, W. Gao, R. Hicks, R.R. Kirkham, K.E. Kunkel, T.J. Martin, T.P. MEYERS, W.Porch, J.D. Shannon, W.J. Shaw, E. Swiatek, and C.D. Whiteman. The Boardman regional flux experiment. *Bulletin of the American Meteorological Society* 73:1785-1795 (1992).
- ECKMAN, R.M. A wavelet decomposition of single-particle diffusion. Preprints, the Tenth Symposium on Turbulence and Diffusion, September 29 - October 2, 1992, Portland, Oregon. American Meteorological Society, Boston, MA 110-113 (1992).
- ECKMAN, R.M., R.J. DOBOSY, and K.S. RAO. Spatial variability of the wind over moderately complex terrain. Preprints, the Tenth Symposium on Turbulence and Diffusion, September 29 - October 2, 1992, Portland, Oregon. American Meteorological Society, Boston, MA (J4)84-(J4)87 (1992).
- EDER, B.K., S.K. LEDUC, and L.E. TRUPPI. The spatiotemporal variability of non-urban ozone concentrations over the eastern United States and its potential replication by satellite data. In: *The Role of Meteorology in Managing the Environment in the 90s. VIP-29. Proceedings, of an International Specialty Conference, Scottsdale, Arizona, January 1993*. Air & Waste Management Association, Pittsburgh, 61-73 (1993).

- Eklund, B., S. Smith, J.F. Durham, and J.S. TOUMA. Estimation of VOC Emissions, ambient air concentrations, and health effects from the excavation of contaminated soil. Proceedings, of the 85th Annual Meeting of the Air & Waste Management Association, Kansas City, Missouri, June 21-26, 1992. Air & Waste Management Association, Pittsburgh, 16 pp. (1992).
- Eldred, R.A., T.A. Cahill, W.C. Malm, and M.L. PITCHFORD. Ten-year trends in sulfur concentrations at National Parks throughout the United States. Abstracts Book, Air & Waste Management Association 86th Annual Meeting, Denver, CO, June 13-18, 1993. Air & Waste Management Association, Pittsburgh, 93-MP-4.06 (1993).
- ELLIOTT, W.P., and D.J. GAFFEN. Effects of conversion algorithms on reported upper-air dewpoint depressions. *Bulletin of the American Meteorological Society* 74(7):1323-1325 (1993).
- Enders, G., R. Dlugi, R. Steinbrecher, B. Clement, R. Daiber, J.V. Eijk, S. Gab, M. Haziza, G. Helas, U. Herrmann, M. Kessel, J. Kesselmeier, D. Kotzias, K. Kourtidis, H.H. Kurth, R.T. MCMILLEN, G. Roider, W. Schurmann, U. Teichmann, and L. Torres. Biosphere/Atmosphere Interactions: Integrated research in a European coniferous forest ecosystem. *Atmospheric Environment* 26A(1):171-189 (1992).
- Engelmann, R.J., W.R. PENDERGRASS, J.R. WHITE, and M.E. HALL. The effectiveness of stationary automobiles as shelters in accidental releases of toxic materials. *Atmospheric Environment* 26(A):3119-3125 (1992).
- GAFFEN, D.J. Historical changes in radiosonde instruments and practices. Final Report. World Meteorological Organization, Instruments and Observing Methods, Report No. 50, 123 (1993).
- GAFFEN, D.J. Observed annual and interannual variations in tropospheric water vapor. NOAA TM ERL ARL-198, 162 pp. (1993).
- GAFFEN, D.J., A. Robock, and W.P. ELLIOTT. Annual cycles of tropospheric water vapor. *Journal of Geophysical Research* 97(D16):18,185-18,193 (1992).
- Garratt, J.R., B.B. HICKS, and R.A. VALIGURA. Comments on "The Roughness Length for Heat and Other Vegetation Parameters for a Surface of Short Grass," by P.G. Duynkerke. *Journal of Applied Meteorology* 32(7):1301-1303 (1993).
- Garodz, L.J., and K.L. CLAWSON. Vortex wake characteristics of B757-200 and B767-200 aircraft using the tower flyby technique Volume 1. NOAA TM ERL ARL-199, 160 pp. (1993).

- Garodz, L.J., and K.L. CLAWSON. Vortex wake characteristics of B757-200 and B767-200 aircraft using the tower flyby technique Volume 2. Appendices. NOAA TM ERL ARL-199, 242 pp. (1993).
- GILLETTE, D.A., E.M. Patterson, Jr., J.M. Prospero, and M.L. Jackson. Soil aerosols. In: *Aerosol Effects on Climate*, S. Gerard Jennings, (ed.). The University of Arizona Press, Tucson & London, 73-104 (1992).
- GILLETTE, D.A., G.J. Stensland, A.L. Williams, W. Barnard, D. Gatz, P.C. Sinclair, and T.C. Johnson. Emissions of alkaline elements calcium, magnesium, potassium, and sodium from open sources in the contiguous United States. *Global Biogeochemical Cycles* 6(4):437-457 (1992).
- GODOWITCH, J.M., R.T. Tang, and J.S. Newsom. Development of an improved urban airshed modeling system. Proceedings, of the 85th Annual Meeting of the Air & Waste Management Association, Kansas City, Missouri, June 21-26, 1992. Air & Waste Management Association, Pittsburgh, 92-86.02 (1993).
- Gorzelska, K., J.N. GALLOWAY, K. Watterson, and W.C. KEENE. Water-soluble primary amine compounds in rural continental precipitation. *Atmospheric Environment* 26(6):1005-1018 (1992).
- GUNTER, R.L., A.D.A. Hansen, J.F. BOATMAN, B.A. BODHAINE, R.C. Schnell, and D.M. Garvey. Airborne measurements of aerosol optical properties over South Central New Mexico. *Atmospheric Environment* 27A(8):1363-1368 (1993).
- HICKS, B.B. Book Review: Measurement of Temperature and Humidity, World Meteorological Organization Technical Note Number 194 (WMO No. 759, 1992, ISBN 92-63-10759-9). *Boundary-Layer Meteorology* 64:421-422 (1993).
- HICKS, B.B. Report of the Second WMO Meeting of Experts to Assess the Response to and Atmospheric Effects of the Kuwait Oil Fires. WMO/GAW Report No. 81, WMO/TD-No. 512, 38 pp. + appendix (1992).
- HICKS, B.B., R.T. MCMILLEN, R.S. Turner, G.R. Holdren, Jr., and T.C. Strickland. A national critical loads framework for atmospheric deposition effects assessment: III Deposition characterization. *Environmental Management* 17(3):343-353 (1993).
- HOSKER, R.P., Jr. NOAA air-surface exchange studies supporting U.S. global climate change research. International Conference on Sustainable Development Strategies and Global/Regional/Local Impacts on Atmospheric Composition and Climate, Center for Atmospheric Sciences, Indian Institute of Technology, Delhi, India, pp. 31-34 (1993).

- HOSKER, R.P., Jr., E.A. Smith, J.R. WHITE, and E.A. Heathcote. Dry deposition to structures: Configuration considerations. *Journal of Preservation Technology* 23(4):26-32 (1991).
- IRWIN, J.S. Boundary layer parameterization and long-range transport. Proceedings, of the objectives for next generation of practical short-range Atmospheric Dispersion Models Workshop, Riso, Denmark, May 6-8, 1992. DCAR, Riso, 99-107 (1992).
- IRWIN, J.S. Summary of the 19th NATO/CCMS International Technical Meeting (ITM) round table discussion on the harmonization of atmospheric dispersion models. Proceedings, of the objectives for next generation of practical short-range Atmospheric Dispersion Models Workshop, Riso, Denmark, May 6-8, 1992. DCAR, Riso, 49-61 (1992).
- IRWIN, J.S., and J.G. Kretzchmar. Summary of the 19th NATO/CCMS International Technical Meeting (ITM) round table discussion on the harmonization of atmospheric dispersion models. Air Pollution Modeling and its Application IX, volume 17, Plenum Press, New York, NY, 769-779 (1992).
- Kaiser, G.D., J.S. TOUMA, and D. Christensen. Contingency modeling analysis for superfund sites and other industrial sources. Abstracts Book, Air & Waste Management Association 86th Annual Meeting, Denver, Colorado, June 13-18, 1993. Air & Waste Management Association, Pittsburgh, 93-MP-22.05 pp. 22 (1993).
- KIM, Y.J., J.F. BOATMAN, R.L. GUNTER, D.L. WELLMAN, and S.W. WILKISON. Vertical distribution of atmospheric aerosol size distribution over south-central New Mexico. *Atmospheric Environment* 27A(8):1351-1362 (1993).
- Lamb, R., D. Gay, H. Westberg, and T.E. PIERCE. A biogenic hydrocarbon emission inventory for the U.S.A. using a simple forest canopy model. *Atmospheric Environment* 27A:1673-1690 (1993).
- Lansari, A., J. Duncan, J. STREICHER, A. HUBER, J. CRESCENTI, R. ZWEIDINGER, and C. Wiesel. Dispersion of uncombusted auto fuel vapor within a residential garage microenvironment. Abstracts Book, Measurement of Toxic and Related Air Pollutants, Durham, NC, May 4-7, 1993. U.S. Environmental Protection Agency, Research Triangle Park, NC, and Air & Waste Management Association, Pittsburgh, 6 pp. (1993).
- Lee, G., L. Zhuang, B.J. Huebert, and T.P. MEYERS. Concentration gradients and dry deposition of nitric acid vapor at the Mauna Loa Observatory, Hawaii. *Journal of Geophysical Research* 98(D7):12,661-12,671 (1993).

- Lu, J., S.P.S. Arya, W.H. SNYDER, and R.E. LAWSON, Jr. A laboratory simulation of turbulent convection over an urban heat island. Preprints, Tenth Symposium on Turbulence and Diffusion, Portland, Oregon September 29 - October 2, 1992. American Meteorological Society, Boston, 172-175 (1992).
- LUHAR, A.K., and K.S. RAO. Lagrangian particle model simulations of atmospheric dispersion in nocturnal drainage flows. Preprints, Tenth Symposium on Turbulence and Diffusion, Portland, Oregon September 29 - October 2, 1992. American Meteorological Society, Boston, (J7)192 - (J7)197 (1992.)
- LUHAR, A.K., and K.S. RAO. Random-walk model studies of turbulent dispersion in katabatic flows. Preprints, Tenth Symposium on Turbulence and Diffusion, Portland, Oregon September 29 - October 2, 1992. American Meteorological Society, Boston, 322-325 (1992).
- LUKE, W.T., R.S. ARTZ, R.R. DRAXLER, S.R. PIOTROWICZ, A.P. PSZENNY, R. WANNINKHOF. Transport of trace species to the South Atlantic Troposphere during the 1991 RITS/CO₂ Cruise. American Geophysical Union Fall Meeting, San Francisco, CA December 7-11, 1992.
- LURIA, M., J.F. BOATMAN, D.L. WELLMAN, R.L. GUNTER, B.A. WATKINS, S.W. WILKISON, and C.C. VAN VALIN. Lake Michigan Ozone Study (LMOS): Measurements from an instrumented aircraft. *Atmospheric Environment* 26A(18):3265-3277 (1992).
- Lusis, M.A., P.K. Misra, N.W. Reid, J.K.S. CHING, D.A. Hansen, J.J. Jansen, and K.J. Puckett. The Eulerian model evaluation and field study. Abstracts Book, 86th Annual Meeting of the Air & Waste Management Association, June 13-18, 1993, Denver, Colorado. Air & Waste Management Association, 93-WP-92A.04 (1993).
- MACHTA, L. Finding the site of the first Soviet nuclear test in 1949. *Bulletin of the American Meteorological Society* 73(11):1797-1806 (1992).
- Mathur, R., and K.L. SCHERE. A regional modeling analysis of the dependencies of atmospheric oxidants to perturbations in NO_x and hydrocarbon emissions. Preprints, Conference on Atmospheric Chemistry, Anaheim, CA January 17-22, 1993. American Meteorological Society, Boston, 31-38 (1993).
- MATT, D.R., and T.P. MEYERS. On the use of the inferential technique to estimate dry deposition of SO₂. *Atmospheric Environment* 27A(4):493-501 (1993).
- McElroy, J.L., H. Moosmüller, R.M. Jorgenson, C.M. Edmonds, R.J. ALVAREZ II, and D.H. Bundy. Airborne UV-DIAL measurements of ozone distributions in southeastern Michigan. Abstracts

- Book, Air & Waste Management Association, 86th Annual Meeting Denver, Colorado June 13–18, 1993. Air & Waste Management Association, Pittsburgh, 93-RA-121.03 (1993).
- McHenry, J.N., F.S. BINKOWSKI, R.L. DENNIS, J.S. Chang, and D. Hopkins. The Tagged Species Engineering Model (TSEM). *Atmospheric Environment* 26A(8):1427-1443 (1992).
- McHenry, J.N., and R.L. DENNIS. The relative importance to sulfate production of oxidation pathways and clouds as predicted by the Regional Acid Deposition Model. Preprints, Conference on Atmospheric Chemistry, January 17-22, 1993, Anaheim, California. American Meteorological Society, Boston, 23-30 (1993).
- MEYERS, T.P. Dry deposition measurements at Huntington Forest. Final Report prepared for the U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC under Interagency Agreement No. DW13933238-01-0 (1993).
- MEYERS, T.P., and D.D. BALDOCCHI. Trace gas exchange above the floor of a deciduous forest 2. SO₂ and O₃ deposition. *Journal of Geophysical Research* 98(D7):12,631-12,638 (1993).
- Middleton, P., J.S. Chang, M. Beauharnois, L. Hash, and F.S. BINKOWSKI. The role of nitrogen oxides in oxidant production as predicted by the Regional Acid Deposition Model (RADM). *Water, Air, and Soil Pollution* 67:133-159 (1993).
- Moosmüller, H., R.J. ALVAREZ II, R.M. Jorgensen, C.M. Edmonds, D.H. Bundy, D. Diebel, M.P. Bristow, and J.L. McElroy. An airborne lidar system for tropospheric ozone measurement. Abstracts Book, Air & Waste Management Association, 86th Annual Meeting, Denver, Colorado June 13–18, 1993. Air & Waste Management Association, Pittsburgh, 93-RA-121.04 (1993).
- Moosmüller, H., R.J. ALVAREZ II, C.M. Edmonds, R.M. Turner, D.H. Bundy, and J.L. McElroy. Airborne ozone measurements with the USEPA UV-DIAL. Optical Remote Sensing of the Atmospheric Technical Digest 5:176-179 (1993).
- NAPPO, C.J. Gravity-wave-generated turbulence in the stable boundary layer over complex terrain. Preprints, Tenth Symposium on Turbulence and Diffusion, September 29 - October 2, 1992, Portland, Oregon. American Meteorological Society, Boston, (J4)64-(J4)67 (1992).
- NAPPO, C.J. Gravity-wave-generated turbulence and diffusion in the stable planetary boundary layer. In: Air Pollution Modeling and its Application IX, H. van Dop and G. Kallos, (eds.). Plenum Press, New York, 613-621 (1992).

- NAPPO, C.J., R.M. ECKMAN, and R.L. Coulter. An episode of wave-generated turbulence in the stable planetary boundary layer. Preprint, Tenth Symposium on Turbulence and Diffusion, September 29 - October 2, 1992, Portland, Oregon. American Meteorological Society, Boston, 118-122 (1992).
- Nguyen, B.C., N. Mihalopoulos, J.P. Putaud, A. Gaudry, L. Gallet, W.C. KEENE, and J.N. GALLOWAY. Covariations in oceanic dimethyl sulfide, its oxidation products and rain acidity at Amsterdam Island in the Southern Indian Ocean. *Journal of Atmospheric Chemistry* 15:39-53 (1992).
- NOVAK, J.H., and T.E. PIERCE. Natural emissions of oxidant precursors. *Water, Air, and Soil Pollution* 67:57-77 (1993).
- Owens, N.J.P., J.N. GALLOWAY, and R.A. Duce. Episodic atmospheric nitrogen deposition to oligotrophic oceans. *Nature* 357:397-399 (1992).
- PARUNGO, F., and B.B. HICKS. Sulfate aerosol distributions and cloud variations during El Nino anomalies. *Journal of Geophysical Research* 98(D2):2667-2675 (1993).
- PARUNGO, F., B. KOPCEWICZ, C. NAGAMOTO, R. Schnell, P. Sheridan, C. Zhu, and J. Harris. Aerosol particles in the Kuwait Oil Fire Plumes: Their morphology, size distribution, chemical composition, transport, and potential effect on climate. *Journal of Geophysical Research* 97(D14):15,867-15,882 (1992).
- PARUNGO, F., C. NAGAMOTO, B. KOPCEWICZ, X. Li, D. Yang, X. Yu, and J. Harris. Investigation of atmospheric aerosols and gases at an East China station. NOAA TM ERL ARL-201, 37 pp. (1993).
- PIERCE, T.E., and J.H. NOVAK. Estimating natural emissions for EPA's Regional Oxidant Model. Proceedings, of an AWMA International Specialty Conference on Emission Inventory Issues in the 1990's VIP-22, Durham, NC September 1991. Air & Waste Management Association, Pittsburgh, 768-778 (1991).
- PIERCE, T.E., and A.R. VAN METER. Volatile organic compound and nitric oxide emissions from corn in the midwestern United States. Proceedings, of an AWMA International Specialty Conference on Emission Inventory Issues in the 1990's VIP-27, Durham, NC, October 1992. Air & Waste Management Association, Pittsburgh, 437-446 (1992).
- PITCHFORD, M., and B. Johnson. Empirical model of vehicle emissions. *Environmental Science and Technology* 27:741-748 (1993).

- PLEIM, J.E., and J.S. Chang. A non-local closure model for vertical mixing in the convective boundary layer. *Atmospheric Environment* 26A:965-981 (1992).
- PLEIM, J.E., and J.K.S. CHING. Interpretive analysis of observed and modeled mesoscale ozone photochemistry in areas with numerous point sources. *Atmospheric Environment* 27A:999-1018 (1993).
- PLEIM, J.E., and A. Xiu. Development and testing of a land-surface and PBL model with explicit soil moisture parameterization. Preprints, Conference on Hydroclimatology, Anaheim, CA, January 17-22 1993. American Meteorological Society, Boston, 45-51 (1993).
- POOLE-KOBER, E.M., and H.J. VIEBROCK. Fiscal year 1992 summary report of NOAA Atmospheric Sciences Modeling Division support to the U.S. Environmental Protection Agency. NOAA TM ERL-ARL-203, 85 pp. (1993).
- RAO, K.S., and A.K. LUHAR. Footprint analysis for scalar flux measurements in the internal boundary layer. Extended Abstracts, International Conference on Sustainable Development Strategies and Global/Regional/Local Impacts on Atmospheric Composition and Climate, Center for Atmospheric Sciences, Indian Institute of Technology, Delhi, India, 119-122, (1993).
- Raupach, M.R., D.A. GILLETTE, and J.F. Leys. The effects of roughness elements on wind erosion threshold. *Journal of Geophysical Research* 98(D2):3023-3029 (1993).
- Roberts, P.J.W., and W.H. SNYDER. Hydraulic model study for Boston outfall. I: Riser configuration. *Journal of Hydraulic Engineering* 119:970-987 (1993).
- Roberts, P.J.W., and W.H. SNYDER. Hydraulic model study for Boston outfall. II: Environment at performance. *Journal of Hydraulic Engineering* 119:988-1002 (1993).
- Rodhe, H., J. GALLOWAY, and Z. Dianwu. Acidification in Southeast Asia - Prospects for the coming decades. *AMBIOA Journal of the Human Environment*, Published by The Royal Swedish Academy of Sciences, 148-150 (1992).
- ROLPH, G.D., R.R. DRAXLER, and R.G. DEPENA. The use of model-derived and observed precipitation in long-term sulfur concentration and deposition modeling. *Atmospheric Environment* 27A(13):2017-2037 (1993).
- Schatzmann, M., W.H. SNYDER, and R.E. LAWSON, JR. Experiments with heavy gas jets in laminar and turbulent cross-flows. *Atmospheric Environment* 27A:1105-1116 (1993).

- Schatzmann, M., W.H. SNYDER, and R.E. LAWSON, JR. Spreading of heavy gas jets. Proceedings, 4th Symposium on heavy gases, Bonn, Germany (in German) September 26-27, 1991.
- SCHERE, K.L., and C.J. Coats. A stochastic methodology for regional wind field modeling. *Journal of Applied Meteorology* 13(12):1407-1425 (1993).
- Schimel, J.P., G.P. Robertson, D.D. BALDOCCHI, J.E. Bogner, E.A. Davidson, J.M. Duyzer, D.H. Ehhalt, D. Fowler, P. Groffman, K. Haider, V.A. Isadorov, L. Klemedtsson, J.M. Melillo, K.A. Smith, W.H. Su, and W. Wieprecht. Impacts of trace gas fluxes in mid-latitude ecosystems. *Ecological Bulletins* 42:124-132 (1992).
- SIEVERING, H., J. BOATMAN, E. Gorman, Y. KIM, L. Anderson, G. Ennis, M. LURIA, and S. Pandis. Removal of sulphur from the marine boundary layer by ozone oxidation in sea-salt aerosols. *Nature* 360:571-573 (1992).
- Spiker, E.C., R.P. HOSKER, V.J. Comer, J.R. WHITE, R.W. Werre, Jr., F.L. Harmon, G.D. Gandy, and S.I. Sherwood. Environmental chambers for study of the deposition flux of gaseous pollutants to material surfaces. *Atmospheric Environment* 26A(16):2885-2892 (1992).
- START, G.E., R.G. CARTER, D.J. HOOVER, J.F. SAGENDORF, C.R. DICKSON, R.C. Johnson, D.H. GEORGE, K.L. CLAWSON, J.L. BRUUN, and N.F. Hakari. Utah Valley 1991-1992 wintertime pollution study. Presentation at the AWMA/AMS International Specialty Conference, Scottsdale, Arizona, January 26-28, 1993. The Role of Meteorology in Managing the Environment in the 90's.
- Stith, J.L., A.J. Alkezweeny, J.E. PLEIM, and J.K.S. CHING. Redistribution of trace chemical species by a small convective cloud. Preprints, Conference on Atmospheric Chemistry, Anaheim, CA, January 17-22, 1993. American Meteorological Society, Boston, 67-73 (1993).
- TOUMA, J.S., W.M. Cox, and H. Thistle. Statistical analysis of the performance of dense gas dispersion models. In: The Role of Meteorology in Managing the Environment in the 90's. VIP-29. Proceedings, of an International Specialty Conference, Scottsdale, Arizona, January 1993. Air & Waste Management Association, Pittsburgh, 139-150 (1993).
- TOUMA, J.S., and D.C. DiCristofaro. Description and sensitivity analysis of the shoreline dispersion model (SDM). In: Air Pollution Modeling and Its Application IX, Volume 17, Han van Dop and George Kallos (eds.), Plenum Press, New York, NY, 153-161 (1992).
- TOUMA, J.S., D.C. DiCristofaro, and G.E. Moore. A tiered approach for modeling plume visibility. In: The Role of Meteorology in Managing the Environment in the 90's. VIP-29. Proceedings,

- of an International Specialty Conference, Scottsdale, Arizona, January 1993. Air & Waste Management Association, Pittsburgh, 37-48 (1993).
- TOUMA, J.S., J.S. IRWIN, and J.A. Tikvart. An update on new air quality modeling techniques for regulatory programs. In: The Role of Meteorology in Managing the Environment in the 90's. VIP-29. Proceedings, of an International Specialty Conference, Scottsdale, Arizona, January 1993. Air & Waste Management Association, Pittsburgh, 87-98 (1993).
- TOUMA, J.S., and K.T. Stroupe. Further development of an interactive air transport model for superfund site applications. Preprints, International Symposium, Measurement of Toxic and Related Air Pollutants, Durham, NC, May 1992. Co-Sponsored by the Atmospheric Research & Exposure Assessment Lab and the AWMA, (1992).
- WATKINS, B.A., J.F. BOATMAN, D.L. WELLMAN, and S.W. WILKISON. Ace 1992 summary data report: Aircraft measurements of meteorological parameters and SF₆. NOAA TM ERL ARL-200, 104 pp. (1993).
- WATSON, T.B., R.G. CARTER, C.R. DICKSON, D.J. HOOVER, G.E. START, and R.C. JOHNSON. Wasatch Front Carbon Monoxide Intensive Study. Volume 1. Final Report. State of Utah Department of Environmental Quality, Salt Lake City, UT, 34 pp. (1993).
- Watson, J.G., M. Green, T.E. Hoffer, D.R. Lawson, M. PITCHFORD, D.J. Eatough, R.J. Farber, W.C. Malm, and C.E. McDade. Project MOHAVE data analysis plan. Abstracts Book, Air & Waste Management Association 86th Annual Meeting, Denver, CO, June 13-18, 1993. Air & Waste Management Association, Pittsburgh, 93-MP-4.10 (1993).
- Xingsheng, L., F. PARUNGO, C. NAGAMOTO, and S. Hoyt. Dimethyl sulfide in the atmospheric surface layer of the Equatorial Pacific Ocean. *Acta Oceanologica Sinica* 1:79-91 (1993).
- ZELENKA, M.P., W.E. Wilson, and P.J. Liroy. Source apportionment of air pollution in China: Extending the usefulness of receptor modeling by combining multivariate and chemical mass balance models. Abstracts Book, Air & Waste Management Association 86th Annual Meeting, Denver, CO, June 13-18, 1993. Air & Waste Management Association, Pittsburgh, 93-TP-58-02 (1993).
- ZELENKA, M.P., H.H. Suh, P. Koutrakis, and J. Waldman. Indoor exposure modeling of acid aerosols. 1993 Abstracts Book, Measurement Toxic and Related Air Pollutants, Durham, NC, May 4-7, 1993. U.S. Environmental Protection Agency, Research Triangle Park, NC, and Air & Waste Management Association, Pittsburgh, 9 pp. (1993).

ZELENKA, M.P., J. Waldman, H. Suh, and P. Koutrakis. Indoor concentration modeling of aerosol, strong acidity. In: Indoor Air '93. Vol. 3. Combustion Products, Risk Assessment, Policies. Proceedings, of the 6th International Conference on Indoor Quality and Climate, Helsinki, Finland, July 4-8, 1993. Indoor Air '93, Helsinki, Finland, 451-456 (1993).

Zhang, Y.Q., A.H. HUBER, S.P.S. Arya, and W.H. SNYDER. Numerical simulation to determine the effects of incident wind shear and turbulence level on the flow around a building. *Journal of Wind Engineering and Industrial Aerodynamic* 46 & 47:129-134 (1993).