GEORGE DAVID EMMITT

Simpson Weather Associates, Inc.
809 E. Jefferson Street
Charlottesville, VA 22902
Telephone: (434)979-3571; Fax: (434)979-5599
gde@swa.com; gde8a@virginia.edu; http://www.swa.com

EDUCATION:

Ph.D., 1975, University of Virginia, Charlottesville, VA, Major: Meteorology "Momentum redistribution by enhanced mixing over a heated island"

M.S., 1972, University of Virginia, Charlottesville, VA, Major: Environmental Sciences, "Wind wave prediction on impounded water bodies: a case study, Smith Mountain Lake"

B.S., 1969, Eastern Nazarene College, Wollaston, Massachusetts, Major: Physics

PRESENT EMPLOYMENT:

April 1998-present	President and Senior Scientist, Simpson Weather Associates, Inc.
July 1992-present	Research Associate Professor, University of Virginia, Department of Environmental Sciences

PREVIOUS EMPLOYMENT:

August 1986-April 1998	Executive Vice President & Senior Scientist, Simpson Weather Associates, Inc.
August 1983-August 1986	Vice President, Simpson Weather Associates, Inc.
July 1981 - August 1983	Visiting Space Scientist, Universities Space Research Association, NASA/MSFC, Huntsville, AL
January 1978 - December 1980	Research Assistant Professor, University of Virginia, Department of Environmental Sciences, Charlottesville, VA
August 1978 - July 1981	Cloud Physics Consultant, Butler National Corporation Lenexa, KS
August 1976 - January 1978	Visiting Scientist, Max-Planck Institut fur Meteorologie Hamburg, West Germany
August 1975 - August 1976	Research Associate/Assistant Professor, University of

PROFESSIONAL ACHIEVEMENTS:

2002: Elected Fellow, American Meterological Society
2001: Selected member of NASA's Global Tropospheric Wind Sounder Science Team
2000: Selected member of NASA's Code Y Information Technology Subcommittee of Earth Science Advisory Committee
2000: Elected Chair of NASA's Working Group on Space-based Hydrology Mission
1999: Elected Chair of NASA's Consolidated Space Operations Contract (CSOC) Science Working Group
1999: Selected member of NASA's New Data Information System Study team
1998: Elected Chairman, NASA's EOSDIS Science Panel
1997: Mission Scientist on NASA's Space Readiness of Coherent Lidar Experiment
1996: Chairman, NASA/GSFC's DAAC User Working Group
1994: Received "Heros of Reinvention" Award from Vice President Gore in recognition of work done on NASA's Earth Observing System Data Information System
1993: Appointed to NASA's Focus Team on Science and Data Organization/Access
1992: Selected to serve on NASA/CNES (USA/French) Joint Science Team for a space-based Doppler lidar.
1991: Selected to serve on NASA's EOSDIS Version 0 Science Advisory Panel.
1991: Elected to serve as Chairman of NASA's Hydrologic Cycle Data Access and Archive Working Group.
1990: Selected as member of NASA's Earth Observing System Data Information System Science Advisory Panel.
1989: Selected to serve on NASA's Lidar Atmospheric Wind Sounder Science Team to guide the development, deployment and use of a space-based lidar for global wind measurement.
1988: Served on NASA's GLOBE science committee for research on the global distribution of aerosol backscatter.
1987: Served on EPA's Meteorology Division In-House Peer Review Panel.
1987: Served on the 5-man Cloud/Chemistry Cloud Physics Organization's Experiment Design Committee (DOE/NSF).
1986: Selected to serve on NASA panel for a Lidar Atmospheric Wind Sounder (LAWS) as an EOS facility.
1985: Served as member of the NASA organizing committee for Symposiums and Workshops on Global Wind Measurements.
1985: Served on advisory panel for the SPACE/MIST storm research field experiment (1986).
1984-87: Member of American Meteorological Society's Cloud Physics Committee.
1982: Received NASA Award for work on the design, execution and analysis of a flight program to sample the exhaust cloud associated with the launch of the NASA Shuttle.
1981: Received NASA Group Award for research done with the NASA airborne Doppler lidar wind measurement experiments conducted during the CCOPE in Montana.

PUBLICATIONS: Reviewed

Addis, R. P., M. Garstang and **G. D. Emmitt**, 1984: Downdrafts from tropical oceanic cumulus. Bound.- Layer Meteor., 28, 23-49.

Augstein, E., M. Garstang and **G. D. Emmitt**, 1980: Vertical mass and energy transports by cumulus clouds in the tropics. Deep Sea Research, Supplement I to Vol. 26, 9022.

Baker, W.,E., **G.D. Emmitt**, P. Robertson, R.M. Atlas, J.E. Molinari, D.A. Bowdle, J. Paegle, R.M. Hardesty, R.T. Menzies, T.N. Krishnamurti, R.A. Brown, M.J. Post, J.R. Anderson, A.C. Lorenc, T.L. Miller and J. McElroy, 1994: Lidar measured winds from space: An essential component for weather and climate prediction. Bull. Amer. Meteor. Soc., 76, 869-888.

Barnes, G., **G. D. Emmitt**, B. Brummer, M. A. LeMone and S. Nicholls, 1980: The structure of a fair weather boundary layer based on the results of several measurement strategies. Mon. Wea. Rev., 108, 349-364.

Emmitt, G.D., 1999: Fugitive coal dust: An old problem demanding new solutions. Port Tech. Internat., No. 9, 125-128.

Emmitt, G. D. and B. Brummer, 1979: Wind measurements with a ship based theodolite. Meteor Forschungergebnisse, 23, 53-62.

Emmitt, G. D., 1978: Tropical cumulus interaction with and modification of the subcloud layer. J. Atmos. Sci., 35, 1485-1502.

Emmitt, G.D., 2002: Satellite measurement of hurricane upper level winds using Doppler lidar. Chap. 13b in Hurricanes: Coping with Disaster, R.H. Simpson, R. Anthes and M. Garstang (eds.), American Geophysical Union, in press.

Frank, W., and **G. D. Emmitt**, 1981: Computation of vertical energy fluxes in moist atmosphere. Bound.-Layer Meteor, 21, 223-230.

Frank, W., **G. D. Emmitt** and C. Warner, 1981: Multiscale analyses of low level vertical fluxes on day 261 of GATE. J. Atmos. Sci., 38, 1964-1976.

Garstang, M., B. E. Kelbe, **G. D. Emmitt** and W. London, 1987: Generation of convective storms over the escarpment of northeastern South Africa. Mon. Wea. Rev., 115, 429-443.

Garstang, M., P. D. Tyson and **G. D. Emmitt**, 1975: The structure of heat islands. Rev. Geophys. Space Sci., 13, 139-165.

PUBLICATIONS: Conference Proceedings/Presentations

2002: Airborne Doppler lidar surface returns: Data products other than tropospheric winds (G.D. Emmitt and C. O'Handley), SPIE Remote Sensing of the Atmosphere, Ocean, Environment and Space, Hangzhou, China, October.

2002: Water surface returns as a function of incidence angle at 2 μm (G.D. Emmitt and C. O'Handley), ILRC meeting, Quebec, Canada, July.

2002: 2 μm Doppler lidar returns from water surfaces and the overlying aerosols (G.E. Emmitt, C. O'Handley, J. Rothermel, S. Johnson, D. Bowdle, P. Kromis, B. Bluth and H. Jonsson), SPIE meeting, Seattle, WA, July.

2002: Impact assessment of a Doppler wind lidar for NPOESS/OSSE (S.J. Lord, M. Masutani, J.C. Woollen, J.C. Derber, G.D. Emmitt, S.A. Wood, S. Greco, R. Atlas, J. Terry, and T.J. Kleespies), AMS Sixth Symp. Integrated Observing Systems, Orlando, FL, January.

2001: Adaptive target of wind observations: the climate research and weather forecasting perspective (G.D. Emmitt and Z. Toth), AMS Fifth Symp. Integrated Observing Systems, Albuquerque, NM, January.

2001: The challenges of accessing the future impact of space-based Doppler wind lidars while using today's global and regional atmospheric models (S. Wood, G.D. Emmitt, and S. Greco), AMS Fifth Symp. Integrated Observing Systems, Albuquerque, NM, January.

2001: Observing system simulation experiments for NPOESS (S.J. Lord, M. Masutani, J.C. Woollen, J.C. Derber, R. Atlas, J. Terry, G.D. Emmitt, S.A. Wood, S. Greco, T.J. Kleespies, and V. Kapoor), AMS Fifth Symp. Integrated Observing Systems, Albuquerque, NM, January.

2001: Global wind observational requirements and the hybrid observing system approach (G.D. Emmitt), AMS Fifth Symp. Integrated Observing Systems, Albuquerque, NM, January.

2001: Simulating space-based lidar performance using global and regional scale atmospheric numerical models (G.D. Emmitt and S.A. Wood), Optical Remote Sensing Topical Meeting, Coeur d' Alene, ID, February.

2001: Feasibility and science merits of a hybrid technology DWL (G.D. Emmitt), 11th Coherent Laser Radar Conf., Malvern, England, July.

2001: The impact of Doppler lidar wind observations on a single-level meteorological analysis (L.P. Riishojgaard, R. Atlas and G.D. Emmitt), SPIE Lidar Remote Sensing for Industry and Environmental Monitoring, II, San Diego, CA, July 29-August 3.

PUBLICATIONS: Conference Proceedings/Presentations (cont.)

2001: Calibration and initial results from the OSSEs for NPOESS (M. Masutani, J.S. Woollen, J. Terry, S.J. Lord, T.J. Kleespies, G.D. Emmitt, S.A. Wood, S. Greco, J.C. Derber, R. Atlas and M. Goldberg), AMS 11th Conf. Satellite Meteor. and Oceanogr., Madison, WI, October.

2000: DLSM: A coherent and direct detection lidar simulation model for simulating space-based and aircraft-based lidar winds (S.A. Wood, G.D. Emmitt and S. Greco), AeroSense 2000, Orlando, FL, April.

2000: Lidar simulations over hurricane Bonnie using CAMEX-3 data, a lidar simulation model and numerical model analyses (S. Greco, S.A. Wood, G.D. Emmitt, M. Nicholls and R. Pielke, Sr.), AMS 24th Conf. Hurr. And Trop. Meteor., Ft. Lauderdale, FL, May.

2000: Hybrid technology Doppler wind lidar: assessment of simulated data products for a space-based system concept (G.D. Emmitt), SPIE Lidar Remote Sensing for Industry and Environment Monitoring, Sendai, Japan, October.

2000: Using coherent Doppler lidar to estimate river discharge (G.D. Emmitt, C. O'Handley, and G.D. Spiers), SPIE Lidar Remote Sensing for Industry and Environment Monitoring, Sendai, Japan, October.

1999: Implementing a Doppler wind lidar on NPOESS using adaptive targeting strategies (G.D. Emmitt, Z. Toth and R. Atlas). AMS Third Symposium on Integrated Observing Systems, Dallas, TX, January 10-15.

1999: SPARCLE: Mission overview and status (G.D. Emmitt, M. Kavaya and T. Miller). 10th Biennial Coherent Laser Radar Technology and Applications Conf., Mt. Hood, OR, June 28-July 2.

1999: Pointing knowledge for SPARCLE and space-based Doppler wind lidars in general (G.D. Emmitt, T. Miller and G. Spiers). 10th Biennial Coherent Laser Radar Technology and Applications Conf., Mt. Hood, OR, June 28-July 2.

1999: Capitalizing on the SPARCLE investment (G.D. Emmitt and T. Miller). 10th Biennial Coherent Laser Radar Technology and Applications Conf., Mt. Hood, OR, June 28-July 2.

1998: The Space Readiness Coherent Lidar Experiment (SPARCLE) Space Shuttle Mission (M.J. Kavaya and G.D. Emmitt. Proc. SPIE Conf. on Laser Radar Technology and Applications III, Orlando, FL, April.

1998: SPARCLE: A first step towards space-based global tropospheric wind observations (G.D. Emmitt). IGARSS '98 Managing Natural Resources Conf., Seattle, WA, July 6-10.

1998: SPARCLE: An approved shuttle mission to demonstrate tropospheric wind sensing using a coherent 2-micron Doppler lidar (G.D. Emmitt). SPIE Annual Meeting, San Diego,

PUBLICATIONS: Conference Proceedings/Presentations (cont.)

CA, July 19-24.

1998: SPARCLE: A space-based mission to demonstrate global monitoring of tropospheric winds with a Doppler lidar (G.D. Emmitt). SPIE Optical Remote Sensing for Industry and Environmental Monitoring, Beijing, China, September 15-17.

1998: SPARCLE: Validation of observing system simulations (SPAce Readiness Coherent Lidar Experiment) (G.D. Emmitt and T. Miller). SPIE International Symposium on Remote Sensing, Barcelona, Spain, September 21-24.

1997: An HDF tutorial for the scientific investigator and small data providers (S. Greco, L. Wood and G.D. Emmitt). Proc. AMS 13th Internat. Conf. on IIPS for Meteorology, Oceanography and Hydrology, Long Beach, CA, February, 402-404.

1997: Optical remote sensors as components of an airborne hurricane observing system (S.A. Wood, G.D. Emmitt and S. Greco). Proc. AMS First Symp. Integrated Observing Systems, Long Beach, CA, February 39-44.

1997: Relevance of cloud statistics derived from LITE data to future Doppler wind lidars (D.M. Winker and G.D. Emmitt). Paper presented at the 9th Conf. on Coherent Laser Radar, Linköping, Sweden, June.

1997: Status of space-based DWL activities in the United States (G.D. Emmitt and W. Baker). Paper presented at the 9th Conf. on Coherent Laser Radar, Linköping, Sweden, June.

1996: Procontrol: Automated fugitive dust control system (G.D. Emmitt, L.S. Wood, E.M. Calvin, and S. Greco), Proc. Seventh Annual Environment Virginia ’96 Symp., 36-43, Lexington, VA, April.

1996: Minimizing groundwater consumption for required fugitive dust control programs (G.D. Emmitt), Proc. Seventh Annual Environment Virginia ’96 Symp., 244-251, Lexington, VA, April.

1995: Simulation studies of the impact of space-based wind profiles on global climate studies (R. Atlas and G.D. Emmitt) . Proc. AMS Sixth Symp. on Global Change Studies, Dallas, TX, January.

1995: Ground-based Doppler lidar signal processing in the vicinity of strong backscatter and/or wind inhomogeneities using a progressive context method (G.D. Emmitt, S.A. Wood and D.L. Bai) Paper presented at the Optical Society of America's CLEO '95 Meeting, Baltimore, MD, May.

1995: Coherent vs incoherent space-based Doppler lidar sampling patterns: Accuracy and representativeness (G.D. Emmitt). Paper presented at the Coherent Laser Radar Topical Page 7
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PUBLICATIONS: Conference Proceedings/Presentations (cont.)

Meeting, Keystone, CO, July 23-27.

1995: A coherent lidar simulation model for simulating space-based and aircraft-based lidar winds (S.A. Wood, G.D. Emmitt, D. Bai, L.S. Wood, S. Greco) . Paper presented at the Opt. Soc. of America's Coherent Laser Radar Topical Meeting, Keystone, CO, July 23-27.

1995: Simulating clouds within a space-based Doppler lidar wind sounder simulation model (G.D. Emmitt and S.A. Wood) Paper presented at the CIDOS-95 Conf., Hanscom AFB, MA, October 24-26.

1994: Query scenarios for interdisciplinary scientists interfacing with EOSDIS, Version 0, Series II(S.A. Wood, G.D. Emmitt, K. McDonald). Paper presented at AMS Tenth Internat. Conf. on Interac. Info. and Process. Systems (IIPS) for Meteor., Oceanogr. and Hydrol., Nashville, TN, January 23-28.

1994: Beta testing of EOSDIS Version 0 using query scenarios from interdisciplinary scientists. Poster paper presented at the IEEE 7th Internat. Working Conf. on Scientific and Statistical Database Management, Charlottesville, VA, September 28-30, 280-282.

1994: Ocean wave motion effects on space-based airborne Doppler lidar wind sounders (G.D. Emmitt). Paper presented at the Optical Society of America's Annual Meeting, October 2-7, Dallas, TX.

1994: Resolving ageostrophic winds with a space-based Doppler lidar wind sounder (G.D. Emmitt). Paper presented at the Fifth Symp. on Global Change Studies, Nashville, TN.

1994: A portable scanning lidar for real-time detection of fugitive dust emissions from multisource facilities (G.D. Emmitt). Paper presented at the Eighth Joint Conf. on Appl. Air Poll. Meteor. with A&WMA.

1993: A Continuous Emission Monitoring and Modeling CEM/M) system for fugitive particulate emissions from coal handling complexes (G.D. Emmitt, C. DiMarzio and R. Doll). Paper presented at the 96th National Western Mining Conference and Exhibition, March, Denver, CO.

1993: Simulation of space-based Doppler lidar wind measurements using ground-based single shot observations (G.D. Emmitt, J. Dieudonné, S.A. Wood and L. Wood). Paper presented at the Optical Remote Sensing of the Atmosphere Sixth Topical Meeting, March, Salt Lake City, UT.

1993: Integration of LOWTRAN into global circulation models for observing system simulation experiments (S.A. Wood and G.D. Emmitt). Paper to be presented at the Conference on Atmospheric Transaction Models, June, Boston, MA.

PUBLICATIONS: Conference Proceedings/Presentations (cont.)

1993: Using ground-based coherent Doppler lidars to evaluate algorithms for shot management and signal processing of proposed space-based wind sounders (G.D. Emmitt). Paper presented at the Coherent Laser Radar: Applications and Technology Topical Meeting, July, Paris, France.

1993: System simulation studies in support of a technology and product demonstration mission for a space-based coherent Doppler lidar wind sounder **(**G.D. Emmitt). Paper presented at the Coherent Laser Radar: Applications and Technology Topical Meeting, July, Paris, France.

1991: Simulated wind measurements with a low power/high PRF space-based Doppler lidar (G.D. Emmitt and S.A.Wood). Optical Remote Sensing of the Atmosphere, Fifth Topical Meeting, Williamsburg, VA, November 18-21.

1991: Global three-dimensional distribution of LAWS observations based upon aerosols, water vapor and clouds (S.A. Wood, G.D. Emmitt and L.S. Wood). Optical Remote Sensing of the Atmosphere, Fifth Topical Meeting, Williamsburg, VA, November 18-21.

1991: Query scenarios for interdisciplinary scientists interfacing with EOSDIS - A prototyping exercise (G.D. Emmitt, S.A. Wood and E. Calvin). Proc. AMS Seventh Internat. Conf. on Interactive Information & Processing Systems for Meteorology, Oceanography and Hydrology, New Orleans, LA, January 14-18, 246-248.

1991: Using a global spectral model in an observing system simulation experiment for LAWS - An EOS wind measuring system (T.N. Krishnamurti, J. Xue, G. Rohaly, D. Fitzjarrald, G.D. Emmitt, S. Houston and S.A. Wood). Proc. AMS Second Symposium on Global Change Studies, New Orleans, LA, January 14-18, 23-27.

1991: Implications of several orbit inclinations for the impact of LAWS in global climate studies (R. Atlas and G.D. Emmitt). Proc. AMS Second Symposium on Global Change Studies, New Orleans, LA, January 14-18, 28-32.

1991: Simulating thin cirrus clouds in observing system simulation experiments (OSSE) for LAWS (G.D. Emmitt and S.A. Wood). Proc. AMS Seventh Symp. on Meteorol. Observa. and Instru., Special Session on Laser Atmospheric Studies, New Orleans, LA, January 14-18, 460-462.

1991: A reference atmosphere for LAWS trade studies: An update (S.A. Wood and G.D. Emmitt). Proc. AMS Seventh Symp. on Meteor. Observa. and Instru., Special Session on Laser Atmospheric Studies, New Orleans, LA, January 14-18, J94-J97.

1991: Optimal nadir scan angle for a space-based Doppler lidar wind sounder (G.D. Emmitt). Proc. Seventh Symp. on Meteor. Observa. and Instru., Special Session on Laser Atmospheric Studies, New Orleans, LA, January 14-18, J98-J99.

PUBLICATIONS: Conference Proceedings/Presentations (cont.)

1991: An index of observation opportunities for EOS laser based instruments (G.D. Emmitt). Paper presented at the Second Symp. on Global Change Studies, New Orleans, LA, January 14-18.

1991: Clear line of sight (CLOS) statistics within cloudy regions and optimal sampling strategies for space-based lidars (G.D. Emmitt and G. Séze). Proc. AMS Seventh Symp. on Meteor. Observa. and Instru., New Orleans, LA, January 14-18, 440-442.

1989: Simulation of a space-based Doppler lidar wind sounder - sampling errors in the vicinity of wind and aerosol inhomogeneities (with S. Wood). Fifth Conference on Coherent Laser Radar, Munich, FRG, June.

1989: Simulated space-based Doppler lidar performance in regions of backscatter inhomogeneities (with S. Wood). Optical Society of America's Conference on Lasers and Electro-Optics, Anaheim, CA, January.

1988: Subvisible cirrus in space-based Doppler lidar simulations (with S. Wood). Atmospheric Transmission Conference, AFGL, Hanscom, MA, June.

1988: Ground-based simulation of a space-based Doppler lidar atmospheric wind sounder (with S. Wood). Optical Society of America's Conference on Lasers and Electro-Optics, Anaheim, CA, April.

1988: Direct measurement of boundary layer winds over the oceans using a space-based Doppler Lidar Wind Sounder. American Meteorological Society's Third Conference on Satellite Meteorology and Oceanography, Anaheim, CA, February.

1987: Assessment of error sources for one component wind measurements with a space-based Doppler lidar (with J. W. Bilbro). Optical Society of America's Fourth Conference on Coherent Laser Radar: Technology and Applications, Aspen, Colorado, July.

1987: Error analysis for total wind vector computations using one component measurements from a space-based Doppler lidar. Optical Society of America's Fourth Conference on Coherent Laser Radar: Technology and Applications, Aspen, Colorado, July 1987.

1987: Impact of a space-based Doppler lidar wind profiler on our knowledge of hurricanes and tropical meteorology (with S. H. Houston). AMS 17th Conference on Hurricanes and Tropical Meteorology, Miami, Fl, April 1987.

1987: A numerical investigation of the role of whisker production in dry ice seeding experiments (with R.D. Farley). AMS 11th Conference on Weather Modification, Edmonton, Alberta, Canada, October 1987.

1986: Assessment of measurement error due to sampling perspective in the space-based Doppler lidar wind profiler (with S. Houston). Second Conference on Satellite

PUBLICATIONS: Conference Proceedings/Presentations (cont.)

Meteorology/Remote Sensing and Applications, May 13-16, Williamsburg, VA.

1986: Constraints on resolving meso-α and meso-ß phenomena using a space-based Doppler lidar wind profiler (with S. Houston). Second Conference on Satellite Meteorology/Remote Sensing and Applications. May 13-16, 1986, Williamsburg, VA.

1986: Topographical influences on radar echo properties --implications to weather modification projects in mountainous terrain (with W. London). Tenth Conference on Weather Modification, May 27-30, Arlington, VA.

1986: Dry ice pellet whiskers--laboratory evaluation of their production and potential importance to cloud seeding. Tenth Conference on Weather Modification, May 27-30, Arlington, VA.

1985: Convergence and vorticity structures in convective storm outflows as detected by an airborne Doppler lidar velocimeter. 14th Conference on Severe Local Storms, October 29-November 1, Indianapolis, IN.

1985: Discrimination of local and synoptic scale forcing of cumulus convection along the eastern Transvaal escarpment using Meteosat imagery. Second Annual Conference of the South African Society for Atmospheric Sciences, November 11-12, Pretoria, SA.

1985: Doppler lidar sampling strategies and accuracies-regional scale. Paper presented at the Symposium and Workshop on Global Wind Measurements, July 29-August 1, Columbia, Maryland.

1984: Behavior of cylindrical dry ice pellets in the presence of supercooled water droplets--field and laboratory experiments. Paper presented at the Ninth Conference on Weather Modification, May 21-23, Park City, Utah.

1984: Airborne simulation of a satellite based Doppler lidar (J.W. Bilbro and G.D. Emmitt), Proc. of the SPIE, Vol. 493, National Symposium and Workshop on Optical Platforms, pp. 321-325.

1983: Anatomy of drought. Symposium on Atmospheric Sciences in South Africa, October 18-20, Pretoria, South Africa. (M. Garstang and G. D. Emmitt).

1983: Evolution of the Nocturnal Boundary Layer as Sensed by a Doppler Lidar Velocimeter. Paper presented at 2nd Topical Meeting on Coherent Laser Radar;

Technology and Applications, August 1-4, Aspen, Co.

1983: Ground based CO_2 Doppler lidar wind measurements of winds in the vicinity of cumulus convection. Paper presented at 9th Conference on Aerospace and Aeronautical Meteorology of the AMS, June 6-9, Omaha, NE.

PUBLICATIONS: Conference Proceedings/Presentations (cont.)

1982: Conical lidar scanning from low earth orbit--the effects of meso-α and convective scale atmospheric phenomena. Paper presented at 11th International Laser Radar Conference, July, Madison, WI.

1980: Measurements of wind shear at the Mod-1 site, Boone, North Carolina (M. Garstang, J. W. Snow and G. D. Emmitt**)**. A Collection of Technical Papers, Paper No. AIAA-80-0648-CP, pp. 200-204.

1980: Measurement of wind shear at the Mod-1 site, Boone, North Carolina. Paper presented at AIAA/SERI Wind Energy Conference, April 9-11, Boulder, CO.

1980: Mesoscale nocturnal boundary layer jets. Minisymposium on Mesoscale Phenomena and their Interactions, September, Geophysical Fluid Dynamics Laboratory, NOAA, Princeton, N.J.

1978: Determination of σ by direct and indirect cloud transport measurements. Paper presented at the GATE Symposium on Oceanography and Surface Layer Meteorology, Kiel, West Germany, May 16-20.

1976: Mass and energy transports of convective clouds, G.D. Emmitt, M. Garstang and J. Simpson. Paper presented at the 10th Tech. Conf. on Hurricanes and Tropical Meteorology, AMS, July, Charlottesville, Va.

PUBLICATIONS: Reports

1972: Remote sensing as a source of data for outdoor recreation planning (W.E. Reed, H. G. Goodell and G. D. Emmitt**)**. Final report to Department of the Interior, Bureau of Outdoor Recreation, Contract No. 1-14-07-3, 210 pp.

1974: The structure of heat islands (P.D. Tyson, M. Garstang and G. D. Emmitt, 1974:. Occasional paper #12, Department of Geography and Environmental Studies, University of the Witwatersrand, Johannesburg, South Africa, 71 pp.

1975: The first 1000 m above a GATE ship (M. Garstang, J. Simpson, G. D. Emmitt, G. Barnes, E. Tollerud). Paper presented at the 9th Tech. Conf. on Hurricanes and Tropical Meteorology, Key Biscayne, FL.

1975: Momentum redistribution by enhanced mixing (G.D. Emmitt**)**. Paper presented at the 9th Tech. Conf. on Hurricanes and Tropical Meteorology, AMS, May, Key Biscayne, FL.

1977: The U. S. GATE tethered balloon system: A discussion of the measurements (M. Garstang, G. D. Emmitt, G. Barnes, D. Fitzjarrald, E. Tollerud and J. D. Brown). Part 3 of Report #2 NSF grant #ATM74-21702 and Final Report on NOAA contract #04-6-158-44067, 89 pp.

1981: Rain Augmentation in Nelspruit (M. Garstang, G. D. Emmitt and B. Kelbe). Final Report to Water Research Commission, Pretoria, R.S.A., p. 266.

1982: MSFC Doppler lidar experiments and operations plans for 1982/83 ground based research (G.D. Emmitt**,** J. W. Bilbro, G. H. Fichtl and D. Fitzjarrald). ES-84, NASA, Marshall Space Flight Center, Huntsville, AL 35812.

1984: NASA/MSFC ground-based Doppler lidar Nocturnal Boundary Layer Experiment (NOBLEX)(G.D. Emmitt**)**. Prepared for Marshall Space Flight Center, Huntsville, AL, under Contract NAS8-34010. NASA Contractor Report 3778.

1984: Evaluation of two 1-D cloud models for the analysis of VAS Soundings (G.D. Emmitt). Prepared for Marshall Space Flight Center, Huntsville, AL, under Contract NAS8-34767. NASA Contractor Report 3771.

1985: Convective storm downdraft outflows detected by NASA/ MSFC's airborne 10.6 □m pulsed Doppler lidar system (G.D. Emmitt). Prepared for Marshall Space Flight Center, Huntsville, AL, under Contract NAS8-35597. NASA Contractor Report 3898.

1986: Simpson Weather Associates, Inc. and Kansas International Corporation Limited, Program for Atmospheric Water Supply, 1983-86 Final Report to the Water Research Commission, Pretoria, South Africa.

PUBLICATIONS: Reports

1987: Contributor to Laser Atmospheric Wind Sounder (LAWS); Instrument Panel Report (Chairman R. J. Curran) (G.D. Emmitt), NASA Earth Observing System, Volume IIg, NASA Headquarters, Washington, D.C.

1994: Norfolk Southern Rail Emission Study (NSRES). Final Rept., February.

1999: NASA Post-2002 Land Surface Hydrology Mission Component for Surface Water Monitoring: HYDRO-SAT HYDROlogical SATellite (C. Vörösmarty, C. Birkett, L. Dingman, D. Lettenmaier, Y. Kim, E. Rodriguez and G.D. Emmitt). Report from the NASA Post-2002 Land Surface Hydrology Planning Workshop, Irvine, CA, April 12-14.

PRESENTATIONS: Seminars/Workshops

2002: Hybrid DWL: simulations of expected data products for use in OSSEs (D. Emmitt and S. Wood), Working Group on Space-based Lidar Winds, North Conway, NH, July 15-18.

2002: Status of IPO's Cal/Val study: the TODWL Spring 2002 checkout flights (D. Emmitt, C. O'Handley, and D. Bowdle), Working Group on Space-based Lidar Winds, North Conway, NH, July 15-18.

2002: Investigation of the marine LAS with an airborne Doppler wind lidar (D. Emmitt, C. O'Handley, D. Bowdle), Working Group on Space-based Lidar Winds, North Conway, NH, July 15-18.

2002: Nadir angle dependence of water surface return at 2 microns using TODWL (D. Emmitt and C. O'Handley), Working Group on Space-based Lidar Winds, North Conway, NH, July 15-18.

2002: TODWL: Between flight programs (D. Emmitt and P. Gatt), Working Group on Space-based Lidar Winds, North Conway, NH, July 15-18.

2002: Technology plan for the coherent subsystem of a space-based hybrid Doppler wind lidar (M. Kavaya, A. Amzajerdian, U. Singh, J. Yu, and D. Emmitt), Working Group on Space-based Lidar Winds, North Conway, NH, July 15-18.

2002: Technology roadmap for a direct detection Doppler lidar subsystem (B. Gentry, M. McGill, G. Schwemmer, B. Heaps, and D. Emmitt), Working Group on Space-based Lidar Winds, North Conway, NH, July 15-18.

2002: Status of the Doppler Lidar Simulation Model (DLSM) for GTWS (S. Wood and D. Emmitt), Working Group on Space-based Lidar Winds, North Conway, NH, July 15-18.

2002: A space-based coherent wind lidar point design for the NASA/NOAA Draft Science and Operational Data Requirements (M. Kavaya, D. Emmitt, R. Frehlich, F. Amzajerdian, U. Singh), Working Group on Space-based Lidar Winds, Key West, FL, January 23-25.

2002: Status of TODWL and other IPO funded activities (G.D. Emmitt et al.), Working Group on Space-based Lidar Winds, Key West, FL, January 23-25.

2002: A hybrid DWL concept for instrument and mission analyses (D.Emmitt, B. Gentry, and M. Kavaya), Working Group on Space-based Lidar Winds, Key West, FL, January 23-25.

2002: Discussion of the GTWS reference atmospheres and their use (D. Emmitt), Working Group on Space-based Lidar Winds, Key West, FL, January 23-25.

PRESENTATIONS: Seminars/Workshops (cont.)

2001: Status of bracketing OSSEs at NCEP for several DWL notional concepts (G.D. Emmitt), Working Group on Space-based Lidar Winds, Oxnard, CA, February 7-9.

2001: Developing a CAL/VAL plan for a space-based Doppler wind lidar (G.D. Emmitt), Working Group on Space-based Lidar Winds, Oxnard, CA, February 7-9.

2001: IPO funded airborne DWL for CAL/VAL planning (G.D. Emmitt), Working Group on Space-based Lidar Winds, Oxnard, CA, February 7-9.

2001: Updated report on Hybrid technology DWLs (G.D. Emmitt), Working Group on Space-based Lidar Winds, Oxnard, CA, February 7-9.

2000: Adaptive targeting study for DWL operations (G.D. Emmitt, Z. Toth, E. Kalnay, R. Atlas). Working Group on Space-based Lidar Winds, Boulder, CO, June 21-23.

2000: Update on the feasibility study for a hybrid technology DWL (G.D. Emmitt). Working Group on Space-based Lidar Winds, Boulder, CO, June 21-23.

2000: Simulated DWL observations for the global OSSEs at NCEP: Coverage, accuracy, and systematic errors (G.D. Emmitt). Working Group on Space-based Lidar Winds, Boulder, CO, June 21-23.

2000: HYDROSAT: An opportunity for space-based Doppler lidar (G.D. Emmitt). Working Group on Space-based Lidar Winds, Boulder, CO, June 21-23.

2000: Update on IPO-funded wind lidar studies (G.D. Emmitt). Working Group on Space-based Lidar Winds**,** Daytona Beach, FL, January 26-28.

2000: Status of the Hybrid DWL feasibility study (G.D. Emmitt). Working Group on Space-based Lidar Winds**,** Daytona Beach, FL, January 26-28.

2000: HYDRA-SAT and the role of coherent Doppler lidar (G.D. Emmitt). Working Group on Space-based Lidar Winds**,** Daytona Beach, FL, January 26-28.

2000: The role of DWL OSSE's and appropriate metrics for a commercial wind data buy (G.D. Emmitt). Working Group on Space-based Lidar Winds**,** Daytona Beach, FL, January

PRESENTATIONS: Seminars/Workshops (cont.)

26-28.

1999: Recent results of IPO funded OSSE efforts at NCEP and GSFC (G.D. Emmitt). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: SPARCLE data product validation plan: Mission scientist's assessment (G.D. Emmitt, R. Menzies and D. Bowdle). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: SPARCLE "Challenges" B Pointing (G.D. Emmitt, T.Miller and G. Spiers). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: SPARCLE performance modeling (G. Spiers and G.D. Emmitt). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: Follow on mission(s) for SPARCLE (M. Kavaya, G.D. Emmitt and T. Miller). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: Status of OSSEs at NCEP (R. Atlas and G.D. Emmitt). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: Review of observational requirements for global DWL winds (G.D. Emmitt). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: Adaptive targeting with a space-based DWL (G.D. Emmitt and R. Atlas). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: Update of LITE analyses of cloud and aerosol backscatter statistics (D. Winker and G.D. Emmitt). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.
1999: SPARCLE Science Team Meeting (G.D. Emmitt). Working Group on Space-based Lidar Winds, Key West, FL, January 19-22.

1999: Status of the NASA New Millennium Program. Presented for C. Raymond by G.D. Emmitt. Working Group on Space-based Lidar Winds, Mt. Hood, OR, July 6-9.

1999: Status of wind lidar OSSEs at NCEP (G.D. Emmitt and R. Atlas). Working Group on Space-based Lidar Winds, Mt. Hood, OR, July 6-9.

1999: SPARCLE: What happened, lessons learned, what next (T. Miller and G.D. Emmitt). Working Group on Space-based Lidar Winds, Mt. Hood, OR, July 6-9.

1999: Results of the ALADIN (ISS) impact study. Presented for W. Wergen et al. By G.D. Emmitt, Working Group on Space-based Lidar Winds, Mt. Hood, OR, July 6-9.

PRESENTATIONS: Seminars/Workshops (cont.)

1999: A notional hybrid DWL on the roadmap to an operational system (G.D. Emmitt). Working Group on Space-based Lidar Winds, Mt. Hood, OR, July 6-9.

1999: Data requirements and specifications (G.D. Emmitt). Working Group on Space-based Lidar Winds, Mt. Hood, OR, July 6-9.

1999: OSSEs and impact metrics definitions (G.D. Emmitt). Working Group on Space-based Lidar Winds, Mt. Hood, OR, July 6-9.

1999: Benefits of a pre-data buy DWL demo mission (G.D. Emmitt). Working Group on Space-based Lidar Winds, Mt. Hood, OR, July 6-9.

1999: An overview of the potential space-based application of coherent Doppler lidar to measure the surface velocity of rivers (G.D. Emmitt). NASA-USGS Workshop on Remote Sensing of River Stage and Discharge, Herndon, VA, September 23-24.

1999: Airborne Doppler lidar observations of river transects (MACAWS) (G.D. Emmitt and J. Rothermel). NASA-USGS Workshop on Remote Sensing of River Stage and Discharge, Herndon, VA, September 23-24.

1998: SPARCLE mission science plan (G.D. Emmitt). NOAA Working Group on Space-based Lidar Winds, Key West, FL, January 20-22.

1998: Pointing knowledge: GPS/INS (G. Kamerman and G.D. Emmitt). NOAA Working Group on Space-based Lidar Winds, Key West, FL, January 20-22.

1998: Velocity error budget (G. Spiers and G.D. Emmitt). NOAA Working Group on Space-based Lidar Winds, Key West, FL, January 20-22.

1998: Simulated performance of SPARCLE and follow-on missions (G.D. Emmitt). NOAA Working Group on Space-based Lidar Winds, Key West, FL, January 20-22.

1998: Simulating coherent and direct detection DWLs for IPO OSSEs (G.D. Emmitt). NOAA Working Group on Space-based Lidar Winds, Key West, FL, January 20-22.

1998: The validation program. OSSEs (G.D. Emmitt). NOAA Working Group on Space-based Lidar Winds, Key West, FL, January 20-22.

1998: Calibration of the GPS/INS (G.D. Emmitt and G. Spiers). NOAA Working Group on Space-Based Lidar Winds, Boulder, CO, July 13-16.

1998: Cloud statistics from LITE and relevance to wind lidar performance (D. Winker and G.D. Emmitt**)**. NOAA Working Group on Space-Based Lidar Winds, Boulder, CO, July 13-16.

PRESENTATIONS: Seminars/Workshops (cont.)

1998: An approach to evaluating the merits of a hybrid technology Doppler wind lidar (G.D. Emmitt**)**. NOAA Working Group on Space-Based Lidar Winds, Boulder, CO, July 13-16.

1998: Update of target atmospheres for use in DWL concept studies (S. Wood and G.D. Emmitt). NOAA Working Group on Space-Based Lidar Winds, Boulder, CO, July 13-16.

1998: Inverted quasi-conical partial VAD processing of MACAWS data taken during turns (G.D. Emmitt, S. Wood and S. Greco). NOAA Working Group on Space-Based Lidar
Winds, Boulder, CO, July 13-16.

1998: Update on recent OSSEs (R. Atlas, S. Wood and G.D. Emmitt). NOAA Working Group on Space-Based Lidar Winds, Boulder, CO, July 13-16.

1998: What is a useful wind measurement? (G.D. Emmitt). NOAA Working Group on Space-Based Lidar Winds, Boulder, CO, July 13-16.

1998: Review of the lidar working group data requirements (G.D. Emmitt). NOAA Working Group on Space-Based Lidar Winds, Boulder, CO, July 13-16.

1997: Status of performance simulations in support of the shuttle and NPOESS missions (G.D. Emmitt), NOAA Working Group on Space-based Lidar Winds, Daytona, FL, January 21-23.

1997: Issues related to the comparison of DWL technologies and the simulation of their performance (e.g., wallplug efficiences and beta vs. wavelength) (G.D. Emmitt), NOAA Working Group on Space-based Lidar Winds, Daytona, FL, January 21-23.

1997: Proposed role of OSSEs for CAMEX III (G.D. Emmitt), NOAA Working Group on Space-based Lidar Winds, Daytona, FL, January 21-23.

1997: Relevance of LITE data analysis to space-based DWL performance (G.D. Emmitt and D. Winker), NOAA Working Group on Space-based Lidar Winds, Northglenn, CO, July 15-17.

1997: Update on OSSEs for NPOESS and CAMEX III (G.D. Emmitt, S. Wood, L. Wood, and S. Greco), NOAA Working Group on Space-based Lidar Winds, Northglenn, CO, July 15-17.

1997: Status report on NASA's DWL shuttle mission -- The science/data perspective (G.D. Emmitt, S. Wood, and M. Kavaya), NOAA Working Group on Space-based Lidar Winds, Northglenn, CO, July 15-17.

PRESENTATIONS: Seminars/Workshops (cont.)

1997: Issues related to DWL scanning, sampling and LOS co-processing (G.D. Emmitt, S. Wood, B. Rye), NOAA Working Group on Space-based Lidar Winds, Northglenn, CO, July 15-17.

1996: Use of MACAWS data to address issues related to a space-based DWL (G.D. Emmitt, S. Greco and J. Rothermel) Paper presented at the NOAA Working Group on Space-Based Lidar Winds, Daytona Beach, FL, February 6-9.

1996: Figures of Merit for DWL OSSEs (G.D. Emmitt and R. Atlas) Paper presented at the NOAA Working Group on Space-Based Lidar Winds, Daytona Beach, FL,February 6-9.

1996: Effects of wind shear on signal processing (G.D. Emmitt) Paper presented at the NOAA Working Group on Space-Based Lidar Winds, Daytona Beach, FL,February 6-9.

1996: Data volume issues for a 2 m small-sat mission (G.D. Emmitt and S.A. Wood) Paper presented at the NOAA Working Group on Space-Based Lidar Winds, Daytona Beach, FL, February 6-9.

1996: Preliminary cloud and cloud porosity statistics from LITE (G.D. Emmitt and D. Winker) Paper presented at the NOAA Working Group on Space-Based Lidar Winds, Daytona Beach, FL, February 6-9.

1995: Use of NASA/NOAA ground-based lidar data to evaluate several signal processing strategies (G.D. Emmitt) Paper presented at the NOAA Working Group on Space-based Lidar Winds, Clearwater, FL, January 31-February 2.

1995: Revised outlook for mid/upper tropospheric returns for a small-satellite wind lidar (G.D. Emmitt**)** Paper presented at the NOAA Working Group on Space-based Lidar Winds, Clearwater, FL, January 31-February 2.

1995: OSSEs in support of a small-satellite mission (G.D. Emmitt**)** Paper presented at the NOAA Working Group on Space-Based Lidar Winds, Clearwater, FL,January 31-February 2.

1995: Status of efforts by the U.S.A. Working Group on Space-Based Lidar Winds (G.D. Emmitt and W.E. Baker) Paper presented at the ESA Doppler Wind Lidar Workshop, Noordwijk, The Netherlands, September 20-22.

1993: Update on LAWS data simulations (G.D. Emmitt). Paper presented at the LAWS Science Team Meeting, January, Clearwater Beach, FL.

1993: Design considerations for a Quick LAWS (G.D. Emmitt). Paper presented at the LAWS Science Team Meeting, January, Clearwater Beach, FL.

PRESENTATIONS: Seminars/Workshops (cont.)

1993: Update on ground-based lidar observations **(**G.D. Emmitt). Paper presented at the LAWS Science Team Meeting, January, Clearwater, FL.

1992: Simulated LAWS performance profiles (G.D. Emmitt). Paper presented at the LAWS Science Team Meeting, July, Cape Cod, MA.

1992: LAWS power budget simulations (G.D. Emmitt). Paper presented at the LAWS Science Team Meeting, July, Cape Cod, MA.

1992: Review of mission science objectives for LAWS (G.D. Emmitt). Paper presented at the LAWS Science Team Meeting, July, Cape Cod, MA.

1991: LAWS, a career in global transports. Seminar given at Florida State University, Tallahassee, FL, January 14-18.

1990: Shot management for LAWS. LAWS Simulation Workshop, March, Goddard Space Flight Center, Greenbelt, MD.

1990: Optimal scanning pattern in partly cloudy regions. LAWS Science Team Meeting, August 1-3, Boulder, CO.

1990: Optimal sampling strategies for space-based laser wind sounders. Seminar at Laboratoire de Météorologie Dynamique, June 8, Ecole Polytechnique, Palaiseau, France.

1990: Preliminary estimates of LAWS global observation opportunities below 15 km. GLOBE Meeting, March 7-8, Huntsville, AL.

1990: Optimal sampling strategies in partly cloudy regions for space-based laser wind sounders. Seminar at Laboratoire de Météorologie Dynamique, Ecole Normal Supérieure, September, Paris, France.

1990: Role of OSSEs in the design of a space-based lidar wind sounder. Seminar at European Center for Medium Range Forecasts, September 4, Reading, England.

1989: LAWS - Can it provide more than just winds? Seminar at NASA Langley Research Center, Hampton, VA, October.

1987: Windstorms: site-specific risk assessment. American International Group's Fall 1987 Seminar on Geophysical Hazards, New York, N.Y., December.

1980: Nocturnal boundary layer measurements made with a tethered balloon. SESAME 1979 Data Users Workshop, January, Boulder, CO.

1979: Seminar on hail suppression and its implications. Departmental Seminar, University of Virginia, April.

PRESENTATIONS: Seminars/Workshops (cont.)

1977: Use of direct and indirect estimates of cumulus transports to estimate total active cloud cover. Seminar paper given at MPI fur Meteorologie, Hamburg, West Germany.

1977: Elected to present final report of the GATE Workshop Boundary Layer Group at the International Conference on the energetics of the tropical atmosphere, Tashkent, U.S.S.R., September; report published in proceedings of the conference.

1977: Invited participant at the GATE summer workshop (3 papers), Boulder, Colorado, July 29-August 12.

1977: Technical aspects of tethered balloon operations. Seminar paper given at the Danish Atomic Energy Laboratories, RISϕ, Denmark.

1977: Cumulus convection below cloud base. Seminar paper given at the Danish Atomic Energy Laboratories, RISϕ, Denmark.

1976: Tropical cumulus activity below cloud base. Seminar paper given at MPI fur Meteorologie, Hamburg, West Germany.

1974: Opportunities for physicists in a Department of Environmental Sciences (G.D. Emmitt). Given at Eastern Nazarene College, Wollaston, MA.

RESEARCH

Principal Investigator: NOAA's Integrated Program Office's (IPO) feasibility study for hybrid Doppler wind lidars

Principal Investigator: NOAA's IPO observing system simulation experiments for space-based DWLs

Principal Investigator: NOAA's IPO targeted observing strategies for wind lidars

Principal Investigator: NOAA's IPO calibration/validation plan for space-based DWLs

Principal Investigator: NOAA's IPO twin otter Doppler wind lidar (TODWL) for cal/val strategy development

Principal Investigator: NASA LaRC, Modification of the Doppler lidar simulation model

Principal Investigator: Provincial Energy Ventures Dust Suppression System Design

Principal Investigator: NASA GSFC – GTWS Science Definition efforts

Principal Investigator: Storm top divergence studies using the LAWS, NASA/Marshall Space Flight Center.

Principal Investigator: Cloud top and planetary boundary layer wind measurements using a space-based lidar, SBIR, U.S. Air Force.

Principal Investigator: Simulation experiments to assess LAWS' impact on global climate change modeling, NASA.

Principal Investigator: Vertical velocity structures significant to space-based and ground-based lidar anemometry, CNES, France.

Principal Investigator: Norfolk Southern Rail Study.

Co-Principal Investigator: Interdisciplinary research scenario - Version ∅, NASA.

Principal Investigator: EOS Laser atmosphere wind sounder (LAWS) investigation, NASA.

Principal Investigator: Space-based Doppler lidar sampling strategies -- algorithm development and simulated observation experiments, NASA.

Principal Investigator: Norfolk Southern Rail study

Principal Investigator: PLACEM, Pier IX Terminal Company/Shell Mining.

Principal Investigator, Interdisciplinary research scenario - Version 0, NASA.

RESEARCH (cont.)

Principal Investigator, Airborne/space-based Doppler lidar wind sounders: Sampling the PBL and other regions of significant B and u inhomogeneities, NASA.

Principal Investigator, Lidar mapping of cloud tops and cloud top winds, SBIR, AFGL.

Principal Investigator: Tropospheric wind observations with Doppler lidars: SPARCLE and follow-on missions, NASA.

Principal Investigator: CAMEX-3, NASA.

Principal Investigator, DTA Pile Moisture Modeling project.

Fugitive coal dust emission project at Elk Run Coal Company

Fugitive coal dust emission project for Norfolk Southern

Design of Procontrol System for SINCOR, Jose, Venezuela