

MELANIE A. WETZEL

Emerita Faculty Member

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Education

Ph.D.	1990	Colorado State University	Atmospheric Sciences
M.S.	1980	University of Washington	Atmospheric Sciences
B.A.	1978	University of Illinois at Urbana-Champaign	Physical Geography

Professional Experience

2007 – present	Emerita Faculty member, Division of Atmospheric Sciences, Desert Research Institute, Nevada System of Higher Education, Reno, NV.
2003 – 2006	Director, Atmospheric Sciences Graduate Program, University of Nevada, Reno
2002 – 2003	Deputy Director, Atmospheric Sciences Graduate Program, University of Nevada, Reno
1990 - 2007	Member of Atmospheric Sciences Program Faculty, Department of Physics, University of Nevada, Reno
1996 - 2007	Associate Research Professor, Division of Atmospheric Sciences, Desert Research Institute
1991 - 1996	Assistant Research Professor, Atmospheric Sciences Center, Desert Research Institute
1988 - 1990	Assistant Remote Sensing Scientist, Atmospheric Sciences, Desert Research Institute
1986 - 1987	Ph.D. Research Assistant, Department of Atmospheric Science, Colorado State University
1980 - 1986	Faculty Research Associate, Cooperative Institute for Research in the Atmosphere, Colorado State University
1978 - 1980	Graduate Research Assistant and Teaching Assistant, Cloud Physics Group, Department of Atmospheric Sciences, University of Washington
1978	Meteorological Radar Operator, Atmospheric Sciences Division, Illinois State Water Survey, Champaign, Illinois
1975-1978	Laboratory Assistant, Department of Geography, University of Illinois at Urbana-Champaign
1974	Research Assistant, Atmospheric Sciences Division, Illinois State Water Survey, Champaign, Illinois

Honors and Awards

1995 Sabbatical Award, National Center for Atmospheric Science, Boulder, CO
1997 Senior Visiting Scientist Appointment at NOAA, Washington DC
1998 Woman of Achievement, Desert Research Institute
1998 University of Nevada, Outstanding Faculty Member in Science and Engineering

Professional Service

- UCAR Unidata Policy Committee (2003-2007), Committee Chair (2004-2007)
- Advisory Panel for the University Corporation for Atmospheric Research (UCAR), Cooperative Program for Operational Meteorology and Training (1999-2004)
- Interim Editorial Board for the *Bulletin of the American Meteorological Society* (2000-2001)
- Steering Committee for NOAA Visiting Scientist Program (1999-2001)
- American Meteorological Society (AMS) Committee on Undergraduate Scholarship Awards (1999-2002)
- AMS Committee on Weather Modification (1996-2001)
- UCAR University Relations Committee (1996-1999)
- UCAR Governance Examination Team (1996)
- UCAR UNIDATA Users Committee (1993-1997)
- UCAR Membership Review Committee (1992-1995)

Publications

- Kim, D.C., C. Lougluier, M.A. Wetzel and W.R. Stockwell, 2007: A comparison of photolysis rate parameters estimated from measured and simulated actinic flux for wintertime conditions at Storm Peak Laboratory, Colorado. *J. Atmos. Chem.*, doi:10.1007/210874-007-9061.2.
- Vellore, R., D. Koracin, M. Wetzel, S. Chai, and Q. Wang, 2007: Challenges in mesoscale prediction of the nocturnal stratocumulus-topped marine boundary layer and implications for operational forecasting. *Weather and Forecasting*, **22**, 1101-1122.
- Vellore, R., D. Koračin, and M. Wetzel, 2006: A method of improving cloud predictions for real-time weather forecasting and visualization. In *Advances in Visual Computing*, Eds., G. Bebis, et al., Springer Publishing.
- Wetzel, M.A., and J.R. Slusser, 2005: UV spectral irradiance, actinic flux and photolysis rates using multispectral satellite data and radiative transfer models. *Optical Engineering*, **44**(4), doi:10.1117/1.1889467.
- Twohy, C.H., M.D. Petters, J.R. Snider, B. Stevens, W. Tahnk, M. Wetzel, L. Russell, and J.-L. Brenguier, 2005: Measurements of the indirect effect of aerosol particles on marine stratiform clouds: Microphysics. *J. Geophys. Res.*, **110**, D08203, doi:10.1029/2004JD005116.
- Wetzel, M., M. Meyers, R. Borys, R. McAnelly, W. Cotton, A. Rossi, P. Frisbie, D. Nadler, D. Lowenthal, S. Cohn, and W. Brown, 2004: Mesoscale snowfall prediction and verification in mountainous terrain. *Weather and Forecasting*, **19**, 806-828.
- Stevens, B., D. H. Lenschow, G. Vali, H. Gerber, A. Bandy, B. Blomquist, J.-L. Brenguier, C. S. Bretherton, F. Burnet, T. Campos, S. Chai, I. Faloona, D. Friesen, S. Haimov, K. Laursen, D. K. Lilly, S. M. Loehrer, S. P. Malinowski, B. Morely, M. D. Petters, D. C. Rogers, L. Russell, V. Savcic-Jovcic, J. R. Snider, D. Straub, M. J. Szumowski, H. Takagi, D. C. Thorton, M. Tschudi, C. Twohy, M. Wetzel, and M. C. van Zanten, 2003: Dynamics and chemistry of marine stratocumulus – DYCOMS II. *Bull. Amer. Met. Soc.*, **84**, 579-593.

- Wetzel, M.A., G.E. Shaw, J. Slusser, R.D. Borys and C. Cahill, 2003: Physical, chemical and ultraviolet radiative signatures of aerosol in central Alaska. *J. Geophys. Res.*, **108** (D14), 4418, doi:10.1029/2002JD003208, 2003
- Lowenthal, D.H., R.D. Borys and M.A. Wetzel, 2002: Aerosol distributions and cloud interactions at a mountaintop laboratory. *J. Geophys. Res.*, 107 (D18), 4345, doi:10.1029/2001JD002046.
- Gonzales, A., J.C. Perez, F. Herrera, R. Rosa, M.A. Wetzel, R.D. Borys and D.H. Lowenthal, 2002: Stratocumulus properties retrieval method from NOAA-AVHRR data based on the discretization of cloud parameters. *Intl. J. Rem. Sens.*, **23**, 627-645.
- Wetzel, M.A., G. Vali, W. Thompson, S. Chai, T. Haack, M. Szumowski and R. Kelly, 2001: Evaluation of COAMPS forecasts using satellite retrievals and aircraft measurements. *Weather and Forecasting*, **16**, 588-599.
- Perez, J.C., F. Herrera, F. Rosa, A. Gonzales, M. Wetzel, R. Borys, and D. Lowenthal, 2000: Retrieval of marine stratus cloud droplet size from NOAA-AVHRR night imagery. *Remote Sensing of Environment*, **73**, 31-45.
- Wetzel, M.A., and L.L. Stowe, 1999: Satellite-observed patterns in stratus cloud microphysics, aerosol optical thickness and shortwave radiative forcing. *J. Geophysical Research*, **104**, 31286-31299.
- Borys, R.D., D.H. Lowenthal, M.A. Wetzel, F. Herrera, A. Gonzalez, and J. Harris, 1998: Chemical and microphysical properties of marine stratiform cloud in the North Atlantic. *J. Geophysical Research*, **103**, No. D17, 22,073-22,085.
- Wetzel, M., D. Dempsey, S. Nilsson, M. Ramamurthy, S. Koch, J. Moody, D. Knight, C. Murphy, D. Fulker, M. Marlino, M. Morgan, D. Yarger, D. Vietor, and G. Cox, 1998: Faculty workshop on using instructional technologies and satellite data for college-level education in the atmospheric and earth sciences. *Bulletin, American Meteorological Society*, **79**, 2153-2160.
- Borys, R.D., and M.A. Wetzel, 1997: Storm Peak Laboratory: A research, teaching and service facility for the atmospheric sciences. *Bulletin, American Meteorological Society*, **78**, 2115-2123.
- Wetzel, M.A., R.D. Borys, and L. Xu, 1996: Analysis methods for land-based fog droplet size and optical depth using satellite data. *J. Applied Meteorology*, **35**, 810-829.
- Ramamurthy, M.K., C. Murphy, J. Moore, M. Wetzel, D. Knight, P. Ruscher, S. Mullen, R. DeSouza, D.S. Hawk, and D. Fulker, 1995: Teaching mesoscale meteorology in the age of the modernized Weather Service. *Bulletin, American Meteorological Society*, **76**, 2463-2473.
- Wetzel, M.A., and G.T. Bates, 1995: Comparison of simulated cloud cover with satellite observations over the Western U.S. *Journal of Climate*, **8**, 296-308.
- Wetzel, M., R. Borys, D. Lowenthal, and S. Brown, 1995: Meteorological support to the Earthwinds Transglobal Balloon Project. *Bulletin, American Meteorological Society*, **76**, 477-488.
- Wetzel, M.A., 1995: Simulation of radiances for future AVHRR platforms with the AVIRIS spectral radiometer. *Int. Jour. Remote Sensing*, **16**, 1167-1177.
- Hallett, J., M.A. Wetzel, and S.A. Rutledge, 1993: 1991 NSF- and UNR-sponsored field course in radar meteorology. *Bulletin, American Meteorological Society*, **74**, 17-23.

- Warburton, J.A., and M.A. Wetzel, 1992: Field study of the potential for winter precipitation enhancement in the Australian Snowy Mountains. *Atmospheric Research*, **28**, 327-363.
- Wetzel, M.A., and T.H. Vonder Haar, 1991: Theoretical development and sensitivity tests of a stratus cloud droplet size retrieval method for AVHRR-K/L/M. *Remote Sensing of Environment*, **36**, 105-119.

Conference Proceedings and Presentations

- Goliff, W., D. Dubois, P. McDonald, M. Wetzel and W. Stockwell, 2008: Visualization of synthetic visual impairment scenery using a 3-D immersive CAVE system. *A&WMA/AAAR Specialty Conference on Aerosol and Atmospheric Optics: Visual Air Quality and Radiation Balance*, Moab, UT, Air & Waste Management Association.
- Saleeby, S.M., W.R. Cotton, R.D. Borys, D. Lowenthal, and M.A. Wetzel, 2007: Relative impacts of orographic forcing and pollution aerosols on mountain snowfall. *12th Conference on Mesoscale Processes*, Waterville Valley, NH, Amer. Meteor. Soc.
- Saleeby, S.M., R.D. Borys, M.A. Wetzel, D.B. Simeral, M.Y. Meyers, W.R. Cotton, R.L. McAnelly, N. Larson, and E. Heffernan, 2006: Model aerosol sensitivity studies and microphysical interactions in an orographic snowfall event. *12th Mountain Meteorology Conference*, Santa Fe, NM, Amer. Meteor. Soc.
- Simeral, D.B., R.D. Borys and M.A. Wetzel, 2006: New snow density across an elevational gradient in the Park Range of Northwestern Colorado. *12th Mountain Meteorology Conference*, Santa Fe, NM, Amer. Meteor. Soc..
- Vellore, R., D. Koračin, and M. Wetzel, 2006: Improvement in cloud predictions using satellite data assimilation for real-time forecasting. *AGU Fall Meeting*, San Francisco, CA, Amer. Geophys. Union.
- Vellore, R.K., D. Koracin, M. Wetzel and J.G. Powers, 2005: Verification study: Modeling the evolution and structure of nocturnal marine stratocumulus during DYCOMS-II. *Sixth Conference on Coastal Atmospheric and Oceanic Prediction and Processes*, Amer. Meteor. Soc, San Diego, CA.
- Uppapalli, S., D. Donovan, B. Wood, R. Jacobson, and M. Wetzel, 2005: Renewable hydrogen based off-grid power control system. *ISES Solar World Conference*, Orlando, FL, International Solar Energy Society.
- Haack, T., and M. Wetzel, 2005: Mesoscale forcing of marine atmospheric boundary layer clouds along the U.S. West Coast. *11th Conference on Mesoscale Processes*, Albuquerque, NM, Amer. Meteor. Soc.
- Koračin, D., R. Vellore, M. Wetzel, and S. Chai, 2005: A method for improving mesoscale prediction of marine stratocumulus evolution during DYCOMS II. *Ocean-Atmosphere-Land Processes and Interactions in the Eastern Pacific. AGU Fall Meeting*, San Francisco, CA, Amer. Geophys. Union.
- Wetzel, M., D. Koračin, R. Vellore and S. Chai, 2005: Temporal and spatial variability of the microphysical characteristics of nocturnal marine stratocumulus observed with GOES Imager. *Ocean-Atmosphere-Land Processes and Interactions in the Eastern Pacific. AGU Fall Meeting*, San Francisco, CA, Amer. Geophys. Union.

- Kim, D.C, M.A. Wetzel, and W.R. Stockwell, 2004: Radiation measurement at Storm Peak Laboratory, Colorado. *Sixth Conf on Atmospheric Chemistry*, Seattle, WA, Amer. Meteor. Soc.
- Wetzel, M., W.R. Stockwell, D. Kim and C. Loughner, 2004: Satellite Based Estimates of Spectral Actinic Flux and Photolysis in Conditions of Variable Cloudcover and High Surface Albedo. *13th Satellite Meteorology and Oceanography*, Norfolk, VA, Amer. Meteor. Soc.
- Wetzel, M.A., W.R. Stockwell, D.C. Kim, and C. Loughner, 2004: Mesoscale distribution of spectral actinic flux and photolysis in conditions of variable cloud cover and high surface albedo. *13th Conference on Satellite Meteorology and Oceanography*, Norfolk, VA, Amer. Meteor. Soc.
- Twohy, C.H., M.D. Petters, JR. Snider, B. Stevens, W. Tahnk, M. Wetzel, L. Russell and F. Burnet, 2004: Measurements of the aerosol indirect effect in marine stratiform clouds. *AAAR Conference*, Atlanta, GA, October 4-8, Amer. Assoc. for Aerosol Research.
- Wetzel, M.A., and R.D. Borys, 2004: Analysis of Valley Inversion Structure Using Radiosonde, Radar Profiler and Mountain mesonet data. *Eleventh Annual Workshop on Weather Prediction in the Intermountain West*, Salt Lake City, UT.
- Chew, S., M. Wetzel, J. Fischer, A. Huggins, D. Pike, B. Brong, and S. Keck, 2004: Integrating Observation Data and New Radar Algorithms into the National Weather Service Interactive Forecast Preparation System. *Eleventh Annual Workshop on Weather Prediction in the Intermountain West*, Salt Lake City, UT.
- Wetzel, M.A., and J.R. Slusser, 2003: Mesoscale distributions of UV spectral irradiance obtained by merging satellite remote sensing and ground-based measurements. *International Symp. on Optical Science and Technology*, San Diego, CA, International Society for Optical Engineering.
- Wetzel, M.A., R.D. Borys and D.R. Lowenthal, 2003: Graduate field training in atmospheric measurements. *12th Symposium on Education*, Long Beach, CA, Amer. Meteor. Soc.
- Adhikari, N.P., M.A. Wetzel, D.R. Koracin and S.K. Chai, 2003: Analysis and prediction of microwave refractivity profiles in nocturnal marine cloud layers. *Fifth Conference on Coastal Atmospheric Prediction and Processes*, Seattle, WA, Amer. Meteor. Soc
- Koracin, D.R. J. Powers, M.A. Wetzel, S. Chai and N. Adhikari, 2003: Improving prediction of the marine coastal clouds using satellite and aircraft data. *Fifth Conference on Coastal Atmospheric Prediction and Processes*, Seattle, WA, Amer. Meteor. Soc
- Chai, S.K., M.A. Wetzel and D. Koracin, Observed radiative cooling in nocturnal marine stratocumulus. *Fifth Conference on Coastal Atmospheric Prediction and Processes*, Seattle, WA, Amer. Meteor. Soc
- Wetzel, M.A., R.D. Borys and D.R. Lowenthal, 2003: Graduate field training in atmospheric measurements. *12th Symposium on Education*, Long Beach, California, Amer. Meteor. Soc.
- Wetzel, M., A. Huggins, S. Chew, S. Keck, J. Fischer, B. Brong, D. Pike, and C. Jordan, 2003: Merging hydrometeorological data for the National Digital Forecast Database. *Tenth Annual Workshop on Weather Prediction in the Intermountain West*, Reno, NV.
- Wetzel, M., 2002: Mesoscale Mapping of UV Spectral Irradiances. *Front Range UV Workshop*, Boulder CO.

- Wetzel, M., R. Borys, J. Slusser, C. Cahill and G. Shaw, 2002: Interannual Variability of UV Irradiance, Ozone and Aerosol in the Arctic. *IARC PI Meeting*, Boulder, CO, International Arctic Research Consortium.
- Wetzel, M., R. Borys, A. Rossi, D. Lowenthal, M. Meyers, P. Frisbie, D. Nadler, R. McAnelly, W. Cotton, W. Brown, S. Cohn, 2002: Verification of Snowfall Forecasts in the Park Range of Colorado, *Ninth Annual Workshop on Weather Prediction in the Intermountain West*, Salt Lake City UT.
- Wetzel, M., and R. Jenrow, 2001: The Ultraviolet Impacts Network: linking atmospheric education and health risk assessment. *10th Symposium on Education*, Albuquerque, New Mexico, Amer. Meteor. Soc.
- Wetzel, M.A., and R.D. Borys, 2000: Effects of clouds, surface albedo and ozone variations on ultraviolet radiation climatology at Storm Peak Laboratory. *Ninth Conf. on Mountain Meteorology*, Aspen, Colorado, Amer. Meteor. Soc.
- Wetzel M.A., Chai S.K., Szumowski M.J., Thompson W., Haack T., Vali, G., and Kelly, R. 2000: Application of satellite microphysical retrievals for the analysis of the COAMPS mesoscale prediction model. *13th International Conference on Clouds and Precipitation*, Reno, NV.
- Byrd, G., T. Spangler, S. Kemner-Richarson, J. Lamos, K. Ginger, M. Wetzel, and A. Mostek, 1999: An Interactive Satellite Meteorology Laboratory Module on the World Wide Web, *Eighth Symposium on Education*, Dallas, TX, Amer. Meteor. Soc.
- Wetzel, M. and B. Dillet, 1998: Microclimatic effects of cloud cover on ultraviolet exposure at high altitude. *Ninth Symposium on Global Change Studies*, Phoenix, AZ, Amer. Meteor. Soc.
- Wetzel, M., R. Borys, A. Winterbauer, B. Heckman, M. Marlino, L. Davis, P. Jeschofnig, and P. Biagi, 1998: Computer-based curriculum development in atmospheric technology. *Seventh Symposium on Education*, Phoenix, Arizona, Amer. Meteor. Soc.
- Wetzel, M., and L. Stowe, 1998: The Sixteen-Year AVHRR Pathfinder Global Dataset: Evaluating the Effects of Aerosol Particles on Cloud Radiative Forcing. *10th Conf. on Satellite Meteorology And Oceanography*, Paris, France, Amer. Meteor. Soc.
- Byrd, G., T. Spangler, S. Kemner-Richardson, J. Lamos, K. Ginger, M. Wetzel, and A. Mostek, 1998: Using computer-based learning technology for introductory weather and climate laboratory modules. *Seventh Symposium on Education*, Phoenix, Arizona, Amer. Meteor. Soc..
- Bates, G.T., S.W. Hostetler, and M. Wetzel, 1997: Analysis of western United States hydrology simulated by the NCAR Regional Climate Model (RegCM2). *13th Conference on Hydrology*, Long Beach, CA, Amer. Meteor. Soc.
- Dana, G. L., M.A. Wetzel, and R.A. Wharton, Jr., 1996: Satellite-derived surface temperatures in the McMurdo Dry Valleys, Antarctica. *International Radiation Symposium*, Fairbanks, Alaska.
- Bates, G., S. Hostetler, and M. Wetzel, 1995: Analysis of Western United States hydrology simulated by the NCAR Regional Climate Model (RegCM2). *AGU Fall Meeting*, San Francisco, CA, American Geophysical Union.
- Powers, J. G., and M.A. Wetzel, 1995: MM5 simulations in the Great Basin: Use of special observations in model verification. *Second Annual Workshop on Weather Prediction in the Intermountain West*, Salt Lake City, UT.

- Wetzel, M.A., 1994: Use of hyperspectral airborne radiances to simulate cloud microphysical retrievals from AVHRR-K. *European Symposium on Satellite Remote Sensing*, Rome, Italy.
- Wetzel, M.A., and G.T. Bates, 1994: Comparison of model-simulated cloud cover with satellite observations. *Fourth Penn State/NCAR Mesoscale Model Users' Workshop*, Boulder, Colorado, National Center for Atmospheric Research.
- Wetzel, M., L. Xu, and R. Borys, 1994: Satellite-derived atmospheric correction methods. *ASPRS Annual Conf.*, Reno, NV, Amer. Soc. Photogrammetry and Remote Sens..
- Wetzel, M., R. Borys, and L. Xu, 1994: Retrieval of fog microphysical parameters from AVHRR and simulated GOES-I channel radiances. *Seventh Conf. Satellite Meteorology and Oceanography*, Monterey, California, Amer. Meteor. Soc.
- Wetzel, M.A., Y. Qiao, J.A. Warburton, D.L. Reinke and C.L. Combs, 1993: Use of satellite cloud climatologies for climate studies at WRCC. *Eighth Conf. on Applied Climatology*, Anaheim, California, Amer. Meteor. Soc.
- Wetzel, M.A., and R.M. Welch, 1992: Simulation of AVHRR-K band ratios with AVIRIS. *Third Annual Airborne Geoscience Workshop*, Pasadena, California, NASA Jet Propulsion Laboratory.
- Wetzel, M.A., and T.H. Vonder Haar, 1990: Remote sensing of cloud droplet effective radius. *Seventh Conf. on Atmospheric Radiation*, San Francisco, CA, Amer. Meteor. Soc.
- Wetzel, M.A., and T.H. Vonder Haar, 1986: The impact of stratocumulus microphysical variations on near-infrared radiance. *Sixth Conf. on Atmospheric Radiation*, Williamsburg, VA, Amer. Meteor. Soc.
- Wetzel, M.A., and T.H. Vonder Haar, 1985: Satellite estimates of rainfall over small watersheds. *Sixth Conf. on Hydrometeorology*, Indianapolis, IN, Amer. Meteor. Soc.