

Dr. Matthew Bunkers, CCM (member)
Northern Plains Weather Services, LLC
Rapid City, SD 57701

605.390.7243 (mobile)
[n rnplnsweather@gmail.com](mailto:nrnplnsweather@gmail.com)

Specialties: forensic meteorology, weather and forecasting, radar, satellite, severe storms, hail, rainfall and flooding, fog, winter weather, heavy snow, icing, slip and falls, fire weather, high winds, lightning verification, applied climate and meteorology, ag weather, education and training, and technical editing.



PEER-REVIEWED PUBLICATIONS

- Bunkers, M. J., M. B. Wilson, M. S. Van Den Broeke, and D. J. Healey, 2022: Scan-by-scan storm-motion deviations for concurrent tornadic and nontornadic supercells. *Wea. Forecasting*, **37**, 749–770, doi: <https://doi.org/10.1175/WAF-D-21-0153.1>.
- Sherburn, K. D., M. J. Bunkers, and A. J. Mose, 2021: Radar-based comparison of thunderstorm outflow boundary speeds versus peak wind gusts from automated stations. *Wea. Forecasting*, **36**, 1387–1403, doi: <https://doi.org/10.1175/WAF-D-20-0221.1>.
- Bunkers, M. J., and M. R. Hjelmfelt, 2021: Thunderstorm downbursts: Windstorms and blowdowns. *Plant Disturbance Ecology: The Process and the Response*. 2nd ed. E. A. Johnson and K. Miyashita, Eds., Academic Press, 65–115, doi: <https://doi.org/10.1016/B978-0-12-818813-2.00003-4>.
- Lackmann, G. M., and Coauthors, 2020: Data availability principles and practice. *Wea. Forecasting*, **35**, 2217, doi: <https://doi.org/10.1175/WAF-D-20-0168.1>.
- Bunkers, M. J., S. R. Fleegel, T. Grafenauer, C. J. Schultz, and P. N. Schumacher, 2020: Observations of hail–wind ratios from convective storm reports across the continental United States. *Wea. Forecasting*, **35**, 635–656, doi: <https://doi.org/10.1175/WAF-D-19-0136.1>.
- Barbosa, A. C., D. W. Stahle, D. J. Burnette, M. C. A. Torbenson, E. R. Cook, M. J. Bunkers, G. Garfin, and R. Villalba, 2019: Meteorological factors associated with frost rings in Rocky Mountain bristlecone pine at Mt. Goliath, Colorado. *Tree-Ring Res.*, **75**, 101–105, doi: <http://dx.doi.org/10.3959/1536-1098-75.2.101>.
- Bunkers, M. J., 2018: Observations of right-moving supercell motion forecast errors. *Wea. Forecasting*, **33**, 145–159, doi: <https://doi.org/10.1175/WAF-D-17-0133.1>.
- Bunkers, M. J., and C. A. Doswell III, 2016: Comments on “Double Impact: When Both Tornadoes and Flash Floods Threaten the Same Place at the Same Time.” *Wea. Forecasting*, **31**, 1715–1721, doi: <http://dx.doi.org/10.1175/WAF-D-16-0116.1>.
- Edwards, L. M., M. J. Bunkers, J. T. Abatzoglou, D. P. Todey, and L. E. Parker, 2014: October 2013 blizzard in western South Dakota [in “Explaining Extreme Events of 2013 from a

- Climate Perspective"]. *Bull. Amer. Meteor. Soc.*, **95** (9), S23–S26, doi: <http://dx.doi.org/10.1175/1520-0477-95.9.S1.1>.
- Bunkers, M. J., D. A. Barber, R. L. Thompson, R. Edwards, and J. Garner, 2014: Choosing a universal mean wind for supercell motion prediction. *J. Operational Meteor.*, **2** (11), 115–129, doi: <http://dx.doi.org/10.15191/nwajom.2014.0211>.
- Bunkers, M. J., and P. L. Smith, 2013: Comments on “An Objective High-Resolution Hail Climatology of the Contiguous United States.” *Wea. Forecasting*, **28**, 915–917, doi: <http://dx.doi.org/10.1175/WAF-D-13-00020.1>.
- Warner, T. A., J. H. Helsdon Jr., M. J. Bunkers, M. M. F. Saba, and R. E. Orville, 2013: UPLIGHTS: Upward lightning triggering study. *Bull. Amer. Meteor. Soc.*, **94**, 631–635, doi: <http://dx.doi.org/10.1175/BAMS-D-11-00252.1>.
- Bunkers, M. J., S. J. Weiss, M. C. Coniglio, A. J. Clark, M. A. Baxter, J. W. Zeitler, D. T. Lindsey, and S. W. Harned, 2013: Editorial: Introducing the *Journal of Operational Meteorology*. *J. Operational Meteor.*, **1** (1), 1–2, doi: <http://dx.doi.org/10.15191/nwajom.2013.0101>.
- Bunkers, M. J., and M. A. Baxter, 2011: Radar tornadic debris signatures on 27 April 2011. *Electronic J. Operational Meteor.*, **12** (7), 1–6. [Available online at <http://nwafiles.nwas.org/ej/pdf/2011-ION1.pdf>.]
- Driscoll, D. G., M. J. Bunkers, J. M. Carter, J. F. Stamm, and J. E. Williamson, 2010: Thunderstorms and flooding of August 17, 2007, with a context provided by a history of other large storm and flood events in the Black Hills area of South Dakota. U.S. Geological Survey Scientific Investigations Report 2010-5187, 139 pp. [Available online at <http://pubs.usgs.gov/sir/2010/5187/>.]
- Bunkers, M. J., J. R. Wetenkamp Jr., J. J. Schild, and A. Fischer, 2010: Observations of the relationship between 700-mb temperatures and severe weather reports across the contiguous United States. *Wea. Forecasting*, **25**, 799–814, doi: <http://dx.doi.org/10.1175/2009WAF2222333.1>.
- Bunkers, M. J., D. R. Clabo, and J. W. Zeitler, 2009: Comments on “Structure and Formation Mechanism on the 24 May 2000 Supercell-Like Storm Developing in a Moist Environment over the Kanto Plain, Japan.” *Mon. Wea. Rev.*, **137**, 2703–2712, doi: <http://dx.doi.org/10.1175/2009MWR2909.1>.
- Bunkers, M. J., 2009: Comments on “Observational Analysis of the Predictability of Mesoscale Convective Systems.” *Wea. Forecasting*, **24**, 351–355, doi: <http://dx.doi.org/10.1175/2008WAF2222129.1>.
- Bunkers, M. J., and J. W. Stoppkotte, 2007: Documentation of a rare tornadic left-moving supercell. *Electronic J. Severe Storms Meteor.*, **2** (2), 1–22, doi: <https://doi.org/10.55599/ejssm.v2i2.7>.
- Bunkers, M. J., J. S. Johnson, L. J. Czepyska, J. M. Grzywacz, B. A. Klimowski, and M. R. Hjelmfelt, 2006: An observational examination of long-lived supercells. Part II: Environmental conditions and forecasting. *Wea. Forecasting*, **21**, 689–714, doi: <http://dx.doi.org/10.1175/WAF952.1>.
- Bunkers, M. J., M. R. Hjelmfelt, and P. L. Smith, 2006: An observational examination of long-lived supercells. Part I: Characteristics, evolution, and demise. *Wea. Forecasting*, **21**, 673–688, doi: <http://dx.doi.org/10.1175/WAF949.1>.
- Bunkers, M. J., 2005: Supercell motion and longevity. Ph.D. dissertation, South Dakota School of Mines and Technology, 145 pp.

- Zeitler, J. W., and M. J. Bunkers, 2005: Operational forecasting of supercell motion: Review and case studies using multiple datasets. *Natl. Wea. Dig.*, **29**, 81–97. [Available online at <http://nwafiles.nwas.org/digest/papers/2005/Vol29No1/Pg81-Zeitler.pdf>.]
- Lindsey, D. T., and M. J. Bunkers, 2005: Observations of a severe, left-moving supercell on 4 May 2003. *Wea. Forecasting*, **20**, 15–22, doi: <http://dx.doi.org/10.1175/WAF-830.1>.
- Klimowski B. A., M. R. Hjelmfelt, and M. J. Bunkers, 2004: Radar observations of the early evolution of bow echoes. *Wea. Forecasting*, **19**, 727–734, doi: [http://dx.doi.org/10.1175/1520-0434\(2004\)019%3C0727:ROOTE%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0434(2004)019%3C0727:ROOTE%3E2.0.CO;2).
- Klimowski, B. A., M. J. Bunkers, M. R. Hjelmfelt, and J. Covert, 2003: Severe convective windstorms over the northern high plains of the United States. *Wea. Forecasting*, **18**, 502–519, doi: [http://dx.doi.org/10.1175/1520-0434\(2003\)18%3C502:SCWOTN%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0434(2003)18%3C502:SCWOTN%3E2.0.CO;2).
- Bunkers, M. J., 2002: Vertical wind shear associated with left-moving supercells. *Wea. Forecasting*, **17**, 845–855, doi: [http://dx.doi.org/10.1175/1520-0434\(2002\)017%3C0845:VWSAWL%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0434(2002)017%3C0845:VWSAWL%3E2.0.CO;2).
- Klimowski, B. A., and M. J. Bunkers, 2002: Comments on “Satellite Observations of a Severe Supercell Thunderstorm on 24 July 2000 Made during the GOES-11 Science Test.” *Wea. Forecasting*, **17**, 1111–1117, doi: [http://dx.doi.org/10.1175/1520-0434\(2002\)017%3C1111:COSOOA%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0434(2002)017%3C1111:COSOOA%3E2.0.CO;2).
- Bunkers, M. J., B. A. Klimowski, J. W. Zeitler, R. L. Thompson, and M. L. Weisman, 2000: Predicting supercell motion using a new hodograph technique. *Wea. Forecasting*, **15**, 61–79, doi: [http://dx.doi.org/10.1175/1520-0434\(2000\)015%3C0061:PSMUAN%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0434(2000)015%3C0061:PSMUAN%3E2.0.CO;2).
- Klimowski, B. A., M. R. Hjelmfelt, M. J. Bunkers, D. Sedlacek, and L. R. Johnson, 1998: Hailstorm damage observed from the GOES-8 satellite: The 5-6 July 1996 Butte-Meade Storm. *Mon. Wea. Rev.*, **126**, 831–834, doi: [http://dx.doi.org/10.1175/1520-0493\(1998\)126%3C0831:HDOFTG%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0493(1998)126%3C0831:HDOFTG%3E2.0.CO;2).
- Bunkers, M. J., 1996: Examination of two dynamically different areas of vertical motion using PC-GRIDDS. *Natl. Wea. Dig.*, **20** (4), 54–70. [Available online at <http://nwafiles.nwas.org/digest/papers/1996/Vol20No4/Pg54-Bunkers.pdf>.]
- Bunkers, M. J., J. R. Miller Jr., and A. T. DeGaetano, 1996: Definition of climate regions in the Northern Plains using an objective cluster modification technique. *J. Climate*, **9**, 130–146, doi: [http://dx.doi.org/10.1175/1520-0442\(1996\)009%3C0130:DOCRIT%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0442(1996)009%3C0130:DOCRIT%3E2.0.CO;2).
- Bunkers, M. J., J. R. Miller Jr., and A. T. DeGaetano, 1996: An examination of El Niño—La Niña-related precipitation and temperature anomalies across the northern plains. *J. Climate*, **9**, 147–160, doi: [http://dx.doi.org/10.1175/1520-0442\(1996\)009%3C0147:AEOENN%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0442(1996)009%3C0147:AEOENN%3E2.0.CO;2).
- Bunkers, M. J., 1993: A climatological evaluation of the Northern Plains from the late 19th century to 1990: Definition of climate regions, comparisons of drought, and El Niño/La Niña teleconnections. M.S. thesis, Department of Atmospheric Sciences, South Dakota School of Mines & Technology, 137 pp. plus appendices.

INFORMAL PUBLICATIONS

- Bunkers, M. J., M. Smith, D. Driscoll, and G. Hoogestraat, 2015: Hydrologic response for a high-elevation storm in the South Dakota Black Hills. NOAA/NWS Rapid City, SD, Internal Report 2015-01, 21 pp. [Available online at www.weather.gov/media/unr/soo/reports/2015-01/NWSUNR-Report-2015-01.pdf.]

- Warner, T. A., M. M. F. Saba, S. Rudge, M. Bunkers, W. Lyons, and R. E. Orville, 2012: Lightning-triggered upward lightning from towers in Rapid City, South Dakota. Preprints, *22nd International Lightning Detection Conf.*, Broomfield, CO, Vaisala, 9 pp. [Available online at <http://www.vaisala.com/en/events/ildcilmc/Documents/Tower%20Studies/Triggered%20Upward%20Lightning%20from%20Towers%20in%20Rapid%20City,%20South%20Dakota.pdf>.]
- Clabo, D. R., and M. J. Bunkers, 2011: Using variable column precipitable water as a predictor for large fire potential. Preprints, *Ninth Symposium on Fire and Forest Meteorology*, Palm Springs, CA, Amer. Meteor. Soc., 11.6. [Available online at [http://ams.confex.com/ams/9FIRE/webprogram/Manuscript/Paper192266/P11-19\(final\).pdf](http://ams.confex.com/ams/9FIRE/webprogram/Manuscript/Paper192266/P11-19(final).pdf).]
- Bunkers, M. J., 2010: How midlevel horizontal humidity gradients affect simulated storm morphology. Preprints, *25th Conf. on Severe Local Storms*, Denver, CO, Amer. Meteor. Soc., P7.1. [Available online at <https://ams.confex.com/ams/pdffiles/175623.pdf>.]
- Bunkers, M. J., 2006: An observational assessment of off-hodograph deviations for use in operational supercell motion forecasting methods. Preprints, *23rd Conf. on Severe Local Storms*, St. Louis, MO, Amer. Meteor. Soc., 8.6. [Available online at <http://ams.confex.com/ams/pdffiles/115414.pdf>.]
- Lindsey, D. T., and M. J. Bunkers, 2004: On the motion and interaction between left-moving and right-moving supercells on 4 May 2003. Preprints, *22nd Conf. on Severe Local Storms*, Hyannis, MA, Amer. Meteor. Soc., 12.2. [Available online at <http://ams.confex.com/ams/pdffiles/81463.pdf>.]
- Bunkers, M. J., B. A. Klimowski, and J. W. Zeitler, 2002: The importance of parcel choice and the measure of vertical wind shear in evaluating the convective environment. Preprints, *21st Conf. on Severe Local Storms*, San Antonio, TX, Amer. Meteor. Soc., P8.2. [Available online at <https://ams.confex.com/ams/pdffiles/47319.pdf>.]
- Bunkers, M. J., J. S. Johnson, J. M. Grzywacz, L. J. Czepyha, and B. A. Klimowski, 2002: A preliminary investigation of supercell longevity. Preprints, *21st Conf. on Severe Local Storms*, San Antonio, TX, Amer. Meteor. Soc., 16.6. [Available online at <https://ams.confex.com/ams/pdffiles/47315.pdf>.]
- Yu, X., M. A. Magsig, and M. J. Bunkers, 2002: Enhancements to a new convective sounding analysis program for AWIPS. Preprints, *21st Conf. on Severe Local Storms*, San Antonio, TX, Amer. Meteor. Soc., JP1.7. [Available online at <https://ams.confex.com/ams/pdffiles/47526.pdf>.]
- Zeitler, J. W., and M. J. Bunkers, 2002: Anticipating and monitoring supercell motion for severe weather operations. Preprints, *21st Conf. on Severe Local Storms*, San Antonio, TX, Amer. Meteor. Soc., JP1.3. [Available online at <https://ams.confex.com/ams/pdffiles/46635.pdf>.]
- Bunkers, M. J., 2002: A new convective sounding analysis program for AWIPS. Preprints, *18th International Conference on Interactive Information and Processing Systems (IIPS)*, Orlando, FL, Amer. Meteor. Soc., P1.15. [Available online at <https://ams.confex.com/ams/pdffiles/29861.pdf>.]
- Bunkers, M. J., and J. W. Zeitler, 2000: On the nature of highly deviant supercell motion. Preprints, *20th Conf. on Severe Local Storms*, Orlando, FL, Amer. Meteor. Soc., 236–239. [Available online at <https://ams.confex.com/ams/Sept2000/webprogram/Paper16299.html>.]
- Bunkers, M. J., L. R. Johnson, J. R. Miller, and C. Hull-Sieg, 1999: Old Black Hills Ponderosa Pines tell a story. *Proc. of the South Dakota Academy of Science*, **78**, 149–162. [Available online at https://www.fs.fed.us/rm/pubs_other/rmrs_1999_bunkers_m001.pdf.]

- Bunkers, M. J., B. A. Klimowski, J. W. Zeitler, R. L. Thompson, and M. L. Weisman, 1998: Predicting supercell motion using hodograph techniques. Preprints, *19th Conf. on Severe Local Storms*, Minneapolis, MN, Amer. Meteor. Soc., 611–614.
- Zeitler, J. W., and M. J. Bunkers, 1998: Shallow arctic air masses and the Black Hills—interactions, inversions, and societal impacts. Preprints, *Eighth Conf. on Mountain Meteorology*, Flagstaff, AZ, Amer. Meteor. Soc., 396–400.
- Bunkers, M. J., 1996: Examination of the preconvective environment associated with a severe nontornadic supercell: Variations in CAPE and SREH. Preprints, *18th Conf. on Severe Local Storms*, San Francisco, CA, Amer. Meteor. Soc., 703–707.
- Hintz, D. L., and M. J. Bunkers, 1995: Examination of an apparent landspout in the eastern Black Hills of western South Dakota. NOAA/NWS CR Tech. Attach. 95–08, 11 p.
- Bunkers, M. J., and J. R. Miller Jr., 1994: How to crack the crystal ball of weather forecasts. *Dakota Farmer*, **112**, 26–27.
- Bunkers, M. J., J. R. Miller Jr., C. H. Sieg, and A. T. DeGaetano, 1993: A comparison of divisional growing season drought between western and southeastern South Dakota. *Proc. of the South Dakota Academy of Science*, **72**, 141–160.
- Bunkers M., E. Cook, D. Gabor, G. Garfin, D. Stahle, and R Villalba, 1992. Frost rings in bristlecone pine, Mt. Goliath, Colorado. Preprints, *Third Annual North American Dendrochronological Fieldweek 31 July – 8 August, 1992*, Nederland, CO, University of Colorado Mountain Research Station, 13 pp.