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## PEER-REVIEWED PUBLICATIONS

- Bunkers, M., and Coauthors, 2023: Advantages to writing shorter articles. *Wea. Forecasting*, **38**, 389–390, <https://doi.org/10.1175/WAF-D-23-0022.1>.
- 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, <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, <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. Miyanishi, Eds., Academic Press, 65–115, <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, <https://doi.org/10.1175/WAF-D-20-0168.1>.
- Bunkers, M. J., S. R. Flegel, 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, <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, <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, <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, <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, <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**, 115–129, <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, <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, <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**, 1–2, <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, <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, <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, <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, <https://doi.org/10.55599/ejssm.v2i2.7>.
- Bunkers, M. J., J. S. Johnson, L. J. Czepyha, 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, <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, <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, <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, [http://dx.doi.org/10.1175/1520-0434\(2004\)019%3C0727:ROOTEE%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0434(2004)019%3C0727:ROOTEE%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, [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, [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, [http://dx.doi.org/10.1175/1520-0434\(2002\)017%3C1111:COSSOA%3E2.0.CO;2](http://dx.doi.org/10.1175/1520-0434(2002)017%3C1111:COSSOA%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, [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, [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, [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, [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.

## **OTHER 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](http://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/pdfpapers/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/pdfpapers/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/pdfpapers/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/pdfpapers/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/pdfpapers/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/pdfpapers/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/pdfpapers/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/pdfpapers/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](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.