

Mark Donald Schwartz

Education

- Ph.D. 1985 Geography (Climatology), University of Kansas
Dissertation: *The Advance of Phenological Spring across Eastern and Central North America*
- M.S. 1982 Geography (Climatology), Michigan State University
- B.S. (with honor) 1980 Lyman Briggs College (Earth Science Field of Concentration)
Michigan State University

Major Honors and Awards

- 2019: American Association of Geographers (AAG) Fellow
2019: AAG Climate Specialty Group (CSG) Lifetime Achievement Award
2019: Amer. Meteorological Society Award for Outstanding Achievement in Biometeorology
2017: Nomination as National Councilor, AAG (not elected)
2015: Univ. of Wisconsin-Milwaukee (UWM) Distinguished University Service Award, \$1500
2015: Dist. Alumni Award/Commencement Speaker, Lyman Briggs College, Mich. State Univ.
2010: Appointment as a UWM Distinguished Professor
2007: Paper of the Year Award, AAG CSG, \$250
2005: AAG R. F. Abler Distinguished Service Honors
2000: UWM Foundation and Graduate School Excellence in Research Award, \$1500
1992: Sigma Xi, The Scientific Research Society, promotion to full membership
1982: Michigan State University, Phi Kappa Phi Honor Society

Professional Memberships

- American Association for the Advancement of Science (AAAS)
American Association of Geographers (AAG)
American Geophysical Union (AGU)
American Meteorological Society (AMS)
International Society of Biometeorology (ISB)
Phi Kappa Phi Honor Society (ΦΚΦ)
Sigma Xi (The Scientific Research Society)
Wisconsin Phenological Society (WPS)

Major Research Grants

- 2020: Collaborative Research: MRA: Quantifying phenological coherence and seasonal predictability across NEON and USA-NPN monitoring sites, National Science Foundation (DEB-2017831, 2017815, & 2017848), Macrosystems Biology and NEON-Enable Science program (\$962,403, UWM budget \$523,202) awarded for January 2021 - December 2023 (with T. Ault, T. Crimmins, A. Donnelly, and R. Ross).
- 2018: Chequamegon heterogeneous ecosystem energy-balance study enabled by a high-density extensive array of detectors, National Science Foundation (AGS-1822420), Atmospheric and Geospace Sciences division (with A. Desai, G. Petty, S. Metzger, and P. Townsend), UW-Madison (\$1,495,767, UWM sub-award budget \$80,274) awarded for August 2018 - July 2021.
- 2012: Bridging spatial scales using phenological measurements to improve understanding of autumn atmosphere-biosphere interactions, National Science Foundation (BCS-1157215), Geography and Regional Science program (\$74,273) awarded for July 2012 - December 2014.
- 2007a: RCN: USA National Phenology Network, National Science Foundation (IOS-0639794), Integrative Organismal Biology division (UWM Budget \$499,999) awarded for March 2007 - February 2014 (with Susan Mazer, UC-Santa Barbara).
- 2007b: Bridging spatial scales using phenological measurements to improve understanding of springtime atmosphere-biosphere interactions, National Science Foundation (BCS-0649380), Geography and Regional Science program (\$232,025) awarded for March 2007 - August 2011 (Additional \$20,341 supplement awarded, BCS-0937735, August 2009).
- 2006: National Phenological Research Center, Research Growth Initiative, UW-Milwaukee (\$80,140) awarded for July 2006 – June 2007
- 2001: Collaborative Research: Connecting Spring Phenology with Lower Atmospheric Energy-Mass Exchange, Phase Two, National Science Foundation (ATM-0085224), Climate Dynamics and Geography and Regional Science programs (UWM Budget \$159,999) awarded for March 2001 - September 2004 (with David Fitzjarrald, University at Albany)
- 1998: Connecting Spring Phenology with Lower Atmospheric Energy-Mass Exchange, National Science Foundation (ATM-9809460), Climate Dynamics program (\$188,122) awarded for October 1998 - September 2001 (Additional \$3,700 supplement awarded March 1999)
- 1995: Connecting Satellite and Surface Measures of Spring's Onset, National Science Foundation (ATM-9510342), Climate Dynamics program (\$126,735) awarded for August 1995 - July 1999
- 1994: Development of a Phenological Model to Predict Peach Maturity from Meteorological Variables (with G. Carbone and G. Reighard), Southeast Regional Climate Center (\$80,000, UWM Budget \$33,669) awarded for June 1994 - May 1996

Workshop Grants

- 2007: 2nd National Phenology Network (NPN) Planning Workshop, National Science Foundation (DBI-0646864), NEON Program (\$44,525) awarded for January 2007 - December 2007 (with Julio Betancourt, USGS/University of Arizona) The workshop was held 9-13 October 2006 in Milwaukee, WI.
- 2006a: 2nd National Phenology Network (NPN) Planning Workshop, National Aeronautics and Space Administration, (\$5,000) awarded for September 2006 - November 2006 (with Julio Betancourt, USGS/University of Arizona) The workshop was held 9-13 October 2006 in Milwaukee, WI.
- 2006b: 2nd National Phenology Network (NPN) Planning Workshop, U.S. Fish and Wildlife Service, (\$5,000) awarded for October 2006 (with Julio Betancourt, USGS/University of Arizona) The workshop was held 9-13 October 2006 in Milwaukee, WI.
- 2006c: 2nd National Phenology Network (NPN) Planning Workshop, U.S. Geological Survey, (\$5,000) awarded for October 2006 - September 2006 (with Julio Betancourt, USGS/University of Arizona) The workshop was held 9-13 October 2006 in Milwaukee, WI.
- 2005: National Phenology Network (NPN) Planning Workshop, National Science Foundation (DEB-0531968), Ecology Program (no UWM Budget, \$27,562 awarded to the University of Arizona, along with \$5,000 each from EPA, NPS, USDA-FS, and USGS) for May 2005 - January 2006 (with Julio Betancourt, USGS/University of Arizona) The workshop was held 22-26 August 2005 in Tucson, AZ.

Books

- Schwartz, M. D. (editor), 2013: *Phenology: An Integrative Environmental Science*, 2nd edition. Springer, Netherlands, 610 pp.
- Schwartz, M. D. (editor), 2003: *Phenology: An Integrative Environmental Science*. Kluwer, Netherlands, 592 pp.
- Lieth, H. and M. D. Schwartz (editors), 1997: *Phenology of Seasonal Climates*. Backhuys, Netherlands, 146 pp.

Book Chapters

- Schwartz, M. D. & L. Liang, 2019: Finding and Analysing Long-term Climate Data. In *Effects of Climate Change on Birds*, 2nd Edition, P. O. Dunn and A. P. Møller, editors, pp. 29-36. Oxford University Press, UK.

- Schwartz, M. D., 2017: Phenology. In *The International Encyclopedia of Geography*, D. Richardson, N. Castree, M. F. Goodchild, A. Kobayashi, W. Liu, & R. A. Marston, editors, John Wiley & Sons, USA.
- Schwartz, M. D., 2013: Introduction. In *Phenology: An Integrative Environmental Science*, 2nd Edition, M. D. Schwartz, editor, pp. 1-5. Springer, Netherlands.
- Schwartz, M. D., Beaubien, E. G., Crimmins, T. M., & J. F. Weltzin, 2013: North America. In *Phenology: An Integrative Environmental Science*, 2nd Edition, M. D. Schwartz, editor, pp. 67-89. Springer, Netherlands.
- Schwartz, M. D. & L. Liang, 2013: High-Resolution Phenological Data. In *Phenology: An Integrative Environmental Science*, 2nd Edition, M. D. Schwartz, editor, pp. 351-365. Springer, Netherlands.
- Schwartz, M. D., & J. L. Betancourt, 2010: Genesis and Progress toward a National Phenology Network for the USA. In *Phenological Research: Methods for Environmental and Climate Change Analysis*, I. L. Hudson and M. R. Keatley, editors, pp. 45-50. Springer, New York.
- Reed, B. C., Schwartz, M. D., & X. Xiao, 2009: Remote Sensing Phenology: Status and the Way Forward. In *Phenology of Ecosystem Processes*, A. Noormets, editor, pp. 231-246. Springer, Netherlands.
- Schwartz, M. D., 2007: Seasonality. In *The American Midwest: An Interpretive Encyclopedia*, R. Sisson, C. Zacher, and A. Cayton, editors, pp. 80-82. Indiana University Press, Bloomington.
- Schwartz, M. D., & W. T. Corcoran, 2005: Airmass Climatology. In *Encyclopedia of World Climatology*, J. E. Oliver, editor, pp. 16-21. Springer, Netherlands.
- Schwartz, M. D., 2005: Spring Green Wave. In *Encyclopedia of World Climatology*, J. E. Oliver, editor, pp. 684-685. Springer, Netherlands.
- Schwartz, M. D., 2004: Global Change and Assessment of the Onset of Spring. In *WorldMinds: Geographical Perspective on 100 Problems*, D. G. Janelle, B. Warf, and K. Hansen, editors, pp. 475-480. Kluwer, Netherlands.
- Schwartz, M. D., 2003: Introduction. In *Phenology: An Integrative Environmental Science*, M. D. Schwartz, editor, pp. 3-7. Kluwer, Netherlands.
- Schwartz, M. D., 2003: Phenoclimatic Measures. In *Phenology: An Integrative Environmental Science*, M. D. Schwartz, editor, pp. 331-343. Kluwer, Netherlands.
- Schwartz, M. D., & E. Beaubien, 2003: North America. In *Phenology: An Integrative Environmental Science*, M. D. Schwartz, editor, pp. 57-73. Kluwer, Netherlands.
- Schwartz, M. D., 1997: Spring Index Models: An Approach to Connecting Satellite and Surface Phenology. In *Phenology of Seasonal Climates*, H. Lieth and M. D. Schwartz, editors, pp. 23-38. Backhuys, Netherlands.
- White, M. A., Brunsell, N., & M. D. Schwartz, 2003: Vegetation Phenology in Global Change Studies. In *Phenology: An Integrative Environmental Science*, M. D. Schwartz, editor, pp. 453-466. Kluwer, Netherlands.

- Qian, S., Chen, X., Lang, W., & M. D. Schwartz: Examining Spring Phenological Responses to Temperature Variations during Different Periods in Subtropical and Tropical China. *International Journal of Climatology* (published online, DOI: <https://doi.org/10.1002/joc.6918>).
- Butterworth, B. J., Desai, A. R., Metzger, S., Townsend, P. A., Schwartz, M. D., Petty, G. W., Mauder, M., Vogelmann, H., Andresen, C. G., Augustine, T. J., Bertram, T. H., Brown, W. O. J., Burban, M., Cleary, P., Durden, D. J., Florian, C. R., Ruiz Guzman, E., Iglinski, T. J., Kruger, E. L., Lantz, K., Lee, T. R., Meyers, T. P., Mineau, J. K., Olson, E. R., Oncley, S. P., Paleri, S., Pertzborn, R. A., Pettersen, C., Plummer, D. M., Riihimaki, L., Sedlar, J., Smith, E. N., Speidel, J., Stoy, P. C., Sührling, M., Thom. J. E., Turner, D. D., Vermeuel, M. P., Wagner, T. J., Wang, Z., Wanner, L., White, L. D., Wilczak, J. M., Wright, D. B., & T. Zheng, 2021: Connecting Land-Atmosphere Interactions to Surface Heterogeneity in CHEESEHEAD 2019. *Bulletin of the American Meteorological Society* **Feb.**: E421-445, DOI: <https://doi.org/10.1175/BAMS-D-19-0346.1>.
- Jiang, M., Chen, X., & M. D. Schwartz, 2020: Why don't phenophase dates in the current year affect the same phenophase dates in the next year? *International Journal of Biometeorology* **64**(9): 1549-1560.
- Gerst, K. L., Crimmins, T. M., Posthumus, E. E., Rosemartin, A. H., & M. D. Schwartz, 2020: How Well Do the Spring Indices Predict Phenological Activity Across Plant Species? *International Journal of Biometeorology* **64**(5): 889-901.
- Zhao, B., Donnelly, A., & M. D. Schwartz, 2020: Evaluating Autumn Phenology Derived from Field Observations, Satellite Data, and Carbon Flux Measurements in a Northern Mixed Forest, USA. *International Journal of Biometeorology* **64**(5): 713-727.
- Donnelly, A., Yu, R., Liu, L., Hanes, J. M., Liang, L., Schwartz, M. D., & A. R. Desai, 2019: Comparing *In-situ* Leaf Observations in Early Spring with Flux Tower CO₂ Exchange MODIS EVI and Modeled LAI in a Northern Mixed Forest. *Agricultural and Forest Meteorology* **278**(15 Nov.): 107673.
- Ren, S., Chen, X., Lang, W., & M. D. Schwartz, 2018: Climatic Controls of the Spatial Patterns of Vegetation Phenology in Mid-Latitude Grasslands of the Northern Hemisphere. *Journal of Geophysical Research: Biogeosciences* **123**(8): 2323-2336. <https://doi.org/10.1029/2018JG004616>
- Izquierdo-Verdiguier, E., Zurita-Milla, R., Ault, T. R., & M. D. Schwartz, 2018: Development and Analysis of Spring Plant Phenology Products: 36 Years of 1-km Grids over the Conterminous US. *Agricultural and Forest Meteorology* **262**: 34-41.
- Donnelly, A., Yu, R., Caffarra, A., Hanes, J., Liang, L., Desai, A. R., Liu, L., & M. D. Schwartz, 2017: Interspecific and Interannual Variation in the Duration of Spring Phenophases in a Northern Mixed Forest. *Agricultural and Forest Meteorology* **243**: 55-67.
- Monahan, W. B., Rosemartin, A., Gerst, K. L., Fisichelli, N. A., Ault, T., Schwartz, M. D., Gross, J. E., & J. F. Weltzin, 2016: Climate Change is Advancing Spring Onset across the U.S. National Park System. *Ecosphere* **7**(10): e01465.

- Elmendorf, S. C., Jones, K. D., Cook, B. I., Diez, J. M., Enquist, C. A. F., Hufft, R. A., Jones, M. O., Mazer, S. J., Miller-Rushing, A. J., Moore, D. J. P., Schwartz, M. D., & J. F. Weltzin, 2016: The Plant Phenology Monitoring Design for the National Ecological Observatory Network. *Ecosphere* **7**(4): e01303.
- Liang, L., Schwartz, M. D., & X. Zhang, 2016: Mapping Temperate Vegetation Climate Adaptation Variability Using Normalized Land Surface Phenology. *Climate* **4**(24): doi:10.3390/cli4020024.
- Yu, R., Schwartz, M. D., Donnelly, A., & L. Liang, 2016: An Observation-based Progression Modeling Approach to Spring and Autumn Deciduous Tree Phenology. *International Journal of Biometeorology* **60**(3): 335-349.
- Ault, T. R., Schwartz, M. D., Zurita-Milla, R., Weltzin, J. F., & J. L. Betancourt, 2015: Trends and Natural Variability of North American Spring Onset as Evaluated by a New Gridded Dataset of Spring Indices. *Journal of Climate* **28**(21): 8363-8378.
- Ault, T. R., Zurita-Milla, R., & M. D. Schwartz, 2015: A Matlab Toolbox for Calculating Spring Indices from Daily Meteorological Data. *Computers & Geosciences* **83**: 46-53.
- Chen, X., An, S., Inouye, D. W., & M. D. Schwartz, 2015: Temperature and Snowfall Trigger Alpine Vegetation Green-up on the World's Roof. *Global Change Biology* **21**(10): 3635-3646.
- Liu, L., Liang, L., Schwartz, M. D., Donnelly, A., Wang, Z., Schaaf, C. B., & L. Liu, 2015: Evaluating the Potential of MODIS Satellite Data to Track Temporal Dynamics of Autumn Phenology in a Temperate Mixed Forest. *Remote Sensing of Environment* **160**(1): 156-165.
- Park, I. W., & M. D. Schwartz, 2015: Long-term Herbarium Records Reveal Temperature Dependent Changes in Flowering Phenology in the Southeastern United States. *International Journal of Biometeorology* **59**(3): 347-355.
- Denny, E. G., Gerst, K. L., Miller-Rushing, A. J., Tierney, G. L., Crimmins, T. M., Enquist, C. A. F., Guertin, P., Rosemartin, A. H., Schwartz, M. D., Thomas, K. A., & J. F. Weltzin, 2014: Standardized Phenology Monitoring Methods to Track Plant and Animal Activity for Science and Resource Management Applications. *International Journal of Biometeorology* **58**(4): 591-601.
- Liang, L., & M. D. Schwartz, 2014: Testing a Growth Efficiency Hypothesis with Continental-scale Phenological Variations of Common and Cloned Plants. *International Journal of Biometeorology* **58**(10): 1789-1797.
- Liang, L., Schwartz, M. D., Wang, Z., Gao, F., Schaaf, C. B., Tan, B., Morissette, J. T., & X. Zhang, 2014: A Cross Comparison of Spatiotemporally Enhanced Springtime Phenological Measurements from Satellites and Ground in a Northern U.S. Mixed Forest. *IEEE Transactions on Geoscience and Remote Sensing* **52**(12): 7513-7526.
- Liu, L., Liu, L., Liang, L., Donnelly, A., Park, I., & M. D. Schwartz, 2014: Effects of Elevation on Spring Phenological Sensitivity to Temperature in Tibetan Plateau Grasslands. *Chinese Science Bulletin* **59**(34): 4856-4863.
- Schwartz, M. D., Hanes, J. M., & L. Liang, 2014: Separating Temperature from Other Factors in Phenological Measurements. *International Journal of Biometeorology* **58**(7): 1699-1704.

- Ault, T. R., Henebry, G. M., de Beurs, K. M., Schwartz, M. D., Betancourt, J. L., & D. Moore, 2013: The False Spring of 2012, Earliest in North American Record. *Eos Transactions AGU* **94**(20, 14 May): 181-182.
- Davies, T. J., Wolkovich, E. M., Kraft, N. J. B., Salamin, N., Allen, J. M., Ault, T. R., Betancourt, J. L., Bolmgren, K., Cleland, E. E., Cook, B. I., Crimmins, T. M., Mazer, S. J., McCabe, G. J., Pau, P., Regetz, J., Schwartz, M. D., & S. Travers, 2013: Phylogenetic Conservatism in Plant Phenology. *Journal of Ecology* **101**(6): 1520-1530.
- McCabe, G. J., Betancourt, J. L., Pederson, G. T., & M. D. Schwartz, 2013: Variability Common to First Leaf Dates and Snowpack in the Western Conterminous United States. *Earth Interactions* **17**: 1-18.
- Schwartz, M. D., Ault, T. R., & J. L. Betancourt, 2013: Spring Onset Variations and Trends in the Continental USA: Past and Regional Assessment Using Temperature-Based Indices. *International Journal of Climatology* **33**(11): 2917-2922.
- Schwartz, M. D., Hanes, J. M., & L. Liang, 2013: Comparing Carbon Flux and High-resolution Spring Phenological Measurements in a Northern Mixed Forest. *Agricultural and Forest Meteorology* **169**: 136-147.
- Cook, B. I., Wolkovich, E. M., Davies, T. J., Ault, T. R., Betancourt, J. L., Allen, J. M., Bolmgren, K., Cleland, E. E., Crimmins, T. M., Kraft, N. J. B., Lancaster, L. T., Mazer, S. J., McCabe, G. J., McGill, B. J., Parmesan, C., Pau, S., Regetz, J., Salamin, N., Schwartz, M. D., & S. E. Travers, 2012: Sensitivity of Spring Phenology to Warming across Temporal and Spatial Climate Gradients in Two Independent Databases. *Ecosystems* **15**(8): 1283-1294.
- Liang, L., Schwartz, M. D., & S. Fei, 2012: Photographic Assessment of Temperate Forest Understory Phenology in Relation to Springtime Meteorological Drivers. *International Journal of Biometeorology* **56**(2): 343-355.
- McCabe, G. J., Ault, T. R., Cook, B. I., Betancourt, J. L., & M. D. Schwartz, 2012: Influences of ENSO and PDO on the Timing of North American Spring. *International Journal of Climatology* **32**(15): 2301-2310.
- Schwartz, M. D., Betancourt, J. L., & J. F. Weltzin, 2012: From Caprio's Lilacs to the USA National Phenology Network. *Frontiers in Ecology and the Environment* **10**(6): 324-327.
- Wolkovich, E. M., Cook, B. I., Allen, J. M., Crimmins, T. M., Travers, S. Pau, S., Regetz, J., Davies, T. J., Betancourt, J. L., Kraft, N. J. B., Ault, T. R., Bolmgren, K., Mazer, S. J., McCabe, G. J., McGill, B. J., Parmesan, C., Salamin, N., Schwartz, M. D., & E. E. Cleland, 2012: Warming Experiments Underpredict Plant Phenological Responses to Climate Change. *Nature* **485**(7399): 494-497.
- Ault, T. R., Macalady, A. K., Pederson, G. T., Betancourt, J. L., & M. D. Schwartz, 2011: Northern Hemisphere Modes of Variability and the Timing of Spring in Western North America. *Journal of Climate* **24**(15): 4003-4014.
- Hanes, J. M., & M. D. Schwartz, 2011: Modeling the Spring Phenology of a Mixed Temperate Forest using MODIS Measurements of Leaf Area Index and Land Surface Temperature. *Theoretical and Applied Climatology* **105**(1-2): 37-50.

- Liang, L., Schwartz, M. D., & S. Fei, 2011: Validating Satellite Phenology through Intensive Ground Observation and Landscape Scaling in a Mixed Seasonal Forest. *Remote Sensing of Environment* **115**(1): 143-157.
- Schwartz, M.D., & J.M. Hanes, 2010: Continental-scale Phenology: Warming and Chilling. *International Journal of Climatology* **30**(11): 1595-1598.
- Schwartz, M. D., & J. M. Hanes, 2010: Intercomparing Multiple Measures of the Onset of Spring in Eastern North America. *International Journal of Climatology* **30**(11): 1614-1626.
- Liang, L., & M. D. Schwartz, 2009: Landscape Phenology: An Integrative Approach to Seasonal Vegetation Dynamics. *Landscape Ecology* **24**(4): 465-472.
- White, M. A., de Beurs, K. M., Didan, K., Inouye, D. W., Richardson, A. D., Jensen, O. P., O'Keefe, J., Zhang, G., Nemani, R. R., van Leeuwen, W. J. D., Brown, J. F., de Wit, A., Schaepman, M., Lin, X., Dettinger, M., Bailey, A., Kimball, J., Schwartz, M. D., Baldocchi, D. D., Lee, J. T., & W. K. Lauenroth, 2009: Intercomparison, Interpretation, and Assessment of Spring Phenology in North America Estimated from Remote Sensing for 1982 to 2006. *Global Change Biology* **15**(10): 2335-2359.
- Hayhoe, K., Wake, C., Huntington, T. G., Luo, L., Schwartz, M. D., Sheffield, J., Wood, E., Anderson, B., Bradbury, J., DeGaetano, A., Troy, T. J., & D. Wolfe, 2007: Past and Future Changes in Climate and Hydrological Indicators in the U.S. Northeast. *Climate Dynamics* **28**(4): 381-407.
- Kathuroju, N., White, M. A., Symanzik, J., Schwartz, M. D., Powell, J. A., & R. R. Nemani, 2007: On the Use of the Advanced Very High Resolution Radiometer for Development of Prognostic Land Surface Phenology Models. *Ecological Modelling* **201**(2): 144-156.
- Schwartz, M. D., Ahas, R., & A. Aasa, 2006: Onset of Spring Starting Earlier Across the Northern Hemisphere. *Global Change Biology* **12**(2): 343-351.
- Borchert, R., Robertson, K., Schwartz, M. D., & G. Williams-Linera, 2005: Phenology of Temperate Trees in Tropical Climates. *International Journal of Biometeorology* **50**(1): 57-65.
- Wolfe, D. W., Schwartz, M. D., Lasko, A. N., Otsuki, Y., Pool, R. M., & N. J. Shaulis, 2005: Climate Change and Shifts in Spring Phenology of Three Horticultural Woody Perennials in Northeastern USA. *International Journal of Biometeorology* **49**(5): 303-309.
- Zhao, T., & M. D. Schwartz, 2003: Examining the Onset of Spring in Wisconsin. *Climate Research* **24**(1): 59-70.
- Lennartson, G. J., & M. D. Schwartz, 2002: The Lake Breeze–Ground-Level Ozone Connection in Eastern Wisconsin: A Climatological Perspective. *International Journal of Climatology* **22**(11): 1347-1364.
- Schwartz, M. D., & X. Chen, 2002: Examining the Onset of Spring in China. *Climate Research* **21**(2): 157-164.
- Schwartz, M. D., Reed, B. R., & M. A. White, 2002: Assessing Satellite-Derived Start-of-Season Measures in the Conterminous USA. *International Journal of Climatology* **22**(14): 1793-1805.
- Schwartz, M. D., & T. M. Crawford, 2001: Detecting Energy-Balance Modifications at the Onset of Spring. *Physical Geography* **21**(5): 394-409.

- Chen, X., Tan, Z., Schwartz, M. D., & C. Xu, 2000: Determining the Growing Season of Land Vegetation Based on Plant Phenology and Satellite Data in Northern China. *International Journal of Biometeorology* **44**(2): 97-101.
- Schwartz, M. D., & B. E. Reiter, 2000: Changes in North American Spring. *International Journal of Climatology* **20**(8): 929-932.
- White, M. A., Schwartz, M. D., & S. W. Running, 2000: Young Students, Satellites Aid Understanding of Climate-Biosphere Link. *Eos Transactions AGU* **81**(1, 4 January): 1&5, (American Geophysical Union's weekly newspaper of geophysics, which carries referred articles on current research) and republished in *Earth in Space* **12**(4, December 1999): 4-7, (magazine for teachers and students of science).
- Lennartson, G. J., & M. D. Schwartz, 1999: A Synoptic Climatology of Surface-Level Ozone in Eastern Wisconsin. *Climate Research* **13**(3): 207-220.
- Schwartz, M. D., & B. C. Reed, 1999: Surface Phenology and Satellite Sensor-Derived Onset of Greenness: An Initial Comparison. *International Journal of Remote Sensing* **20**(17): 3451-3457.
- Schwartz, M. D. 1998: Green-wave Phenology. *Nature* **394** (6696): 839-840.
- Schwartz, M. D., Carbone, G. J., Reighard G. L., & W. R. Okie, 1997: Models to Predict Peach Phenology from Meteorological Variables. *HortScience* **32**(2): 213-216.
- Schwartz, M. D. 1996: An Air Mass-Based Approach to Regional GCM Validation. *Climate Research* **6**(3): 227-235.
- Schwartz, M. D. 1996: Examining the Spring Discontinuity in Daily Temperature Ranges. *Journal of Climate* **9**(4): 803-808.
- Schwartz, M. D. 1995: Detecting Structural Climate Change: An Air Mass-Based Approach in the North Central United States, 1958-1992. *Annals of the Association of American Geographers* **85**(3): 553-568.
- Schwartz, M. D. 1994: Monitoring Global Change with Phenology: The Case of the Spring Green Wave. *International Journal of Biometeorology* **38**(1): 18-22.
- Schwartz, M. D., & B. R. Skeeter, 1994: Linking Air Mass Analysis to Daily and Monthly Mid-Tropospheric Flow Patterns. *International Journal of Climatology* **14**(4): 439-464.
- Carbone G. J., & M. D. Schwartz, 1993: The Potential Impact of Winter Temperature Increases on South Carolina Peach Production. *Climate Research* **2** (3): 225-233.
- Schwartz, M. D. 1993: Assessing the Onset of Spring: A Climatological Perspective. *Physical Geography* **14**(6): 536-550.
- Schwartz, M. D. 1992: Phenology and Springtime Surface Layer Change. *Monthly Weather Review* **120**(11): 2570-2578.
- Schwartz, M. D. 1991: An Integrated Approach to Air Mass Classification in the North Central United States. *The Professional Geographer* **43**(1): 77-91.
- Schwartz, M. D. 1990: Detecting the Onset of Spring: A Possible Application of Phenological models. *Climate Research* **1**(1): 23-29.
- Schwartz, M. D. 1990: Meteorological Causes of the 1881 Fire in Michigan's Thumb Area. *Weather and Forecasting* **5**(1): 148-157.
- Schwartz, M. D., & T. R. Karl, 1990: Spring Phenology: Nature's Experiment to Detect the Effect of "Green-up" on Surface Maximum Temperatures. *Monthly Weather Review* **118**(4): 883-890.

- Schwartz, M. D., & G. A. Marotz, 1988: Synoptic Events and Spring Phenology. *Physical Geography* **9**(2): 151-161.
- Harman, J. R., & M. D. Schwartz, 1987: Climatology of Heavy Snowfall in the Interior Lower Peninsula of Michigan. *East Lakes Geographer* **22**: 190-202.
- Schwartz, M. D., & G. A. Marotz, 1986: An Approach to Examining Regional Atmosphere-Plant Interactions with Phenological Data. *Journal of Biogeography* **13**(5): 551-560.
- Schwartz, M. D., Harman J. R., & G. A. Marotz, 1985: Air Mass Characteristics over the North Central United States. *Geographic Perspectives* **13**(56): 13-26.
- Li. X., Ault, T., Zurita-Milla, R., & M. D. Schwartz: Characterizing Interannual to Multi-Decadal Variability in the Seasonal Window of Spring Onset across the Northern Hemisphere. Under revision.

Peer Reviewed Review Articles in Journals

- Cleland, E. E., Chuine, I., Menzel, A., Mooney, H. A., & M. D. Schwartz, 2007: Shifting plant phenology in response to global change. *Trends in Ecology and Evolution* **22**(7): 357-365.
- Schwartz, M. D. 1999: Advancing to Full Bloom: Planning Phenological Research for the 21st Century. *International Journal of Biometeorology* **42**(3): 113-118.

Selected Other Publications

- Rosemartin, A. H., Denny, E. G., Weltzin, J. F., Marsh, R. L., Wilson, B. E., Mehdipoor, H., Zurita-Milla, R., & M. D. Schwartz, 2015: Lilac and Honeysuckle Phenology Data 1956-2014. *Scientific Data* **2**: 150038.
- Schwartz, M. D., Enquist, C. A. F., & E. G. Denny, 2013: Phenological Implications of Warming Temperatures and Extreme Climatic Events. *Eos Transactions AGU* **94**(10, 5 March): 99.
- Enquist, C. A. F., Rosemartin, A., & M. D. Schwartz, 2012: Identifying and Prioritizing Phenological Data Products and Tools. *Eos Transactions AGU* **93**(37, 11 September): 356.
- Wang, X. L., Peterson, T. C., Lawrimore, J., Brunet-India, M., Cerveny, R., Donlon, C., Driouech, F., Wan Hassan, W. A., Hollmann, R., Schwartz, M. D., & Z. Zhang, 2008: Monitoring the Earth's climate. *World Meteorological Organization Bulletin* **57**(2): 75-79.
- Betancourt, J. L., Schwartz, M. D., Breshears, D. D., Brewer, C. A., Frazer, G., Gross, J. E., Mazer, S. J., Reed, B. C., & B. E. Wilson, 2007: Evolving Plans for the USA National Phenology Network. *Eos Transactions AGU* **88**(19, 8 May): 211.
- Betancourt, J. L., Schwartz, M. D., Breshears, D. D., Cayan, D. R., Dettinger, M. D., Inouye, D. W., Post, E., & B. C. Reed, 2005: Implementing a U.S. National Phenology Network. *Eos Transactions AGU* **86**(51, 20 December): 539-541.

- van Vliet, A. J. H., & M. D. Schwartz, 2002: Editorial: Phenology and climate: the timing of life cycle events as indicators of climatic variability and change. *International Journal of Climatology* **22**(14): 1713-1714.
- Schwartz, M. D. 2000: Networking with the Satellites: Perspectives on the Future of Phenology, pp. 169-173. In *Biometeorology and Urban Climatology at the Turn of the Millennium: Selected Papers from the Conference ICB-ICUC'99*, R. J. de Dear, J. D. Kalma, T. R. Oke, and A. Auliciems, eds., WCASP-50, WMO/TD No. 1026, World Meteorological Organization, Geneva.

Professional Service Highlights

- Chair, Board of Directors (became Advisory Committee in 2011), USA National Phenology Network: 2006-2012
- Chair, Climate Specialty Group, Association of American Geographers: 2010-2012
- Chair, Phenology Commission, International Society of Biometeorology (ISB): 1999-2005, 2008-2017 (also Chair, ISB Phenology Study Group: 1996-1999)
- Chair, Program Committee for the meeting of the 16th American Meteorological Society Conference on Biometeorology and Aerobiology, Vancouver, B.C., Canada, August 2004.
- Co-Chair, Organizing Committee, National Phenology Network Planning Workshop: 2005
- Co-Chair, Phenology Commission, International Society of Biometeorology: 2005-2008
- Director, Climate Specialty Group, Association of American Geographers: 1999-2001
- Field Editor for Phenology, *International Journal of Biometeorology*: 2004-present
- Guest Editor (with A. vanVliet), *International Journal of Climatology*, Vol. 22, Issue 14, 2002.
- President, International Society of Biometeorology: 2014-2017
- President, Wisconsin Phenological Society: 1996-present (V. Pres. 1994-1996)
- President-elect, International Society of Biometeorology: 2011-2014
- Review Editor, *Climate Research*: 2001-2006
- Secretary, International Society of Biometeorology: 2008-2013
- Vice-Chair, Advisory Committee, USA National Phenology Network: 2013-2015
- Vice-Chair, Climate Specialty Group, Association of American Geographers: 2008-2010
- Vice-President, International Society of Biometeorology: 2005-2008

University of Wisconsin-Milwaukee Department of Geography Appointments

- Fall 2010 to Present* Distinguished Professor
- Fall 2002 to* Professor; Courses developed: Phys. Climatology, Advanced Remote Sensing
- Spring 2010* Phenology Seminar
- Fall 1996 to* Associate Professor; Courses developed: Applied Climatology, Freshman
- Spring 2002* Seminar, Geographic Techniques Seminar
- Fall 1992 to* Assistant Professor; Courses developed: Intro. Physical Geography,
- Spring 1996* Microclimatology, General Climatology, Remote Sensing, Climates of the Past and Climate Modification, Climatology Seminar