

MARK D. SVOBODA

PERSONAL

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EDUCATION

Ph.D. 2016 University of Nebraska-Lincoln. Natural Resources with Human Dimensions
Specialization

M.A. 1992 University of Nebraska-Lincoln. Geography with Remote Sensing/Climatology/GIS
Specialization

B.S. 1989 University of Nebraska-Lincoln. Geography with Climatology Specialization
Minor for Bachelor's Degree: Meteorology

CURRENT AND PREVIOUS POSITIONS

Director/Associate Research Professor, National Drought Mitigation Center (NDMC), University of Nebraska-Lincoln (UNL), School of Natural Resources (SNR), Lincoln, NE. September 2016-present.

Climatologist/Geoscientist, Monitoring Program Area Leader, National Drought Mitigation Center (NDMC), University of Nebraska-Lincoln (UNL), School of Natural Resources (SNR), Lincoln, NE. July 2011-2016.

Climatologist/Associate Geoscientist, Monitoring Program Area Leader, NDMC (UNL). July 2006-June 2011.

Climatologist/Assistant Geoscientist, NDMC (UNL). February 2004-June 2006

Climatologist, NDMC, University of Nebraska-Lincoln (UNL), June 1995-Jan. 2004

Geographic Information Specialist, USDA-Soil Conservation Service (SCS), Midwest National Technical Center, Lincoln, NE, June 1993-May 1995.

As the NDMC's Director, he administers the research, operational and outreach programs of the NDMC and NOAA's Drought Risk Management Research Center (DRMRC). Mark works closely with federal, tribal, state, basin, local and international officials and governments on drought monitoring early warning information systems, drought impacts, risk management planning and collaborative research. He provides expertise on a wide range of climate/water management issues and is responsible for assessing user product needs and responding to information/data requests. Other duties include supervising the NDMC's various operational decision support tool web site development/maintenance and product creation. Responsibilities also cover handling media interviews and requests for other drought information. Svoboda is involved with drought monitoring, assessment, and prediction committees and activities at the state, regional, tribal, national and international levels. He served as a co-chair for the Monitoring and Prediction Task Group of the Interim National Drought Council and as co-chair of the Monitoring and Prediction working group under the U.S. National Drought Policy Commission. Mark is the co-founder (1999), and continues to work as one of the principal authors, of the weekly U.S. Drought Monitor (<http://droughtmonitor.unl.edu>) and he also serves as one of the primary authors for the monthly North American Drought Monitor. His work with the Core Team of the Western Governors' Association led to the development of a report and recommendations on creating a National Integrated Drought Information System (NIDIS) for the United States. Svoboda sits on the external NOAA NIDIS Implementation Team and was co-chair for the original NIDIS drought portal development as well as assisting in a leadership capacity for NIDIS's regional drought early warning system activities. Mark is internationally known for

his drought monitoring/early warning work and has been a keynote speaker, consultant, advisory board member, or an invited expert for activities in over 50 countries/organizations to date including: World Meteorological Organization (2010, 2014-16), Global Water Partnership (2014-16), USAID (July 2007, 2015-17 in Jordan, Lebanon, Tunisia and Morocco), Caribbean Institute of Meteorology and Hydrology (CIMH/Barbados)(2010-16), Organization of Eastern Caribbean States (2015-16), Brazil/World Bank (2013-15), Morocco/World Bank (2014-15), China (2005 and 2012); Turkey (2011 and 2014-15) Consultant for the United Nation's FAO, Argentina (October 2010); Poland (June 2010), Spain (June 2010 and February 2006), WMO/Mali (2009), Chile (2009), Australia (November 2008), Portugal (Nov 2007), European Commission (July 2007), and the Republic of Korea (2005 and 2012).

AREAS OF RESEARCH INTEREST

drought monitoring, drought early warning and information systems; drought indicators/indices and impacts; "flash drought"; soil moisture and its role in drought monitoring; decision support tool development; water resource issues; GIS and remote sensing applications.

AWARDS AND HONORS

2012—The "Omtvedt Innovation Award" in recognition of exceptional service provided by the NDMC at the University of Nebraska and the Institute of Agriculture and Natural Resources.

PROFESSIONAL AFFILIATIONS, APPOINTMENTS, AND ACTIVITIES

Member of: American Meteorological Society, American Geophysical Union, National Hydrologic Warning Council and American Association of State Climatologists
Member, 2010-2016, American Meteorological Society's Applied Climate Committee
Led Drafting Committee for the AMS's revision of their Drought Information Statement
Member, 2016-present, Integrated Drought Management Programme (IDMP) Advisory Committee for the World Meteorological Organization of the United Nations and the Global Water Partnership
Guest Editor, 2015, Special Issue on Drought in Advances in Meteorology Journal
Contributing author, 2011, United Nations International Strategy for Disaster Reduction (ISDR) Global Assessment Report (GAR11) on Disaster Risk Reduction
Review Editor, 2011-2012, National Climate Assessment, SW Climate Assessment Technical Team
Member, 2011-2015, UNISDR GAR13 and GAR 15 Risk Model Scoping Team on Drought Risk
Member, 2006-present, NOAA-National Integrated Drought Information System (NIDIS) Implementation and Web Portal Development Teams (Co-chair). Also Co-Lead (2013-present) for the Missouri Basin Regional Drought Early Warning System Pilot Program
Faculty Fellow, (2014-present), with the Robert B. Daugherty Water for Food Institute
Faculty Fellow, (2014-present), with the Center for Great Plains Studies
Member, 2011-present, NOAA-Modeling, Analysis, Predictions and Projections Drought Task Force
Co-Chair, 2014-present, NOAA-Modeling, Analysis, Predictions and Projections Drought Task Force 2
Technical Coordinator, 2005, U.S.-China Bilateral Drought Workshop, Beijing, China
Member, 2003-2004, WGA/NOAA NIDIS Core Team
Co-Chair, 2001-2005, Monitoring and Prediction Task Group, Interim National Drought Council
Co-Chair, 1999-2000, Monitoring and Prediction Working Group, National Drought Policy Commission
Co-author, 1999-present, U.S. Drought Monitor (<http://drought.unl.edu/dm>)
Co-author, 2002-present, North American Drought Monitor
Member, 1995-present, Nebraska Water Availability and Outlook Committee (WAOC)

Peer Journal/Chapter/Proposal/Grant/Report/Assessment Reviewer for: Intergovernmental Panel on Climate Change (IPCC) AR4 chapter(s) reviewer, 2012 National Climate Assessment chapter review editor and chapter co-author, American Geosciences Institute's Congressional Hazards Caucus Alliance, Journal of Climate, International Journal of Climatology, AMS's Journal of Applied Meteorology and Climatology, AMS's Journal of Hydrometeorology, Natural Hazards Journal, Journal of Geophysical

Research, Geophysical Research Letters, Climate Research, International Journal of Remote Sensing, Journal of Water Resources Management, Journal of Hydrology and Earth System Sciences, Applied Geography, The Professional Geographer, Geocarto International, Environmental Reviews, proposal reviewer for NOAA's Office of Global Programs Sectoral Application Research Program (SARP), and as an Expert Proposal Evaluator and Rapporteur for the European Commission.

RELEVANT PUBLICATIONS

Journal Articles (peer reviewed)

- Otkin, J., Anderson, M. C., Hain, C., **Svoboda, M.**, Johnson, D. M., Mueller, R., Tadesse, T., Wardlow, B., Brown, J., 2016. Assessing the evolution of soil moisture and vegetation conditions during the 2012 United States flash drought. *Ag. Forest Meteorology*, Volumes 218-219, 230-242. doi:[10.1016/j.agrformet.2015.12.065](https://doi.org/10.1016/j.agrformet.2015.12.065)
- Svoboda, M.**, Fuchs, B., Poulsen, C., Nothwehr, J., 2015. The Drought Risk Atlas: Enhancing Decision Support for Drought Risk Management in the United States. *J. Hydrology*, 526, 274-286. doi: [10.1016/j.jhydrol.2015.01.006](https://doi.org/10.1016/j.jhydrol.2015.01.006)
- Trnka, M., Brazdil, R., Mozny, M., Stepanek, P., Dubrovsky, M., Zahradnicek, P., Balek, B., Dobrovolny, P., Semaradova, D., Hlavinka, P., Eitzinger, J., Wardlow, B., **Svoboda, M.**, Hayes, M. J., 2015. Soil moisture trends in the Czech Republic between 1961 and 2012. *Int. J. Climatology*, 35(13): 3733-3747. doi:10.1002/joc.4242
- Otkin, J., Shafer, M., **Svoboda, M.**, Wardlow, B., Anderson, M., Hain, C., Basara, J., 2015. Facilitating the Use of Drought Early Warning Information through Interactions with Agricultural Stakeholders. *Bulletin of the American Meteorological Society*, 96(7), 1073-1078. doi:10.1175/BAMS-D-14-00219.1
- Tadesse, T., Wardlow, B., Brown, J. F., **Svoboda, M.**, Hayes, M. J., Fuchs, B., Gutzmer, D., 2015. Assessing the Vegetation Condition Impacts of the 2011 Drought across the U.S. Southern Great Plains Using the Vegetation Drought Response Index (VegDRI). *J. Applied Meteorology and Climatology*, 54, 153-169. <http://journals.ametsoc.org/doi/pdf/10.1175/JAMC-D-14-0048.1> doi:10.1175/JAMC-D-14-0048.1
- Otkin, J., Anderson, M., Hain, C., **Svoboda, M.**, 2015. Using Temporal Changes in Drought Indices to Generate Probabilistic Drought Intensification Forecasts. *J. Hydrometeorology*, 16(1), 88-105. doi: <http://dx.doi.org/10.1175/JHM-D-14-0064.1>
- Nam, W., Hayes, M. J., Svoboda, M., Tadesse, T., Wilhite, D., 2015. Drought hazard assessment in the context of climate change for South Korea. *Agricultural Water Management*, 160, 106-117. doi:[10.1016/j.agwat.2015.06.029](https://doi.org/10.1016/j.agwat.2015.06.029) <http://www.sciencedirect.com/science/article/pii/S0378377415300433>
- You, J., Hubbard, K., Shulski, M., **Svoboda, M.**, Hayes, M. J., 2015. Development of a Long-Term Serially Complete Dataset of U.S. Temperatures and Precipitation for Climate Services. *J. Service Climatology*, pp.1-23. <http://www.journalofserviceclimatology.org/>
- Xia, Y., M. B. Ek, C. D. Peters-Lidard, D. Mocko, **M. Svoboda**, J. Sheffield, and E. F. Wood, 2014. Application of USDM statistics in NLDAS-2: Optimal blended NLDAS drought index over the continental United States, *J. Geophys. Res. Atmos.*, 119(6), 2947-2965 doi:[10.1002/2013JD020994](https://doi.org/10.1002/2013JD020994).
- Yu, M., Li, Q., Hayes, M. J., **Svoboda, M. D.** and Heim, R. R., 2014. Are droughts becoming more frequent or severe in China based on the Standardized Precipitation Evapotranspiration Index: 1951–2010? *Int. J. Climatol.*, 34(3): 545–558. doi: 10.1002/joc.3701
- Hunt, E., **M. Svoboda**, B. Wardlow, K. Hubbard, M.J. Hayes and T. Arkebauer, 2014. Monitoring the effects of rapid onset of drought on non-irrigated maize with agronomic data and climate-based drought indices. *J. Agric. For. Meteorol.*, 191C, 1-11. doi: 10.1016/j.agrformet.2014.02.001.

- Otkin, J. A., M. C. Anderson, C. Hain, and **M. Svoboda**, 2014. Examining the relationship between drought development and rapid changes in the Evaporative Stress Index. *J. Hydrometeor.*, 15(3), 938-956. DOI: 10.1175/JHM-D-13-0110.1
- Trnka, M., Brázdil, R., Balek, J., Semerádová, D., Hlavinka, P., Možný, M., Štěpánek, P., Dobrovolný, P., Zahradníček, P., Dubrovský, M., Eitzinger, J., Fuchs, B., **Svoboda, M.**, Hayes, M., Žalud, Z. (2014). Drivers of soil drying in the Czech Republic between 1961 and 2012. *Royal Meteorological Society, John Wiley & Sons, Ltd. International Journal of Climatology*. <http://onlinelibrary.wiley.com/doi/10.1002/joc.4167/abstract>
- Nam, W.-H., Kim, T., Hong, E.-M., Hayes, M. J., **Svoboda, M.**, 2015. Water Supply Risk Assessment of Agricultural Reservoirs using Irrigation Vulnerability Model and Cluster Analysis. *J. Korean Society of Agricultural Engineers*, 57, 59-67.
- Nam, W.-H., Hayes, M. J., Wilhite, D., **Svoboda, M.**, 2015. Projection of Temporal Trends on Drought Characteristics using the Standardized Precipitation Evapotranspiration (SPEI) Index in South Korea. *J. Korean Society Ag Engineers*, 57, 37-45
- Fu, X., **M. Svoboda**, Tang, Z., Dai, Z., Wu, J., 2013. An overview of US state drought plans: crisis or risk management? *Natural Hazards/Springer*, 69(3), 1607-1627. <http://link.springer.com/article/10.1007%2Fs11069-013-0766-z#page-1>
- Trnka, M., Kersenbaum, C., Eitzinger, J., Hayes, M. J., Hlavinka, P., **Svoboda, M.**, Dubrovsky, M., Semerádová, D., Wardlow, B., Pokorný, E., Možný, M., Wilhite, D., Waltman, W., Zalud, Z., 2013. Consequences of climate change for the soil climate in central Europe and central U.S. *Int. J. of Climate Change*
- Dubrovsky, M., Hayes, M. J., Duce, P., Trnka, **M.**, **Svoboda, M.**, Zara, P., 2013. Multi-GCM projections of future drought and climate variability indicators for the Mediterranean region. *Springer Regional Environmental Change*.
- Otkin, J. A., M. C. Anderson, C. Hain, I. Mladenova, J. Basara, and **M. Svoboda**, 2013. Examining flash drought development using the thermal infrared based Evaporative Stress Index. *J. Hydrometeor.*, 14, 1057-1074.
- Anderson, M. C., C. Hain, J. A. Otkin, X. Zhan, K. Mo, **M. Svoboda**, W. Dulaney, and A. Pimstein, 2013. An intercomparison of drought indicators based on thermal remote sensing and NLDAS-2 simulations with U.S. Drought Monitor classifications. *J. Hydrometeor.*, 14, 1035-1056.
- Pozzi, W., Sheffield, J., Stefanski, R., Cripe, D., Pulwarty, R., Heim, R., Brewer, M. J., Vogt, J., Westerhoff, R., Pappenberger, F., Werner, M., Lloyd-Hughes, B., Wagner, W., Mo, K., Schubert, S., Dijk, A. v., **Svoboda, M.**, Bettio, L., Nicholson, M., van Beek, R., Bierkens, M., Nunez, L., Lawford, R., Goncalves, L. G., Dutra, E., Wetterhall, F. (2013). Towards A Global Drought Early Warning System: Expanding international cooperation for the development of a framework for global drought monitoring and forecasting. *Bulletin of the American Meteorological Society*. 10.
- Hayes, M., **M. Svoboda**, N. Wall, and M. Widhalm, 2011. The Lincoln Declaration on Drought Indices: Universal meteorological drought index recommended. *Bulletin of the American Meteorological Society*, 92(4): 485-488.
- Hlavinka, P., M. Trnka, J. Balek, D. Semerádová, M. Hayes, **M. Svoboda**, J. Eitzinger, M. Možný, M. Fischer, E. Hunt, and Z. Zalud, 2011. Development and evaluation of the SoilClim model for water balance and soil climate estimates. *Agricultural Water Management*, 98(8): 1249-1261.
- Ryu, J.H., **M.D. Svoboda**, J.D. Lenters, T. Tadesse, and C. Knutson, 2010. Finding Potential Extents for ENSO-driven Hydrologic Drought Forecasts in the United States. *Climatic Change*, 101: Numbers 3-4, 575-597, DOI: 10.1007/s10584-009-9705-0
- Tadesse, T., B. Wardlow, M. Hayes, **M. Svoboda** and J. Brown, 2011. The Vegetation Outlook (VegOut): a New Method for Predicting Vegetation Seasonal Greenness. *GIScience and Remote Sensing*, 47(1), 25-52.
- Wardlow, B.D., M.J. Hayes, **M.D. Svoboda**, T. Tadesse, and K.H. Smith, 2009. Sharpening the Focus on Drought: New Monitoring and Assessment Tools at the National Drought Mitigation Center. *Earthzine*, unpaginated (Available on-line at: <http://www.earthzine.org/2009/03/30/sharpening->

[the-focus-on-drought-%e2%80%93-new-monitoring-and-assessment-tools-at-the-national-drought-mitigation-center/](#)).

- Wu, H., **M.D. Svoboda**, M.J. Hayes, D.A. Wilhite, and Wen, F., 2007. Appropriate Application of the Standardized Precipitation Index in Arid Locations and Dry Seasons. *International Journal of Climatology*, 27: 65-79.
- Trnka, M., M. Dubrovsky, **M. Svoboda**, D. Semerádová, M. Hayes, Z. Zalud, and D. Wilhite, 2008. Developing a Regional Drought Climatology for the Czech Republic. *International Journal of Climatology*. [On-line] DOI: 10.1002/joc.1745
- Dubrovsky, M., **M. Svoboda**, M. Hayes, D. Wilhite, Z. Zalud, and P. Hlavinka, 2006. The Application of Relative Drought Indices in Assessing Climate Change Impacts on Drought Conditions in Czechia. *Theoretical and Applied Climatology*. [On-line] DOI: 10.1007/s00704-008-0020-x
- Wu, H., M.J. Hayes, D.A. Wilhite, and **M.D. Svoboda**, 2005. The effect of Data Length on the Standardized Precipitation Index Calculation. *Int. Journal of Climatology*, 25:4, 505-520.
- Svoboda, M.**, D. LeComte, M. Hayes, R. Heim, K. Gleason, J. Angel, B. Rippey, R. Tinker, M. Palecki, D. Stooksbury, D. Miskus, and S. Stephens, 2002. The Drought Monitor. *Bulletin of the American Meteorological Society*, 83(8):1181-1190.
- Lawrimore, J., R.R. Heim Jr., **M. Svoboda**, V. Swail, and P.J. Englehart, 2002. Beginning a New Era of Drought Monitoring Across North America, *Bulletin of the American Meteorological Society*, 83 (8): 1191–1192.
- Svoboda, M.**, M. Hayes and D. Wilhite, 2002. The Role of Integrated Drought Monitoring in Drought Mitigation Planning. *Annals of Arid Zone*, 40(1): 1-11.
- Peters, A., E. Walter-Shea, L. Ji, A. Viña, M. Hayes, and **M. Svoboda**, 2002. Drought Monitoring with NDVI-Based Standardized Vegetation Index. *Photogrammetric Engineering & Remote Sensing*, 68(1):71-75.
- Hayes, M., **M. Svoboda**, D. Wilhite, and O. Vanyarkho, 1999. Monitoring the 1996 Drought Using the Standardized Precipitation Index. *Bulletin of the American Meteorological Society*, 80(3): 429-438.

Book Chapters, Magazine Articles and Technical Reports (peer and non-peer reviewed)

- Huang, J., **Svoboda, M.**, Wood, A., Schubert, S., Peters-Lidard, C., Wood, E. and Pulwarty, R., 2016. Research to Advance National Drought Monitoring and Prediction Capabilities, *NOAA MAPP Drought Task Force*, pp 1-28. [On-line] doi:10.7289/V5V122S3
- Hayes, M. J., Lopez Perez, M., **Svoboda, M.**, Fuchs, B., Engle, N., Adreu, J. Perspectives from the Outside: Contributions to the Drought Paradigm Shift in Brazil from Spain, Mexico, and the United States. In *Drought in Brazil: Proactive Management and Policy. Perspectives from the Outside: Contributions to the Drought Paradigm Shift in Brazil from Spain, Mexico, and the United States*. Taylor and Francis. **Status:** Submitted
- Svoboda, Mark D.**, 2014. "Drought." *Achieving Sustainability: Visions, Principles, and Practices*. Ed. Debora Rowe. Vol. 1. Detroit: Macmillan Reference USA, 2014. 213-220. *Gale Virtual Reference Library*. Web.
- Fuchs, Brian, **M. Svoboda**, D.A. Wilhite and M.J. Hayes, 2014. Drought Indices for Drought Risk Assessment in a Changing Climate. In *Handbook of Engineering Hydrology: Vol. 2: Modeling, Climate Change, and Variability*, S. Eslamian, ed., CRC Press.
- Grasso, V., Yamada, M., Mori, J., Rubiera, J., **Svoboda, M.**, Davies, D., Dickerson Jr., P. G., White, J. E., de Groeve, T., 2014. Early Warning of Natural Hazards. In *Encyclopedia of Natural Hazards*. Ramesh P. Singh, Chapman University (Ed.), Early Warning of Natural Hazards. Taylor and Francis.
- Svoboda, M.** (2014). The Colorado River: A Basin Under Perpetual Distress. Eric J. Fitch (Ed.),

- November 2014: North American Transboundary Border Issues ed., vol. 16, pp. 18-23. Middleburg, VA: Water Resources IMPACT. *American Water Resources Association*.
http://www.awra.org/impact/issues/1411imp_toc.pdf
- Smith, K. H., **Svoboda, M.**, Hayes, M. J., Reges, H., Doesken, N., Lackstrom, K., Dow, K., Brennan, A., 2014. The Drought Impact Reporter Can Support Citizen Science Initiatives. *Bulletin of the American Meteorological Society*, Vol. 95 (11), pp. 1659-1662.
- Lawford, R., Toll, D., Doorn, B., Entin, J., Mocko, D. M., **Svoboda, M.**, Rodell, M., Koster, R., Shubert, S., -Z. Liang, X., Cai, X., Wardlow, B., Xia, Y., Verdin, J., Ek, M. (2014). On the use of NASA Earth observations to characterize the 2012 U.S. Drought. (vol. 23). *Global Energy and Water Exchanges News*.
- Knutson, C., Redmond, K., **Svoboda, M.**, 2013. Drought: The Knowledge Base. In Planning and Drought. James C. Schwab AICP (Ed.), (vol. 574, pp. 144 pp.). Chicago, IL: Drought: The Knowledge Base. *American Planning Association Planning Advisory Service*.
http://www.planning.org/store/product/?ProductCode=BOOK_P574
- Wilhite, D.A., M.J. Hayes, and **M. Svoboda**. 2012. Drought. Encyclopedia of Environmetrics. Abdel H.El-Shaarawi and Walter P.iegorsch, editors. John Wiley and Sons.
- World Meteorological Organization, 2012: *Standardized Precipitation Index User Guide (Svoboda, M., M. Hayes and D. Wood)*. (WMO-No. 1090), Geneva.
- Hayes, M. J., **M. D. Svoboda**, B. D. Wardlow, M. C. Anderson, and F. Kogan, 2012. Drought Monitoring: Historical and Current Perspectives. In: Remote Sensing of Drought: Innovative Monitoring Approaches, B. Wardlow, M. Anderson, and J. Verdin, eds., CRC Press.
- Nghiem, S., B.D. Wardlow, D. Allured, **M.D. Svoboda**, D. LeComte, M. Rosencrans, S.K. Chan and G. Neumann, 2012. Microwave Remote Sensing of Soil Moisture—Science and Applications. In: Remote Sensing of Drought: Innovative Monitoring Approaches, B. Wardlow, M. Anderson, and J. Verdin, eds., CRC Press.
- Svoboda, M.**, K. Helm-Smith, M. Widhalm, M. Shafer, C. Knutson, M. Spinar, D. Woudenberg, M. Sittler, R. McPherson and H. Lazrus, 2011. *Drought Ready Communities: A Guide to Community Drought Preparedness*. National Drought Mitigation Center, p. 53. Available on-line:
http://drought.unl.edu/portals/0/docs/DRC_Guide.pdf
- Tadesse, T., B.D. Wardlow, **M.D. Svoboda**, M.J. Hayes, 2012. Predicting Remote Sensing Based Seasonal Greenness: the Vegetation Outlook (VegOut). In: Remote Sensing of Drought: Innovative Monitoring Approaches, B. Wardlow, M. Anderson and J. Verdin, eds., CRC Press, Boca Raton, FL. CRC Press.
- Hayes, M., D. Wilhite, **M. Svoboda**, and M. Trnka, 2011. Investigating the Connections between Climate Change, Drought, and Agricultural Production. In: Handbook on Climate Change and Agriculture, R. Mendelsohn and A. Dinar, eds., Edward Eigar Publishing Ltd.
- Svoboda, M.** and Z. Tang. 2010. Developing a Drought Planning Evaluation System in the United States. In: *Environmental Planning*, R.D. Newton, editor, Nova Science Publishers, Inc., Hauppauge, NY, U.S., pp. 221-231.
- Nghiem, S.V., J. Verdin, **M. Svoboda**, D. Allured, J. Brown, B. Liemann, G. Neumann, E. Engman and D. Toll. Improved Drought Monitoring with NASA Satellite Data. *EWRI Currents*, 12(3), p7. Summer 2010.
- Knutson, C.L., **M.D. Svoboda**, J. Ryu, B. Lubeck, D. Smith, J. Fanning (2010) Development of a Drought Decision Support Portal for the Republican River Basin of Nebraska, Colorado, and Kansas, Final Report to NOAA's Sectoral Applications Research Program, Silver Spring, MD.
- Wardlow, B., M. Hayes, **M. Svoboda**, and T. Tadesse 2010. Opportunities for Integrating NASA Data into Drought Applications: A Prospectus from the National Drought Mitigation Center. *NASA White Paper* submitted to NASA Headquarters Hydrology and Agricultural Application Branch, Washington, DC.
- Woudenberg, Donna L., **Mark D. Svoboda**, Nicole Wall, Tonya Bernadt, Melissa

- Widhalm, Jane Okalebo, Crystal Bergman, Sandra Jones, Deborah Wood, and Cody Knutson. March 2010. Low Flow/Stage Related Impacts in the Upper Colorado River Basin: Low Water Impact Information Database Project, Grant Technical Report, 224 pages.
- Woudenberg, Donna L., **Mark D. Svoboda**, and Denise Gutzmer. March 2010. Low Flow/Stage Related Impacts in the Alabama, Coosa, & Tallapoosa (ACT) and Apalachicola, Chattahoochee, & Flint (ACF) River Basins: Low Water Impact Information Database Project, Grant Technical Report, 97 pages.
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- Wilhite, D. A., **M.D. Svoboda**, and M. J. Hayes. 2005. Drought Monitoring in the United States: Status and Trends. In: *Monitoring and Predicting Agricultural Drought: A Global Study*, V. J. Boken, A. P. Cracknell, and R. L. Heathcote, eds., Oxford University Press, pp. 121-131.
- Knutson, C.L., M. Higgins, and **M.D. Svoboda**. 2005. Low Flow/Stage Related Impacts in the North Platte River Basin of Nebraska, Wyoming, and Colorado. NDMC Report to Central Region Climate Services, NOAA/National Weather Service, Kansas City, MO, July.
- Knutson, C.L., and **M.D. Svoboda**. 2004. Low Flow/Stage Related Impacts in the Upper Mississippi River Basin. NDMC Report to Central Region Climate Services, NOAA/National Weather Service, Kansas City, MO, August.
- Waltman, W. J., S. Goddard, S. E. Reichenbach, **M.D. Svoboda**, M. J. Hayes, and J. S. Peake, 2003. Patterns and Trends of Soil Climate Regimes and Drought Events in the Northern Great Plains. *Papers of the Applied Geography Conferences*, 26: 333-342.
- Hayes, M., D. Wilhite, and **M. Svoboda**, 2000. Monitoring Drought Using the Standardized Precipitation Index. In: *Drought: A Global Assessment*, Vol. 1, D. Wilhite, ed., Routledge, pp. 168-180.
- Wilhite, D. A., M. J. Hayes, and **M.D. Svoboda**, 2000. Drought monitoring and assessment: Status and trends in the United States. In: *Drought and Drought Mitigation in Europe*, J. Vogt and F. Somma, eds., Kluwer Academic Publishers, pp. 149-160.

GRANTS AWARDED

- Providing Drought Information Services for the Nation: The National Drought Mitigation Center. M. Hayes, **M. Svoboda**, C. Knutson, T. Tadesse, D. Bathke and B. Fuchs. NOAA-CPO-SARP. \$2,445,736. 6/1/2015-5/31/2018. **(Co-PI)**
- Drought Information Services for Agriculture across the United States. M. Hayes, B. Fuchs and **M. Svoboda**. USDA-OCE. \$839,442. 10/1/2015-9/30/2016. **(Co-PI)**
- Development of the MENA Regional Drought Management System. M. Hayes, M. Svoboda, C. Knutson. USAID/International Centre for Biosaline Agriculture (ICBA). \$1,025,440. 1/1/2016-3/31/2017. **(PI)**
- Drought Early Warning and Policy in the Eastern Caribbean. B. Fuchs, M. Hayes, **M. Svoboda**, C. Knutson and T. Tadesse. Organization of Eastern Caribbean States. \$49,227. **(Co-PI)**
- The Wind River Indian Reservation's Vulnerability to the Impacts of Drought and the Development of Decision Tools to Support Drought Preparedness. C. Knutson, **M. Svoboda**. DOI/USGS. \$253,547. 6/2015-5/2017. **(Co-PI)**
- Development of the Middle East and North Africa Network of Water Centers. M. Hayes, **M. Svoboda**, B. Fuchs, T. Tadesse and K. Smith. Development Alternatives, Inc. \$40,052. 2/1/2015-12/31/2015, **(Co-PI)**

Development of Probabilistic Drought Intensification Forecasts Using the GOES-Based Evaporative Stress Index. J. Otkin, M. Anderson, **M. Svoboda**, C. Hain and X. Zhan. NOAA-CPO-MAPP. \$594,118. 8/2014-8/2017. **(Co-PI)**

Advancing Drought Monitoring and Prediction Using a Multi-Index Multivariate Framework. A. AghaKouchak, A. Wood and **M. Svoboda**. NOAA-CPO-MAPP. \$443,960. 8/2014-8/2017. **(Co-PI)**

Integrating GRACE and GRACE Follow-on Data into Flood and Drought Forecasts of Drought Categories. M. Rodell, B. Zaitchik, **M. Svoboda**, B. Wardlow, P. Restrepo & others. NASA-Applied Sciences. \$1,637,285. 10/2014-9/2018. **(Co-Investigator)**

Drought Impacts: Vulnerability Thresholds in Monitoring and Early Warning Research. K. Stahl, C. Knutson, **M. Svoboda**, J. Hannaford, K. Collins, I. Overton, N. Crossman, M. Colloff, and M. Acreman. National Science Foundation/Belmont Forum ICER. \$1,526,850. 9/2013-8/2016. **(Co-PI)**

The Quick Drought Response Index (Quick DRI): An Integrated Approach for Rapid Response Agricultural Drought Monitoring. B. Wardlow, **M. Svoboda**, M. Hayes, T. Tadesse, M. Anderson, M. Rodell, and J. Brown. NASA-ROSES. \$1,150,701. 8/2013-8/2016. **(Co-PI)**

ET Mapping over North America. M. Anderson, C. Hain, B. Wardlow and **M. Svoboda**. NASA-ROSES. \$106,575. 12/31/2013-12/12/2016. **(Co-PI)**

Drought Risk Management for the United States. M. Hayes, **M. Svoboda**, C. Knutson, T. Tadesse, B. Fuchs, and D. Bathke. NOAA-University of Oklahoma. \$693,696. 9/1/2014-8/31/2016. **(Co-PI)**

Improving U.S. Drought Monitoring—Integrating Soil Moisture Data and Developing a Drought Blends Portal. M. Hayes, **M. Svoboda** and B. Fuchs. USDA-OCE, \$240,000. 7/16/2014-7/15/2015. **(Co-PI)**

Drinking Water Utilities. C. Knutson, M. Hayes and **M. Svoboda**. Cadmus Group, Inc. \$17,072. 9/25/2014-6/15/2015. **(Co-PI)**

Technical Assistance on Drought Preparedness in Brazil. M. Hayes, **M. Svoboda**, C. Knutson, B. Fuchs and K. Smith. The World Bank. \$70,000. 10/2013-6/2015 **(Co-PI)**

NDMC Drought Information Services for Agriculture. M. Hayes, **M. Svoboda** and B. Fuchs. USDA-OCE, \$200,000. 9/2013-2/2015. **(Co-PI)**

Regional Climate Services Support in the High Plains Region. Fuchs, B., **M. Svoboda** and M. Hayes. NOAA-National Climatic Data Center. \$265,000. 10/2013-3/2015. **(Co-PI)**

Facilitating Adaptive Management Under Conditions of Rapid Drought Onset Using the GOES-Based Evaporative Stress Index. J. Otkin, M. Anderson, M. A. Shafer, **M. Svoboda**, J. Basara, and B. Wardlow, C. Hain and X. Zhan. NOAA-CPO-MAPP. \$299,940. 9/2013-08/2015. **(Co-Investigator)**

Dual Assimilation of Microwave and Thermal-Infrared Satellite Observations of Soil Moisture into NLDAS for Improved Drought Monitoring. M. Anderson, C. Hain, J. Otkin, B. Wardlow and **M. Svoboda**. NOAA-CPO-MAPP. \$592,374. 8/2011-7/2014. **(Co-Investigator)**

Development of a Multi-Scale Remote Sensing Based Framework for Mapping Drought over North America. C. Hain, M. Anderson, X. Zhan, F. Gao, **M. Svoboda**, B. Wardlow, J. Otkin and C. Kongoli. NASA-ROSES. \$106,576. 8/2013-08/2016. **(Co-Investigator)**

Drought Information Service in Support of the National Integrated Drought Information System NIDIS. M. Hayes, **M. Svoboda**, C. Knutson, B. Fuchs and D. Bathke. NOAA-OAR. \$739,803. 10/2013-9/2014. **(Co-PI)**

2013 Workshop on Remote Sensing for Drought Monitoring and Water Resources Applications. **M. Svoboda** and B. Wardlow. NASA. \$24,553. **(PI)**

Enhancing Decision Support for Drought Risk in the United States: The Drought Risk Atlas. **M. Svoboda**, M. Hayes, B. Fuchs, M. Shulski, M. Timofeyeva and M. Brewer. NOAA-Climate Program Office: Sectoral Applications Research Program (SARP). \$260,131. 8/2012-7/2014. **(PI)**

The Quick Drought Response Index (QuickDRI): An Integrated Approach for Rapid-Response Agricultural Drought Monitoring. B. Wardlow, **M. Svoboda**, M. Hayes, T. Tadesse, J. Brown. M. Anderson and M. Rodell. NASA ROSES ESA: Water Resources. \$199,678. 8/1/2012-7/31/2013. **(Co-PI)**

Regional Climate Services Support in the High Plains Region. Shulski, M., **M. Svoboda** and M. Hayes. NOAA-National Climatic Data Center. \$1,696,136,000. 9/2011-3/2013. **(Co-PI)**

Evapotranspiration and Drought Monitoring Using GOES-R Products for NIDIS. B. Wardlow and **M. Svoboda**. NOAA-MAPP. \$8,864. 8/24/2012-8/22/2013 **(Co-PI)**

Drought Mitigation, Nebraska. M.J. Hayes, **M. Svoboda**, C. Knutson and B. Wardlow. USDA-NIFA. \$558,401. 8/2010-7/2012. **(Co-PI)**

Dual Assimilation of Microwave and Thermal-Infrared Satellite Observations of Soil Moisture into NLDAS for Improved Drought Monitoring. NOAA. M. Anderson (USDA-ARS), B. Wardlow, **M. Svoboda**. NOAA-MAPP. \$592,374, 8/2011-7/2014. **(Co-Investigator)**

Use of Satellite Data and Model Products in Improving the Categorization, Delineation and Mitigation of Agricultural Drought. McNider, R.T., J. Christy, D. Zierden, **M. Svoboda**, B. Wardlow, A. Limaye, J. Mecikalski and G. Hoogenboom. NASA. \$20,383. 9/1/2010-8/31/2012. **(Co-Investigator)**

NIDIS Portal Content Development and Help Desk Support. **M.D. Svoboda**. NOAA. \$497,797. 8/15/2009 - 8/14/2012. **(PI)**

A GOES Thermal-Based Drought Early Warning Index for NIDIS, Anderson, M.C., K. Mo, **M. Svoboda**, B. Wardlow, X. Zhan, J.R. Mecikalski, W.P. Kustas, and J.F. Brown. NOAA Climate Dynamics and Experimental Prediction (CDEP). \$682,884. 8/1/2009 – 7/30/2012. **(Investigator)**

Integrating Enhanced GRACE Water Storage Data into the U.S. and North American Drought Monitors, Rodell, M., J. Lawrimore, J.S. Famiglietti, R. Heim, R. Reichle, **M. Svoboda**, B. Wardlow, B. Zaitchik, and A. Pinheiro. NASA's Decision Support through Earth Science Research Results. NASA. \$597,000. 8/6/2008 – 8/5/2011. **(Co-PI)**

Development of a "Drought Ready Communities" Program. **M.D. Svoboda**, M. Sittler, K. H. Smith, M. Shafer, M. Palecki, C. L. Knutson, D. Arndt, D. Woudenberg and J. Angel. NOAA. \$288,670. Grant No. NA08OAR4310696. 7/1/2008 - 6/30/2010. **(PI)**

Drought Mitigation, NE Project, M. Hayes, **M. Svoboda**, C. Knutson, and B. Wardlow. USDA-CSREES. \$347,246. 7/15/2008 – 7/14/2010. **(Co-PI)**

Building a Drought Impact Reporting System for Hawaii. **M.D. Svoboda**, M. J. Hayes, and Y. Ding. Commission on Water Resource Management, State of Hawaii. \$100,000. 6/23/2008 - 6/30/2011. **(Co-PI)**

Developing a Predictive Capability Decision Support System for Drought Mitigation, J. Ryu, **M. Svoboda**, C. Knutson. NASA. \$331,000. 8/1/2008 - 7/31/2011. **(Co-PI)**

Development of a Drought Decision Support Portal for the Republican River Basin of Nebraska, Colorado, and Kansas. C. L. Knutson, **M. Svoboda**, J. H. Ryu, B. Lubeck, D. Smith and J. Fanning. NOAA. \$223,525. 8/1/2007 - 7/31/2009. **(Investigator)**

Low-flow Impact Study for the Upper Colorado Basin, **M. Svoboda**, M. Hayes, C. Knutson, and D. Woudenberg. NOAA/NIDIS. \$87,000. 10/1/2008 – 3/1/2010. **(Co-PI)**

Low-flow Project in the Alabama, Coosa, Tallapoosa (ACT), and the Apalachicola, Chattahoochee, Flint (ACF) River Basins, **M. Svoboda**, M. Hayes, C. Knutson, and D. Woudenberg. \$24,999. 9/15/2008 – 3/15/2010. **(Co-PI)**

EuroGEOSS: A European Approach to GEOSS, **M. Svoboda**. European Commission/Research Directorate General of the Environment. \$7,600,000. 12/1/2008 – 11/30/2011. **(Collaborator)**

NIDIS Portal Content Development and Help Desk Support. **M.D. Svoboda**. NOAA. \$165,409. 8/15/2008 - 8/14/2009. **(PI)**

Rangeland and Forage Geospatial Decision Support System for Drought Risk Management. D.A. Wilhite, K. Hubbard, **M. Svoboda**, T. Tadesse, J. Brown, M. Hayes, C. Knutson, J. Volesky, and M. Tooze. USDA/RMA. \$1,023,038. (10/1/2005 to 9/30/2010). **(Investigator)**

Transitioning the Drought Impact Reporter into an Operational System. M. Hayes, D. Wilhite, **M. Svoboda**, G. Garfin, C. Knutson, D. Wood, and M. Higgins. NOAA Office of Global Programs. \$453,523. (3/1/07 to 2/28/10). **(Investigator)**

Enhancement of the U.S. Drought Monitor by Integrating Earth Science Data. S.V. Nghiem, G.R. Brakenridge, R. Dole, D. LeComte, E.G. Njoku, J. Verdin, and D.A. Wilhite, Co-PIs. **Collaborators: M. Svoboda**, B. Wardlow, and T. Tadesse. NASA. \$119,000. (2007-2010).

Drought Risk, Impact, and Mitigation Information System. S. Goddard and D. Wilhite, co-PIs. **Collaborators: M. Hayes, M. Svoboda**, T. Tadesse, C. Knutson, K. Schoengold, and K. Hubbard. USDA/RMA. \$6,407,472. (10/1/2005 to 9/30/2008).

Climate and Soil Risk Information System. S. Goddard and D. Wilhite, co-PIs. **Collaborators: M. Hayes, M. Svoboda**, and C. Knutson. USDA/RMA. \$1,212,055. (6/1/2005 to 5/31/2008).

CONFERENCE PROCEEDINGS AND ABSTRACTS

Svoboda, M., 2015. The U.S. Drought Monitor: Evolution and recent achievements. In Drought: Research and Science-Policy Interfacing. Joaquin Andreu, Abel Solera, Javier Paredes-Arquiola, David Haro-Montegudo, Henny van Lanen (Ed.), pp.201-206. The U.S. Drought Monitor:

- Evolution and recent achievements. CRC Press/Balkema. ISBN 9781138027794
<https://www.crcpress.com/Drought-Research-and-Science-Policy-Interfacing/Andreu-Solera-ParedesArquiola-HaroMonteagudo-van-Lanen/9781138027794>
- Hannaford, J., Acreman, M., Stahl, K., Bachmair, S., **Svoboda, M.**, Knutson, C., Crossman, N. D., Overton, I. C., Colloff, M. J., 2015. Enhancing drought Monitoring and Early Warning by linking indicators to impacts. In *Drought: Research and Science-Policy Interfacing.*, Joaquin Andreu, Abel Solera, Javier Paredes-Arquiola, David Haro-Monteagudo, Henny van Lanen (Ed.), pp.287-292. Enhancing drought Monitoring and Early Warning by linking indicators to impacts. CRC Press/Balkema. ISBN 9781138027794
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- Svoboda, M.D.**, 2011. Incorporating a Composite Approach to Monitoring Drought in the United States. In: *Agricultural Drought Indices. Proceedings of the WMO/UNISDR Expert Group Meeting on Agricultural Drought Indices 2-4 June 2010, Murcia, Spain*, Sivakumar, M.V.K., R. P. Motha, D.A. Wilhite and D. Wood (Eds.). Geneva, Switzerland: World Meteorological Organization. AGM-11, WMO/TD No. 1572; WAOB-2011. 182 pp.
- Svoboda, M.D.**, (contributing author), 2011. Chapter 3: Drought Risks. In: *UNISDR (2011) Global Assessment Report on Disaster Risk Reduction*. Geneva, Switzerland: United Nations International Strategy for Disaster Reduction. Information Press, Oxford, UK, 178 pp.
- Svoboda, M.D.**, 2011. Project PI (Lead). *Drought Ready Communities: A Guide to Community Drought Preparedness*. On-line PDF available at:
<http://drought.unl.edu/Planning/PlanningProcesses/DroughtReadyCommunities.aspx>
- Hayes, M., C. Bergman, D. Bathke, J. Nothwehr, N. Wall, **M. Svoboda**, T. Bernadt, and J. Robine, 2011. Engaging Drought Decision-Makers across the United States. *Proceedings of COST 734 Final Conference*, Topolcianky, Slovakia, May 4-5, 2011.
- Ferguson, D., C. Alvord, M. Crimmins, M.H. Redsteer, M. Hayes, C. McNutt, R. Pulwarty and **M. Svoboda**, 2011. Drought Preparedness for Tribes in the Four Corners Region. *Report from the April 2010 Workshop in Flagstaff, AZ: Climate Assessment for the Southwest*.
- Hayes, M., D. Bathke, J. Nothwehr, J. Robine, C. Bergman, **M. Svoboda**, N. Wall, and T. Bernadt, 2010. Vision into Action: the Establishment and Facilitation of an Effective Drought Coordinator Network in the United States. In: *A View of the Future for Research on Climate Change Impacts on Water: Workshop Focusing on Adaptation Strategies and Information Needs*. Sponsored by NOAA, the Water Research Foundation, and the Water Environment Research Foundation. Denver, CO, August 31-September 1, 2010. (abstract)
- Tadesse, T., B.D. Wardlow, M.J. Hayes, **M.D. Svoboda**, J. Li, C.C. Poulsen, and K. Callahan, 2010. Predicting general vegetation condition using different scenarios over the central U.S. *Water for Food: Growing More with Less, Second Annual International Conference*, May 2-5, 2010, Lincoln, Nebraska. (abstract)
- C. Knutson, **M.D. Svoboda**, K. Smith, M. Widhalm, D. Woudenberg, J. Angel, M. Spinar, M. Shafer 2010. Development of a National Drought-Ready Communities Program, *Proceedings of the Association of American Geographers Annual Meeting*, Washington, D.C., April 15, 2010 (abstract)
- Tadesse, T, B. Wardlow, M. Hayes, **M. Svoboda**, J. Li, K. Callahan, and C.C. Poulsen, 2010. Scenario-based vegetation outlook (S-VegOut): predicting general vegetation condition using different scenarios over the central United States. *90th Annual American Meteorological Society Annual Meeting*, Atlanta, GA, January 17-21. (abstract)
- Hayes, M., **M. Svoboda**, B. Fuchs, S. Scott, K. Smith, C. Knutson, and B. Wardlow, 2010. Drought services: activities and tools at the National Drought Mitigation Center. *American Meteorological Society's 18th Conference on Applied Climatology*. January 17-21, Atlanta, GA. (abstract)

- Houborg, R., M. Rodell, J. Lawrimore, L. Bailing, R. Reichle, R. Heim, M. Rosencrans, R. Tinker, J. Famiglietti, **M. Svoboda**, B. Wardlow, and B. Zaitchik, 2010. Using enhanced GRACE water storage data to improve drought detection by the U.S. and North American drought monitors. *IEEE International Geoscience and Remote Sensing Symposium*, Honolulu, HI, July 25-30. (refereed conference symposium)
- Houborg, R., M. Rodell, B. Li, R. Reichle, R. Heim, J. Lawrimore, M. Rosencrans, R. Tinker, J.S. Famiglietti, **M. Svoboda**, B. Wardlow, and B.F. Zaitchik, 2010. Toward integrating enhanced terrestrial water storage data into the U.S. and North American drought monitors. *American Meteorological Society 90th Annual Meeting*, Atlanta, GA, January 18-21. (refereed conference symposium)
- Hlavinka, Petr, Trnka, Miroslav, M. Hayes, M. Dubrovský, **M. Svoboda**, J. Eitzinger, J. Balek, D. Semerádová, and L. Bartošová, 2008. Expected Effects of Regional Climate Change on the Soil Moisture Regimes in Central Europe and Central US. *Geophysical Research Abstracts*. [online]. URL: [http://EuropeanGeosciencesUnion, Vienna, 13 – 18 April 2008](http://EuropeanGeosciencesUnion.Vienna,13-18April2008). (peer reviewed)
- Trnka M., Dubrovsky M., Semeradova D., Zalud Z., **Svoboda M.**, Hayes M., and Wilhite D., 2006. New Method for Assessment of the Drought Climatology - Czech Republic as a Case Study, European Geosciences Union, Vienna, Austria, April 2-7. (peer reviewed)
- Kapler P., Trnka M., Semeradova D., Dubrovsky M., Zalud Z., **Svoboda M.**, Eitzinger J., Hosch J., and Mozny M., 2006. Change of Soil Moisture and Temperature Regimes under Present and Changed Climatic Conditions. In 6th European Conference on Applied Climatology, Ljublanja, Slovenia March 3-8. (peer reviewed)
- Dubrovsky M., Hayes M., Trnka M., **Svoboda M.**, Wilhite D.A., Zalud, Z., Semeradova D., 2006. Projection of Future Drought Conditions Using Drought Indices Applied to GCM-simulated Weather Series. The Geological Society of America, Longmont, CO, September 18-20. (Poster)
- Hayes, M., M. Dubrovsky, M. Trnka, **M. Svoboda**, D. Wilhite, Z. Zalud, and D. Semeradova, 2005. Application of Drought Indices for the Changed Climate. Proceedings of the American Geophysical Union, San Francisco, CA, December 7. (peer reviewed)
- Hayes, M. **M. Svoboda**, M. Higgins, D. Wilhite, and D. Wood, 2005. The Drought Impact Reporter: A Web-based Drought Impacts Reporting Tool. Proceedings of the American Geophysical Union, San Francisco, CA, December 7. (peer reviewed)
- Svoboda, M.**, M. Hayes, D. Wilhite, M. Higgins, and D. Wood, 2005. A Web-based National Drought Impacts Reporting Tool. Proceedings of the 15th Conference on Applied Climatology, Savannah, GA, June 14. (peer reviewed)
- Knutson, C.L., **M.D. Svoboda**, and D.R. Kluck, 2005. An Early Warning System for Riverine Drought Impacts: A National Weather Service Pilot Program. Proceedings of the 15th Conference on Applied Climatology, Savannah, GA, June 14. (peer reviewed)
- Knutson, C.L., **M.D. Svoboda**, and D.R. Kluck, 2005. A Pilot Program for a Low Flow Impacts Database for the National Weather Service. Proceedings of the 85th American Meteorological Society Annual Meeting, San Diego, CA, January 13. (peer reviewed)
- Dubrovsky, M., M. Trnka, **M. Svoboda**, M. Hayes, D. Wilhite, Z. Zalud, and D. Semeradova, 2005. Drought Conditions in the Czech Republic in Present and Changed Climate. Proceedings of the European Geophysical Union, Vienna, Austria, June 15. (peer reviewed)
- Dubrovsky, M., M. Trnka, **M. Svoboda**, M. Hayes, D. Wilhite, Z. Zalud, and D. Semeradova, 2005. Application of Three Drought Indices to Assess Impact of Climate Change on Drought Conditions. Proceedings of the European Meteorological Society, Utrecht, Netherlands, September 15. (peer reviewed)
- Svoboda, M.**, M. Hayes, D. Wilhite, and T. Tadesse, 2004. Recent Advances in Drought Monitoring. 14th Conference on Applied Climatology. Seattle, WA. January 12-16. (peer reviewed)
- Hayes, M., **M. Svoboda**, C. Knutson, and D. Wilhite, 2004. Estimating the Economic Impacts of Drought. 14th Conference on Applied Climatology. Seattle, WA. January 12-16. (peer reviewed)

- Hayes, M., and **M. Svoboda**, 2002. Determining Drought Severity and Extent: The U.S. National Drought Monitor. 15th Conference on Biometeorology and Aerobiology. Kansas City, MO. October 27-November 1. (peer reviewed)
- Svoboda, M.**, M. Hayes, and R. Tinker, 2002. Three years and counting: What's new with the Drought Monitor? 13th Conference on Applied Climatology. Portland, OR. May 12-16.
- Svoboda, M.**, 2000. An Introduction to the Drought Monitor. *Drought Network News*, 12(1): 15-20. (non-peer reviewed)
- Svoboda, M.**, M. Hayes, and C. Knutson, 1997. A Historical Perspective of Nebraska Climate Using the Standardized Precipitation Index. 10th Conference on Applied Climatology. Reno, NV. October 20-23. (peer reviewed)
- Yamoah, C., M. Hayes, and **M. Svoboda**, 1997. Application of the Standardized Precipitation Index to Estimate Crop Yields in Nebraska. 10th Conference on Applied Climatology. Reno, NV. October 20-23. (peer reviewed)

HIGHLIGHTED INTERNATIONAL ACTIVITIES

- Invited presentation on joint drought monitoring efforts between the NDMC and DWFI in front of the Water for Food Institute's International Advisory Panel as part of the annual conference in Lincoln. (2016)
- Assisted and presented at a stakeholder forum in Adelaide, Australia as part of an international research team focused of researching the relationship between drought indicators and impacts. (2016)
- As part of a consulting contract between the NDMC and Organization of Eastern Caribbean States, I helped plan, organize, facilitate and presented in Antigua and materials produced were also utilized for workshops in St. Kitts and Saint Lucia in coordination with the Caribbean Institute for Meteorology and Hydrology in Barbados. (2016)
- Invited speaker for the MENA Regional Stakeholder's Workshop for the development of a regional drought risk management system/platform based on the methodology I built for Morocco. Cairo, Egypt (2015)
- Consultant for World Meteorological Organization/Global Water Partnership's in developing a *Drought Indicators and Indices Handbook* as part of activities for the Integrated Drought Management Program of the WMO (2014-15)
- World Bank consultant for drought monitoring and early warning system development for northeast Brazil and collaborations with ANA and Ministry of Integration. Presented a panel talk at the Brazilian Water Conference. Activities in Fortaleza, Ceara and Brasilia. (2013-15)
- World Bank consultant for Moroccan Royal Remote Sensing Centre on developing a composite drought indicator for Morocco in Rabat (2014-15)
- Consultant for a Turkish consulting firm on the application of a gridded composite drought index/monitoring system. Ankara, Turkey (2014-15)
- Invited speaker at the Global Change Research Centre's InterDrought Project workshop on "State-of-the-Art Drought Monitoring Methods and the Art of Sharing it with Stakeholders" in Brno, Czech Republic. (February 2015)
- Organized and conducted a Drought Early Warning and Information System training workshop for the Caribbean Region at the Caribbean Institute for Meteorology and Hydrology in Bridgetown, Barbados (January 2015)
- Invited speaker for the Global Drought Information System meetings in Pasadena, CA (December 2014)
- Invited keynote speaker for the European Geophysical Union's Leonardo HYPER Drought Conference in Prague, Czech Republic (November 2014)

- Invited speaker for the North American Drought Monitor Forum with partners in Canada and Mexico in Toronto, Canada (June 2014)
- Invited speaker (by U.S. Department of State/NIDIS and Turkish Meteorological Service) for the International Workshop on Drought Management in Ankara, Turkey (March 2014)
- Belmont Forum/National Science Foundation DrIVER project kick-off meetings with partners in Germany, UK, U.S. and Australia in Freiburg, Germany (January 2014)
- Expert panel/discussant participant, rapporteur and side event presenter for the High-Level Meeting on National Drought Policy sponsored by the WMO and other United Nations organizations in Geneva, Switzerland (March 2013)
- External advisory board member for European Commission research project entitled: Fostering European Drought Research and Science-Policy Interfacing, Milan, Italy (February 2013)
- Member of the Organizing Committee for the Asia-Pacific Economic Cooperation Climate Center's International Conference on Climate, Water and Policy (ICCWP) 2012, Busan, Republic of Korea. (September 2012)
- Organized and conducted a Drought Risk Management and Early Warning workshop for the Caribbean region in Kingston, Jamaica. (May 2012)
- Consultant for the World Meteorological Organization (WMO) in developing a *User's Guide on the Standardized Precipitation Index* for their constituents around the globe (2011-2012)
- Invited speaker for the Drought Monitoring, Assessing and Planning Under Global Climate Change Workshop in Beijing, China. (June 2012)
- Helped host and conduct a Climate Change short course for delegates from Vietnam to the University of Nebraska-Lincoln (May 2012)
- Speaker and participant at the North American Drought Monitor Forum in Cancun, Mexico. (April 2012)
- Invited speaker and poster presentation at the WCRP Global Drought Information System Workshop in Frascati, Italy. (April 2012)
- Invited speaker and external advisory board member for European Commission research project entitled: Fostering European Drought Research and Science-Policy Interfacing, Valencia, Spain (March 2012)
- Invited speaker for a drought session at the International Workshop on Water-related Disaster Prediction and Prevention at Hohai University, Nanjing, China. (November 2011)
- Invited expert for the United Nations International Strategy for Disaster Reduction (UNISDR) Global Assessment Report on Disaster Risk Reduction (GAR13 + 15) scoping team. Beijing, China (November 2011)
- Invited speaker for the Integrated Research on Disaster Risk (IRDR) 2011 Conference in Beijing, China (November 2011)
- Invited speaker, panelist and facilitator for South Korea's Asia Pacific Economic Cooperation (APEC) Climate Center's APCC 2011 Climate Symposium in Honolulu, HI (October 2011)
- Part of UNL's School of Natural Resources' faculty cadre for program information exchange with the ICTA Faculty at the Autonomous University of Barcelona. Barcelona, Spain (October 2011)
- Consultant and workshop organizer for the United Nations/Food and Agriculture Organization (FAO) and Turkish Ministry of Agriculture for drought early warning and mitigation planning evaluation. Ankara, Turkey. (April 2011)
- Invited speaker and workshop organizer for Drought Workshop: Monitoring through Earth Observations, hosted by the Group on Earth Observations (GEO). Presented at the Global Earth Observations System of Systems (GEOSS) in Sydney, Australia. (April 2011)
- Invited speaker (3 presentations) at the Canada Extremes Workshop in Winnipeg, Manitoba, Canada. (February 2011)

- Invited key note speaker and consultation with Argentine officials at the 33rd Congress of Argentina Animal Production on drought early warning systems in Viedma, Argentina. (October 2010)
- Invited to present and provide consultation at a workshop with Argentine officials, decision makers and resource managers of the Patagonia region on developing a drought early warning system in Viedma, Argentina. (October 2010)
- Invited presenter and Advisory Board member participation (for EuroGEOSS project) at the INSPIRE European Commission international meetings in Krakow, Poland. (June 2010)
- Invited to participate and present in the World Meteorological Organization (WMO)/United Nations International Strategy for Disaster Reduction (ISDR) Expert Group Meeting on Agricultural Drought in Murcia, Spain. (June 2010)
- Helped host, present and participated in the World Meteorological Organization's Inter-Regional Workshop on Indices and Early Warning Systems for Drought in Lincoln, NE, U.S.A. (December 2009)
- Organizer and presenter/participant for the NDMC on behalf of the World Meteorological Organization Drought Monitoring/Early Warning Workshop in Bamako, Mali (September 2009)
- Invited participant and speaker for the XEROCHORE Workshop on Drought and Natural Systems (Climate and Hydrology) in Noordwijkerhout, The Netherlands (June 2009)
- Invited speaker for the "International Seminar on Drought and Climate Risk Management" in La Serena, Chile (May 2009)
- International Workshop for CHANGE Climate/Water/Drought/Policy Meetings
CHANGE: Climate and Hydrology Academic Network for Governance and the Environment U.S./Mexico/Canada, Mexico City, Mexico (March 2009)
- Invited speaker and participant at the annual Canada Drought Research Initiative annual meeting in Regina, Saskatchewan, Canada (January 2009)
- Invited speaker on drought monitoring and early warning for a U.S. delegation participating in a bilateral drought workshop between Australia and the United States hosted by the Australian Bureau of Rural Sciences entitled "*Drought in a changing climate, sharing management approaches*" at the Australian National University in Canberra, Australia. (November 2008)
- Invited plenary speaker and panelist for the International Conference on Drought Management Systems sponsored by Portugal's Ministry of Environment, Water Institute, and the European Union in Lisbon, Portugal. (November 2007)
- Consultant for Chemonics on assessing the status of the Moroccan Drought Observatory in Rabat, Morocco. (August/December 2007)
- Invited Expert Evaluator and Rapporteur for the European Commission in Brussels for research proposal reviews. (July, 2007)
- Invited roundtable expert and plenary speaker for Mediterranean: Water and Drought Forum, in Zaragoza, Spain sponsored by the Spanish Ministry of Environment. (February 2006)
- Appointed Technical Coordinator for the United States in organizing a U.S.-China Bilateral drought monitoring and assessment workshop with the Chinese Meteorological Administration, Beijing, China. (November 2005)
- Invited speaker for International Workshop on Drought Management Issues and consultation for the Korean Drought Project under the Korea Water Resources Corporation (KOWACO) in Seoul and Daejeon, Korea (November 2005)
- Invited speaker for international workshop in Vienna, Austria. "Drought and Drought Monitoring in Agriculture". (June 2004)
- Responsible for initial contact between NDMC and Czech Republic scientists leading to a joint NATO research project for scientific exchange between the two countries on drought and climate change related matters. Participation and presentations at meetings at Mendel Ag. Univ. in Brno (May 2003) and the Hydrometeorological Institute in Prague (June 2004).

- Invited lecturer for an advanced course on “Drought Preparedness and Mitigation Strategies in the Mediterranean” in Zaragoza, Spain. Sponsored by the International Center for Advanced Mediterranean Agronomic Studies (CIHEAM) in Zaragoza, Spain, and the International Center for Agriculture in the Dry Areas (ICARDA). (April 2004)
- Invited lecturer for an advanced course on “Management strategies to mitigate drought in the Mediterranean: monitoring, risk analysis, and contingency planning” in Rabat, Morocco. Sponsored by the International Center for Advanced Mediterranean Agronomic Studies (CIHEAM) in Zaragoza, Spain, the Institute of Agronomy and Veterinarian Sciences, Hassan II in Rabat, Morocco, and the European Commission (DGI). (May 2001)
- Presentation and participation in the Central and Eastern European Workshop on Drought Mitigation in Budapest-Felsögöd, Hungary. (April 2000)
- Assisted the NDMC in conducting two Planning for Drought Workshops in Recife and Fortaleza, Brazil, sponsored by the World Bank, Inter-American Institute for Cooperation in Agricultural Sciences, the State of Ceara and the Superintendent for the Development of the Northeast (SUDENE). (December 1998)
- Assisted the NDMC in conducting a Planning for Drought Workshop sponsored by the U.S. Bureau of Reclamation, Mexican National Water Commission and Mexican Institute of Water Technology in Cuernavaca, Mexico. (October 1998) Also invited to speak on the drought monitoring activities of the U.S. at the follow up workshop in El Paso, TX. (October 1999)
- Drought monitoring consultant for the Hungarian Meteorological Service in Budapest, Hungary. (September 1997)