

CODY L. KNUTSON

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EDUCATION

Ph.D. 2004 Geography, University of Nebraska-Lincoln
M.A. 1997 Anthropology, University of Nebraska-Lincoln
M.S. 1996 Geological Engineering, South Dakota School of Mines and Technology
B.S. 1993 Geological Engineering, South Dakota School of Mines and Technology

CURRENT ACADEMIC APPOINTMENT

Research Associate Professor/Social Scientist (07/2012 – present), National Drought Mitigation Center (NDMC), School of Natural Resources, University of Nebraska-Lincoln (UNL)

Serve as the NDMC's Planning and Social Science Program Leader supervising staff and graduate students, leading research and service activities, and teaching periodically. Activities include research on drought impacts, management strategies, and stakeholder information needs; facilitating the development of decision support tools using participatory science processes; collaborating with stakeholders to develop drought risk management plans; and providing training to support capacity building on the topics of drought, water scarcity, and climate change.

PAST PROFESSIONAL EXPERIENCE

2006 – 2012 Research Assistant Professor, National Drought Mitigation Center, UNL
2004 – 2006 Assistant Geoscientist, National Drought Mitigation Center, UNL
2002 – 2004 Water Resources Specialist, National Drought Mitigation Center, UNL
2001 – 2003 Lecturer and Teaching Assistant, Anthropology and Geography Department, UNL
2001 – 2002 Applied Anthropologist, Development Systems International, Lincoln, NE
1997 – 2000 Water Resources Specialist, National Drought Mitigation Center, UNL
1996 – 1997 Technical Assistant, United States Geological Survey, Lincoln, NE
1994 – 1996 Hydrologic Technician (seasonal), USDA Forest Service, Custer, SD
1994 – 1995 Research and Teaching Assistant, Geology and Geological Engineering Department, South Dakota School of Mines and Technology, Rapid City, SD
1993 – 1994 Project Manager, American Technical Services, Sioux Falls, SD
1991 – 1992 Geologist (seasonal), Independence Mining Corporation, Elko, NV

PUBLICATIONS

Peer-Reviewed Journal Articles

Haigh, T., W. Schacht, C. Knutson, J. Volesky, A. Smart, and M. Stockton (in review)
Operationalizing Drought Preparedness for Rangeland Managers, *Rangeland Ecology and Management*

- K. Floress, A. Reimer, A. Thompson, M. Burbach, C. Knutson, L. Prokopy, M. Ribaud, J. Ulrich-Schad (in press) Measuring Farm Conservation Behaviors: Challenges and Best Practices, *Land Use Policy*
- McNeeley, S., C. Dewes, C. Stiles, T. Beeton, I. Rangwala, M. Hobbins, and C. Knutson (in press) Anatomy of an interrupted irrigation season: Micro-drought at the Wind River Indian Reservation, *Climate Risk Management*
- Church, S., T. Haigh, M. Widhalm, S.G. de Jalon, N. Babin, J.S. Carlton, M. Dunn, K. Fagan, and C. Knutson (2017) Agricultural Trade Publications and the 2012 Midwestern Drought: A Missed Opportunity for Climate Risk Communication, *Climate Risk Management*, Vol. 15: 45-60
- Knutson, C. and B. Fuchs (2016) New Tools for Assessing Drought Conditions for Range Management, *Rangelands*, Vol. 38 (4): 177-182.
- Collins, K., J. Hannaford, M. Svoboda, C. Knutson, N. Wall, T. Bernadt, N. Crossman, I. Overton, M. Acreman, S. Bachmair, and K. Stahl (2016) Stakeholder Co-inquiries on Drought Impacts, Monitoring and Early Warning Systems. *Bulletin of the American Meteorological Association*. doi:10.1175/BAMS-D-16-0185.1
- Bachmair, S., K. Stahl, K. Collins, J. Hannaford, M. Acreman, M. Svoboda, C. Knutson, K. H. Smith, N. Wall, B. Fuchs, N. Crossman, and I. Overton (2016) Drought Indicators Revisited: Practice in Monitoring and Early Warning and the Link to Drought Impacts, *WIREs Water*. doi: 10.1002/wat2.1154
- Carlton, J.S., A.S. Mase, C.L. Knutson, M.C. Lemos, T. Haigh, D.P. Todey, L.S. Prokopy (2015) The effects of drought on climate change beliefs, risk perceptions, and adaptation attitudes, *Climatic Change*, Vol. 135(2): 211-226.
- Prokopy, L., C. Hart, R. Massey, M. Widhalm, J. Klink, J. Andresen, J. Angel, T. Blewett, O. Doering, R. Elmore, B. Gramig, P. Guinan, B. Hall, A. Jain, C. Knutson, M. Lemos, L. Wright Morton, D. Niyogi, R. Power, M. Shulski, C.X. Song, E. Takle, D. Todey (2015) Using a Team Survey to Improve Communication for Enhanced Delivery of Agro-Climate Decision Support Tools, *Agricultural Systems*, Vol 138, 31-37.
- Haigh, T., L. Wright Morton, M.C. Lemos, C. Knutson, L.S. Prokopy, Y.J. Lo, J. Angel (2015) Agricultural Advisors as Climate Information Intermediaries: Exploring Differences in Capacity to Communicate Climate. *Weather, Climate, and Society*, Vol 7, 83-93.
- Prokopy, L.S., T. Haigh, A. Mase, J. Angel, C. Hart, C. Knutson, M. Lemos, Y. Lo, J. McGuire, L. Morton, J. Perron, D. Todey, M. Widhalm (2013) Agricultural Advisors: A Receptive Audience for Weather and Climate Information? *Weather, Climate, and Society*, Vol. 5 (2), pp. 162-167.
- Knutson, C. L., and T. Haigh (2013) A Drought Planning Methodology for Ranchers in the Great Plains, *Rangelands*. Vol. 35 (1), pp. 27-33.
- Haigh, T., and C.L. Knutson (2013) Role of Perceived Control and Planning in Ranch Drought Preparedness, *Great Plains Research Journal*, 23(1): 51-58
- Arbuckle, J., L. Prokopy, T. Haigh, J. Hobs, T. Knott, C. Knutson, A. Loy, A. Mase, J. McGuire, L. Morton, J. Tyndall, M. Widhalm (2013) Climate change beliefs, concerns, and attitudes toward adaptation and mitigation among farmers in the Midwestern United States. *Climatic Change Letters*. Vol. 117 (4): 943-950.
- Mehta, V., C. L. Knutson, N.J. Rosenberg, J.R. Olson, M.J. Hayes, N. Wall, and T. Bernadt (2013) Decadal Climate Information Needs of Stakeholders for Decision Support in

- Water and Agriculture Production Sectors: A Case Study of the Missouri River Basin. *Climate, Weather, and Society*. Vol. 5: 27-42.
- Knutson, C.L., T. Haigh, M. Hayes, M. Widlham, J. Nothwehr, and M. Kleinschmidt (2011) Farmer Perceptions of Sustainable Agriculture Practices and Drought Risk Reduction in Nebraska, USA, *Journal of Renewable Agriculture and Food Systems*, 26(3): 255-266
- Ryu, J.H., M.D. Svoboda, J.D. Lenters, T. Tadesse, and C.L. Knutson (2010) Finding Potential Extents for ENSO-Driven Hydrologic Drought Forecasts in the United States, *Climatic Change*, 101(3-4): 575-597
- T. Tadesse, M. Haile, G. Senay, B.D. Wardlow, and C.L. Knutson (2008) The need for integration of drought monitoring tools for proactive food security management in sub-Saharan Africa, *Natural Resources Forum*, 32:4, pp. 303-316
- Knutson, C.L., S. Jones, M.E. Sittler, M. Higgins, M.D. Svoboda, D.R. Kluck, and D.A. Wilhite (2008) Development of a Low Flow Early Warning System for the NOAA National Weather Service, USA, *International Journal of Ecological Economics and Statistics*, Vol. 12: 44-57
- Knutson, C.L., M.J. Hayes, and M.D. Svoboda (2007) Case Study of Tribal Drought Planning: The Hualapai Tribe. *Natural Hazards Review*, Vol. 8(4): 125-131
- Cooter, E., B. Eder, C. Rosenzweig, B. Lynn, R. Goldberg, C. Knutson, M. Hayes, D. Wilhite, J. DeCarolis, and T. Barnett. Effects of Climate Change on Weather and Water (2005) *Environmental Management*, Special Issue on Climate Change and Air Quality, pp. 32-35
- Hayes, M.J., C.L. Knutson, and Q. Hu (2005) Multiple-Year Droughts in Nebraska, *NebGuide*, University of Nebraska Cooperative Extension Service, Lincoln, NE
- Hayes, M.J., O. Wilhelmi, and C.L. Knutson (2004) Reducing Drought Risk: Bridging Theory and Practice. *Journal of Natural Hazards Review*. 5(2): 106-113.
- Wilhite, D.A., M. Hayes, C. Knutson, and K.H. Smith (2000) Planning for Drought: Moving from Crisis to Risk Management, *Journal of the American Water Resources Association*, 36(4): 697-710.
- Wilhite, D.A., M. Hayes, C. Knutson, and K.H. Smith (2000) Planning for Drought: Moving from Crisis to Risk Management, *Water Resources Journal*, 207: 8-22 (re-printed from the Journal of the American Water Resources Association).
- Gollapudi, C.L. Knutson, S.S. Bang, and M.R. Islam (1995) A New Method for Controlling Leaching Through Permeable Channels. *Chemosphere* 30(4): 695-705.

Book Chapters

- Prabhakar, S.V.R.K., C. Knutson, J. Cummins and B.N. Razafindrabe (2017) Decision Making for Responding to Drought - Ensuring They are Driven by Objective Assessments of Drought. In Madu, C. and Chu-Hua Kuei (eds.) *Handbook of Disaster Risk Reduction and Management*, World Scientific Press & Imperial College Press: London, U.K.
- Hannaford, J., M. Acreman, K. Stahl, S. Bachmair, M. Svoboda, C. Knutson, N.D. Crossman, I.C. Overton, M.J. Colloff (2015) Enhancing Drought Monitoring and Early Warning by Linking Indicators to Impacts. In: J.A. Alvarez, A. Solera, J. Paredes-Arquiola, D. Haro-Monteagudo, and H. van Lanen (eds.) *Drought: Research and Science Policy-Interfacing*, CRC Press.
- Knutson, C., Redmond, K., and M. Svoboda (2013) Drought: The Knowledge Base. In: James C. Schwabe (ed.) *Planning and Drought*, American Planning Association Planning Advisory Service, Vol 574. Chicago, IL.

- Knutson, C.L. and T. Haigh (2013) Ranchers in the United States, Scientific Information, and Drought Risk. In: L. Botterill and G. Cockfield (eds.), *Drought Risk Management and Policy: Decision Making Under Uncertainty*, CRC Press: Boca Raton, FL
- Knutson, C.L. (2013) Managing Water Stress, Drought, and Climate Change in the 21st Century. In: J. Maestu (ed.), *Water Trading and Global Water Scarcity*, RFF Press: Washington, D.C.
- Tadesse, T., D.A. Wilhite, M.J. Hayes, J.F. Brown, and C.L. Knutson (2006) Modern Drought Monitoring Tool for Decision Support Systems, In: A. Anttiroiko and M. Malkia (eds.), *Encyclopedia of Digital Government*, Volume 3:1212-1218
- Wilhite, D.A., M.J. Hayes, and C.L. Knutson (2005) Drought Preparedness Planning: Building Institutional Capacity. In: D.A. Wilhite (ed.), *Drought and Water Crises: Science, Technology, and Management Issues*. CRC Press: Boca Raton, FL

United Nations Publications

- FAO/Daugherty Water for Food Institute (in press) Drought Characterization and Management in the Near East and North Africa Region (M. Bazza, C. Knutson, and M. Kay, eds.), Food and Agriculture Organization of the United Nations, Rome, Italy, 150 pp.
- FAO/Daugherty Water for Food Institute (2016) Drought Characteristics and Management in the Caribbean (A. Trotman, M. Bazza, C. Knutson, and M. Kay, eds.), Food and Agriculture Organization of the United Nations, Rome, Italy, 93 pp.
- Knutson, C., I. Beernaerts, and M. Bazza (2014) Towards Risk-Based Drought Management in Europe and Central Asia, European Commission on Agriculture Thirty-Eighth Session, Bucharest, Romania, April, Food and Agriculture Organization of the United Nations Policy Paper, ECA 38/14/4
- UNDP (2010) *Local Climate Change Adaptation: Case Studies from the Community Water Initiative*, C.L. Knutson (Lead Author), United Nations Development Programme, New York, NY, 30 pp.
- UNISDR (2009) *Drought Risk Reduction Framework and Practices: Contributing to the Implementation of the Hyogo Framework for Action*, C.L. Knutson (Co-Lead Author), United Nations International Strategy for Disaster Reduction, Geneva, Switzerland, 194+vi pp.
- FOA/NDMC (2008) *The Near East Drought Planning Manual: Guidelines for Drought Mitigation and Preparedness Planning*, C. L. Knutson (Lead Author), Food and Agriculture Organization of the United Nations Near East Regional Office and the National Drought Mitigation Center, USA. FAO: Rome, Italy, 52+iv pp.
- FAO/NDMC (2008) *A Review of Drought Occurrence, Monitoring, and Planning Activities in the Near East Region*, C.L. Knutson (Lead Author), Food and Agriculture Organization of the United Nations Near East Regional Office and the National Drought Mitigation Center, USA. FAO: Rome, Italy, 44+ix pp.
- UNISDR (2007) *Drought Risk Reduction Framework and Practices: Contributing to the Implementation of the Hyogo Framework for Action*, C.L. Knutson (Lead Author), United Nations secretariat for the International Strategy for Disaster Reduction (UN/ISDR), Geneva, Switzerland, 97+vi pp

Other Publications and Reports

- Knutson, C., (2017) Drought Risk and Vulnerability Assessment (extended abstract), Proceedings of the NENA Regional Stakeholder Workshop on Operationalizing the Regional Collaborative Platform to Address Water Consumption, Water Productivity and Drought Management in Agriculture, FAO and Daugherty Water for Food Institute, Cairo, Egypt, October 27-29, 2015
- Jedd, T., S. Fragaszy, C. Knutson, M. Hayes, M. Svoboda, and N. Wall (2017) Development of the MENA Regional Drought Management System: Tunisia Needs Assessment. Report to International Center for Biosaline Agriculture, Dubai, UAE, 38 pp.
- Jedd, T., S. Fragaszy, C. Knutson, M. Hayes, M. Svoboda, and N. Wall (2017) Development of the MENA Regional Drought Management System: Jordan Needs Assessment. Report to International Center for Biosaline Agriculture, Dubai, UAE, 40 pp.
- Jedd, T., S. Fragaszy, C. Knutson, M. Hayes, M. Svoboda, and N. Wall (2017) Development of the MENA Regional Drought Management System: Lebanon Needs Assessment. Report to International Center for Biosaline Agriculture, Dubai, UAE, 37 pp.
- Jedd, T., S. Fragaszy, C. Knutson, M. Hayes, M. Svoboda, and N. Wall (2017) Development of the MENA Regional Drought Management System: Morocco Needs Assessment. Report to International Center for Biosaline Agriculture, Dubai, UAE, 52 pp.
- Wright Morton, L., L.S. Prokopy, J.G. Arbuckle, Jr., C. Ingels, M. Thelen, R. Bellm, D. Bowman, L. Edwards, C. Ellis, R. Higgins, T. Higgins, D. Hudgins, R. Hoorman, J. Neufelder, B. Overstreet, A. Peltier, H. Schmitz, J. Voit, C. Wegehaupt, S. Wohnoutka, R. Wolkowski, L. Abendroth, J. Angel, T. Haigh, C. Hart, J. Klink, C. Knutson, R. Power, D. Todey, and M. Widhalm. 2016. *Climate Change and Agricultural Extension; Building Capacity for Land Grant Extension Services to Address the Agricultural Impacts of Climate Change and the Adaptive Management Needs of Agricultural Stakeholders*. Technical Report Series: Findings and Recommendations of the Climate and Corn-based Cropping Systems Coordinated Agricultural Project. Vol 3 of 5. CSCAP Publication no. CSCAP-0192-2016.
- Hannaford, J., M. Acreman, K. Stahl, S. Bachmair, M. Svoboda, C. Knutson, N.D. Crossman, I.C. Overton, and M.J. Collof (2015) Enhancing drought monitoring and early warning by linking indicators to impacts - an international perspective (extended abstract). Proceedings of the International Conference on Drought: Research and Science-Policy Interfacing, European Commission, March 10-13, Valencia, Spain.
- Wall, N., T. Haigh, C. Knutson, and T. Bernadt (2015) Workshops in the Southern Great Plains Focus on Drought Risk Management on the Ranch. *Southern Climate Monitor*, Vol 5 (10): 2-3, October.
- Blue, J., R.A. Krop, N. Hiremath, C. Gillette, J. Rooke, C.L. Knutson, and K. Smith (2015) Drought Management in a Changing Climate: Using Cost-Benefit Analyses to Assist Drinking Water Utilities, Water Research Foundation Web Report #4546
- Church, S., Haigh, T., Melissa J Widhalm, Prokopy, L., Arbuckle, J., Hobbs, J., Knoot, T., Knutson, C., Loy, A., Mase, A., Mcguire, J., Morton, L., Tyndall, J. (2015). Farmer Perspectives on Agricultural Practices, Information, and Weather Variability in the Corn Belt: A Statistical Atlas, Volume 2. Purdue University Research Repository. doi:10.4231/R79W0CFS

- Tyndall, J., J.G. Arbuckle, T. Haigh, C. Knutson, L. Wright Morton, L. Stalker Prokopy, M. Widhalm. (2015) New Atlas Features Corn Belt Farmers' Perspectives on Agriculture and Climate, *Journal of Extension*, Vol 53 (1)
- Nam, W.H., Hayes, M.J., Wilhite, D.A., Tadesse, T., Svoboda, M.D., Knutson, C.L. (2014) Drought management and policy based on risk assessment in the context of climate change. *Journal of the Korean Society of Agricultural Engineers*, 56 (2): 2-15
- Loy, A., J. Hobbs, J.G. Arbuckle, L. Wright Morton, L. Stalker Prokopy, T. Haigh, T. Knoot, C. Knutson, A. Saylor Mase, J. McGuire, J. Tyndall, M. Widhalm (2013) Farmer Perspectives on Agriculture and Weather Variability in the Corn Belt: A Statistical Atlas (pp 109 pgs). Iowa State University: CSCAP 05153-2013. Ames, IA: Cropping Systems Coordinated Agricultural Project (CAP): Climate Change, Mitigation, and Adaptation in Corn-based Cropping Systems.
- Smith, K., and C. Knutson (2013) Drought Management Database Debuts in 2013, *Southern Climate Monitor*, 11th ed., vol 3: 2-3.
- Knutson, C., N. Wall, and M. Svoboda (2013) Developing Seasonal Predictive Capacity for Drought Mitigation Support: Report of Workshop Group Discussions. Technical Report to NASA and the University of Idaho.
- Gasteyer, S., C. Knutson, N. Wall, and A. Schutz (2013) Shifting Intermediaries: Tracing the Land Grant Role in Water Management in Nebraska. Technical Report to the USDA North Central Regional Center for Rural Development, East Lansing, MI.
- M. Eversoll, C. Knutson, and M. Hayes (2013) Tribal Drought Planning Activities in the Missouri River Basin, Report to the NOAA NIDIS Program Office, Boulder, CO, 10 pp.
- Knutson, C.L., T. Haigh, and P. Reece (2012) Managing Drought Risk on the Ranch: A Planning Guide for Great Plains Ranchers, National Drought Mitigation Center, University of Nebraska-Lincoln, pp. 39
- Haigh, T. and C. Knutson (2012) Modeling Impacts of Decadal Climate Variability in the Missouri River Basin Project: Stakeholder Advisory Team Interviews Report. Technical Report Submitted to USDA-NIFA.
- Svoboda, M., K.H. Smith, M. Widhalm, D. Woudenberg, C. Knutson, M. Sittler, J. Angel, M. Spinar, M. Shafer, R. McPherson, H. Lazrus (2011) Drought-Ready Communities: A Guide to Community Drought Preparedness, National Drought Mitigation Center, p. 53.
- Islam, M.Z., C. Knutson, and A. Boug (2010) Strategy and action plan to reduce the risk of mass mortalities of reintroduced ungulates in the Mahazat as-Sayd Protected Area in Saudi Arabia. *Gnusletter* 28(2): 9-15
- Knutson, C.L., and M.Z. Islam (2009) *A Plan to Reduce the Risk of Mass Mortalities of Reintroduced Animals in the Mahazat as-Sayd Protected Area in Saudi Arabia*, National Wildlife Research Center and National Commission for Wildlife Conservation and Development: Taif and Riyadh, Saudi Arabia, 30 pp.
- Knutson, C.L. (2009) A Drought Monitoring and Early Warning System for Western India, Quarterly Newsletter of the Indian Centre for Climate and Societal Impacts, 2(1):5-6, Gujarat, India.
- Knutson, C.L. (2008) Adaptation to Water Stress in the Great Plains. *Water Resources IMPACT*, Vol. 10(4), pp18-21
- Knutson, C.L. (2008) The role of water conservation in drought planning. *Journal of Soil and Water Conservation*, Vol. 63(5)

- Knutson, C.L. (2008) Review of *Methods and Tools for Drought Analysis and Management*, Giuseppe Rossi, Teodora Vega, and Brunella Bonaccorso (Eds.), *Eos*, 89(2)
- Wilhite, D.A., and C.L. Knutson (2008) Drought management planning: Conditions for success, *Options Mediterraneennes*, Series A., No. 80, pp. 141-148
- Rosenberg, N.J., V.M. Mehta, M.J. Hayes, C.L. Knutson, and M.E. Sittler (2007) Decadal Climate Information Needs of Stakeholders and Policymakers in the Missouri River Basin, Technical Report to NOAA Climate Office/Sectoral Applications Research Program, Silver Spring, MD
- Woudenberg, D.L., C.L. Knutson, M.D. Svoboda, and S. Jones (2007) Low Flow/Stage Related Impacts in the Red River of the North and Upper Mississippi River Basins, North Dakota and Minnesota: Low Water Impact Information Database Project, Technical Report to Central Region Climate Services, NOAA National Weather Service, Kansas City, MO
- Woudenberg, D.L., C.L. Knutson, M.D. Svoboda, and S. Jones (2007) Low Flow/Stage Related Impacts in the Upper Trinity River Basin: Low Water Impact Information Database Project, Technical Report to Southern Region Hydrologic Services, NOAA National Weather Service, Fort Worth, TX
- Knutson, C.L., S. Jones, M. Sittler, and M.D. Svoboda (2006) Low Flow/Stage Related Impacts in the Upper Missouri River Basin: Technical Report to Central Region Climate Services, NOAA National Weather Service, Kansas City, MO
- Knutson, C.L., M.D. Svoboda, and M.J. Hayes (2006) Analyzing Tribal Drought Management: A Case Study of the Hualapai Tribe. Technical Report to the Natural Hazards and Applications Information Center, University of Colorado, Boulder, CO
- Knutson, C.L., M. Higgins, and M.D. Svoboda (2005) Low Flow/Stage Related Impacts in the North Platte River Basin. Technical Report to Central Region Climate Services, NOAA National Weather Service, Kansas City, MO
- Knutson, C.L. (2004) Pick-Sloan Plan. In: D. Wishart (ed.), *Encyclopedia of the Great Plains*, University of Nebraska Press: Lincoln, NE, pp. 858-859
- Knutson, C.L. (2004) *Rural Water Development for Marginal Regions: With a Case Study of South Dakota's Mni Wiconi Rural Water Project*. Ph.D. Dissertation. University of Nebraska Press: Lincoln, NE
- Knutson, C.L. (2004) Low Flow/Stage Related Impacts in the Upper Mississippi River Basin. Technical Report to Central Region Climate Services, NOAA National Weather Service, Kansas City, MO
- Knutson, C., M. Bloomstedt, and K. Slaughter (2001) Agricultural Producers of Howard County, Nebraska: Perceptions of Drought Mitigation and Response. *Drought Network News*, 13(1): 3-6
- Knutson, C.L. and M.J. Hayes (2001) South Carolina Drought Mitigation and Response Assessment: 1998-2000 Drought. Response Report #136, Natural Hazards Research and Applications Information Center, University of Colorado, Boulder, CO
- Wilhite, D.A., M. Hayes, C. Knutson, and K.H. Smith (1999) A Methodology for Drought Planning, Prepared for the U.S. Bureau of Reclamation, Denver, CO
- Knutson, C., M. Hayes, and K. T. Phillips (1998) How to Reduce Drought Risk, Guide Prepared by the Preparedness and Mitigation Working Group of the Western Drought Coordination Council, Lincoln, NE

Knutson, C.L. (1996) Bacteriogenic Plugging of High Permeability Areas Through a Reduction in Porosity, M.S. Thesis, South Dakota School of Mines and Technology, Rapid, City, SD

GRANT SUPPORT

Pending

Stiles, C., N. Umphlett, T. Haigh, C. Knutson, N. Cooley, and K. Cozzetto. Building Capacity to Make Informed Decisions: Enhancing the Resilience of Tribes through Climate and Drought Needs Assessments and Training Sessions, NOAA SARP, \$153,549, 7/1/18-6/30/19

Current

J. DeAngelis, D. Rouse, S. Burke, C. Knutson, and M. Svoboda. CTP FEMA Approved Special Project: Drought Mitigation in a Multi-Hazard Context, FEMA, \$234,983, 10/1/17-9/30/19

Huq, S., R. Red Cloud, J. Rattling Leaf, C. Chapman, C. McNutt, C. Knutson, C. Stiles, L. Edwards, and D. Kluck, Great Plains Tribal Water Alliance Climate Partnership: Category 1: Development of Water Resources Vulnerability Assessments Process and Guidebook, BIA Tribal Climate Resilience Program, \$206,258, 10/16-9/18

Huq, S., R. Red Cloud, J. Rattling Leaf, C. Chapman, C. McNutt, C. Knutson, C. Stiles, L. Edwards, and D. Kluck, Great Plains Tribal Water Alliance Climate Partnership: Category 2: Development of Water Resources Vulnerability Assessments to Build Tribal Resilience, BIA Tribal Climate Resilience Program, \$243,202, 10/16-9/18

Hayes, M., C. Knutson, C. Neale, M. Svoboda, B. Wardlow, and D. Wilhite, Development of the MENA Regional Drought Management System, International Center for Biosaline Agriculture/USAID, \$1,025,440, 1/16-03/18

Mehta, V., N. Rosenberg, and C. Knutson, Decadal Drought Information Needs of Food and Bio-fuels Agriculture in the Missouri River Basin, NOAA CPO/CSI/SARP, \$285,000, 8/15-7/18

Hayes, M., M. Svoboda, C. Knutson, T. Tadesse, D. Bathke, and B. Fuchs, Providing Drought Information Services for the Nation: The National Drought Mitigation Center (NDMC), NOAA/CPO, \$2,443,222, 6/15-5/18

Knutson, C., M. Cottenoir, J. Wellman, S. McNeeley, and M. Svoboda, The Wind River Indian Reservation's Vulnerability to the Impacts of Drought and the Development of Decision Tools to Support Drought Preparedness, USGS/North Central Climate Science Center, \$393,618, 6/15-3/18

Previous Grant Support

Hayes, M. D. Bathke, B. Fuchs, C. Knutson, M. Svoboda, and T. Tadesse, Drought Risk Management for the U.S., University of Oklahoma/NOAA, \$693,696, 9/14-8/17

Stahl, K., C. Knutson, M. Svoboda, J. Hannaford, K. Collins, J.C. Overton, N.D. Crossman, M.J. Colloff, and M. Acreman, Drought Impacts: Vulnerability Thresholds in Monitoring and Early Warning Research, Belmont Forum and G8 Research Councils, \$1,540,249 (\$542,073 to Knutson and Svoboda through NSF), 10/13-9/17

- Svoboda, M., C. Knutson, M. Hayes, and B. Fuchs, Drought Risk Management and Planning Assistance in the Caribbean. Caribbean Institute of Meteorology and Hydrology/USAID, \$49,917, 1/17-6/17
- Smart, A., S. Clay, D. Clay, T. Troovien, L. Perkins, W. Schacht, J. Volesky, C. Knutson, and M. Stockton, Demonstrating Grazing Land Resilience to Drought in the Northern Great Plains. USDA NRCS, \$713,019, 4/13-3/17
- Prokopy, L.S., J. Andresen, J. Angel, T. Bartholomay, T. Blewett, O. Doering, R. Elmore, B. Erickson, B. Gramig, P. Guinan, C. Hart, S. Hillberg, A. Jain, C. Knutson, M.C. Lemos, R. Massey, L. Wright Morton, D. Niyogi, M. Shuski, X.C. Song, G. Takle, and D. Todey, Useful to Usable (U2U): Transforming Climate Variability and Change Information for Cereal Crop Producers, USDA NIFA-AFRI, \$5,000,000, 3/11-3/17
- Mehta, V., C. Knutson, A. Mehta, R. Srinivasan, B. McCarl, and N. Rosenberg, Decadal Climate and Societal Impacts Predictability and Prediction Studies in the Missouri River Basin Using NCAR, GFDL, and UKMO-Hadley Centre Earth System Models; HUMUS-SWAT Hydrology and EPIC Crop Models; FASOM Economic Land Use Model; and MRBRIVERSIM Water Availability and Use Model, USDA, \$1,500,000, 6/11-5/16
- Knutson, C. and T. Haigh, Risk Management Education for Ranchers in the Oklahoma City, OK, RMA Region: Drought Planning, Range Management, and FCIC Options. USDA RMA, \$75,594, 10/14-3/16
- Fuchs, B., M. Svoboda, C. Knutson, K. Smith, and M. Hayes, Drought Management Assistance for the Eastern Caribbean States, Organisation of Eastern Caribbean States, \$49,227, 1/16-5/16
- Knutson, C., Global Review of FAO Regional Drought Studies, Daugherty Water for Food Institute, UNL, \$6,241, 10/14-2/15
- Knutson, C. and T. Haigh, Survey to Investigate Grazing Land Resilience to Drought in the Central and Northern Great Plains, UNL ARD, \$11,500, 7/14-2/15
- Hayes, M., M. Svoboda, C. Knutson, B. Fuchs, and K. Smith, Technical Assistance on Drought Preparedness, World Bank, \$25,000, 7/14-6/15
- Hodgins, M., J. Blue, R. Krop, and C. Knutson, Drought Management Under a Changing Climate: Using Cost-Benefit Analyses to Assist Drinking Water Utilities, NOAA CPO CSI/SARP, \$179,764, 8/13-7/15
- Prokopy, L., C. Knutson, M. Lemos, L. Wright Morton, and C. Hart, Evaluating the Impact of Extreme Drought on Farm Advisors' Perception of Climate Risks in the U.S. Corn Belt, NOAA CPO CSI/SARP, \$298,000, 8/13-7/15
- Hayes, M., M. Svoboda, C. Knutson, T. Tadesse, D. Bathke, and B. Fuchs, Drought Information Service in Support of the National Integrated Drought Information Service, NOAA, \$739,803, 10/13-9/14
- Hayes, M., M. Svoboda, C. Knutson, B. Fuchs, and K. Smith, Technical Assistance on Drought Preparedness, World Bank, \$40,000, 10/13-6/14
- Knutson, C., T. Haigh, J. Volesky, N. Wall, T. Bernadt, and J. Nothwehr, The Role of Drought Preparedness in Improving the Sustainability of Great Plains Ranches, USDA NCR SARE, \$56,366, 2/12-1/14
- Knutson, C., T. Haigh, J. Volesky, and D. Woudenberg, Risk Management Planning on the Ranch, USDA RMA, \$93,752, 10/11-9/12
- Gasteyer, S., C. Knutson, N. Wall, and A. Schutz, Shifting Intermediaries – Tracing the Land Grant Role in Water Management in Nebraska, USDA NCR CRD, \$20,000, 10/12-9/13

- Knutson, C.L., M.J. Hayes, K.H. Smith, M. Widhalm, J. Nothwehr, and T. Haigh, Transition of an Interactive Drought Management Database for the Identification and Comparison of Drought Mitigation and Response Strategies, NOAA, \$203,861, 9/11-8/13
- Mehta, V., C.L. Knutson, N. Rosenberg, D. Kluck, and J. Aber, Interannual to Decadal Climate Variability Information for Risk Assessment, Urban Water Policy, and Decision Support: Case Studies of Kansas City, Lincoln, and Great Falls Urban Areas within the Missouri River Basin, NOAA, \$299,000, 10/11-9/13
- Hayes, M.J., C.L. Knutson, M.D. Svoboda, and B. Wardlow, Drought Mitigation-Nebraska Project, USDA CSREES, \$558,401, 8/10-7/12
- Mehta, V., M.J. Hayes, C.L. Knutson, and R. Olsen, An Assessment of Decadal Drought Information Needs of Stakeholders and Policymakers in the Missouri River Basin for Decision Support, NOAA, \$294,111, 5/08-04/11
- Cai, X., J. Ryu, X. Liang, P. Kumar, M.D. Svoboda, C.L. Knutson, M. Sittler, D. A. Wilhite, J. Angel, and M. Palecki, Developing a Predictive Capability Decision Support System for Drought Mitigation, NASA, \$959,788, 05/08-04/12
- Hayes, M.J., C.L. Knutson, M.D. Svoboda, and B. Wardlow, Drought Mitigation-Nebraska Project, USDA CSREES, \$437,243, 8/09-7/11
- Hayes, M.J., C.L. Knutson, M.D. Svoboda, B.D. Wardlow, Drought Mitigation – Nebraska Project. USDA CSREES, \$347,246, 7/08-7/11
- Hayes, M., C. Knutson, D. Wilhite, and M. Svoboda, Transitioning the Drought Impact Reporter into an Operational System, NOAA, \$453,523, 8/07-7/11
- Goddard, S., Wilhite, et al., D., M. Hayes, M. Svoboda, C. Knutson, T. Tadesse, K. Schoengold, K.G. Hubbard and B. Wardlow, Drought Risk, Impact, and Mitigation Information System, USDA RMA, \$6,407,472, 10/05-9/10
- Wilhite, D., M. Hayes, T. Tadesse, J. Brown, C. Knutson, M. Svoboda, and J. Volesky, Rangeland and Forage Geospatial Decision Support System for Drought Risk Management, USDA RMA, \$1,023,038, 10/05-9/10
- Knutson, C., M. Svoboda, and J. Ryu, Development of a Drought Decision Support Portal for the Republic River Basin of Nebraska, Colorado, and Kansas, NOAA, \$223,525, 08/07-07/10
- Hayes, M.J., C.L. Knutson, M.D. Svoboda, B.D. Wardlow, Drought Mitigation – Nebraska Project. USDA CSREES, \$347,246, 7/08-7/10
- Svoboda, M.D., M.E. Sittler, K.H. Smith, C.L. Knutson, M. Shafer, D.L. Woudenberg, M. Palecki, and J. Angel, Development of a Drought Ready Communities Program, NOAA Climate Program Office, \$288,670, 07/08-06/10
- Hayes, M.J and C.L. Knutson, Advising the Colorado Drought Planning Process, State of Colorado, \$10,000, 12/09-5/10
- Knutson, C.L., M.J. Hayes, M.D. Svoboda, and D. Woudenberg, Surveying Potential Low-Flow Impacts in the Upper Colorado River Basin, NOAA-NWS, Kansas City, MO, \$87,000, 10/08-3/10
- Knutson, C.L., M.D. Svoboda, M.J. Hayes, and D. Woudenberg, Surveying Potential Low Flow Impacts in the Alabama, ACT, and ACF River Basins, NOAA-NWS, Ft. Worth, TX, \$24,999, 9/08-03/10
- Burbach, M., C. Knutson, and B. Ramamurthy, Integrated Real-Time Ground Water-Level Monitoring Network to Support Drought Impact Assessment and Mitigation Programs, USDA RMA, \$403,293, 10/05-12/09

- Knutson, C.L., M.J. Hayes, M.D. Svoboda, D. Woudenberg, and M. Widhalm, Low Flow Project in the Southern U.S., NWS Southern Region Headquarters, Ft. Worth, TX, \$24,999, 9/08-9/09
- Buman, T.J, R. Buman, J. Ridgely, S. Buman, P. Mitchell, J. Hatfield, C. Knutson, and M. Hayes, Mitigating the Economic Risk of Stock Reduction During Drought: An Adoption Support Tool for Cattle Producers, USDA RMA, \$576,136, 9/03-8/07
- Wilhite, D.A. and C.L. Knutson, Development of Drought Risk Reduction Framework and Practices Document, UNISDR, \$23,023, 3/07
- Knutson, C.L., D.A. Wilhite, and M.D. Svoboda, Surveying Potential Low-Flow Impacts for the NWS Advanced Hydrologic Prediction Service in the Upper Missouri River Basin, NWS Central Region Headquarters, Kansas City, MO, \$25,000, 10/05-9/06
- Hayes, M.J., C. L. Knutson, R. Hitchcock, W. Waltman, J. Peake, and M. Kleinschmit, Sustainable Adaptations to Drought and Climate Variability in Agricultural Production Systems Across Nebraska. NOAA Office of Global Programs, Silver Springs, MD, \$107,909, 7/04 - 6/06
- Knutson, C.L., D.A. Wilhite, and M.D. Svoboda, Surveying Potential Low-Flow Impacts near NWS Forecast Points in the North Platte River Basin, NWS Central Region Headquarters, Kansas City, MO, \$7,000, 10/04-9/05
- Knutson, C.L., D.A. Wilhite, and M.D. Svoboda, Surveying Potential Low-Flow Impacts near NWS Forecast Points in the Upper Mississippi River Basin, NWS Central Region Headquarters, Kansas City, MO, \$5,000, 10/04-9/04
- Knutson, C.L., M.D. Svoboda, and D. Woudenberg, Hualapai Tribal Drought Management, Natural Hazards Research and Applications Information Center, Boulder, CO, \$2,732, 11/04-10/05

PUBLIC ENGAGEMENT ACTIVITIES

Public Presentations (2006-present)

- Made 163 public presentations (106 invited) across the United States and internationally on a range of drought, water resources, and climate change topics

U.S. Workshop/Training Organization and Facilitation

- Organized/facilitated 57 workshops across the United States on drought and climate change topics to provide training and solicit stakeholder input on tools developed by the National Drought Mitigation Center and its partners.

SELECTED INTERNATIONAL WORK

- 2017 **Dubai, United Arab Emirates** – trained Morocco, Tunisia, and Jordan representatives on drought vulnerability assessment, ICBA/USAID
- 2017 **Basseterre, St. Kitts** - writeshop facilitator to develop a national drought policy and plan; CIMH/USAID
- 2017 **St. Johns, Antigua** - writeshop facilitator to develop a national drought policy and plan; CIMH/USAID

- 2016 **Wallingford, United Kingdom** – presenter and facilitator in a stakeholder workshop to gather perspectives on drought early warning needs; G8 Belmont Forum/NSF
- 2016 **Wallingford, United Kingdom** – presenter, participant, and advisor for a workshop to evaluate results from the UK Historic Droughts Project; U.K. National Environment Research Council
- 2016 **St. Johns, Antigua** – organizer, trainer, and writeshop facilitator to develop a national drought policy and plan; CIMH/USAID
- 2016 **Rodney Bay Village, St. Lucia** - organizer, trainer, and writeshop facilitator to develop a national drought policy and plan; CIMH/USAID
- 2015 **Cairo, Egypt** – presenter and participant in a workshop to develop a regional agricultural platform to address water consumption, water productivity, and drought management in the MENA region; FAO and UNL Water for Food Institute
- 2015 **Wallingford, United Kingdom** – participant in a stakeholder workshop to investigate drought management efforts and needs in the country; G8 Belmont Forum/NSF
- 2014 **Freiburg, Germany** - project meeting to investigate the links between drought indicators and impacts in the U.S., Europe and Australia; G8 Belmont Forum/NSF
- 2013 **Izmir, Turkey** - trainer at a workshop to educate officials from Central Asian countries on how to develop national drought management policies; FAO/WMO/UNCCD
- 2011 **Nanjing, China** - presenter at the International Workshop on Water-Related Disaster Prediction and Reduction; Hohai University
- 2011 **Ankara, Turkey** - trainer at the Drought Monitoring and Planning Training Workshop for the Turkish Government; Food and Agriculture Organization of the UN
- 2011 **Bangkok, Thailand** - session chair and participant in planning UNDP’s Africa-Asia Drought Risk Management Peer Assistance Project; United Nations Development Programme
- 2010 **Menemen, Turkey** - organizer and trainer at the Drought Management Workshop for the Near East and Central Asia; Food and Agriculture Organization of the UN
- 2010 **Amman, Jordan** - organizer and trainer for the Training Workshop on Integrated Drought Preparedness and Management in Iraq; UNICEF and UNESCO
- 2009 **Sde Boker, Israel** - trainer as part of the U.S. Middle East Peace Process at the Water Resources Hydrology and Climate Change Training Workshop for officials from Israel, Jordan, and the Palestinian Territory; USDA Foreign Agriculture Service

- 2008 **Jeddah, Saudi Arabia** - organizer and facilitator of workshop to develop a drought plan for the Mahazat as-Sayd Protected Area (national wildlife sanctuary); Saudi Arabia National Wildlife Research Center
- 2008 **Zaragoza, Spain** - presenter at the Market Instruments in Integrated Water Management Conference; Expo Zaragoza 2008 (World Water Fair)
- 2008 **Girona, Spain** - presenter at the Conference on Water Scarcity and Management Under Mediterranean Climate; The Catalan Institute for Water Research
- 2007 **Ahmedabad, India** - presenter at the Workshop on Monsoon Climate Variability and Change, and advisory board member to create the Indian Center for Climate and Societal Impacts Research; Nirma University of Science and Technology
- 2007 **Cairo, Egypt** - field research to develop a drought planning guide for the Near East Region; Food and Agriculture Organization of the UN
- 2007 **Kelowna, Canada** - participant at the National Drought Strategy for Agriculture Working Group Meeting; Agri-Food Canada
- 2007 **Cairo, Egypt** - field research to investigate drought risk management in the Near East Region; Food and Agriculture Organization of the UN
- 2007 **Geneva, Switzerland** - presenter at the UN International Strategy for Disaster Reduction's 1st Global Platform for Disaster Risk Reduction; UN ISDR
- 2006 **Beijing, China** - chair of sessions at the International Expert Meeting on Drought Risk Reduction to develop a framework for implementing the Hyogo Framework for Action in terms of drought; UN International Strategy for Disaster Reduction

PROFESSIONAL REVIEW AND ADVISORY SERVICES

- 2016 Guest Editor, Climate Risk Management journal
- 2015-2016 Expert reviewer for seven regional drought study publications, Food and Agriculture Organization of the United Nations Global Drought Study
- 2015 InterTribal Buffalo Council Grant Program Reviewer
- 2006-2017 Journal article reviewer: Journal of the American Water Resources Association; Journal of Hydrology; Current Opinion in Environmental Sustainability; Weather, Climate and Society; BMC Public Health; Journal of Applied Geography; Southeastern Geographer; Eos; Water Resources Research; Disasters Journal; Natural Resources Forum; International Journal of Ecological Economics and Statistics; Range Ecology and Management; Journal of Soil and Water Conservation; Regional Environmental Change; Climatic Change; Bulletin of the American Meteorological Society; Journal of Environmental Management
- 2005-2014 Grant proposal reviewer for National Institutes for Water Resources/USGS, NOAA Climate Program Office, Indo-US Science and Technology Forum,

- ProVention Consortium, USDA CSREES (National Water Quality Grants), University of Nebraska-Lincoln and University of Idaho Hatch projects.
- 2006-2011 Book, chapter, and book proposal reviewer for the American Geophysical Union, CRC Press, Springer, Cambridge University Press, and Oxford University Press
- 2011 Program reviewer for the United Nations Development Programme's Africa-Asia Drought Risk Management Peer Assistance Project
- 2007 IPCC Reviewer for the Technical Paper on Climate Change and Water
- 2007 Guest Editor, Journal of Natural Hazards Review
- 2007 NOAA Sectoral Applications Research Program Review Panel, National Research Council
- 2005 IPCC Reviewer, Chapter 3: Freshwater Resources and Their Management, Working Group II Fourth Assessment: Impacts, Adaptation, and Vulnerability

ACADEMIC AND PROFESSIONAL AWARDS

- 2017 Climate Adaptation Leadership Award for Natural Resources – Honorable Mention (Wind River Drought Preparedness Team); sponsor: National Fish, Wildlife, and Plant Climate Adaptation Strategy's Joint Implementation Working Group
- 2015 USDA NIFA Partnership Award for Mission Integration (U2U multi-university project team)
- 2013 UNL-IANR Omtvedt Innovation Award for exceptional service (NDMC team)
- 2011 Fellow, UNL Environmental Studies Program
- 2009 Editor's Choice Honorable Mention for Best Article, "The Role of Water Conservation in Drought Planning," Journal of Soil and Water Conservation
- 2007 Fellow, Center for Great Plains Studies
- 2001-02 Graduate Teaching Assistantship, Anthropology and Geography Department, UNL
- 2001 Research Fellowship, Human Rights and Human Diversity Initiative, UNL
- 2000-01 Doctoral Research Fellowship, UNL, 2000-2001
- 2000 Gamma Theta Upsilon International Geographic Honor Society
- 1997 Certificate of Appreciation, United States Geological Survey
- 1996 Service Award, USDA Black Hills National Forest
- 1994 Research and Teaching Assistantship, Geology and Geological Engineering Department, South Dakota School of Mines and Technology
- 1990 Tau Beta Pi National Engineering Honor Society

UNIVERSITY OF NEBRASKA-LINCOLN SELECTED SERVICE

- 2009-present Member, Environmental Studies Coordinating Committee
- 2009-2012 Member, Outreach Committee, School of Natural Resources (SNR)
- 2009-2011 ACE Curriculum Certification Coordinator, Faculty of Geography and GIScience
- 2009-2010 Co-coordinator, Faculty of Geography and GIScience, SNR
- 2009-2011 Chair, Geography and GIScience Program Graduate Curriculum Committee
- 2008-2009 Member, UNL Climate Change Initiative Advisory Panel
- 2007-present Leader, NDMC Planning and Social Science Program Area
- 2006-2009 Member, Faculty Advisory Committee, SNR

EXTERNAL PROFESSIONAL SERVICE

- 2017-present DOI North Central Climate Science Center University Consortium Member
- 2015-present United Kingdom Historic Droughts Project International Advisory Panel
- 2014-present North Central Region Water Network Member
- 2013-present Missouri River Interest Group Member
- 2012-present DOI North Central Climate Science Center Adaptation Working Group Member
- 2012-present NOAA RISA – Southern Climate Impacts Planning Program Affiliate
- 2012-2013 Colorado Water Conservation Board - Drought Mitigation Planning Committee
- 2010-present NC1190 Multistate Hatch Project on Catalysts for Water Resources Protection
- 2010-2011 Water Resources Committee Chair, Rotary International District 5650
- 2008-2009 Education Committee, National Integrated Drought Information System
- 2007-2010 Scientific Advisory Committee, Indian Centre for Climate and Societal Impacts, Ahmedabad, India
- 2006-2007 Conceptual Design Committee, National Integrated Drought Information System
- 2006-2010 Drought Advisory Group, United Nations International Strategy for Disaster Reduction
- 1999-2000 Environmental Issues Working Group, National Drought Policy Commission
- 1999-2000 Municipal and Industrial Water Working Group, National Drought Policy Commission
- 1998-present Municipal Water Supply, Health, and Energy Subcommittee, Nebraska Climate Assessment and Response Committee
- 1997-1999 Drought Preparedness Committee, Western Drought Coordination Council
- 1997-1999 Drought Response Committee, Western Drought Coordination Council