

**DONALD A. WILHITE**  
**October 2015**

**PERSONAL DATA**

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**EDUCATION**

B. S. 1967 University of Central Missouri—Warrensburg. Major, Geography; Minor, History  
M. A. 1969 Arizona State University-Tempe. Major, Geography/Climatology.  
Ph.D. 1975 University of Nebraska-Lincoln. Major, Geography/Climatology and Water Resources.

**PRESENT AND PREVIOUS POSITIONS**

Professor, Applied Climate Science, School of Natural Resources, University of Nebraska-Lincoln, 1988 to present.

Fellow, Daugherty Water for Food Institute, University of Nebraska, 2013 to present.

Director, School of Natural Resources, University of Nebraska-Lincoln, August 2007 to August 1, 2012.  
Appointment: 100% administration.

Founding Director, National Drought Mitigation Center, and Professor of Agricultural Climatology.  
School of Natural Resources, University of Nebraska-Lincoln. September 1995-July 2007.

Founding Director, International Drought Information, Center and Professor of Agricultural Climatology.  
Department of Agricultural Meteorology, University of Nebraska-Lincoln. September 1988-1995.

Assistant/Associate Professor, Department of Agricultural Meteorology, University of Nebraska-Lincoln. 1979-1988.

Water Resource Scientist, Water Resources Center, University of Nebraska-Lincoln, 1977-1979.

Agricultural Climatologist, Agrometeorology Section, Soil and Irrigation Research Institute, Department of Agriculture, Republic of South Africa. 1976-1977.

**RESEARCH INTERESTS**

Drought monitoring, mitigation, planning, and policy; climate impact assessment; climate change, and the use of climate information in decision making.

**CURRENT/RECENT NATIONAL/INTERNATIONAL LEADERSHIP ACTIVITIES**

- Chair, Management and Advisory Committees, Integrated Drought Management Program, organized under the auspices of the World Meteorological Organization and the Global Water Partnership, June 2013-present.

- Member, Organizing Committee for Regional Capacity Building Workshops, under the auspices of the World Meteorological Organization, FAO, UNCCD, UN-Water, and the Convention on Biological Diversity (6 workshops organized for Eastern/Central Europe, Latin America, South and Southeast Asia, Eastern and Southern Africa, Near East and North Africa and West and Central Africa), March 2013 to present.
- Chair, International Organizing Committee for a High-Level Meeting on National Drought Policy sponsored by the World Meteorological Organization, the Food and Agriculture Organization, and the U.N. Convention to Combat Desertification. July 2011-March 2013.
- Member, External Advisory Committee, MaRIUS: Managing the Risks, Impacts and Uncertainties of droughts and water Scarcity. Oxford University.
- Member, External Advisory Committee, Fostering European Drought Research and Science-Policy Interfacing, Henny van Lanen, Project Coordinator, The Netherlands, funded by the European Commission.
- Member, Advisory Committee, Drought Early Warning and Forecasting for Africa project (DEWFORA), UNESCO-IHE, funded by the European Union, January 2011-present.
- Book series editor, Drought and Water Crises. CRC Press, Taylor and Francis Publishers, Boca Raton, Florida. 2009-present. Books published or currently in production include:
  - *Natural Drought Cycles and Human Life: Societal Impacts of Decadal Climate Variability and Their Predictability* (Vikram Mehta), expected publication 2016.
  - *Western Water Policy and Planning in a Variable and Changing Climate*, Kathleen Miller, Alan Hamlet, Douglas Kenney, Kelly Redmond, expected publication 2016.
  - *Facilitating a Drought Paradigm Shift: Tales from Brazil*, Erwin De Nys, Nathan Engle, Antônio Rocha Magalhães (Editors), expected publication 2016.
  - *Drought, Climate Variability and Change: An Australian Perspective*, Daniela Anna Stehlik. Expected publication 2016.
  - *Drought, Risk Management, and Policy: Decision Making under Uncertainty*. L.C. Botterill and G. Cockfield (eds.). 2013.
  - *Remote Sensing of Drought: Innovative Monitoring Approaches*. B.D. Wardlow, M.C. Anderson, and J.P. Verdin. 2012.
- Co-chair, Executive Council, National Integrated Drought Information System (NIDIS), NOAA, 2007-present.
- Member, Scientific Committee, International Workshop on the Economics of Drought Preparedness, sponsored by the Mediterranean Agronomic Institute, ICARDA, Turkish Ministry of the Environment. Istanbul, Turkey, March 2010.
- Member, Scientific Committee, International Conference on Drought and Water Scarcity. Sponsored by the Spanish Ministry of the Environment. Madrid, Spain. February 2010.
- Member, Scientific Committee, International Conference on Climate Change and Food Security. Sponsored by the Government of Jordan and ICARDA. Amman, Jordan. February 2010.
- Co-Organizer, Interregional Workshop on Indices and Early Warning Systems for Drought. Sponsored by the World Meteorological Organization, United Nations Commission to Combat Desertification, U.S. Department of Agriculture, National Oceanic and Atmospheric Administration, December 8-11, 2009, Lincoln, Nebraska.
- Consultant, World Meteorological Organization. Preparation of project proposal for the formation of a Drought Management Center for South-Eastern Europe (11 countries) in association with the U.N. Convention to Combat Desertification. 2007.

- Technical program chair, Managing Drought and Water Scarcity in Vulnerable Environments: Creating a Roadmap for Change in the U.S. Sponsored by the Geological Society of America with co-sponsorship by 18 national and regional organizations and federal agencies, 2006.
- International Team Leader, National Drought Strategy Technical Cooperation Project: Jordan. Food and Agriculture Organization. Cairo, Egypt. 2005-2006.
- Chair, Task Force on the Socio-economic Benefits of Meteorological and Hydro-meteorological Information, World Meteorological Organization. Geneva, Switzerland. 2006-present.
- Science advisor, Mediterranean Drought Planning Project (MEDROPLAN), Mediterranean Institute for Agronomic Research, Zaragoza, Spain. Funded by the European Commission (2.5 million Euros). 2003-2006.
- Member, Organizing Committee, Understanding and Responding to Multiple Environmental Stresses, Committee on Earth-Atmosphere Interactions, Board of Atmospheric Sciences and Climate, National Academy of Sciences. 2005-2006.
- Chair, Drought Discussion Group, United Nations International Strategy for Natural Disaster Reduction. Geneva, Switzerland. 2002-2007.

### **HONORS AND AWARDS**

Recipient, 2015 Conservation Education Award, Nebraska Wildlife Federation.  
 Nominated, 2015 World Water Prize, Stockholm Water Institute (along with Mike Hayes and the NDMC)  
 Elected Fellow, American Meteorological Society, October 2013  
 Appointed Fellow, Daugherty Water for Food Institute, University of Nebraska, 2013  
 Award of Merit, Gamma Sigma Delta-Nebraska Chapter, The Honor Society of Agriculture  
 International Scholar Award, Phi Beta Delta, April 2007.

### **EDITORIAL BOARD MEMBERSHIPS**

Disaster Prevention and Management: An International Journal  
 Advances in Natural and Technological Hazards Research, Book Series, Springer Publishers  
 Weather and Climate Extremes, Elsevier Publishers

### **RECENT INVITED GUEST LECTURES/KEYNOTES, 2011-2015**

- ✓ Keynote, Regional Capacity Building Workshops on National Drought Management Policies (6 workshops), 2013-2015.
- ✓ Keynote, Moroccan Academy of Technical Sciences, Integrated Drought Management, 2015.
- ✓ Heuermann Lecture, Assessing and Understanding Climate Change: Implications for Nebraska, 2014.
- ✓ Keynote, Drought symposium in support of the MaRIUS project, Oxford University. 2014.
- ✓ Keynote, Stockholm Water Week, Stockholm. 2014.
- ✓ Keynote, National Climate Change Adaptation Program Expo, Bonn. 2014.
- ✓ Keynote, International Climate Change Adaptation Futures Conference, special sessions on national drought policy, Fortaleza. 2014.
- ✓ Keynote, High-level Meeting on National Drought Policy, WMO, Geneva, Switzerland, 2013.
- ✓ Keynote, International Workshop on Drought Monitoring, Assessment, and Planning under Global Climate Change, Beijing, 2012.
- ✓ International Lecture Series, Hohai University, Nanjing, 2012.

- ✓ Drought and Climate Workshop, Shanghai, 2012.
- ✓ President's Distinguished Lecture Series, Sam Houston State University, 2012.
- ✓ Holtry Distinguished Lecture Series, South Dakota State University, 2012.
- ✓ Keynote speaker, Global Drought Information System workshop, WMO World Climate Research Program, Frascati, Italy, 2012.
- ✓ Chancellor's Nebraska Lecture Series, University of Nebraska-Lincoln, 2011.

### **EXTERNAL GRANTS – SELECTED HIGHLIGHTS AT UNL**

Recipient or co-recipient of more than **\$20 million** in grant support since 1981 from NSF, USDA, NOAA, DOI, and other sources.

- Arctic workshop, Implications of a Changing Arctic on Water Resources and Agriculture in the Central U.S. 2015.
  - NOAA/NIDIS, \$40,000
  - USDA, \$39,860
  - UNL, \$25,000
- National Drought Mitigation Center, U.S. Department of Agriculture, \$2,000,000 from 1995-2007.
- Estimating Impacts of Complex Climatic Events. D.A. Wilhite and M.J. Hayes, Co-Principal Investigators. NOAA. \$300,000. 7/1/06-6/30/09.
- Drought Risk, Impact, and Mitigation Information System. S. Goddard and D.A. Wilhite, Co-PIs. USDA/RMA. \$6,407,472. 10/1/2005 to 9/30/2010.
- Rangeland and Forage Geospatial Decision Support System for Drought Risk Management. D.A. Wilhite, Principal Investigator. USDA/RMA. \$1,023,038. 10/1/2005 to 9/30/2010.
- Climate and Soil Risk Information System. S. Goddard, K. Hubbard, and D. Wilhite, Co-PIs. USDA FCIC/RMA. \$1,212,055. 6/1/2005 - 5/31/2008.
- National Drought Monitoring System for Drought Early Warning Using Hydrologic and Ecologic Observations from NASA Satellite Data. S.V. Nghiem, G.R. Brakenridge, R. Dole, D. LeComte, E.G. Njoku, J. Verdin, and D.A. Wilhite, Co-PIs. NASA. \$798,364. 11/1/2005 to 10/31/2008.
- Risk Assessment and Exposure Analysis on the Agricultural Landscape: A Holistic Approach to Spatio-Temporal Models and Tools for Agricultural Risk Assessment and Exposure Analysis. PIs, S. Goddard, D.A. Wilhite, J. Deogun, M. Hayes, K. Hubbard, H. Jose, S. Reichenbach, W. Waltman, and M. Svoboda. USDA Risk Management Agency, \$1,086,600. 10/1/02-3/31/05.
- Intelligent Joint Evolution of Data and Information: An Integrated Framework for Drought Monitoring and Mitigation. A.K. Samal, PI. Co-PIs, K.G. Hubbard, L.K. Soh, W. Waltman, and D.A. Wilhite. NSF, \$199,900. 9/1/02-8/30/04.
- Improving Drought Monitoring through the Integration of Climate and Satellite-Based Data. D.A. Wilhite, K.G. Hubbard, and M.J. Hayes, Co-Principal Investigators. USGS, \$241,000. 7/1/02-6/30/05.
- Engaging Agricultural Communities in the Great Plains of the U.S. with the Application and Development of Climate Prediction and Information. Steven Hu, PI. Co-PIs, Gary Lynne, William Waltman, D.A. Wilhite, K.G. Hubbard, M.J. Hayes. NOAA Office of Global Programs, \$432,916. 5/1/02-7/31/06.
- Digital Government: A Decision Support System for Drought Risk Management. S. Reichenbach, S. Goddard, W. Waltman, J. Deogun, D. Wilhite, P. Revesz, K. Hubbard, and M. Hayes, Principal Investigators. NSF, \$1,103,643. 5/1/01-4/30/04.
- Preparation of Cooperative Drought Contingency Plans. D.A. Wilhite, Principal Investigator.

Funding received from the Bureau of Reclamation, U.S. Department of Interior. \$200,000, 1997-1999.

- Regional Training Seminars on Drought Planning and Management (Latin American and Caribbean Regions). United Nations Environment Program, World Meteorological Organization, and NOAA. \$100,000. D.A. Wilhite, Principal Investigator. 1991-1993.

### **SELECTED PUBLICATIONS (1982 - 2015)**

**More than 130 books, journal articles, book chapters, and technical reports.**

#### **Books and Technical Reports:**

- Bathke, D., R. Oglesby, C. Rowe and D.A. Wilhite. 2014. *Understanding and Assessing Climate Change: Implications for Nebraska*. IANR/SNR Special Report. September. 72 pp.
- Wilhite, D.A. 2014. *Guidelines for the Development of National Drought Policies and Preparedness Plans*. Special report from the Global Water Partnership and the World Meteorological Organization, Integrated Drought Management Program. Geneva, Switzerland and Stockholm, Sweden.
- Sivakumar, M.K.V., D. Wilhite, and J. Qu. 2011. *Proceedings of an Expert Meeting on a Compendium for National Drought Policy* (George Mason University, July 2011). World Meteorological Organization, Geneva, Switzerland.
- Sivakumar, M.K.V., R. Motha, D. Wilhite, and D. Wood. 2011. *Proceedings of an Expert Meeting on Agricultural Drought Indices* (Murcia, Spain, June, 2010), World Meteorological Organization, Geneva, Switzerland.
- Iglesias, A., A. Cancelliere, F. Cubillo, L. Garrote, and D. Wilhite, (eds.) 2009. *Coping with Drought Risk in Agriculture and Water Supply Systems: Drought Management and Policy Development in the Mediterranean*. Springer Publishers, Dordrecht, The Netherlands.
- Wilhite, D.A. (ed.) 2005. *Drought and Water Crises: Science, Technology and Management Issues*. CRC Press, Boca Raton, FL.
- Botterill, L. Courtenay and D.A. Wilhite (eds.). 2005. *From Disaster Response to Risk Management: Australia's National Drought Policy*. Springer Publishers. Dordrecht, The Netherlands.
- Wilhite, D.A. (ed.). 2000. *Drought: A Global Assessment* (2 volumes, 51 chapters, 700 pages). Hazards and Disasters: A Series of Definitive Major Works (7 volume series), edited by A.Z. Keller. Routledge Publishers.
- Wilhite, D.A., (ed.) 1993. *Drought Assessment, Management, and Planning: Theory and Case Studies*. Natural Resources Management and Policy Series. A. Dinar and D. Zilberman, Series Editors, Kluwer Publishers. April. 293 pp.
- Wilhite, D.A. and W.E. Easterling, (eds.) 1987. *Planning for Drought: Toward a Reduction of Societal Vulnerability*. Proceedings of the International Symposium and Workshop on Drought. Westview Press, Boulder, Colorado. September. 597 pp.

#### **Selected Journal Articles (peer-reviewed)**

Oglesby, R., D. Bathke, D. Wilhite and C. Rowe. 2015. Understanding and Assessing Projected Future Climate Change for Nebraska and the Great Plains (Invited Review Essay). *Great Plains*

*Research* 25: 97-107.

Wilhite, D.A 2015. Changing the Drought Management Paradigm: The Role of National Drought Policies. *Parcerias Estratégicas* (Strategic Partnerships), Center for Strategic Studies and Management, Brasilia. (in press)

Wilhite, D.A., M.V.K. Sivakumar, R. Pulwarty. 2014. Managing Drought Risk in a Changing Climate: The Role of National Drought Policy. *Weather and Climate Extremes*, Elsevier Publishers. <http://dx.doi.org/10.1016/j.wace.2014.01.002>.

M.V.K. Sivakumar, D.A. Wilhite, R.S. Pulwarty and R. Stefanski. 2013. The Need for National Drought Policies: Summary of the High-level Meeting on National Drought Policy (HMNDP). *Bulletin of the Amer. Meteorol. Soc.* (Published online).

Wilhite, D.A. 2014. Changing the paradigm for drought management: Can we break the Hydro-illogical Cycle? *Water Resources Impact* (Invited essay, Special Issue, *AWRA at 50: The Future for Water Resources in the United States*. January. American Water Resources Association.

M.V.K. Sivakumar, R. Stefanski, M. Bazza, S. Zelaya, D. Wilhite, and A. Rocha Magalhaes. 2014. High-level Meeting on National Drought Policy: Summary and Major Outcomes. *Weather and Climate Extremes* (Special Issue, March 2014). Elsevier Publishers.

Trnka, M, K.C. Kersebaum, J. Eitzinger, M. Hayes, P. Hlavinka, M. Svoboda, M. Dubrovský, D. Semerádová, B. Wardlow, E. Pokorný, M. Možný, D. Wilhite, Z. Žalud. 2013. Consequences of Climate Change for the Soil Climate in Central Europe and the Central Plains of the United States. *Climatic Change* (published on line May 31, 2013, DOI 10.1007/s10584-013-0786-4).

Wilhite, D.A. 2012. Breaking the Hydro-Illogical Cycle: Changing the Paradigm for Drought Management (Invited Comment), *EARTH Magazine*, July (pp. 71-72) [www.earthmagazine.org](http://www.earthmagazine.org)).

Wilhite, D.A. 2011. Breaking the Hydro-Illogical Cycle: Progress or Status Quo for Drought Management in the United States. *European Water* 34:3-16.

Trnka, M., M. Dubrovsky, M. Svoboda, D. Semeradova, 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

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.

Wilhite, D.A., M. Svoboda, and M.J. Hayes. 2007. Understanding the Complex Impacts of Drought: A Key to Enhancing Drought Mitigation and Preparedness. *J. of Water Resources Management* 5: 763-774.

- M. Dubrovsky, M.D. Svoboda, M. Trnka, M.J. Hayes, D.A. Wilhite, Z. Zalud, P. Hlavinka. 2006. 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.
- Tadesse, T., D.A. Wilhite, M.J. Hayes, S.K. Harms, and S. Goddard. 2005. Discovering Associations Between Climatic and Oceanic Parameters to Monitor Drought in Nebraska Using Data-Mining Techniques. *Journal of Climate*, 18(10):1541-1550.
- Wu, H., M.J. Hayes, D.A. Wilhite, and M.D. Svoboda. 2005. The Effect of the Length of Record on the Standardized Precipitation Index Calculation. *International Journal of Climatology*, 25:505-520.
- Tadesse, T., D.A. Wilhite, S.K. Harms, M.J. Hayes, and S. Goddard. 2004. Drought Monitoring Using Data Mining Techniques: A Case Study for Nebraska, U.S.A. *Natural Hazards* 33(1):137-159.
- Wu, H., K.G. Hubbard, and D.A. Wilhite. 2004. An Agricultural Drought Risk Assessment Model for Corn and Soybeans. *International Journal of Climatology* 24:723-741.
- Wu, H. and D.A. Wilhite. 2004. An Operational Agricultural Drought Risk Assessment Model for Nebraska, USA. *Natural Hazards* 33(1):1-21.
- Wilhelmi, O., K. Hubbard, and D.A. Wilhite. 2002. Spatial Representation of Agroclimatology in a Study of Agricultural Drought. *International Journal of Climatology* 22: 1399-1414.
- Wilhelmi, O. and D.A. Wilhite. 2002. Assessing Vulnerability to Agricultural Drought: A Nebraska Case Study. *Natural Hazards* 25: 37-58.
- Wilhite, D.A. 2002. Combating Drought through Preparedness. *Natural Resources Forum* 26: 275-285.
- White, D.H., D.A. Wilhite, B. O’Meagher, G.L. Hammer. 2001. Highlights of Drought Policy and Related Science in Australia and the U.S.A. *Water International* 26(3): 349-357.
- Wilhite, D.A. 2001. Moving Beyond Crisis Management. *Forum for Applied Research and Public Policy* 16(1): 20-28.
- Wilhite, D.A. and D.A. Wood. 2001. Revisiting Drought Relief and Management Efforts in the West: Have We Learned from the Past? *Journal of the West* 40(3):18-25

- Wilhite, D.A. 2000. Drought Response and Preparedness in the Context of Sub-Saharan Africa (invited). *J. of Contingency Planning and Crisis Management* 8(2):81-92. Special issue, H. Bruins (ed.).
- Wilhite, D.A., M.J. Hayes, C. Knutson, and K.H. Smith. 2000. Planning for Drought: Moving from Crisis to Risk Management. *J. of Amer. Water Res. Assoc.* 36:697-710.
- Byun, Hi-Ryong and D.A. Wilhite. 1999. Objective Quantification of Drought Severity and Duration. *J. of Climate* 12:2747-2756.
- Hayes, M.J., M.D. Svoboda, D.A. Wilhite, and O.V. Vanyarkho. 1999. Monitoring the 1996 Drought Using the Standardized Precipitation Index. *Bull. Amer. Meteorol. Society* 80: 429-438.
- Wilhite, D. A. 1997. State Actions to Mitigate Drought: Lessons Learned. *Jour. of the American Water Res. Assoc.*: 33(5): 961-968.
- Wilhite, D. A. 1997. Responding to Drought: Common Threads from the Past, Visions for the Future. *Jour. of the American Water Res. Assoc.*: 33(5): 951-959.
- Wilhite, D.A. 1996. A Methodology for Drought Preparedness. *Natural Hazards* 13:229-252.
- Wilhite, D.A. 1995. Reducing Vulnerability to Drought. *Water Resources and Environmental Hazards* (Proceedings of AWRA International Symposium), June.
- Wilhite, D.A. and S.R. Rhodes. 1994. State-level Drought Planning in the United States: Factors Influencing Plan Development. *Water International* 19:15-24.
- Wilhite, D.A. 1993. Understanding the Phenomenon of Drought: Prerequisite to Reducing Vulnerability. *Hydro-Review* 12:136-148.
- Meyer, S.J., K.G. Hubbard, and D.A. Wilhite. 1993. A crop specific index for corn. I. Model development and validation. *Agronomy Journal* 85:388-395.
- Meyer, S.J., K.G. Hubbard, and D.A. Wilhite. 1993. A crop specific index for corn. II. Application in drought assessment. *Agronomy Journal* 85:396-399.
- Klinedinst, P.L., D.A. Wilhite, G.L. Hahn, and K.G. Hubbard. 1993. The potential effects of climate change on summer season milk production and reproduction. *Climatic Change* 23:21-36.
- Wilhite, D.A. 1991. Drought planning: A process for state government. *Water Resources Bulletin* 27(1):29-38.
- Wilhite, D.A. 1991. Drought planning and state government: Current status. *Bull. Amer.*

*Meteorol. Society* 72(10):1531-36.

Wilhite, D.A. 1990. The enigma of drought: Management and policy issues for the 1990s. *Internatl. J. of Environ. Studies* 36:41-54.

Wilhite, D.A., N.J. Rosenberg and M.H. Glantz. 1986. Improving federal response to drought. *J. Climate and Appl. Meteorol.* 25(3):332-342.

Wilhite, D.A. 1986. Drought policy in the U.S. and Australia: A comparative analysis. *Water Resources Bull.* 22:(3)425-438.

Wilhite, D.A. and D.A. Wood. 1985. Planning for drought: The role of state government. *Water Resources Bull.* 21:31-38.

Wilhite, D.A. and M.H. Glantz. 1985. Understanding the drought phenomenon: The role of definitions. *Water International* 10:111-120.

Wilhite, D.A., N.J. Rosenberg and D.A. Wood. 1984. Improving governmental response to drought: Lessons from the mid-1970s. *Proceedings of the Symposium on Regional and State Water Resources Planning*, Amer. Res. Assoc. pp. 171-178.

### **Chapters in Books:**

Wilhite, D. 2015. Drought Management Policies and Preparedness Plans: Changing the Paradigm from Crisis to Risk Management. In *Land Restoration: Reclaiming landscapes for a sustainable future*. M. Frick, I. Chabay and J. Helgeson (Ed.), Land Restoration: Reclaiming landscapes for a sustainable future. Elsevier Publishers. (in press)

Fuchs, B.A., M.D. Svoboda, D.A. Wilhite, and M.J. Hayes. 2015. Drought Indices for Drought Risk Assessment in a Changing Climate (Chapter 43). In: *Handbook of Engineering Hydrology Vol. 2: Modeling Climate Changes and Variability*, Saeid Eslamian (ed.), Taylor and Francis Publishers (in press).

Wilhite, D.A., M.J. Hayes, and M. Svoboda. 2013. Drought. *Encyclopedia on Environmetrics*. Abdel H. El-Shaarawi and Walter P. Piegorsch, editors. John Wiley and Sons.

Hayes, M., D. Wilhite, M. Svoboda, and M. Trnka. 2011. Investigating the Connections between Climate Change, Drought, and Agricultural Production. In: R. Mendelsohn and A. Dinar (eds.), *Handbook on Climate Change and Agriculture*. Edward Eigar Publishing Ltd.

Wilhite, D.A. 2011. National Drought Policies: Addresses Impacts and Societal Vulnerability. In: Sivakumar, M.K.V., D. Wilhite, and J. Qu. 2011. *Proceeding of an Expert Meeting on a*

*Compendium on National Drought Policy* (George Mason University, July 2011). World Meteorological Organization, Geneva, Switzerland.

Wilhite, D.A. 2011. Essential Elements of National Drought Policy: Moving Towards Creating National Drought Policy Guidelines. In: Sivakumar, M.K.V., D. Wilhite, and J. Qu. 2011. *Proceeding of an Expert Meeting on a Compendium on National Drought Policy* (George Mason University, July 2011). World Meteorological Organization, Geneva, Switzerland.

Sivakumar, M.K.V., R. Pulwarty, D. Wilhite, and J. Ginnetti. Proposed Elements in a Compendium on National Drought Policy. *Proceedings of an Expert Meeting on National Drought Policy*. World Meteorological Organization.

Wilhite, D.A. 2011. Quantification of Agricultural Drought for Effective Drought Mitigation and Preparedness: Key Issues and Challenges. In: Sivakumar, M.K.V., R. Motha, D. Wilhite, and D. Wood. 2011. *Proceedings of an Expert Meeting on Agricultural Drought Indices* (Murcia, Spain, June, 2010). World Meteorological Organization, Geneva, Switzerland.

Wilhite, D.A. 2009. The Role of Monitoring as a Component of Preparedness Planning: Delivery of Information and Decision Support Tools. In: Iglesias, A., A. Cancelliere, F. Cubillo, L. Garrote, and D. Wilhite, eds. *Coping with Drought Risk in Agriculture and Water Supply Systems: Drought Management and Policy Development in the Mediterranean*. Springer Publishers, Dordrecht, The Netherlands.

Knutson, C.L. and D.A. Wilhite. 2009. New Developments and Opportunities for Drought Risk Reduction in Asia. In: P.K. Low (ed.), *Global Change and Sustainable Development: Asia-Pacific Perspectives*. Cambridge University Press: Cambridge, England.

Wilhite, D.A. 2007. Preparedness and Coping Strategies for Agricultural Drought Risk Management: Progress and Trends. In: M.K.V. Sivakumar and R. Motha (eds.), *Agricultural Risk Management: Challenges and Opportunities*. Springer Publishers.

Tadesse, T., D.A. Wilhite, M.J. Hayes, J.F. Brown, and C.L. Knutson. 2006. Modern drought monitoring tools for decision support systems. In: Ari-Veikko Anttiroiko and Matti Malkia (eds.), *Encyclopedia of Digital Government*, Volume 3, 1212–1218.

Wilhite, D.A. 2005. Drought policy and preparedness: The Australian experience in an international context. In: L. Courtenay Botterill and D.A. Wilhite (eds.) *From Disaster Response to Risk Management: Australia's National Drought Policy*, pp. 157-176. Springer Publishers. Dordrecht, The Netherlands.

Wilhite, D.A. 2005. Drought. In: J.E. Oliver (ed.) *Encyclopedia of World Climatology*, pp. 338-341. Springer Publishers. London.

Wilhite, D.A. 2005. Drought. In: *Encyclopedia of Weather and Climate*. Cambridge University Press, Cambridge, U.K.

Wilhite, D.A. 2005. The role of disaster preparedness in national planning with specific reference to drought. In: M.K.V. Sivakumar, R.P. Motha, and H. Das (eds.) *Natural Disasters and Extreme Events in Agriculture*. pp. 23-37. Springer Publishers. Berlin.

Wilhite, D.A., L. Botterill, and K. Monnik. 2005. National drought policy: Lessons learned from Australia, South Africa, and the United States. In: D.A. Wilhite (ed.) *Drought and Water Crises: Science, Technology, and Management Issues*. pp. 137-172. CRC Press. Boca Raton, FL.

Wilhite, D.A. and M. Buchanan-Smith. 2005. Drought as hazard: Understanding the natural and social context. In: D.A. Wilhite (ed.) *Drought and Water Crises: Science, Technology, and Management Issues*. pp. 3-29. CRC Press. Boca Raton, FL.

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*. pp. 93-135. CRC Press. Boca Raton, FL.

Wilhite, D., M. Svoboda, and M. Hayes. 2005. Monitoring Drought in the United States: Status and Trends. In: V.J. Boken, A.P. Cracknell, and R.L. Heathcote (eds.) *Monitoring and Predicting Agricultural Drought: A Global Study*. pp. 121-131. Oxford University Press. New York.

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## **INTERNATIONAL PROGRAM ACTIVITIES AND PROJECTS**

- 2015. **Egypt.** Co-organizer, NENA Regional Collaborative Platform Workshop on Water Productivity and Drought Management. FAO. Cairo. October.
- 2015. **Switzerland.** Chair, Advisory and Management Committees Integrated Drought Management Programme. Geneva. September.
- 2015. **Ghana.** Keynote speaker and facilitator at Central and Western Africa Regional Capacity Building Workshop. Accra. May.
- 2015. **Egypt.** Invited seminar and meetings, FAO Regional Office for the Near East and North Africa region. Cairo. March.
- 2015. **Morocco.** Invited presentation at the Moroccan Academy of Technical Sciences. Rabat. February.
- 2014. **Egypt.** Keynote speaker and facilitator at the NENA Regional Capacity Building Workshop on National Drought Policy. Cairo. Sponsored by UN-Water, WMO, FAO, UNCCD and CBD. Cairo. November.
- 2014. **United Kingdom.** Presentation at the drought symposium in support of the MaRIUS project, Oxford University. Oxford. September.
- 2014. **Switzerland.** Chaired the Management and Advisory Committee meetings, Integrated Drought Management Program, Geneva. September.
- 2014. **Sweden.** Keynote speaker at the Stockholm Water Week, Stockholm. September.
- 2014. **Germany.** Invited keynote speaker at the National Climate Change Adaptation Program Expo. Bonn. August.
- 2014. **Ethiopia.** Keynote speaker and facilitator at the East African Regional Capacity Building Workshop on National Drought Policy, Addis Ababa. Sponsored by UN-Water, WMO, FAO, UNCCD and CBD. August.
- 2014. **Greece.** Invited lecturer, Drought Summer School as part of the European Drought R/SPI project, Syros. June.
- 2014. **Brazil.** Keynote presentation at the International Climate Change Adaptation Futures Conference, special sessions on national drought policy. Fortaleza. May.
- 2014. **Vietnam.** Keynote speaker and facilitator at the Asian Regional Capacity Building Workshop on National Drought Policy. Sponsored by UN-Water, WMO, FAO, UNCCD and CBD. Hanoi. May.
- 2013. **Brazil.** Invited participant in a drought policy workshop organized by the Ministry of National Integration and the World Bank and gave the keynote presentation at the Regional Capacity Building Workshop on National Drought Policy for Latin America and the Caribbean, Fortaleza; invited keynote presentation at the Ministry of National Integration. Brasilia. December.

- 2013. **Mexico**. Evaluated 26 basin council drought plans in support of a national drought program organized through Conagua, Mexico City, November.
- 2013. **Mexico**. Invited keynote presentation at the launching meeting for the Mexico National Drought Program, met with the Interagency Drought Commission, Mexico City, May..
- 2013. **Indonesia**. Invited keynote presenters at the Asia-Pacific Economic Commission annual climate symposium, Jakarta. November.
- 2013. **Switzerland**. Chaired the Management and Advisory Committee Meetings of the Integrated Drought Management Program, Geneva. October.
- 2013. **Switzerland**. Invited participant, first meeting of the management committee, Integrated Drought Management Program of WMO and GWP, Geneva. June.
- 2013. **Switzerland**. Invited keynote presentation at the High-level Meeting on National Drought Policy (HMNDP), Geneva, March.
- 2013. **U.K.** Invited keynote speakers, 2013 annual conference of the U.K. Irrigation Association, February and met with colleagues at the Center for Ecology and Hydrology, Wallingford.
- 2013. **Germany**. Invited participant in a Global Climate Observation System Workshop, February.
- 2012. **Brazil**. Chaired a HMNDP conference program planning meeting, Brasilia, and participated in a side event to promote HMNDP at Rio+20, Rio de Janeiro.
- 2012. **Switzerland**. Chaired a HMNDP conference program planning meeting, World Meteorological Organization, Geneva.
- 2012. **Italy**. Met with FAO officials to discuss drought mitigation technologies project and UNL/WFI MOU.
- 2012. **Italy**. Attended the Hydrology and Society Conference, Torino.
- 2012. **Slovenia**. Presented a seminar for the Drought Management Center for Southeastern Europe at the Biotechnical University, Ljubljana.
- 2012. **Switzerland**. Participant/presenter, Meeting with Diplomatic Missions, High-level Meeting on National Drought Policy, Geneva.
- 2012. **China**. Meetings with Shanghai Meteorological Bureau, faculty and students at Hohai University (Nanjing), and invited keynote speaker, International Workshop on Drought Planning and Assessment, Beijing Normal University (Beijing).
- 2012. **Brazil**. International Organizing Committee meeting, WMO/UNCCD High-level National Drought Policy initiative, Brasilia, and Panelist, Side-bar event on national drought policy, Rio+20 Conference, Rio de Janeiro.
- 2012. **Italy**. Invited speaker at the Global Drought Information System workshop, WMO World Climate Research Program, Frascati, Italy.
- 2011. **Switzerland**. Invited participant at a meeting of the International Organizing Committee on National Drought Policy. Geneva.
- 2011. **China**. Invited keynote presentation. International Workshop on Water-related Disaster Prediction and Prevention. Hohai University, Nanjing.
- 2011. **Morocco**. Invited participant and co-organizer. International Symposium on Drought Information Systems. Casablanca.

- 2011. **Spain**. Autonomous University of Barcelona. International meeting between faculty in the School of Natural Resources and the ICTA faculty.
- 2011. **Japan**. Invited keynote speaker, Tottori University, lecture and workshop on drought management.
- 2011. **Italy**. Invited speaker, European Water Resources Association Annual Meeting. Catania, Sicily.
- 2011. **Australia**. Workshop on Australian and U.S. Drought Policy and Management (contributors to a book to be published by CRC Press as part of Drought and Water Scarcity book series, D.A. Wilhite, series editor). Canberra.
- 2011. **Austria**. Invited presenter, Session on Drought, Water Scarcity, and Food Security. European Geophysical Union General Assembly, Vienna.
- 2011. **Spain**. Workshop on Drought Prediction and Predictability in a Changing Climate. Invited speaker. World Climate Research Program/WMO. Barcelona.
- 2010. **Spain**. Participant and keynote presentation, CAPHaz-Net conference, European Union Project. Barcelona.
- 2010. **Switzerland**. Consultation meeting, Integrated Drought Management Program. World Meteorological Organization. Geneva. 2010. **Brazil. ICID-18**. Plenary and Workshops on Drought and Climate Change. Fortaleza. August.
- 2010. **Spain**. Participant and co-organizer. Agricultural Drought Index Working Group Meeting. Sponsored by the World Meteorological Organization. Murcia, June.
- 2010. **Spain**. Keynote speaker and session moderator. International Conference on Drought and Water Scarcity. February.
- 2009. **Italy**. Technical Workshop on Water Scarcity. Food and Agriculture Organization. Rome. December.
- 2009. **Switzerland**. Chaired a meeting of the World Meteorological Organization's Task Force on the Social and Economic Benefits of Weather, Climate, and Hydrological Information. Geneva. June.
- 2008. **Australia**. Co-organized and participated in a Drought Management Workshop with the Bureau of Rural Sciences and the Bureau of Meteorology and American scientists.
- 2008. **China**. Participated in a joint workshop between the University of Nebraska and Xi'an University to discuss collaborative research opportunities.
- 2008. **Spain**. Presented an invited paper at the Drought Management Conference as part of Water Expo 2008.
- 2008. **China**. Attended a National Science Foundation workshop in Nanjing at Hohai University and presented an invited paper.
- 2008. **Spain**. Participated in a CIHEAM short course on Drought Mitigation and Planning as a Senior Lecturer.

- 2007. **Switzerland.** Attended WMO's Public Weather Service Program's Conference. Presented an invited paper.
- 2007. **Hungary.** Attended the U.S. Trade and Development Agency's Conference on Natural Disasters.
- 2007. **Spain.** Attended the WMO Madrid Conference on the Socio-Economic Benefits of Weather, Climate, and Water Services as Chair, WMO Task Force on the topic.
- 2007. **Spain.** Met with co-editors of a book in preparation on drought preparedness guidelines for the Mediterranean region for Springer Publishers to be published in 2007 or 2008.
- 2007. **Slovenia and Switzerland.** Assessed facilities of the Slovenian Meteorological Services to host a drought management center for South-Eastern Europe (11 countries) and prepared a project proposal under sponsorship of the World Meteorological Organization for the creation of a Drought Management Center for Southeast Europe.
- 2006. **India.** To participate in an Agricultural Risk Management Workshop with sponsorship by the World Meteorological Organization.
- 2006. **Australia.** To advise the Australian Bureau of Meteorology and the Bureau of Resource Sciences on drought monitoring and policy issues.
- 2006. **Jordan.** To evaluate national drought strategy project funded by FAO. Serving as the International Team Leader.
- 2006. **Syria.** To conduct a short course on drought mitigation for the Mediterranean and Near-East region under sponsorship of ICARDA, CIHEAM, and FAO.
- 2006. **Switzerland.** To chair a Task Force meeting for the World Meteorological Organization on the socio-economic benefits of meteorological and hydrometeorological information.
- 2006. **Italy.** To participate as a member of the Task Force on Assessment of Natural Disaster Impacts on Agriculture (ANADIA) for the World Meteorological Organization.
- 2006. **Mexico.** To participate in the 4<sup>th</sup> World Water Forum, co-convene a session with WMO and U.S.D.A. on drought risk management, and present the keynote paper.
- 2005. **South Korea.** To participate in an international drought seminar in Seoul in association with the formation of a national drought management strategy program.
- 2005. **China.** To participate in a drought monitoring workshop in Beijing under the US/China Bilateral Science Agreement.
- 2005. **Italy.** To participate in a MEDROPLAN workshop on drought mitigation for the Mediterranean Region and meet with FAO officials in Rome to discuss drought programs.
- 2005. **France.** To give a keynote presentation at the annual meeting of the European Water Resources Association in Menton.

- 2005. **China.** To discuss the organization of a drought monitoring workshop with officials from the Chinese Meteorological Administration as a member of the U.S. delegation representing USDA, NOAA, and the NDMC.
- 2005. **Spain.** To meet with staff at the Mediterranean Agronomic Institute in Zaragoza and others from the Polytechnic University of Madrid to plan a short course on drought mitigation for February 2006.
- 2005. **Egypt.** To meet with FAO officials to discuss regional drought projects and an Egyptian National Drought Center.
- 2005. **Japan.** To participate in a drought session organized for the U.N.'s World Conference on Disaster Reduction, Kobe.
- 2004. **Namibia.** To participate in a UNESCO sponsored workshop on the feasibility of creating an integrated drought management center for Southern Africa.
- 2004. **Morocco.** To assess progress on the national drought observatory at IAVII and participate in a workshop on risk assessment in drought planning.
- 2004. **Austria.** Presented a paper to the International Workshop on Drought and Drought Monitoring, Vienna.
- 2004. **Czech Republic.** Participated in discussion related to the NATO Science Program project with colleagues from Mendel University and presented a paper to the National Meteorological Institute.
- 2004. **Jordan.** Conducted a one-day workshop and made a plenary presentation at the International Water Demand Management Conference, Dead Sea, Jordan.
- 2004. **Spain.** Served as principal lecturer at a CIHEAM Short Course on Drought Preparedness and Mitigation Strategies for the Mediterranean Region. Zaragoza.
- 2004. **South Korea.** Attended the International Conference on High-Impact Weather and Climate: Understanding, Prediction, and Socio-Economic Consequences, and helped organize drought sessions. Seoul.
- 2004. **China.** To attend and participate in an expert meeting on reducing the impacts of extreme events/natural disasters in agriculture, forestry, and fisheries sponsored by the World Meteorological Organization.
- 2003. **Germany.** To attend, present, and chair a parallel drought session at the International Conference on Early Warning, Bonn.
- 2003. **Switzerland.** To chair a meeting of the drought discussion group, International Strategy for Disaster Reduction Secretariat, Geneva.
- 2003. **Spain.** To launch the MEDROPLAN project funded by the European Commission and plan a short course on drought mitigation for April 2004.
- 2003. **Italy.** To discuss implementation of a regional network on drought preparedness for the Mediterranean and Near East region with FAO, ICARDA, and CIHEAM.
- 2003. **Czech Republic.** To launch a NATO Science Program project on drought and crop production.

- 2003. **Malaysia.** To conduct a drought mitigation workshop for the National Hydrologic Institute and explore collaborative opportunities with the National Drought Mitigation Center.
- 2003. **South Korea.** To present the keynote address at the annual meeting of the Korean Meteorological Society and give lectures at universities and research institutes.
- 2002. **Spain.** To collaborate with the International Center for Advanced Mediterranean Agronomic Studies and other groups from the Mediterranean region on development of a proposal to establish a regional drought preparedness network.
- 2002. **Slovenia.** To present a keynote address at the International Conference on Drought Mitigation and Prevention of Land Desertification and discuss development of a regional drought preparedness project for eastern and central European countries.
- 2002. **Hungary.** To meet with the Ministries of Environment and Agriculture and the Hungarian Meteorological Service to develop a strategy for drought mitigation planning in Hungary.
- 2001. **Morocco.** To present an invited paper at the International Conference on Drought in Morocco and meet with members of the National Drought Observatory project team from the Institute of Agronomy and Veterinary Science and the National School of Agriculture.
- 2001. **Mexico.** To advise the National Water Commission (CNA) on development of a drought management plan for the Rio Grande/Bravo River Basins.
- 2001. **Thailand.** To participate in the United Nations DESA/ESCAP/NOAA Interregional Symposium on Water-Related Disaster Reduction and Response in Bangkok.
- 2001. **Switzerland.** To discuss initiation and partnerships for a Global Drought Preparedness Network with the World Meteorological Organization, International Secretariat for Disaster Reduction and other U.N. agencies.
- 2001. **Morocco.** To lecture at an advanced course on “Management strategies to mitigate drought in the Mediterranean: Monitoring, risk analysis, and contingency planning” sponsored by CIHEAM, IAVII, and the European Commission and continue collaboration on the national drought observatory project.
- 2001. **Brazil and Argentina.** To lecture at the Institute of Agronomy in Campinas, Brazil, and participate in World Meteorological Week, Institute of Meteorology, Brasilia. To participate in the Hemispheric Conference on Vulnerability to Socio-Natural Hazards, Mendoza, Argentina.
- 2001. **Morocco.** To initiate the 3-year project to establish a national drought observatory, policy, and plan.
- 2000. **Morocco.** Participated in discussions to finalize a work plan for a 3-year project funded by USAID and the USDA/FAS to develop a national drought observatory, including a national drought policy and plan.
- 2000. **Spain.** Participated in a planning meeting in Zaragoza, Spain, sponsored by the International Center for Advanced Mediterranean Agronomic Studies, to organize a short course on Management Strategies to Mitigate Drought Effects in the

- Mediterranean Region: Preventive Methods and Contingency Plans (planned for May 2001).
- 2000. **Portugal**. Co-organizer of experts meeting on drought early warning systems sponsored by the World Meteorological Organization, U.N. Convention to Combat Desertification, and UNDP's Office to Combat Desertification and Drought, Lisbon.
  - 2000. **Hungary**. Co-organizer and presenter at the Eastern and Central Europe Drought Mitigation Workshop, Budapest.
  - 2000. **Australia**. Organized focus session on drought mitigation for the World Water Congress, Melbourne.
  - 1999. **Brazil**. To participate in a panel discussion at the Conference of the Parties, U.N. Convention on Desertification, with sponsorship by the UNDP and WMO, Recife.
  - 1999. **Morocco**. To attend a workshop on strategic planning and adaptation to drought organized by the Moroccan Ministry of Agriculture, Rabat.
  - 1999. **Brazil**. To attend and present a keynote presentation at a drought and integrated water resources conference sponsored by the World Bank, Fortaleza.
  - 1999. **Switzerland**. To attend in the Climate Prediction and Agriculture workshop at the World Meteorological Organization, Geneva.
  - 1999. **Zimbabwe**. To conduct a workshop for UNDP/UNSO and WMO on the use of climate information in agricultural decision making.
  - 1999. **South Africa**. To present the keynote address at the "International Conference on Integrated Drought Management: Lessons Learned for Sub-Saharan Africa" in Pretoria and conduct a pre-conference workshop on drought mitigation and planning.
  - 1999. **Switzerland**. To work with the World Meteorological Organization and the U.N. Development Program on a drought/climate forecasting project for Southern Africa.
  - 1999. **Italy**. To participate in a European Drought Mitigation Network Workshop sponsored by the European Commission's Space Applications Center and the U.K. Institute of Hydrology.
  - 1998. **Brazil**. To conduct two drought planning workshops in the Nordeste Region, one for the State of Ceará and one for the other states in the region, and meet with officials of SUDENE and other state/regional agencies under sponsorship of IICA and the World Bank.
  - 1998. **Mexico**. To conduct a workshop on drought mitigation planning under sponsorship of the International Boundary and Water Commission, National Water Commission, and the Bureau of Reclamation.
  - 1998. **Hungary**. To participate in a workshop organized by the Ministry of Agriculture to initiate the development of a drought mitigation plan for Hungary.

- 1998. **Mexico.** To meet with officials to discuss collaboration programs between the Institute of Ecology/National Drought Research Center and the National Drought Mitigation Center.
- 1997. **Spain.** To present the keynote address at the 3<sup>rd</sup> International Conference on the Management of Droughts.
- 1997. **Hungary.** To conduct research on using agrometeorological information to mitigate the effects of drought.
- 1997. **Brazil.** Presented a special conference on drought management and preparedness at the 10<sup>th</sup> Brazilian Congress on Agrometeorology.
- 1997. **Israel.** Principal lecturer at the WMO-sponsored workshop on drought and desertification.
- 1996. **Australia.** Evaluated status and experiences of Australia's national drought policy and presented lectures in Canberra, Melbourne, and Brisbane.
- 1996. **Switzerland.** Discussed future drought-related programming needs with the Director of the World Climate Program of the World Meteorological Organization and the Secretariat of the International Decade for Natural Disaster Reduction.
- 1996. **Hungary.** Invited paper presented at a meteorological conference organized in celebration of the centennial edition of *Időjárás*, the journal of the Hungarian Meteorological Service. Collaborated with members of the Meteorological Service in preparation of a joint research proposal.
- 1995. **Costa Rica.** Evaluated a pilot drought management project in northwest Costa Rica as part of a regional program.
- 1995. **Alberta, Canada.** Assisted Alberta Agriculture in conceptualizing a provincial drought preparedness plan.
- 1995. **The Gambia.** Assisted in the organization of and served as a resource person for a West African Drought Management and Preparedness Training Seminar in Banjul, the Gambia, sponsored by the World Meteorological Organization, U.N. Sudano-Sahelian Office, and other organizations.
- 1995. **Canada.** Attended and presented a paper at the Sustainable Development on the Great Plains Conference 95, Winnipeg, Manitoba.
- 1995. **Switzerland.** Invited participant/lecturer in an Expert Meeting on Drought Monitoring organized by the World Climate Program of the World Meteorological Organization in association with the Commission on Sustainable Development.
- 1995. **Costa Rica.** Advisor to CORECA (Central American Regional Research Organization) on regional drought mitigation/preparedness strategies under sponsorship of the Organization of American States.
- 1995. **United Kingdom.** Advisor to the U.K. Drought Mitigation Working Group and lecturer at Oxford University, Royal Geographical Society, and the University College London.
- 1994. **Brazil.** Presented an invited paper, Drought and Desertification, at the Brazilian Meteorological Congress on Desertification. Belo Horizonte.

- 1993. **Switzerland.** Visited with representatives of the World Meteorological Organization concerning new program initiatives in drought monitoring as part of the U.N. Commission on Sustainable Development.
- 1993. **Hungary.** Participated in an NCAR organized workshop on ENSO/Famine Early Warning Systems sponsored by UNEP and USAID/OFDA.
- 1993. **Uruguay.** Organized and conducted a training seminar on drought management and preparedness for Latin American and the Caribbean Region. Montevideo, Uruguay.
- 1993. **Switzerland.** Chaired an informal expert meeting on desertification and drought organized by the World Meteorological Organization held in response to the Agenda 21, Chapter 12, of the U.N. Conference on Environment and Development.
- 1992. **Switzerland.** Visited with representatives of the World Meteorological Organization concerning the forthcoming training seminar on drought management and preparedness for the Latin American and Caribbean Regions organized and conducted by the International Drought Information Center.
- 1992. **Brazil.** Participated in the International Conference on the Impacts of Climate Variations and Sustainable Development in Semi-arid Lands, Fortaleza, Brazil.
- 1991. **China.** To lecture at the National Drought Workshop to officials of the Institute of Water Conservancy and Hydrologic Resources Center, Ministry of Water Resources, and other agencies on drought mitigation and response planning.
- 1991. **Brazil.** To participate in a workshop on sustainable development in semi-arid regions.
- 1991. **Uruguay.** To assess government drought response efforts and assist in the development of a national drought policy and plan.
- 1991. **Philippines.** To participate in a national drought policy workshop for the Philippines.
- 1991. **Thailand.** To conduct a regional training workshop on drought management and planning under the sponsorship of NOAA/WMO and UNEP.
- 1990. **Canada.** To present an invited paper at the Conference on the Impacts of Climate Change and Variability in the Great Plains.
- 1989. **Brazil.** To conduct a regional training workshop on drought management and planning under sponsorship of the Banco do Nordeste and FUNCEME.
- 1989. **South Africa.** To consult with scientists in the Department of Agriculture and Water Supply on Drought Policy.
- 1989. **Botswana.** To conduct a regional training workshop on drought management and planning for nations of eastern and southern Africa with support from NOAA and WMO.
- 1989. **Uruguay.** To consult with Uruguayan government officials to evaluate response activities to current drought conditions and make recommendations for future actions. Visit at the request of President Julio Maria Sanguinetti through the

American Embassy and the Department of State, sponsored by the United Nations Development Program.

- 1989. **Brazil.** To plan a regional training seminar on drought management and planning with Brazilian government officials. The seminar is sponsored by the Banco do Nordeste and FUNCEME (Meteorological Foundation of Ceará).
- 1989. **South Africa and Botswana.** To present a keynote address on drought management to a regional drought workshop sponsored by SARCCUS and meet with South African scientists. The visit to Botswana will be to meet with scientists in the Rural Development Program to make final arrangements for a regional drought workshop scheduled for late September in Gaborone.
- 1988. **Switzerland and Hungary.** To present an invited seminar at the World Meteorological Organization (Geneva) on the 1988 U.S. drought and drought management concepts and discuss the formation of the International Drought Information Center and its activities. The purpose of the Hungarian visit was to continue discussions on the extreme meteorological event project initiated in 1987.
- 1988. **Thailand.** To participate in a meeting of the Working Group on Climate Anomalies Associated with El Niño/Southern Oscillation events under sponsorship of the U.N. Environment Program (Bangkok).
- 1987. **Switzerland and Hungary.** To visit the headquarters of the World Meteorological Organization (Geneva) and participate in a workshop on extreme meteorological events in the U.S. and Hungary (Budapest) under sponsorship of the National Science Foundation.
- 1987. **Puerto Rico.** To present invited paper and participate in Workshop on Natural Hazards Mitigation in the Americas under sponsorship of the National Science Foundation. University of Puerto Rico--Mayaguez Campus.
- 1986. **Canada.** To present invited paper and participate in the Canadian Hydrology Symposium on Drought: The Impending Crisis? Regina, Saskatchewan.
- 1986. **Brazil.** To consult with Brazilian scientists on water management practices and attend Drought Symposium under sponsorship of Partners of the Americas. Teresina, Piaui and Fortaleza, Ceara.
- 1984. **Australia.** Research visit to collect data and information on Australian policy responses to 1982-83 drought under sponsorship of the National Science Foundation. Sydney, Melbourne. Adelaide, Canberra.
- 1983. **China.** To participate in planning meeting for joint research program and to visit potential research locations in the North China Plain. Beijing, Jinan, Zengchou, Handan.
- 1980. **Portugal.** To participate in NATO Advanced Study Institute on Drought Control Technology. Lisbon.