

Curriculum Vitae

Rezaul Mahmood

Department of Geography and Geology
Western Kentucky University
Bowling Green, KY 42101
(270) 745-5979 (W)
e-mail: rezaul.mahmood@wku.edu

CURRENT APPOINTMENT:

Associate Professor (2006-present)
Department of Geography and Geology
Western Kentucky University

Associate Director
Kentucky Climate Center and Kentucky Mesonet Project

COURSES TAUGHT:

Meteorology	Introduction to Physical Geography
Weather Analysis and Forecasting	Computer based Statistics
Physical Climatology	Dynamic Meteorology

CURRENT RESEARCH:

LULCC and its impacts on weather and climate
Soil moisture modeling, analysis, and soil moisture-climate relationships
Air quality meteorology
Boundary layer climatology/Land-surface-atmosphere interactions
Hydrometeorology
Climate and agriculture

RECENT APPOINTMENTS:

Assistant Professor, 2001-2006, Department of Geography and Geology, Western Kentucky University

Post-Doctoral Research Associate, 1999-2001, High Plains Regional Climate Center (HPRCC), School of Natural Resource Sciences, University of Nebraska-Lincoln (UNL)

EDUCATION:

THE UNIVERSITY OF OKLAHOMA, NORMAN

PhD. in Geography, 1999

Department of Geography
Area of Specialization: Climatology/hydrology
Minor: Geographical Information Systems
Cognate Field: Meteorology

Title of the dissertation: *Monsoonal Rainfall Variability, Water Stress, and Rainfed Rice Productivity in Bangladesh.*

STATE UNIVERSITY OF NEW YORK AT ALBANY (SUNYA)

Master of Arts in Geography, 1993
Department of Geography and Planning

Title of M. A. Thesis: *Climatic Change and Boro Rice Yield in Bangladesh: Application of a Parametric Crop Yield Model.* Department of Geography and Planning, State University of New York, Albany, NY.

UNIVERSITY OF DHAKA, BANGLADESH

Master of Science in Geography
Graduated in July, 1989

Bachelor of Science in Geography
Graduated in May, 1988

PEER REVIEWED PUBLICATIONS & BOOK CHAPTERS:

*Student co-author

Mahmood, R. and Hubbard, K. G. 2009. Agricultural Cool Island (ACI). In *Land Use Policy*. Eds. A. C. Denman and Oliver M. Penrod. New York: Nova Science Publishers. pp. 217-229.

Quintanar, A. I., **Mahmood, R.**, Motley, M. V.*, Yan, J., Loughrin, J., Lovanh, N. 2009. Simulation of boundary layer trajectory dispersion sensitivity to soil moisture conditions: MM5 and Noah-based investigation. *Atmospheric Environment* 43: 3774-3785.

Pielke Sr., R. A., Davey, C., Niyogi, D., Fall, S., Steinweg-Woods, J., Hubbard, K. G., Lin, X., Cai, M., Lim, Y-K., Li, H., Nielsen-Gammon, J., Gallo, K., Hale, R., **Mahmood, R.**, Foster, S., McNider, R. T., Blanken, P. 2009. Reply to comment by David E. Parker, Phil Jones, Thomas C. Peterson, and John Kennedy on “Unresolved Issues with the Assessment of Multi-Decadal Global Land Surface Temperature Trends” *Journal of Geophysical Research-Atmospheres* 114, D05105, doi:10.1029/2008JD010938.

- Mahmood, R.**, Pielke Sr., R. A. Hubbard, K. G., Niyogi, D., Bonan, G., Lawrence, P., Baker, B., McNider, R., McAlpine, C., Etter, A., Gameda, S., Qian, B., Carleton, A., Beltran-Przekurat, A., Chase, T., Quintanar, A. I., Adegoke, J. O., Vezhapparambu, S., Conner, G., Asefi, S., Sertel, E., Legates, D. R., Wu, Y., Hale, R., Frauenfeld, O. N., Watts, A., Shepherd, M., Mitra, C., Anantharaj, V. G., Fall, S., Lund, R., Nordfelt, A., Blanken, P., Du, J., Chang, H-I., Leeper, R., Nair, U. S., Dobler, S., Deo, R., Syktus, J. 2009. Impacts of land use land cover change on climate and future research priorities. *Bulletin of the American Meteorological Society* (in press)
- Quintanar, A. I., **Mahmood, R.**, Loughrin, J. H., Lovanh, N., Motley*, M. V. 2009. A system for estimating Bowen Ratio and evaporation from waste lagoons. *Applied Engineering in Agriculture* (in press)
- You, J., Hubbard, K. G., **Mahmood, R.**, Sridhar, V., Todey, D. 2009. Quality control of soil water data in ACIS - A case study in Nebraska. *Journal of Hydrologic Engineering* (in press)
- Foster, S. and **Mahmood, R.** 2009. Spatial metadata for weather stations and the interpretation of climate data. In *Historical Climate variability and Impacts in the United States*. Eds. Lesley-Ann Dupigny-Giroux and Cary Mock. Springer-Verlag: New York. (in press)
- Quintanar, A. I and **Mahmood, R.** 2009. Ensemble forecast spread induced by soil moisture changes. *Monthly Weather Review* (submitted)
- Sen Roy, S. and **Mahmood, R.**, Quintanar, A. I., and Gonazalez, A. 2009. Impacts of irrigation on dry Season precipitation in India. *Journal of Geophysical Research- Atmospheres* (submitted)
- Leeper, R., **Mahmood, R.**, Quintanar, A. I. 2009. Sensitivity of planetary boundary layer atmosphere to historical and future changes of land use/land cover, vegetation fraction, and soil moisture in Western Kentucky, USA. *Global and Planetary Change* (submitted)
- Leeper, R., **Mahmood, R.**, Quintanar, A. I. 2009. Near surface atmospheric response to simulated changes in land-cover, vegetation fraction, and soil moisture over Western Kentucky. *Publications in Climatology* (submitted)
- Mahmood, R. 2008. The Kentucky Mesonet: Background and future applications. In *The Corn and Climate Report: A Practical Guide to Help Midwestern Farmers Understand and Respond to a Changing Climate*. Eds. Jordan, B., Kluck, D., Mock, D., Schulz, P., Takle, G., and Wash, S. Ames, IA: Iowa State University. pp. 18-19. (Online)
- Mahmood, R., Hubbard, K. G., Leeper, R.*, and Foster, S. A. 2008. Increase in near surface atmospheric moisture content due to land use changes: Evidence from the observed dew point temperature data. *Monthly Weather Review*, 13:1554-1561.

- Mahmood, R. and Foster, S. A. 2008. Meso-scale weather and climate observations in Kentucky for societal benefit. *Focus on Geography*, 50: 32-36. (Special issue on Kentucky)
- Quintanar, A., **Mahmood, R.**, Loughrin, J., Lovanh, N. C. 2008. A coupled MM5-Noah land surface model-based assessment of sensitivity of planetary boundary layer variables to anomalous soil moisture conditions. *Physical Geography*, 29: 54-78 (DOI: 10.2747/0272-3646.29.1.54)
- Loughrin, J. H., Lovanh, N., and **Mahmood, R.** 2008. Equilibrium sampling used to monitor malodors in a swine waste lagoon. *Journal of Environmental Quality*, doi:10.2134/jeq2006.0534 (37: 1-6)
- Loughrin, J. H., Lovanh, N., Quintanar, A., and **Mahmood, R.** 2008. Equilibrium sampling of malodorous compounds in air using stir bar sorptive extraction. *Transaction of the ASABE* 51:1747-1752.
- Mahmood, R., Keeling*, T., Foster, S. A., and Hubbard, K. G. 2008. Observed data-based evidence of impacts of irrigation on 20th century temperature in the Ogallala aquifer region. *Climatic Change* (submitted)
- Mahmood, R., Littell, A*, Hubbard, K. G., and You, J. 2008. Observed data-based assessment of relationships of near-surface soil moisture to soil moisture at multiple depths, precipitation and temperature. *Journal of Hydrometeorology*, (submitted)
- Mahmood, R. and Hubbard, K. G. 2007. Relationship between soil moisture of near surface and multiple depths of the root zone under heterogeneous land uses and varying hydroclimatic conditions. *Hydrological Processes*, DOI: 10.1002/hyp.6578 (pp. 3449-3462)
- Roy, S. S., **Mahmood, R.** Niyogi, D. D. S., Lei, M., Foster, S. A., Hubbard, K., G., Douglas, E., Pielke Sr., R. A. 2007. Impacts of the agricultural Green Revolution induced land use changes on air temperatures in India. *Journal of Geophysical Research-Atmospheres*, VOL. 112, D21108, doi:10.1029/2007JD008834.
- Pielke Sr., R. A., Davey, C., Niyogi, D., Fall, S., Steinweg-Woods, J., Hubbard, K. G., Lin, X., Cai, M., Lim, Y-K., Li, H., Nielsen-Gammon, J., Gallo, K., Hale, R., **Mahmood, R.**, Foster, S., McNider, R. T., Blanken, P. 2007. Unresolved Issues with the Assessment of Multi-Decadal Global Land Surface Temperature Trends. *Journal of Geophysical Research- Atmospheres*, 112, D24S08, doi:10.1029/2006JD008229.
- Mahmood, R., Foster, S. A., Logan*, D. 2006. The GeoProfile Metadata, Exposure of Instruments, and Measurement Bias in Climatic Record Revisited. *International Journal of Climatology*, 26: 1091-1124.
- Mahmood R., Foster, S. A., Keeling*, T., Hubbard, K. G., Carlson*, C., and Leeper*, R. 2006.

- Impacts of irrigation on 20th century temperature in the Northern Great Plains. *Global and Planetary Change*, 54: 1-18. (Special issue on LULCC and its impacts on Climate)
- Mahmood, R. and Hubbard, K. G. 2005. Assessing bias in evapotranspiration and soil moisture estimates due to the use of modeled solar radiation and dew point temperature data. *Agricultural and Forest Meteorology*, 130: 71-84.
- Mahmood, R., Hubbard, K. G., and Christy Carlson* 2004. Modification of growing season surface temperature records in the Northern Great Plains due to land use transformation: verification of modeling results and implication for global climate change. *International Journal of Climatology*, 24:311-327.
- Mahmood, R. and Hubbard, K. G. 2004. An analysis of simulated long-term soil moisture data for three land uses under contrasting hydroclimatic conditions in the Northern Great Plains. *Journal of Hydrometeorology*, 5:160-179.
- Mahmood, R., Legates, D. R., Meo, M. 2004. The role of soil water availability in potential rainfed rice productivity in Bangladesh: Applications of the CERES-Rice model. *Applied Geography*, 24: 139-159.
- Mahmood, R. and Hubbard, K. G. 2003. Simulating sensitivity of soil moisture and evapotranspiration under heterogeneous soils and land uses. *Journal of Hydrology*, 280:72-90.
- Mahmood, R., Meo, M., Legates, D. R., and Morrissey, M. L. 2003. The CERES-Rice model-based estimates of potential monsoon season rainfed rice productivity in Bangladesh. *The Professional Geographer*, 55: 261-275.
- Hubbard, K. G., **Mahmood, R.** and Carlson, C.* 2003. Estimating daily dew point temperature for the Northern Great Plains using maximum and minimum temperature. *Agronomy Journal*, 95:323-328.
- Adegoke, O. A., Pielke Sr., R. A., Eastman, J., **Mahmood, R.**, and Hubbard, K. G. 2003. Impact of irrigation on mid summer surface fluxes and temperature under dry synoptic conditions: A regional atmospheric model study of the U. S. High Plains. *Monthly Weather Review*, 131: 556-564.
- Mahmood, R. and Hubbard, K. G. 2002. Anthropogenic land use change in the North American Tall Grass-Short grass transition and modification of near surface hydrologic cycle. *Climate Research*, 21: 83-90.
- Mahmood, R. and Hubbard, K. G. 2002. Effect of time of temperature observation and estimation of daily solar radiation for the Northern Great Plains, USA. *Agronomy Journal*, 94: 723-733.
- Mahmood, R., Hubbard, K. G., and Carlson, C.* 2002. Land use change and modification of near-

surface thermal records in the Northern Great Plains. *Bulletin of the American Meteorological Society*, 83: 504.

Mahmood, R., Hubbard, K. G., and Hou, Q. 2001. Soil moisture monitoring and modeling in the Great Plains. In, *Automated Weather Stations for Applications in Agriculture and Water Resources Management: Current Use and Future Perspectives*, (Ed.) Hubbard, K. G. and Sivakumar, M. V. K. Lincoln, NE: High Plains Climate Center and Geneva, Switzerland : World Meteorological Organization. pp. 163-171.

Mahmood, R. 1998. Air temperature variations and rice productivity in Bangladesh: a comparative study of the performance of the YIELD and the CERES-Rice models. *Ecological Modelling*, 106: 201-212.

Mahmood, R. 1998. Thermal climate variations and potential modifications in cropping pattern in Bangladesh. *Theoretical and Applied Climatology*, 61:231-243.

Mahmood, R. 1997. Impacts of Air Temperature Variations on the Boro Rice Phenology in Bangladesh: Implications for Irrigation Requirements. *Agricultural and Forest Meteorology*, 84:233-247.

Mahmood, R. 1996. Scale issues in soil moisture modelling: problems and prospects. *Progress in Physical Geography*, 20:273-291.

Mahmood, R. and Hayes, J. T. 1995. A model-based assessment of impacts of climate change on the boro rice yield in Bangladesh. *Physical Geography*, 16:463-86.

EDITORIAL EXPERIENCE:

Mahmood, R., Pielke Sr., R. A., and Hubbard, K. G. 2006. *Guest Editors* for a theme issue on Land use change and its impacts on Climate. Published by the journal *Global and Planetary Change*.

Frauenfeld, O and Mahmood, R. 2008. Coordinating Editors for a theme issue on Land use change and its impacts on Climate.

Mahmood, R. and Legates, D. R. 2008. *Guest Editors* for a theme issue on Soil moisture. Published by the journal *Physical Geography*.

BOOK CHAPTERS AND OTHER SCHOLARLY PUBLICATIONS:

Mahmood, R., Adegoke, J. O., and Niyogi, D. 2009. Editorial: Land use/land cover change and its impacts on weather and climate. *Boundary-Layer Meteorology*.

Frauenfeld, O. W. and Mahmood, R. 2008. Editorial: Impacts of Land Use and Land Cover Change on the Atmosphere Special Collection. *Journal of Applied Meteorology and*

Climatology.

Mahmood, R., Pielke Sr., R., Hubbard, K. G. 2007. Effect of human activities on the atmosphere. *Eos, Transactions, American Geophysical Union*, 88: 580.

Mahmood R., Pielke Sr., R. A., Hubbard, K. G. 2006. Editorial: Land Use/land cover change and its impacts on climate. *Global and Planetary Change*, 54: vii

CONFERENCE PAPERS:

Baldwin*, W. M. and Mahmood, R. 2005. An assessment of key aspects of warm and cool season severe flash flooding in the Southern Appalachians. *Proceedings of 21st Conference on Weather Analysis and Forecasting*. American Meteorological Society, Boston. pp. 1-12. (www.ametsoc.org)

Henry*, C, Mahmood, R., Smallcomb, C., McLane, M., and Champlin*, D. 2005. The evolution of a warm season severe eastern Kentucky flash flood. *Proceedings of 21st Conference on Weather Analysis and Forecasting*. American Meteorological Society, Boston. pp. 1-11. (www.ametsoc.org)

Legates, D. R., Leathers, D. J., DeLiberty, T. L., Quelch, G. E., Brinson, K., Buttke, J., **Mahmood, R.**, and Foster, S. 2005. DEOS: The Delaware Environmental Observing System. *CD-ROM Proceedings, 85th Annual Meeting of the American Meteorological Society*, The American Meteorological Society: Boston. pp. 1-5.

Mahmood, R., Hubbard, K. G., Carlson, C. 2002. Land use change and modification of near surface temperature records in the Northern Great Plains: verification of modeling results. *Proceedings, 13th Conference on Applied Climatology*, The American Meteorological Society: Boston. pp. 262-264.

Mahmood, R. and Hubbard, K. G. 2002. Sensitivity of soil moisture and evapotranspiration to soils and land use heterogeneity. *Proceedings, 13th Conference on Applied Climatology*, The American Meteorological Society: Boston. pp. 265-268.

Adegoke, J. O, Pielke Sr., R. A., Eastman, J. L., **Mahmood, R.**, Hubbard, K. G. 2002. Modeling the impacts of irrigation on midsummer surface energy budget and the convective boundary layer (CBL) in the U. S. high plains. *Proceedings, 16th Conference on Hydrology, The American Meteorological Society*. The American Meteorological Society: Boston. pp. 192-195.

Mahmood, R. and Hubbard, Kenneth G. 2000. Time of observation and estimation of daily solar radiation for the Northern Great Plains. *Proceedings, 12th Conference on Applied Climatology*, The American Meteorological Society: Boston. pp. 78-81.

Hubbard, Kenneth G., **Mahmood, R.**, Hou, Q. 2000. Daily soil moisture measurement network

of the Northern Great Plains: sensors, their calibration, and applications. *Proceedings, 12th Conference on Applied Climatology*, The American Meteorological Society: Boston. pp. 150-152.

Mahmood, R. Humes, K. S., and Legates, D. R. 1999. Scale-aggregation of Landsat-TM data and information loss. *Proceedings, 1999 ASPRS Annual Conference, Portland, Oregon*, pp. 733-742. The American Society for Photogrammetry and Remote Sensing: Bethesda, MD.

Meo, M. and **Mahmood, R.** 1999. The effect of the 1995-96 southwestern drought on fire suppression activities in Oklahoma. *Proceedings, 11th Conference on Applied Climatology*, pp. 161-166. The American Meteorological Society: Boston.

Mahmood, R. 1996. Model-based Estimates of Air Temperature Variations on the Boro Rice Phenology in Bangladesh. *Proceedings, 22nd Annual Conference on Agricultural and Forest Meteorology*, pp. 367-368. The American Meteorological Society: Boston.

PROFESSIONAL PRESENTATIONS:

Paper, titled, "A comparative sensitivity evaluation of the WRF and MM5 models under varied soil moisture condition." was presented at the **105th Annual Meeting of the Association of American Geographers**, Las Vegas, NV, 22-27 April, 2009. (co-authored with Ronnie Leeper and Arturo Quintanar)

Poster, titled, "Summer Season Flash Flood Climatology for the Appalachian Mountain Region of Eastern Kentucky", was presented at the Student Research Conference, Western Kentucky University, Bowling Green, KY, March 2009. (co-authored with Jane Wix and Nicholas Rodgers)

Poster, titled, "Summer Season Flash Flood Climatology for the Appalachian Mountain Region of Eastern Kentucky", was presented at the **105th Annual Association of American Geographers** Las Vegas, NV, March 22-27, 2009. (co-authored with Jane Wix and Nicholas Rodgers)

Poster, titled, "Soil Moisture Analysis for the 2007 Drought in the Southeastern Region of the United States", was presented at the 39th annual WKU Student Research Conference, Bowling Green, KY, 21 February, 2009.

Poster, titled, "Soil Moisture Analysis for the 2007 Drought in the Southeastern Region of the United States", was presented at the Kentucky-West Virginia LSAMP 2009 Student Research Symposium, Roanoke, WV, 24-25 April, 2009.

Presentation, titled, "Applications of Regional Atmospheric Modeling System (RAMS) to Assess Sensitivity of Planetary Boundary Layer to Varying Volumetric Soil Moisture", was presented at the Kentucky-West Virginia LSAMP 2009 Student Research Symposium, Roanoke,

WV, 24-25 April, 2009.

Presentation, titled, “Atmosphere and Emissions” was presented at the USDA PIs meeting at Auburn, AL, 22 January, 2009.

Paper, titled, “The Kentucky Mesonet: Background and future applications”, was presented at the **Workshop on Corn and Climate**, Iowa State University, Ames, IA, 9-10 September, 2008. **(Invited Presentation and Panelist)**

Paper, titled, “Data collection and quality assurance of the Kentucky Mesonet” was presented at the **17th Conference on Applied Climatology**, Whistler, BC, Canada, 11-15 August, 2008. (co-authored with Megan Ferris, Stuart Foster, Dana Grabowski, Stephen Struebig, Zach Brown, and Michael Grogan)

Paper, titled, “Sensitivity of planetary boundary layer variables to anomalous soil moisture conditions: The MM5-based assessment”, was presented at the **104th Annual Meeting of the Association of American Geographers**, Boston, MA, 14-19 April, 2008. (co-authored with Arturo Quintanar, John Loughrin and Nanh Lovanh)

Poster, titled, “Flash Flood Climatology of the Appalachian Region (1978-2005)”, was presented at the **104th Annual Meeting of the Association of American Geographers**, Boston, MA, 14-19 April, 2008. (co-authored with William Rodgers)

Paper, titled, “Simulating Near-Surface and Atmospheric Responses to changes in Land-Cover and Vegetation Fraction”, was presented at the **104th Annual Meeting of the Association of American Geographers**, Boston, MA, 14-19 April, 2008. (co-authored with Ronnie Leeper and Arturo Quintanar)

Poster, titled, “Near-surface and atmospheric response to modeled land use and vegetation fraction changes”, was presented at the **62nd Annual meeting of Southeastern Division, The Association of American Geographers**, Charleston, SC 18-20, November, 2007. (co-authored with Ronnie Leeper and Arturo Quintanar)

Poster, titled, “Flash floods in the Appalachian region”, was presented at the **62nd Annual meeting of Southeastern Division, The Association of American Geographers**, Charleston, SC 18-20, November, 2007. (co-authored with William Rodgers)

Paper, titled, “Implementation of the communications and technology infrastructure to support the Kentucky Mesonet” was presented at the **93rd Annual Meeting of the Kentucky Academy of Sciences**, Louisville, KY 8-10 November, 2007. (Co-authored with D. Michael Grogan, Zachary Brown, and Stuart A. Foster)

Paper, titled, “Installation and maintenance of scientific instrumentation as part of the Kentucky Mesonet”, was presented at the **93rd Annual Meeting of the Kentucky Academy of Sciences**, Louisville, KY 8-10 November, 2007. (Co-authored with Stephen Struebig, Dana Grabowski, and Stuart A. Foster)

Paper, titled, “Near-surface and atmospheric response to modeled land-Use and vegetation fraction changes”, was presented at the **93rd Annual Meeting of the Kentucky Academy of Sciences**, Louisville, KY 8-10 November, 2007. (Co-authored with Ronnie D. Leeper, Arturo I. Quintanar)

Paper, titled, “The MM5-based assessment of sensitivity of planetary boundary layer variables to anomalous soil moisture conditions”, was presented at the **93rd Annual Meeting of the Kentucky Academy of Sciences**, Louisville, KY 8-10 November, 2007.

Paper, titled, “Impact of Vegetation Roughness Parameters Changes In Boundary Layer Variables” was presented at the NSF funded Workshop on **Detecting the Atmospheric Response to the Changing Face of the Earth: A Focus on Human-Caused Regional Climate Forcings, Land-Cover/Land-Use Change, and Data Monitoring**, August 27-29, 2007 Boulder, CO. (co-authored with Quintanar, Arturo I., John Loughrin, and Nanh C. Lovanh)

Paper, titled, “Numerical Modeling of Near-Surface and Atmospheric Response to Land-Use and Fractional Vegetation Coverage Change” was presented at the NSF funded Workshop on **Detecting the Atmospheric Response to the Changing Face of the Earth: A Focus on Human-Caused Regional Climate Forcings, Land-Cover/Land-Use Change, and Data Monitoring**, August 27-29, 2007 Boulder, CO. (co-authored with Ronnie Leeper and Arturo Quintanar)

Illustrated Paper, titled, “Pacific Decadal Oscillation, Streamflow, and Precipitation in the Mammoth Cave/Upper Green River Watershed, KY”, was presented at the **103rd Annual Meeting of the Association of American Geographers**, San Francisco, CA, 17-21 April, 2007. (co-authored with Christopher Westendorf) (NSF-REU participant)

Poster, titled, “Temporal Shifts in Seasonal High (Peaks) and Low (Dips) Diurnal Temperature Range”, was presented at the **103rd Annual Meeting of the Association of American Geographers**, San Francisco, CA, 17-21 April, 2007. (co-authored with Nicholas Lawalin)

Poster, titled, “Increase in Near Surface Atmospheric Moisture Content Due to Land Use Changes”, was presented at the **103rd Annual Meeting of the Association of American Geographers**, San Francisco, CA, 17-21 April, 2007. (co-authored with Ronnie Leeper)

Paper, titled, “Spatio-Temporal Variations of Observed Soil Moisture in Nebraska During the Warm Season”, was presented at the **103rd Annual Meeting of the Association of American Geographers**, San Francisco, CA, 17-21 April, 2007. (co-authored with Ashley Littell)

Poster, titled, “Flash Floods in the Appalachian Region (1993-2005)”, was presented at the **103rd Annual Meeting of the Association of American Geographers**, San Francisco, CA, 17-21 April, 2007. (co-authored with William Rodgers)

Paper, titled, “Kentucky Mesonet: Instrumentation and an update” was presented at the **87th Annual meeting of the American Meteorological Society/16th Conference on Applied**

Climatology, San Antonio, TX 21-26, January, 2007.

Paper, titled, “Shifts in the U. S. seasonal daily temperature range (DTR) peaks and dips in the 20th century” was presented at the **87th Annual meeting of the American Meteorological Society/16th Conference on Applied Climatology**, San Antonio, TX 21-26, January, 2007.

Paper, titled, “The development of GeoProfiles for United States Historical Climatology Network stations in Kentucky” was presented at the **87th Annual meeting of the American Meteorological Society/16th Conference on Applied Climatology**, San Antonio, TX 21-26, January, 2007. (co-authored with Stuart Foster)

Paper, titled, “Exploring spatial and temporal variability of DTR among USHCN stations in the Ohio River Valley” was presented at the **87th Annual meeting of the American Meteorological Society/16th Conference on Applied Climatology**, San Antonio, TX 21-26, January, 2007. (co-authored with Stuart Foster)

Paper, titled, “Building the Foundation of the Kentucky Mesonet” was presented at the **92nd Annual Meeting of the Kentucky Academy of Sciences**, Morehead, KY 9-11 November, 2006. (Co-authored with Stuart Foster).

Poster, titled, “Increase in Near Surface Atmospheric Moisture Content Due to Land Use Changes” was presented at the **61st Annual meeting of Southeastern Division, The Association of American Geographers**, Morgantown, WV 19-21, November, 2006. (co-authored with Ronnie Leeper)

Poster, titled, “Flash Floods in the Appalachian Region (1993 - 2005)” was presented at the **61st Annual meeting of Southeastern Division, The Association of American Geographers**, Morgantown, WV 19-21, November, 2006. (co-authored with William Rodgers)

Poster, titled, “Diurnal Temperature Range Analysis” was presented at the **61st Annual meeting of Southeastern Division, The Association of American Geographers**, Morgantown, WV 19-21, November, 2006. (co-authored with Nicholas Lawalin)

Paper, titled, “Spatio-Temporal Variations of Observed Soil Moisture in Nebraska During the Warm Season” was presented at the **92nd Annual Meeting of the Kentucky Academy of Sciences**, Morehead, KY 9-11 November, 2006. (Co-authored with Ashley Littell)

Poster, titled, “Flash Floods in the Appalachian Region (1993-2005)” was presented at the **92nd Annual Meeting of the Kentucky Academy of Sciences**, Morehead, KY 9-11 November, 2006. (Co-authored with William N. Rodgers)

Poster, titled, “Diurnal Temperature Range Analysis for the Eastern United States in the 20th Century” was presented at the **92nd Annual Meeting of the Kentucky Academy of Sciences**, Morehead, KY 9-11 November, 2006. (Co-authored with Nicholas Lawalin)

Poster, titled, “The Influence of Land Use Change on Near Surface Atmospheric Moisture

Content” was presented at the **92nd Annual Meeting of the Kentucky Academy of Sciences**, Morehead, KY 9-11 November, 2006. (Co-authored with Ronnie Leeper)

Paper, titled, “Building the Kentucky Mesonet: A Commitment to the Commonwealth” was presented at the **University of Kentucky, Biosystems and Agricultural Engineering**. December 1, 2006. (invited; Co-authored with Stuart Foster)

Paper titled, “The Kentucky Mesonet: Building Partnerships with Local Communities”, was presented at the **Green River Resource Conservation & Development Council / GRADD Natural Resources Council**. Owensboro, KY, November 14, 2006. (invited; co-authored with Stuart Foster)

Paper, titled, “Kentucky Mesonet: An overview of the current status and future goals” was presented at the **Annual Scientific Symposium of the Ohio River Basin Consortium for Research and Education**, Murray, KY 25-27 October, 2006. (Invited presentation)

Paper, titled, “Agricultural Cool Island” was presented at the **102nd Annual Meeting of the Association of American Geographers**, Chicago, IL, 7-11 April, 2006.

Paper, titled, “An assessment of key aspects of warm and cool season severe flash flooding in the southern Appalachians” was presented at the **102nd Annual Meeting of the Association of American Geographers**, Chicago, IL, 7-11 April, 2006. (co-authored with William Baldwin)

Poster, Titled, “Relationship Between Mesometeorological Patterns and Ground Ozone Concentration Variability” was presented at the **Nov. 20-22, 2005 60th Annual meeting of Southeastern Division, The Association of American Geographers, West Palm Beach, FL** 20-22, November, 2005. (co-authored with Dasen Kendrick*)

Paper, titled, “Forecasting, radar and damage analysis of the 13 July 2004 derecho through central Kentucky” was presented at the **91st Annual Meeting of the Kentucky Academy of Sciences**, Murray, KY 10-12 November, 2005. (co-authored with Ashley Littell* and Stuart Foster)

Paper, titled, “Relationship between mesometeorological patterns and ground ozone concentration variability” was presented at the **91st Annual Meeting of the Kentucky Academy of Sciences**, Murray, KY 10-12 November, 2005. (co-authored with Dasen Kendrick* and Stuart Foster)

Paper, titled, “An assessment of key aspects of warm and cool season severe flash flooding in the Southern Appalachians” was presented at the **21st Meeting of the Weather Analysis and Forecasting**, Washington, DC, 1-5 August, 2005. (co-authored with William Baldwin)

Paper, titled, “The evolution of a warm season severe eastern Kentucky flash flood” was presented at the **21st Meeting of the Weather Analysis and Forecasting**, Washington, DC, 1-5 August, 2005. (co-authored with Christina Henry)

Paper, titled, "Impacts of irrigation on regional-scale temperature in the Great Plains" was presented at the **101st Annual Meeting of the Association of American Geographers**, Denver, CO, 5-9 April, 2005.

Paper, titled, "The life cycle of a warm season severe eastern Kentucky flash flood" was presented at the **101st Annual Meeting of the Association of American Geographers**, Denver, CO, 5-9 April, 2005. (co-authored with Christina Henry)

Paper, titled, "An assessment of May 2, 2002 flash flood of Buchanan County, Virginia" was presented at the **101st Annual Meeting of the Association of American Geographers**, Denver, CO, 5-9 April, 2005. (co-authored with Jessica Phillips)

Poster, titled, "Large-scale climate variations and streamflow response in the Green River basin, KY" was presented at the **101st Annual Meeting of The Association of American Geographers**, Denver, CO, 5-9 April, 2005. (co-authored with Leslie Lyons; NSF-REU participant)

Paper, titled, "Instrument exposure bias in temperature records" was presented at the **90th Annual Meeting of the Kentucky Academy of Sciences**, Murray, KY 4-6 November, 2004. (co-authored with Dr. Stuart Foster)

Paper, titled, "The evolution of a severe eastern Kentucky flash" was presented at the **90th Annual Meeting of the Kentucky Academy of Sciences**, Murray, KY 4-6 November, 2004. (co-authored with Christina Henry)

Paper, titled, "An analysis of May 2, 2002 severe flash flooding of Buchanan county, Virginia" was presented at the **90th Annual Meeting of the Kentucky Academy of Sciences**, Murray, KY 4-6 November, 2004. (co-authored with Jessica Phillips)

Poster, titled, "Streamflow response in the Green River basin during large-scale climate variations" was presented at the **90th Annual Meeting of the Kentucky Academy of Sciences**, Murray, KY 4-6 November, 2004. (co-authored with Leslie Lyons)

Poster, titled, "Seasonal variations of significant weather events across south central Kentucky" was presented at the **90th Annual Meeting of the Kentucky Academy of Sciences**, Murray, KY 4-6 November, 2004. (co-authored with Ashley Littell)

Paper, titled, "Life cycle of a severe eastern Kentucky flash flood" was presented at the **59th Annual meeting of Southeastern Division, The Association of American Geographers**, Biloxi, MS 21-23, November, 2004. (co-authored with Christina Henry)

Paper, titled, "An investigation of May 2, 2002 flash flood of Buchanan county, Virginia" was presented at the **59th Annual meeting of Southeastern Division, The Association of American Geographers**, Biloxi, MS 21-23, November, 2004. (co-authored with Jessica Phillips)

Poster, titled, “Large-scale climate variations and streamflow response in the Green River basin” was presented at the **59th Annual meeting of Southeastern Division, The Association of American Geographers**, Biloxi, MS 21-23, November, 2004. (co-authored with Leslie Lyons)

Paper, titled, “Assessing bias in evapotranspiration and soil moisture due the use of modeled solar radiation and dew point temperature” was presented at the **100th annual conference of the Association of American Geographers** at Philadelphia, Pennsylvania, March 13- March 20, 2004.

Paper, titled, “Land use change, modification of soil moisture content, and near surface temperature records in the Northern Great Plains” was presented at the **99th annual conference of the Association of American Geographers** at New Orleans, Louisiana, March 5- March 9, 2003.

Paper, titled, “An analysis of simulated point Soil Moisture for Three Land Uses Under Contrasting Hydroclimatic Conditions in the Northern Great Plains” was presented at the **57th annual conference of the Association of American Geographers, Southeastern Division** at Richmond, VA, November 23-26, 2002.

Poster, titled, “Climate prediction, information, and policy response: a retrospective assessment of drought management in Oklahoma” was presented at the **PI’s conference, NOAA-OGP**, South Carolina, September, 2002.

Paper, titled, “Land use change and modification of near surface temperature records in the Northern Great Plains: verification of modeling results” was presented at the **13th Conference on Applied Climatology**, Portland, Oregon, May 13-16, 2002.

Paper, titled, “Sensitivity of soil moisture and evapotranspiration to soils and land use heterogeneity” was presented at the **13th Conference on Applied Climatology**, Portland, Oregon, May 13-16, 2002.

Paper, titled, “Soil moisture and evapotranspiration in Great Plains: the role of heterogeneous soil physical properties and land uses” was presented at the **56th annual conference of the Association of American Geographers, Southeastern Division** at Lexington, KY, November 17-20, 2001.

Paper, Titled, “Understanding soil water climatology of the Northern Great Plains: application of a soil water balance model” was presented at the **97th annual conference of the Association of American Geographers** at New York, New York, February 27- March 4, 2001.

Paper, Titled, “Land use change and its impacts on the soil moisture hydrology in the Northern Great Plains” was presented at the **97th annual conference of the Association of American Geographers** at New York, New York, February 27- March 4, 2001.

Poster, titled, “Soil moisture monitoring and modeling in the Northern Great Plains”, was presented at the **GEWEX/BAHC International Workshop on Soil Moisture**, University of Oklahoma, Norman, Oklahoma, May 15-19, 2000.

Paper, titled, "Application of a soil water balance model to historical soil moisture estimation over eastern Nebraska", was presented at the **12th Conference on Applied Climatology**, Asheville, North Carolina, May 8-11, 2000.

Paper, titled, "Daily soil moisture measurement network of the Northern Great Plains: sensors, their calibration, and applications", was presented at the **12th Conference on Applied Climatology**, Asheville, North Carolina, May 8-11, 2000.

Paper, titled, "Time of observation and estimation of daily solar radiation for the Northern Great Plains", was presented at the **12th Conference on Applied Climatology**, Asheville, North Carolina, May 8-11, 2000.

Paper, titled, "Soil moisture monitoring and modeling in the Plains", was presented at the **International Workshop on Automated Weather Stations for Applications in Agriculture and Water Resources Management: Current Use and Future Perspectives**, University of Nebraska-Lincoln, Lincoln, Nebraska, March 6-10, 2000.

Paper, Titled, "El Nino Related Monsoonal Rainfall Variability in South Asia: Testing of Some Hypotheses" was presented at the **94th annual conference of the Association of American Geographers** at Boston, Massachusetts, March 25-29, 1998.

Paper, Titled, "El Nino Related Monsoonal Rainfall Variability in South Asia" was presented at the **93rd Annual Conference of the Association of American Geographers** at Fort Worth, Texas, April 1-5, 1997.

Paper, Titled, "Seasonal Distribution of Precipitation Extremes Over the Southern Great Plains", was presented at the **92nd Annual Conference of the Association of American Geographers** at Charlotte, North Carolina, April 9-13, 1996.

Paper, Titled, "Model-based Estimates of Impacts of Air temperature Variations on the Boro Rice Phenology in Bangladesh" was presented at the **76th Annual Conference of the American Meteorological Society**, Atlanta, Georgia, January 28-February 3, 1996.

Paper, Titled, " Impacts of Air Temperature Fluctuations on the Boro Rice Phenology in Bangladesh: A Model-based assessment" was presented at the **91st Annual Conference of the Association of American Geographers** at Chicago, Illinois, March 14-18, 1995.

Paper, Titled, "Impacts of El Nino Related Monsoonal Rainfall Variability and Resultant Rice Productivity in Bangladesh and Eastern India: A Model-based Assessment" was presented at the **Annual Conference of the South West Division, The Association of American Geographers**, held on the 21-22nd October, 1994, Hot Springs, Arkansas.

Paper, Titled, "Systematic Climate Perturbation and Boro Rice Yield in Bangladesh: Application of a Parametric Crop Yield model" was presented at the **90th Annual Conference of The Association of American Geographers at San Francisco**, California, 29 March - 2 April, 1994.

Paper, Titled, "Monsoonal Fluctuations and Rice Yield in Bangladesh: Application of a Numerical Crop Yield model" was presented at the **1992 Annual Conference of the Middle States Division, The Association of American Geographers** at Syracuse, New York.

Paper, Titled, " Some Aspects of Variations of Rainfall Over Bangladesh" was presented in the **9th Annual Student Conference on water resources organized by the American Water Resources Association** held on the 6th April, 1991 at Syracuse, New York.

INVITED PRESENTATIONS:

University of Alabama, Tuscaloosa, AL (1999)
University of Nebraska-Lincoln, Lincoln, NE (1999)
Kent State University, Kent, OH (2000)
University of Montana, Missoula, MN (2000)
California State University, Los Angeles, CA (2001)
Western Kentucky University, Bowling Green, KY (2001)
University of Missouri-Columbia, Columbia, MO (2001)
Kansas State University, Manhattan, KS (2001)
University of Minnesota, Twin Cities, MN (2002)
University of Delaware, Newark, DE (2003)

GRANT REVIEWER:

The National Science Foundation, USA (Office of Polar Programs, Atmospheric Science, Hydrology, Geography and Regional Science).

University Grant Committee, Hong Kong.

MANUSCRIPT REVIEWER:

Geophysical Research Letters
Journal of Applied Meteorology and Climatology
International Journal of Climatology
Climate Research
Agricultural and Forest Meteorology
Physical Geography
Applied Geography
Journal of Hydrology
Hydrological Sciences Journal
Journal of the American Water Resources Association
Agricultural Water Management
Journal of Spatial Hydrology
International Journal of Environmental Pollution
International Journal of Remote Sensing
Geography Compass
Global and Planetary Change

EDITORIAL BOARD MEMBER:

Physical Geography
Geography Compass

PROFESSIONAL MEMBERSHIP:

The Association of American Geographers (AAG)
The American Meteorological Society (AMS)
The American Geophysical Union (AGU)
The American Association of State Climatologists (AASC)
South Eastern Division, the Association of American Geographers (SEDAAG)

DISSERTATION COMMITTEE:

Prakash K. Patil, 2002, Department of Geography, University of Pune, India.

THESIS PROJECT DIRECTOR FOR THE FOLLOWING STUDENTS:

Daniel Taylor (Outstanding Graduate Student in Geoscience--2004), Christina Henry, William Baldwin, Dasen Kendrick, Ashley Littell (Outstanding Graduate Student in Geoscience--2007), and Ronnie Leeper (Outstanding Graduate Student in Geoscience; and Outstanding Graduate Student of the Ogden College of Science and Engineering--2009)

THESIS COMPLETED:

Title: Spatio-temporal analysis of observed soil moisture data from Nebraska. **Completed by:** Ashley Littell. **Thesis Project Director:** Dr. Rezaul Mahmood. April, 2007.
Currently employed by Connected Nation

Title: An analysis of key aspects of warm and cool season flash flooding in the southern Appalachians. **Completed by:** William Baldwin. **Thesis Project Director:** Dr. Rezaul Mahmood. April, 2007.
Currently employed by Tennessee Emergency Management Agency (TEMA) (September, 2007)

Title: Flash flooding in eastern Kentucky: An analysis of 3-4 August 2001 event. **Completed by:** Christina Henry. **Thesis Project Director:** Dr. Rezaul Mahmood. November, 2006.
Was employed by University of Kentucky (June, 2007)

Title: The Relationship Between Meteorological Patterns and Rural Ground Ozone Concentration. **Completed by:** Dasen Kendrick. **Thesis Project Director:** Dr. Rezaul Mahmood. December, 2005.

Currently employed by a private environmental consulting firm in Houston, TX. (December, 2006)

Title: Evaluating Spatial Variability of Precipitation in Kentucky with Exploratory Data Analysis. **Completed by** Daniel R. Taylor. **Thesis Project Director:** Dr. Rezaul Mahmood. September, 2004.

Currently employed by the US Government. (September, 2004)

PAST PROFESSIONAL EXPERIENCE (TEACHING):

- * Instructor, Physical Geography, Department of Geography, The University of Oklahoma, Spring and Summer, 1996.
- * Lecturer, Computer Science Minor Program, SUNYA, Spring, 1993. Assigned to Teach Introduction to Mainframe Computing and Programming with Mainframe SPSS.
- * Teaching Assistant, Computer Science Minor Program, SUNYA, Fall, 1991 to Fall, 1992.
- * Teaching Assistant for the Course 'Geography of New York State' at the Department of Geography and Planning, SUNYA, in spring, 1991.
- * Lecturer, Dept. of Geography, Dhaka City College, Dhaka, Bangladesh, August, 1989 - March, 1990.

PAST PROFESSIONAL EXPERIENCE (RESEARCH):

- * Post-doctoral research associate, High Plains Regional Climate Center, School of Natural Resource Sciences, University of Nebraska-Lincoln. 1999 – 2001.
- * Research assistant, Science and Public Policy Program, Summer, 1997 to Spring, 1999. Title of the project: "Climate prediction, information, and policy response: a retrospective assessment of drought management in Oklahoma."
- * Student Intern, Space Imaging/EOSAT, Summer, 1996 to Spring , 1997.
- * Research Assistant, Department of Geography, The University of Oklahoma, Fall, 1994 to Spring, 1996. Title of the project: "Abnormal precipitation and floods and droughts in the Southern Great Plains."
- * Member, University at Albany Graduate Student Organization's research grant review committee, 1992.
- * Geographer-Researcher and SPANS Analyst, Agricultural Sector Team, Canadian International Development Agency, Dhaka, Bangladesh, April - August, 1990.
- * Research Assistant, Center for Urban Studies, University of Dhaka, Bangladesh, April-July, 1989.
- * Assisted faculty members as a research assistant in 12 research projects (1983-1988).

PROFESSIONAL ACTIVITIES (SERVICE):

Lead co-organizer (with Roger Pielke Sr. and Kenneth G. Hubbard) of a **NSF funded workshop**, titled, Detecting the Atmospheric Response to the Changing Face of the Earth: A Focus on Human-Caused Regional Climate Forcings, Land-Cover/Land-Use Change, and Data Monitoring, August 27-29, 2007 Boulder, CO.

Organized first meeting of KY-Mesonet consortium. (Geography Symposium: “Building the Kentucky Mesonet”). **92nd Annual Meeting of the Kentucky Academy of Sciences**, Morehead, KY 9-11 November, 2006.

Organizer, two special sessions in hydroclimatology and land use/land cover change, at the 102nd annual meeting of the AAG, 2006.

Organizer, three special sessions in hydroclimatology, at the 101st annual meeting of the AAG, 2005.

Chair, one special session in hydroclimatology, at the 101st annual meeting of the AAG, 2005.

Organizer, two special sessions in hydroclimatology, at the 100th annual meeting of the AAG, 2004.

Chair, one special session in hydroclimatology, at the 100th annual meeting of the AAG, 2004.

Organizer, special session in hydroclimatology, at the 99th annual meeting of the AAG, 2003.

Chair, one special session in hydroclimatology, at the 99th annual meeting of the AAG, 2003.

Organizer, two special sessions in hydroclimatology at the 97th annual meeting of the Association of American Geographers, 2001.

Chair, one special session on hydroclimatology at the 97th annual meeting of the Association of American Geographers, 2001.

Young Scholar Director, 1997-1999, Climate Specialty Group (CSG), The Association of American Geographers.

Organizer, two special sessions in hydroclimatology at the 94th annual meeting of the Association of American Geographers, 1998.

Chair, one special session in hydroclimatology at the 94th annual meeting of the Association of American Geographers, 1998.

Organizer, two special sessions in hydroclimatology at the 93rd annual meeting of the Association of American Geographers, 1997.

Organizer, three special sessions in hydroclimatology at the 92nd annual meeting of the Association of American Geographers, 1996.

Chair, Special Session on Precipitation Climatology: Temporal Aspects, at the 92nd annual meeting of the Association of American Geographers, 1996.

COMPUTER EXPERIENCE: UNIX, VAX/VMS, LOTUS 123, QUATRO-PRO, EXCEL, SPSS, FORTRAN, C, MATLAB, SAS, ARC/INFO, ARCVIEW, SPANS, WORD PERFECT, AND MS-WORD.

MENTORING: Dan Taylor, Christina Henry, Dasen Kendrik, William Baldwin, David Logan, Christopher A. Hawkins, Ronnie Leeper, Travis Keeling (Outstanding undergraduate student in Geography), Jessica S. Phillips, William Rodgers (Outstanding undergraduate student in Geography), Nicholas Lawalin, Astrid Gonzalez, Jane Wix, Timothy Malone, Danny Gant, Ryan Torres.

AWARDS:

Recipient of the Western Kentucky University Award for Research and Creativity, 2005-2006.

Recipient of the Ogden College of Science and Engineering, WKU, Award for Research and Creativity, 2005-2006.

WKU Nominee for the Kentucky Academy of Science's Distinguished Scientist Award, 2006.

Winner of the Ralph E. and Margaret Olson Geography Graduate Student of the Year Scholarship, 1997. (Received: \$1000)

Winner of the Francis E. Lortz Scholarship of 1995. Presented by the *American Society for Photogrammetry and Remote Sensing*, Rolla Region. (Received: \$500)

Second Prize Winner for the Paper, Titled, " Impacts of Air Temperature Fluctuations on the Boro Rice Phenology in Bangladesh: A Model-based assessment". Climate Specialty Group Student Paper Competition, 91st Annual Conference of the Association of American Geographers, Chicago, March 14-18, 1995.

Honorable Mention for the Presentation of the Paper, Titled, "Impacts of El Nino Related Monsoonal Rainfall Variability and Resultant Rice Productivity in Bangladesh and Eastern India: A Model-based Assessment". Annual Conference 1994, South West Division, Association of American Geographers. Held at Hot Springs, Arkansas, October 21-22.

GRANTS:

Total Grant Support Successfully Obtained: \$6,573,885

Coordinating PIs- Claire Rinehart and Rezaul Mahmood. WKU-High Performance Computing Center. Submitted to: U. S. Department of Education. Total Budget: \$2,379,000. Status: **Funded**.

PI-Stuart Foster, Co-PI Rezaul Mahmood. Developing an environmental monitoring system for Kentucky. Submitted to: NOAA. Total budget: \$700,000. Status: **Funded**.

PI- Rezaul Mahmood. 2009. Emission dispersion modeling from the livestock farms. Submitted to: The United States Department of Agriculture. Total Budget: \$135, 229. Status: **Funded**.

PI-Rezaul Mahmood. Timing Shifts in Occurrence of Continental-scale Seasonal High and Low Atmospheric Moisture Content. Submitted to WKU: Total Budget: \$5,000. Status: **Funded**.

PI-Rezaul Mahmood, Nanh Lovanh, and John Loughrin. Factors controlling the emissions of malodors and greenhouse gases from livestock operations: Monitoring to mathematical modeling of fate and transport processes. Submitted to USDA. Total Budget: \$391,182. Status: Not funded.

PI-Rezaul Mahmood, James Gary, and Jun Yan. 2009. MRI: Acquisition of Land-Surface Energy Flux Measurement Equipments and Building Cyberinfrastructure for Understanding the Role of Soil Moisture in Development of Planetary Boundary Layer. Submitted to: The NSF. Total budget: \$1,159,000. Status: Not funded.

PI- Cathleen Webb and Rezaul Mahmood. 2008. Impacts of Land Use/Land Cover in the Upper Green River Watershed in Western Kentucky. Submitted to: The NSF. Total budget: \$428, 000. Status: Not funded.

PI-Nanh Lovanh, John Loughrin, and Rezaul Mahmood. Factors controlling the emissions of malodors and greenhouse gases from livestock operations: Monitoring to mathematical modeling of fate and transport processes. Submitted to USDA. Total Budget: \$579,000. Status: Not funded.

PI-Stuart Foster, Co-PI Rezaul Mahmood. 2008. Developing an environmental monitoring system for Kentucky. Submitted to: NOAA. First Year budget: \$668, 997. Status: **Funded**.

PI- Rezaul Mahmood. 2008. Emission dispersion modeling from the livestock farms. Submitted to: The United States Department of Agriculture. Total Budget: \$112, 599. Status: **Funded**.

PI-Rezaul Mahmood, James Gary, Jun Yan, and Stuart Foster. 2008. MRI: Acquisition of Land-Surface Energy Flux Measurement Equipments and Building Cyberinfrastructure for Understanding the Role of Soil Moisture in Development of Planetary Boundary Layer. Submitted to: The NSF. Total budget: \$1,200,000. Status: Not funded.

PI- Phillip Womble, Tim Stombaugh, Rezaul Mahmood, John Spadaro. 2007. AgWatch: A Method of Detecting Crop Disease Breakouts Using Multispectral Sensors. Pre-proposal. Submitted to: National Institute For Hometown Security. Total Budget: \$973,000. Status: Not Funded.

PI- Eugene S. Takle, WKU PI-Rezaul Mahmood, Co-PIs Jun Yan, Gregory Goodrich, Yanmei Li, Stuart Foster. 2007. Midwest Consortium for Climate Assessment (MiCCA). Submitted to: NOAA. WKU budget: \$250, 000. Status: Not Funded.

PI-Stuart Foster, Co-PI Rezaul Mahmood. 2007. Developing an environmental monitoring system for Kentucky. Submitted to: NOAA. First Year budget: \$400, 000. Status: **Funded.**

PI- Rezaul Mahmood. 2007. Emission dispersion modeling from the livestock farms. Submitted to: The United States Department of Agriculture. Total Budget: \$82, 878. Status: **Funded.**

PI-Rezaul Mahmood, Roger Pielke Sr., Kenneth Hubbard. 2007. Workshop on Detecting the Atmospheric Response to the Changing Face of the Earth (Boulder, Colorado, August 27-29, 2007). Submitted to: The National Science Foundation. Total Budget: \$15, 000. Status: **Funded.**

PI-Stuart Foster, Co-PI Rezaul Mahmood. 2006. Developing an environmental monitoring system for Kentucky. Submitted to: NOAA. First Year budget: \$1, 500, 000. Status: **Funded.**

PI-Rezaul Mahmood. Changes in timing of first and last days of frost and annual frost frequency due to land use change. WKU Faculty Research Council. Total Budget: \$5, 000. Status: **Funded.**

PI-Rezaul Mahmood, Co-PI Jun Yan, Lakshmi Narasimhan, Christi McMichael, John Tibe, and Stuart Foster. 2007. Pre-proposal: The Center for Integrated Land Atmosphere Studies (CILAS). Submitted to: **The National Science Foundation.** Total Budget: \$4, 200, 000. Status: Not funded

PI-Lakshmi Narasimhan, Co-PI Rezaul Mahmood, James Gary, Jun Yan, and Christi McMichael. Collaborative Research: EDAM: An anchor desk for Environmental Disaster Analysis & Management -Design of foundational infrastructure based on high performance & grid computing. Submitted to: The National Science Foundation. Total Budget: \$368, 199. Status: Not funded.

PI- Rezaul Mahmood. 2006. Emission dispersion modeling from the livestock farms. Submitted to: The United States Department of Agriculture. Total Budget: \$40, 000. Status: **Funded.**

PI-Rezaul Mahmood. 2006. Flash flood climatology of the Appalachian region. Submitted to: The National Climatic Data Center/NOAA. Total Budget: \$1, 900. Status: **Funded.**

PI-Rezaul Mahmood. 2005. Collaborative research: Spatio-temporal variability of soil moisture and land memory processes in the Great Plains. Submitted to: The National Science Foundation. Total Budget: \$225, 704. Status: Not funded.

PI- Rezaul Mahmood. 2005. The First Assessment of Observed Data-based Soil Moisture Variations in the Northern Great Plains. Total Budget: \$5, 000. Status: **Funded.**

PI-Rezaul Mahmood 2005. Measurement and modeling of near surface micro- and meso-scale

processes. Submitted to: The United States Department of Agriculture. **Total Budget: \$45,000.** Status: **Funded.**

PI-Michael Trapasso, Co-PI Rezaul Mahmood. 2005. Establishment of research grade climate/meteorology laboratory facility. Proposal submitted to KY NSF-EPSCoR. **Total Budget: \$75,000.** Status: **Funded.**

PI-David Legates, Co-PI Rezaul Mahmood and Collaborators. 2005. Estimating bias in precipitation measurement. Submitted to The National Science Foundation. **Total Budget: \$290,000.** Status: Not funded.

PI- Michael Trapasso, Co-PI Rezaul Mahmood. 2005. Enhancement of computation facilities for the Climate/Meteorology program. **Total Budget: \$10,000.** Status: **Funded.**

PI-Cathleen Webb, Co-PI Rezaul Mahmood. 2004. Summer Research Experience for Undergraduates in the Mammoth Cave/ Upper Green River Watershed. Proposal submitted to: The National Science Foundation (NSF). **Total Budget: \$254,000.** Status: **Funded**

PI-Kenneth G. Hubbard, Rezaul Mahmood, and David R. Legates. 2004. Spatio-temporal variability of soil moisture and land memory processes in the Great Plains. Submitted to: The National Science Foundation. Total Budget: \$347,000. Status: Not Funded.

PI-Rezaul Mahmood, Daniel Leathers, and David R. Legates. 2004. An alternative hypothesis of El Nino related monsoonal rainfall variability in Bangladesh and Eastern India. Submitted to: The National Science Foundation. Total Budget: \$282,000. Status: Not Funded.

PI-Rezaul Mahmood. 2004. Assessing Precipitation Variability in the Mid-latitudes Using A High Density Precipitation Measuring Network in the Mammoth Cave National Park. Budget: \$1,000. Status: **Funded.** (second phase)

PI- Michael Trapasso, Co-PI Rezaul Mahmood. 2004. Enhancement of computation facilities for the Climate/Meteorology program. Amount requested: \$25,000. Status: Not Funded.

PI-Rezaul Mahmood and Co-PI Stuart Foster. 2004. Development of south central Kentucky mesonet. Total Budget: **\$24,000.** Status: **Funded.**

PI-Rezaul Mahmood. 2004. Impacts of Land Use Change on Near Surface Dew Point Temperature Records in the Great Plains. Submitted to the National Climatic Data Center. Total Budget: **\$2,500.** Status: **Funded.**

PI-Rezaul Mahmood, Daniel Leathers, and David R. Legates. 2003. An alternative hypothesis of El Nino related monsoonal rainfall variability in Bangladesh and Eastern India. Submitted to: The National Science Foundation. Total Budget: \$318,000. Status: Not Funded.

PI-Kenneth G. Hubbard, Rezaul Mahmood, and David R. Legates. 2003. Spatio-temporal variability of soil moisture and land memory processes in the Great Plains. Submitted to: The

National Science Foundation. Total Budget: \$264, 000. Status: Not Funded.

PI-Rezaul Mahmood. 2003. Flash flooding in the Eastern Kentucky: A hydrometeorological case study. Submitted to: The National Oceanic and Atmospheric Administration. **Total Budget: \$10, 000.** Status: **Funded.**

PI- Michael Trapasso, Co-PI Rezaul Mahmood. 2003. Real-time meteorological data feed to Climate/Meteorology lab. **Total Budget: \$24, 000.** Status: **Funded**

PI-Rezaul Mahmood. 2003. Relationship between near-surface and root zone soil moisture: Implication for remote sensing. WKU faculty research council. **Total Budget: \$5, 000.** Status: **Funded**

PI-Rezaul Mahmood. 2003. Assessing Precipitation Variability in the Mid-latitudes Using A High Density Precipitation Measuring Network in the Mammoth Cave National Park. **Total Budget: \$1, 000.** Status: **Funded.**

PI-Stuart Foster, Co-PI Rezaul Mahmood. 2003. Joint initiative on local and regional hydroclimatic research. Funding source: Applied Research and Technology Program (ARTP), Western Kentucky University. **Total Budget: \$25, 000.** Status: **Funded.**

PI-Stuart Foster, Co-PI Rezaul Mahmood. 2003. Developing an environmental monitoring system for Kentucky. Proposed budget: \$3,248,500. Status: Pending

PI-Rezaul Mahmood. 2003. Precipitation measurement at the Mammoth cave National Park. Funding Source: Kentucky Council on Postsecondary Education. **Total Budget: 13, 000.** Status: **Funded.**

PI-Michael Trapasso, Co-PI Rezaul Mahmood. 2002. Meteorological lab upgrade. Funding organization: Western Kentucky University. **Total Budget: \$24, 762.** Status: **Funded.**

PI-Rezaul Mahmood. 2002. Determining Sensitivity of a Physically-based Soil Water Model to Estimated Solar Radiation and Relative Humidity. Proposal Submitted to Western Kentucky University Faculty Research Council. **Total Budget: \$5, 000.** Status: **Funded.**

PI-Rezaul Mahmood. 2003. An assessment of El Nino related monsoonal rainfall variability in Bangladesh and eastern India. KY NSF-EPSCoR. Proposed total budget: \$49, 000. Status: Not funded.

PI-Rezaul Mahmood. 2002. An alternative hypothesis of El Nino related monsoonal rainfall variability in Bangladesh and eastern India. Proposal submitted to: The National Science Foundation, CAREER Program. Amount requested: \$491, 921. Status: Not funded.

PI-Kenneth G. Hubbard, Co-PI Rezaul Mahmood and Alan Basist. 2002. Soil moisture climatology and land memory processes in the Northern Mississippi and Missouri Basins. Proposal submitted to: The Office of Global Programs, The National Oceanic and Atmospheric

Administration (NOAA). Amount Requested: \$189, 223. Status: Not funded.

PI-Cathleen Webb, Co-PI Rezaul Mahmood. 2002. Summer Research Experience for Undergraduates in the Mammoth Cave/ Upper Green River Watershed. Proposal submitted to: The National Science Foundation (NSF). Amount requested: \$314, 061. Status: Not funded.

PI-Michael Trapasso, Co-PI Rezaul Mahmood. 2002. Meteorological lab upgrade. Funding organization: Western Kentucky University. Proposed budget: \$33, 632. Status: Not funded.

PI-Rezaul Mahmood, Co-PI Chris Groves. 2002. Mammoth cave meteorological flux measuring instrumentation. Funding Organization: National Park Service. Proposed budget: \$200, 000. Status: Not funded.

PI-Kenneth G. Hubbard, Co-PI Rezaul Mahmood and Alan Basist. 2001. Soil moisture climatology and land memory processes in the Northern Mississippi and Missouri Basins. Proposal submitted to: The Office of Global Programs, The National Oceanic and Atmospheric Administration (NOAA). Amount Requested: \$267, 277. Status: Not funded.

PI-Cathleen Webb, Co-PI Rezaul Mahmood. 2001. Summer Research Experience for Undergraduates in the Mammoth Cave/ Upper Green River Watershed. Proposal submitted to : The National Science Foundation (NSF). Amount requested: \$284,880. Status: Not funded.

PI-Nevil Speer 2001. A case study of anthropogenic inputs in a karst/non-karst watershed: stakeholder participation in watershed management. Proposal submitted to: The United States Department of Agriculture (USDA). Amount Requested: \$590,296. Status: Not funded

PI-Rezaul Mahmood, Co-PI Burl I. Naugle, Co-PI Christopher Groves, Co-PI Sturat Foster. 2001. Flooding in karst watersheds: a hydrometeorological and hydro-geomorphic analysis. Proposal submitted to: KYEPSCoR. Amount requested: \$20,000. Status: Not funded.

PI-Rezaul Mahmood. 2001. El Nino related monsoonal rainfall variability in Bangladesh and eastern India: an analysis of synoptic-scale atmospheric forcing. Proposal Submitted to Western Kentucky University Faculty Research Council. **Total Budget: \$3,930.** Status: **Funded.**

PI-Kenneth G. Hubbard, Co-PI Rezaul Mahmood and Geoffrey Henebry. 2000. Soil moisture persistence and water cycling through land-surface-atmosphere-continuum in the Northern Great Plains. Proposal submitted to: The National Aeronautics and Space Administration (NASA). Amount Requested: \$595,324. Status: Not funded.

PI-Kenneth G. Hubbard, Co-PI Rezaul Mahmood and Alan Basist. 2000. Soil moisture climatology and land memory processes in the Northern Mississippi and Missouri Basins. Proposal submitted to: The Office of Global Programs, National Oceanic and Atmospheric Administration (NOAA). Amount Requested: \$401,812. Status: Not funded.

PI-Kenneth G. Hubbard, Co-PI Rezaul Mahmood, Mary Knapp, Allen Bender, John Enz, and Gary Peterson. 2000. Understanding Drought and mitigating its impacts through monitoring, modeling,

and education. Pre-proposal submitted to: United States Department of Agriculture-North Central Region. Amount requested: \$85,878. Status: Not funded.

PI-Rezaul Mahmood. Impacts of scale-aggregation of Landsat-TM data on energy flux estimation. Funded by Oklahoma NASA Space Grant Consortium (OSGS), 1999. Amount: \$2,500. **Funded**

Dissertation Field Research Grant from the University of Oklahoma, 1998. Amount: \$1,850. **Funded.**

Travel Grant from the Department of Geography and College of Geosciences, The University of Oklahoma, 1998. Amount: \$750. **Funded**

PI-D. R. Legates, Co-PI Rezaul Mahmood. The Himalayan Snow Melt Runoff and It's Impact on the Flooding Magnitude of the Lower Ganges-Brahmaputra basin. Pre-proposal Submitted to: National Aeronautics and Space Administration. Amount Requested: \$210,000. Status: Not funded. 1997.

PI-Mark Morrissey, Co-PI- Rezaul Mahmood. El Nino Related Monsoonal Rainfall Variability and Rice Productivity in South Asia. Submitted to: National Science Foundation. Amount Requested: \$9,150. Status: Not funded. 1997.

PI-D. R. Legates, Co-PI May Yuan and Rezaul Mahmood. Interactions between Monsoonal Rainfall Variability and Rice Productivity in South Asia Using a GIS-based Approach. Submitted to: National Science Foundation. Amount Requested: \$120,000. Status: Not funded. 1997.

Received \$250 from the Graduate Student Senate to participate 94th annual meeting of the Association of American Geographers at Boston, Massachusetts. 1998.

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